APPENDIX A:

Alaska Class I Area Monitoring Data Summary Tables and Charts

Includes the following subsections:

Subsection	IMPROVE Monitor	Class I Area(s) Represented
A.1	DENA1	Denali NP
A.2	SIME1	Simeonof WA
A.3	TRCR1	Trapper Creek*
A.4	TUXE1	Tuxedni WA

*Not a Federal Class I Area

A.1. DENALI NP (DENA1)

The following tables and figures are presented in this section for Denali National Park represented by the DENA1 IMPROVE Monitor:

- **Table A.1-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure A.1-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure A.1-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure A.1-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure A.1-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure A.1-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure A.1-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure A.1-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure A.1-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table A.1-1
Denali NP, AK (DENA1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	2.7	2.5	2.3	2.2	2.4	2.1	2.5	2.5	2.5	2.5	2.4	0.0	0.5	2.4	2.4	0.0	0%
Worst 20% Days	10.6	9.1	10.2	9.9	9.4	10.4	9.8	8.8	9.3	14.7	8.5	0.0	0.4	9.9	10.6	0.7	7%
All Days	5.5	5.2	5.4	5.5	5.2	5.2	5.6	5.2	5.5	7.0	5.2	0.0	0.2	5.3	5.7	0.4	8%
Total Extinction (Mm-1)																	
Best 20% Days	13.1	12.9	12.6	12.4	12.8	12.3	12.9	12.9	12.8	12.9	12.8	0.0	0.5	12.8	12.8	0.0	0%
Worst 20% Days	44.0	27.1	29.7	27.3	27.0	32.3	27.4	24.4	26.2	59.5	23.8	-0.2	0.3	31.0	34.0	3.0	10%
All Days	21.2	17.7	18.3	18.0	17.6	18.4	18.3	17.2	18.1	25.5	17.2	0.0	0.5	18.6	19.5	0.9	5%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	0.8	1.0	0.8	0.7	0.8	0.5	1.0	0.9	0.9	1.0	0.8	0.0	0.2	0.8	0.9	0.1	13%
Worst 20% Days	4.6	4.6	6.0	5.4	3.6	4.5	8.5	5.6	7.6	13.1	4.0	0.5	0.1	4.9	7.8	2.9	59%
All Days	2.4	2.5	2.8	2.7	2.1	2.5	3.8	2.7	3.5	5.1	2.4	0.1	0.0	2.5	3.5	1.0	40%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0%
Worst 20% Days	0.7	0.6	0.4	0.5	0.8	0.6	0.7	0.9	0.8	0.7	0.9	0.0	0.1	0.6	0.7	0.1	17%
All Days	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.0	0.4	0.3	0.4	0.1	33%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	0.5	0.3	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.0	0.4	0.3	0.3	0.0	0%
Worst 20% Days	23.5	7.1	8.7	7.0	7.9	12.5	3.6	3.9	3.3	30.4	5.0	-0.6	0.2	10.8	10.7	-0.1	-1%
All Days	5.7	2.1	2.6	2.3	2.5	3.1	1.5	1.7	1.6	6.9	1.7	-0.1	0.3	3.0	3.0	0.0	0%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.1	-0.1	-50%
Worst 20% Days	2.3	1.3	1.4	1.6	1.3	1.7	0.9	1.1	0.8	2.1	1.1	-0.1	0.2	1.6	1.3	-0.3	-19%
All Days	0.8	0.6	0.7	0.7	0.5	0.6	0.5	0.5	0.4	0.7	0.5	0.0	0.1	0.6	0.5	-0.1	-17%
Soil Extinction (Mm-1)																	
Best 20% Days	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.5	0.0	0.0	0.0	0%
Worst 20% Days	0.2	0.5	0.5	0.2	0.2	0.2	0.4	0.2	0.3	0.4	0.2	0.0	0.4	0.3	0.3	0.0	0%
All Days	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.0	0.3	0.1	0.2	0.1	100%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.0	0.1	0.2	0.3	0.1	50%
Worst 20% Days	1.2	1.8	1.6	1.0	1.3	1.2	1.2	0.9	1.3	1.3	1.1	0.0	0.2	1.4	1.2	-0.2	-14%
All Days	0.7	0.8	0.7	0.6	0.6	0.6	0.7	0.6	0.7	0.8	0.8	0.0	0.4	0.7	0.7	0.0	0%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.1	0.1	0.0	0%
Worst 20% Days	0.5	0.3	0.0	0.5	0.9	0.7	1.0	0.8	1.0	0.6	0.6	0.1	0.0	0.4	0.8	0.4	100%
All Days	0.2	0.2	0.1	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.3	0.0	0.0	0.2	0.3	0.1	50%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure A.1-1
Denali NP, AK (DENA1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

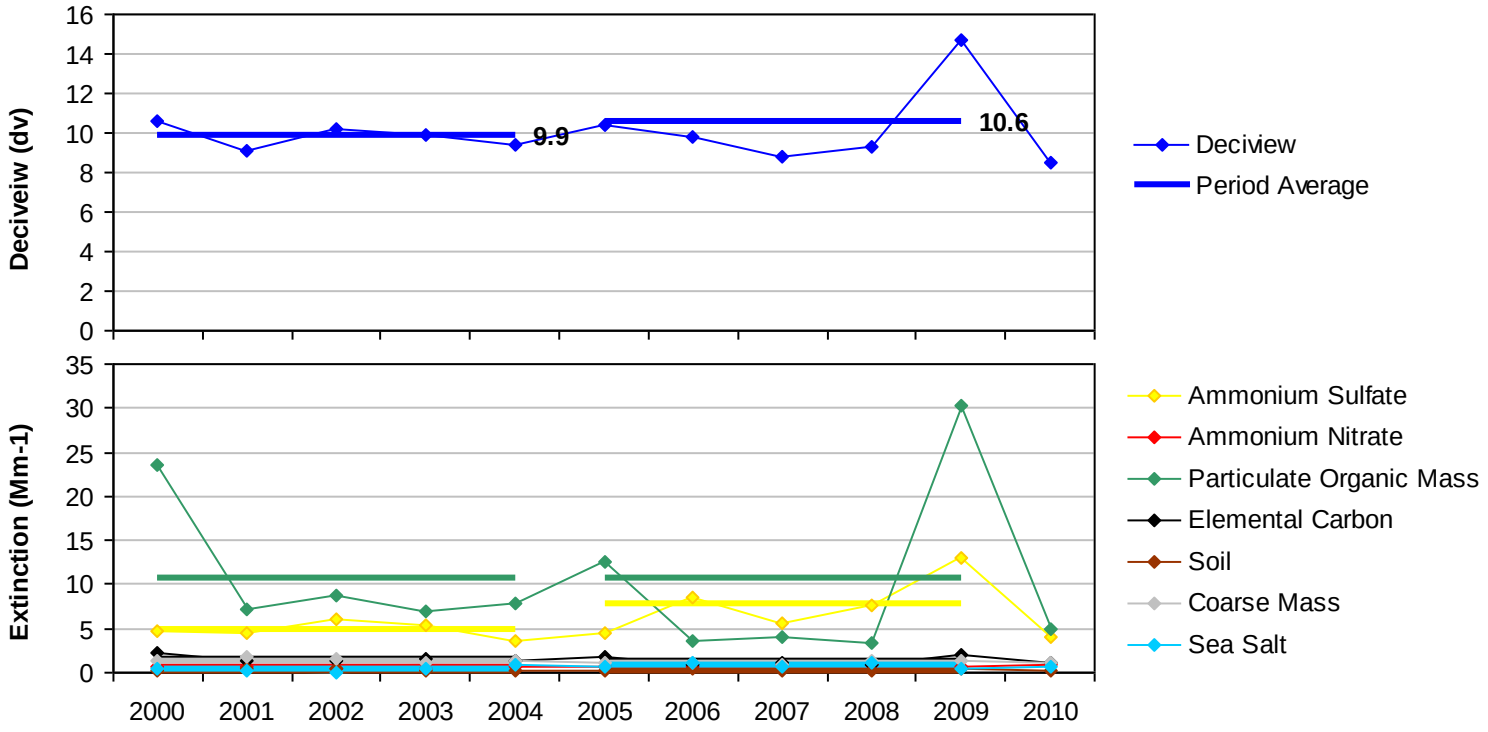


Figure A.1-2
Denali NP, AK (DENA1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

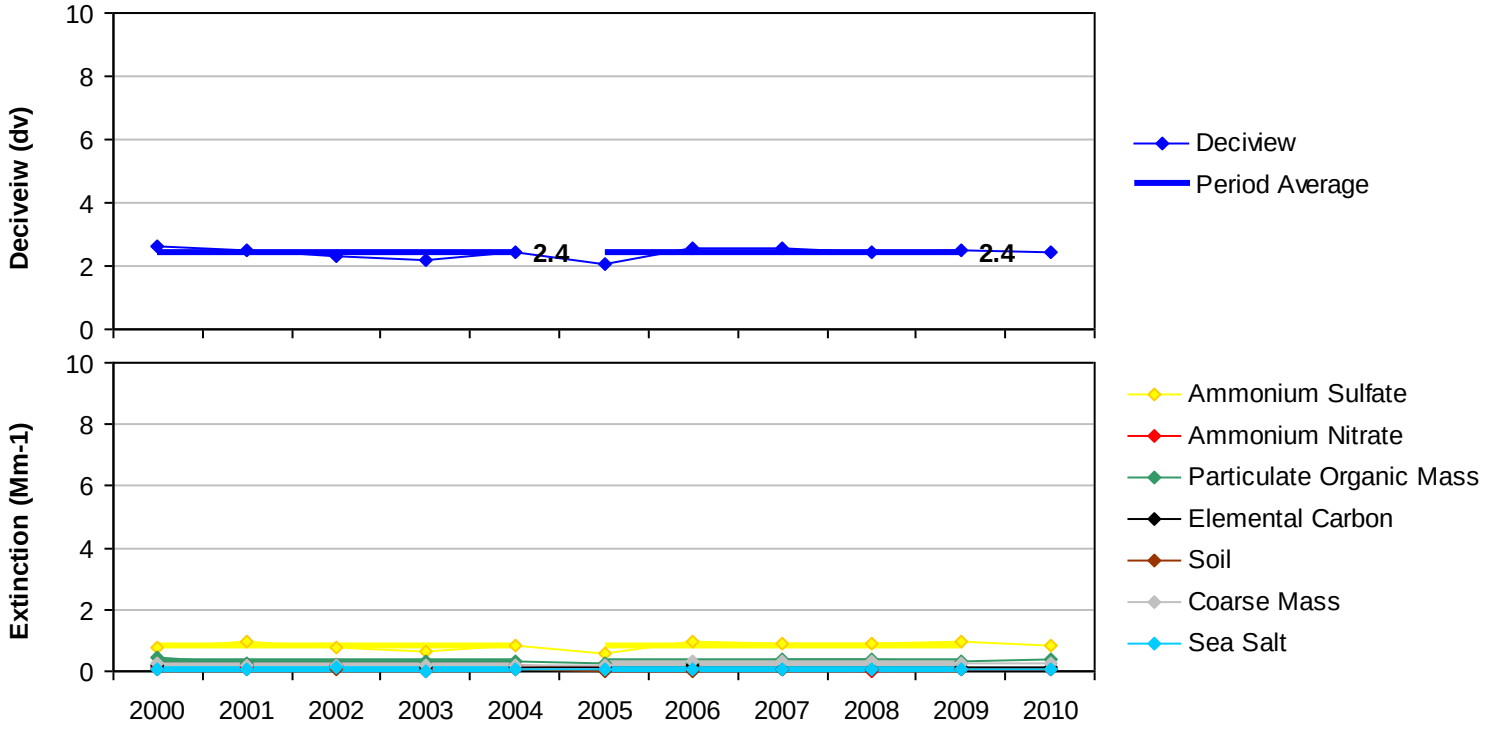


Figure A.1-3
Denali NP, AK (DENA1 Site)
20% Most Impaired Visibility Days

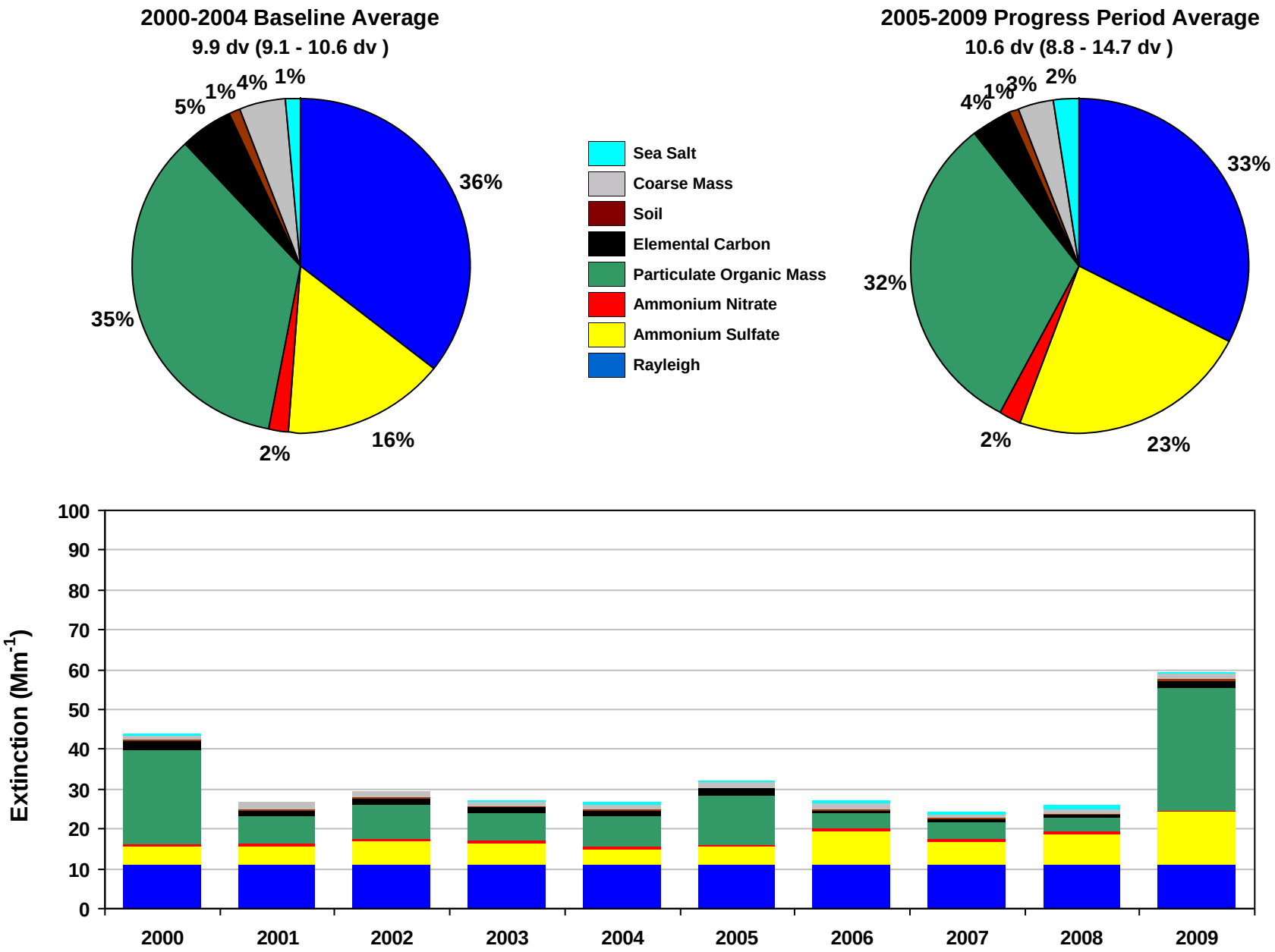
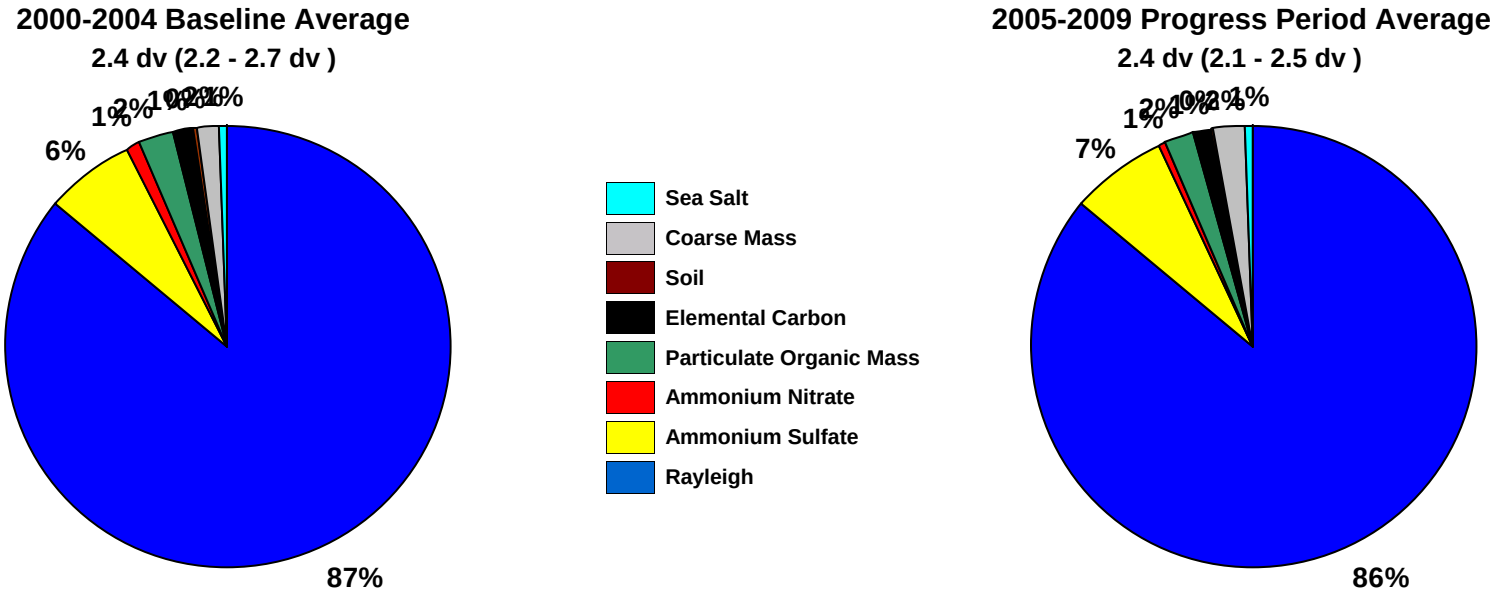


Figure A.1-4
Denali NP, AK (DENA1 Site)
20% Least Impaired Visibility Days



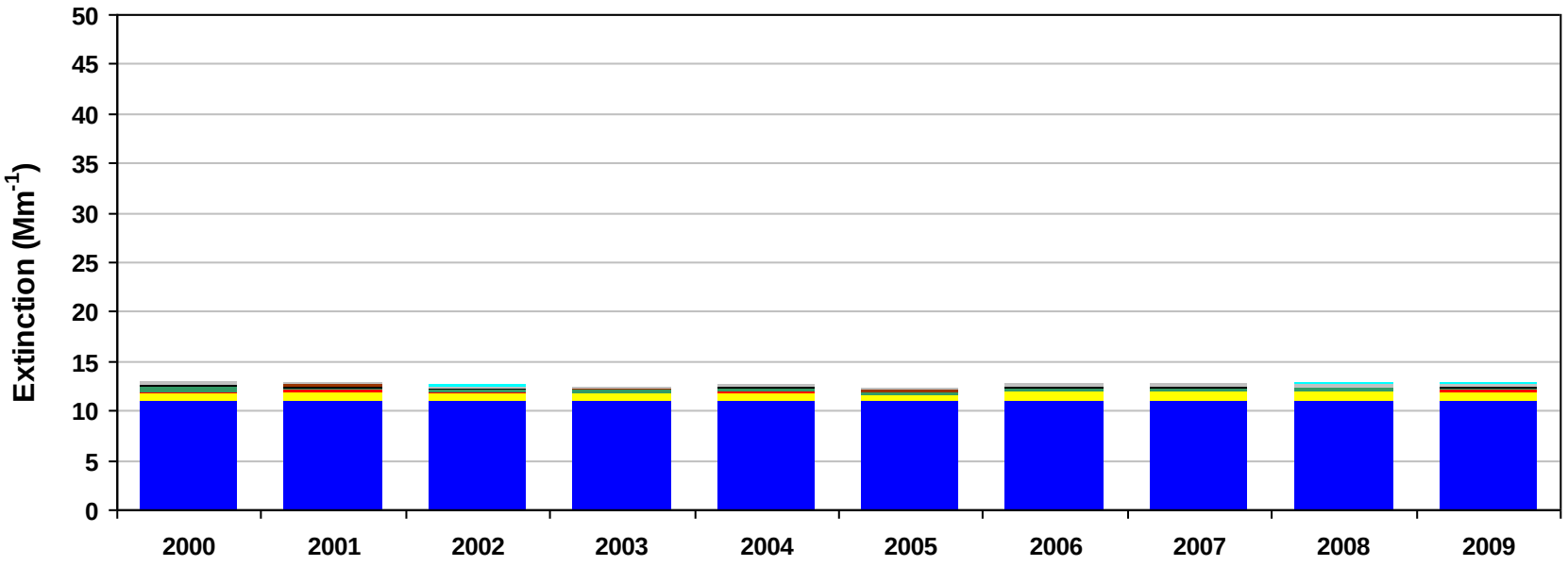


Figure A.1-5
Denali NP, AK (DENA1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

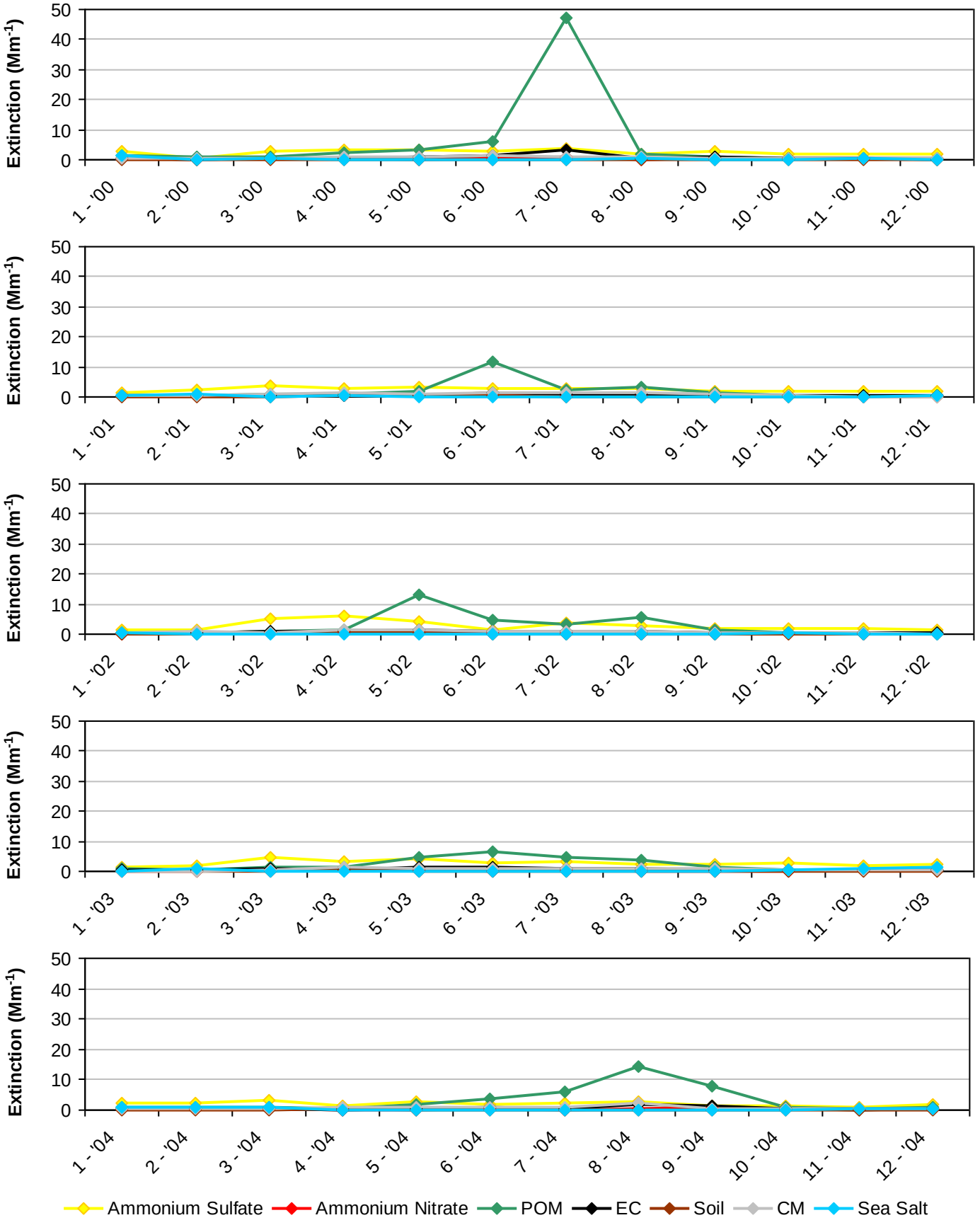


Figure A.1-6
Denali NP, AK (DENA1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

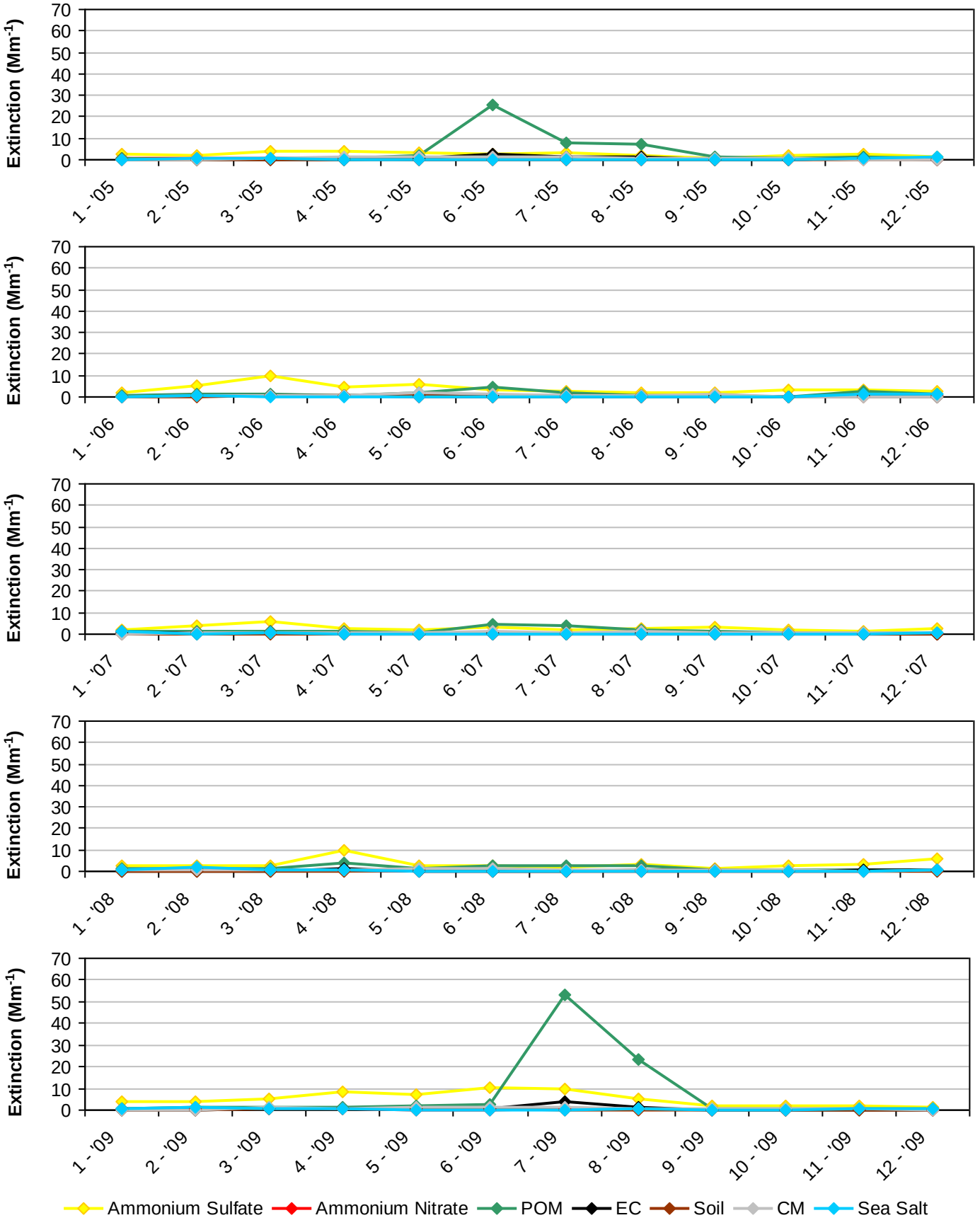


Figure A.1-7
Denali NP, AK (DENA1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

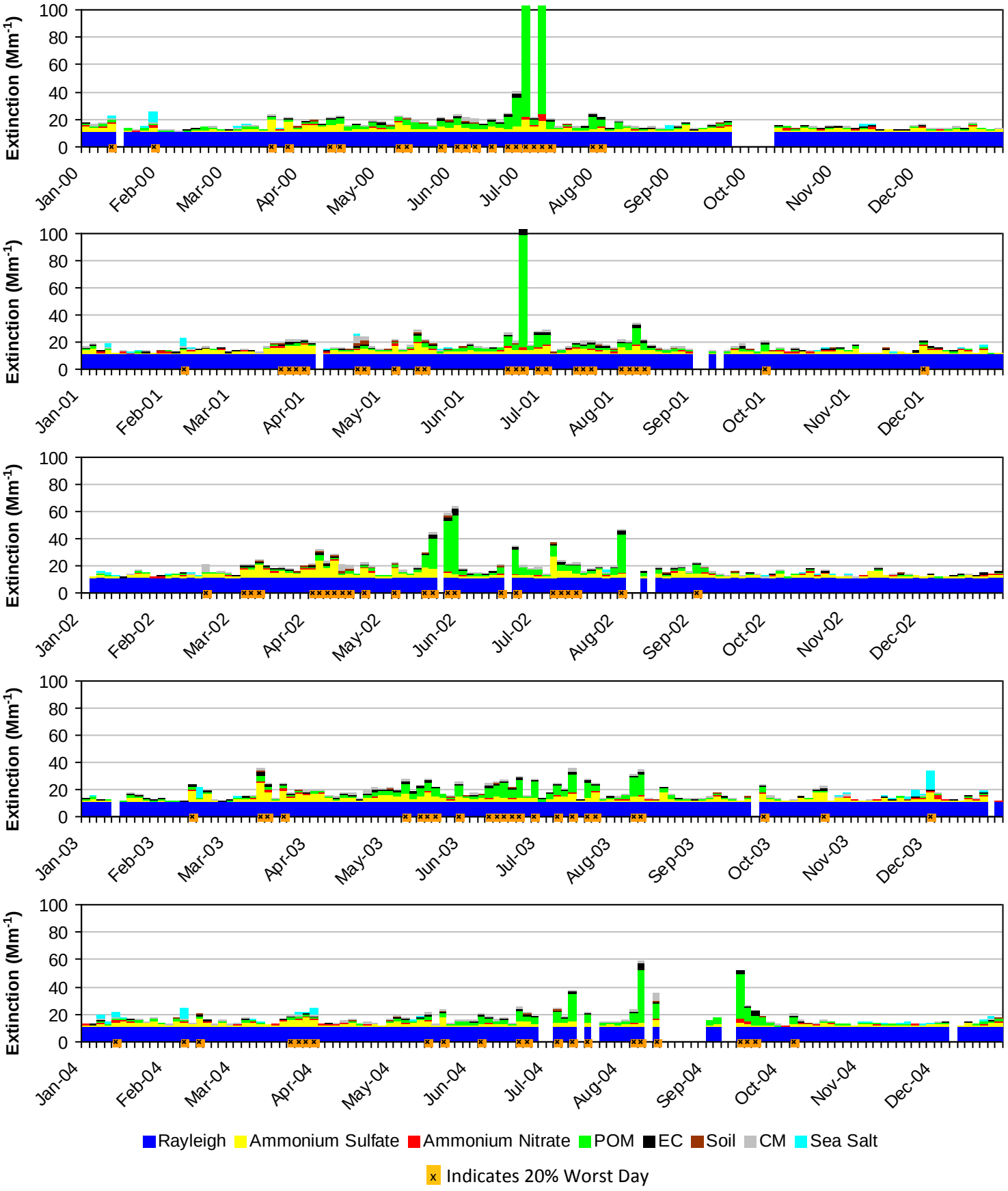
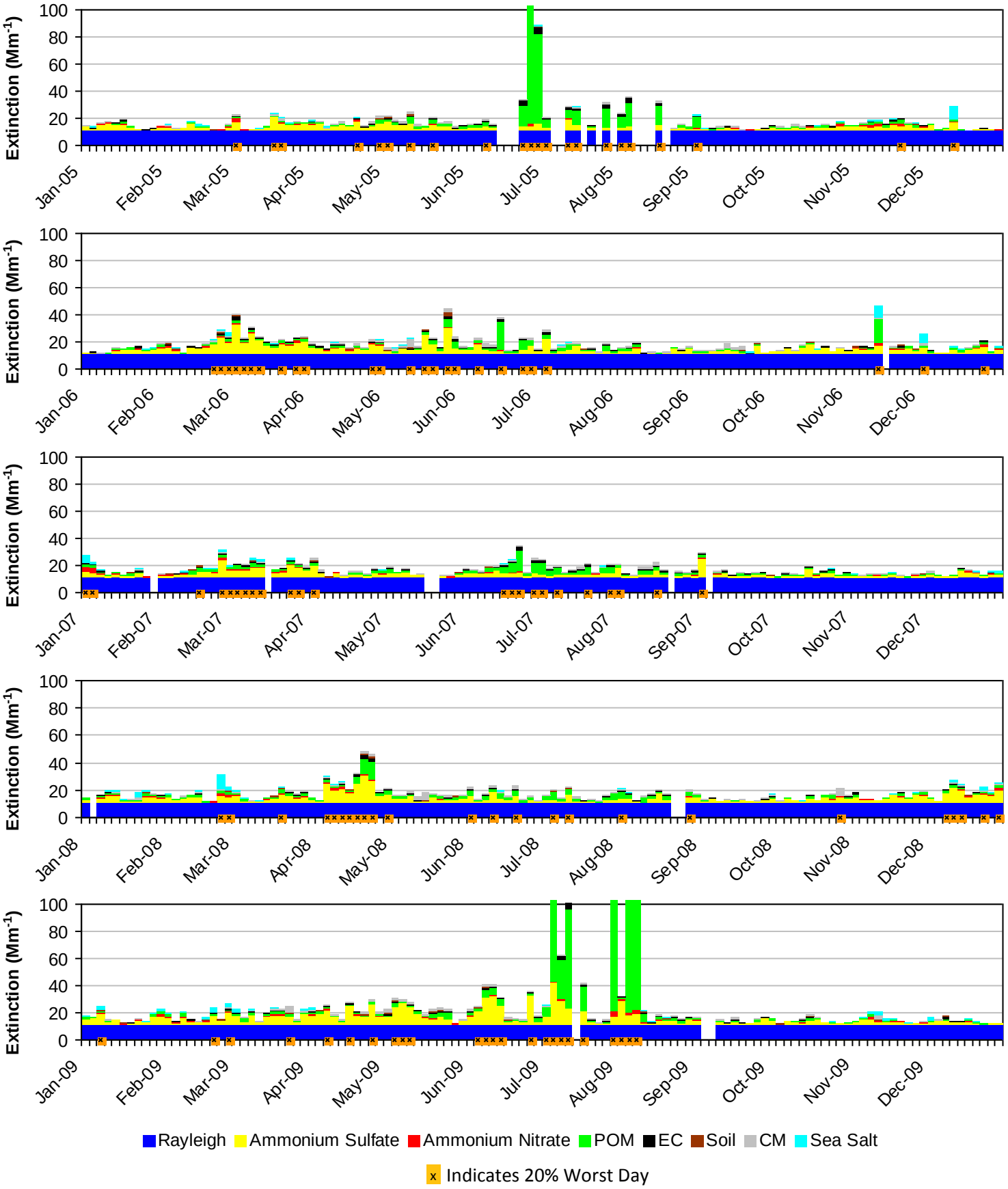


Figure A.1-8
Denali NP, AK (DENA1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



A.2. SIMEONOF WA (SIME1)

The following tables and figures are presented in this section for the Simeonof Wilderness Area represented by the SIME1 IMPROVE Monitor:

- **Table A.2-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure A.2-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure A.2-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure A.2-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure A.2-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure A.2-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure A.2-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure A.2-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

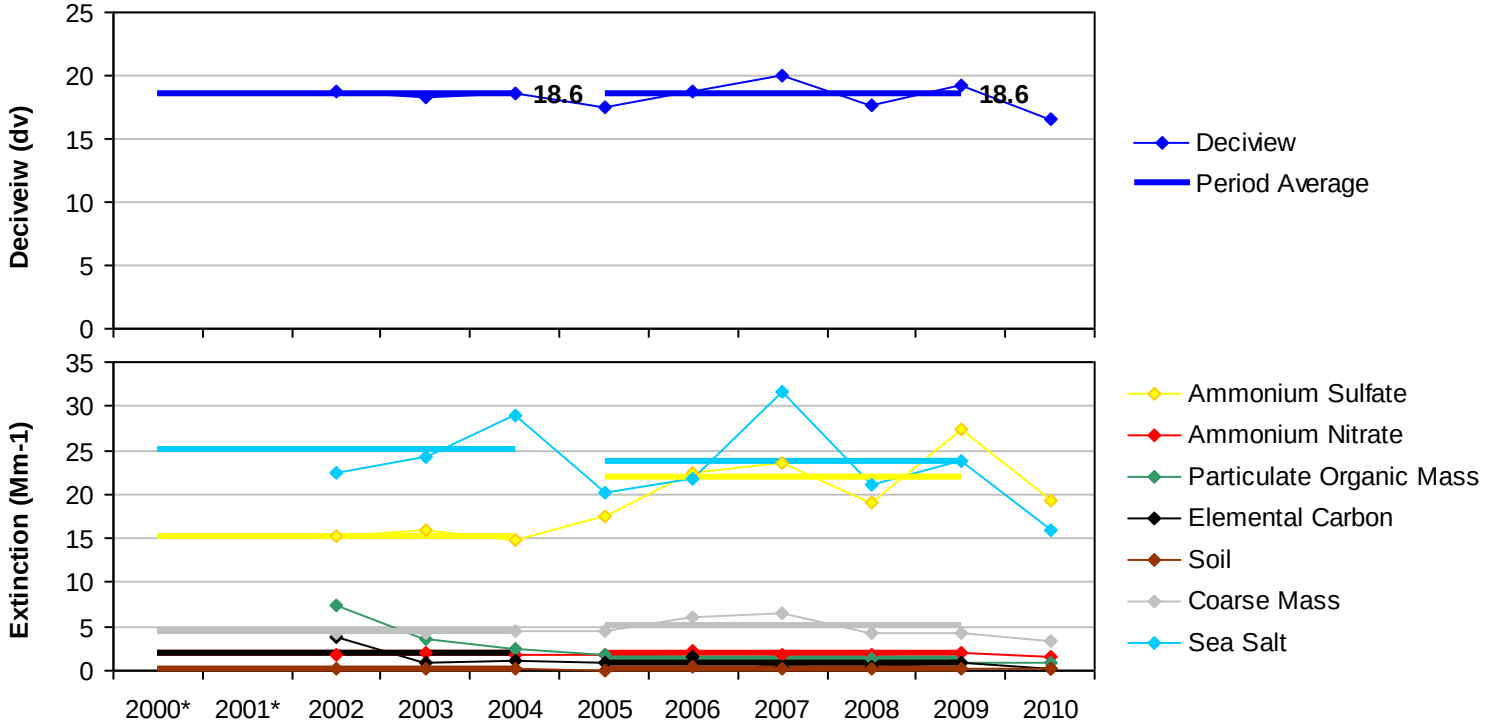
- **Figure A.2-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table A.2-1
Simeonof WA, AK (SIME1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	---	7.8	6.8	8.3	7.8	8.3	8.1	7.5	8.3	7.6	0.1	0.2	7.6	8.0	0.4	5%
Worst 20% Days	---	---	18.8	18.2	18.6	17.4	18.7	20.0	17.7	19.2	16.6	0.1	0.4	18.6	18.6	0.0	0%
All Days	---	---	13.0	12.2	12.9	12.4	13.2	13.3	12.0	13.4	11.4	0.1	0.2	12.7	12.8	0.1	1%
Total Extinction (Mm-1)																	
Best 20% Days	---	---	21.9	19.9	23.0	21.9	23.1	22.5	21.2	23.1	21.5	0.2	0.1	21.6	22.4	0.8	4%
Worst 20% Days	---	---	67.2	63.2	65.9	58.8	68.2	76.6	60.2	71.6	53.6	0.9	0.3	65.4	67.1	1.7	3%
All Days	---	---	39.8	37.0	39.1	36.8	40.5	42.0	35.9	41.7	33.1	0.3	0.4	38.6	39.4	0.8	2%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	---	4.3	2.6	4.3	3.6	4.8	4.0	3.8	4.6	4.1	0.1	0.3	3.7	4.2	0.5	14%
Worst 20% Days	---	---	15.2	16.0	14.7	17.5	22.5	23.5	19.0	27.4	19.2	1.7	0.0	15.3	22.0	6.7	44%
All Days	---	---	9.9	9.5	9.5	9.9	12.3	12.3	10.4	14.3	9.7	0.6	0.0	9.6	11.8	2.2	23%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	---	0.5	0.4	0.7	0.5	0.6	0.5	0.4	0.5	0.4	0.0	0.4	0.5	0.5	0.0	0%
Worst 20% Days	---	---	1.8	2.1	1.9	1.8	2.2	1.8	1.9	2.0	1.5	0.0	0.3	1.9	1.9	0.0	0%
All Days	---	---	1.3	1.2	1.3	1.2	1.2	1.2	1.0	1.2	0.9	0.0	0.1	1.3	1.2	-0.1	-8%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	---	0.7	0.4	0.7	0.3	0.2	0.2	0.5	0.3	0.5	-0.1	0.1	0.6	0.3	-0.3	-50%
Worst 20% Days	---	---	7.5	3.7	2.5	1.8	1.7	0.5	1.3	0.9	1.0	-0.6	0.0	4.6	1.2	-3.4	-74%
All Days	---	---	2.8	1.7	1.2	1.0	0.7	0.6	0.9	0.7	0.7	-0.2	0.0	1.9	0.8	-1.1	-58%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	---	0.4	0.5	0.4	0.4	0.7	0.6	0.4	0.6	0.6	0.0	0.2	0.4	0.5	0.1	25%
Worst 20% Days	---	---	3.8	0.9	1.1	0.9	1.5	0.4	0.4	0.8	0.3	-0.2	0.0	1.9	0.8	-1.1	-58%
All Days	---	---	1.5	0.8	0.7	0.9	1.0	0.7	0.5	0.7	0.7	-0.1	0.1	1.0	0.8	-0.2	-20%
Soil Extinction (Mm-1)																	
Best 20% Days	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0%
Worst 20% Days	---	---	0.2	0.2	0.2	0.1	0.4	0.2	0.1	0.2	0.2	0.0	0.5	0.2	0.2	0.0	0%
All Days	---	---	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.3	0.1	0.1	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	---	1.1	1.1	1.1	1.1	1.3	1.2	1.1	1.1	1.0	0.0	0.4	1.1	1.2	0.1	9%
Worst 20% Days	---	---	4.4	4.3	4.5	4.5	6.2	6.4	4.4	4.4	3.3	0.0	0.5	4.4	5.2	0.8	18%
All Days	---	---	2.7	2.5	2.5	2.5	3.0	3.2	2.6	2.3	1.9	0.0	0.6	2.6	2.7	0.1	4%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	---	2.9	2.9	3.8	4.1	3.5	4.0	2.9	4.1	3.0	0.1	0.1	3.2	3.7	0.5	16%
Worst 20% Days	---	---	22.3	24.1	29.0	20.3	21.8	31.6	21.1	23.9	16.0	0.1	0.6	25.2	23.7	-1.5	-6%
All Days	---	---	9.5	9.2	11.8	9.3	10.0	11.9	8.5	10.4	7.2	0.1	0.4	10.1	10.0	-0.1	-1%

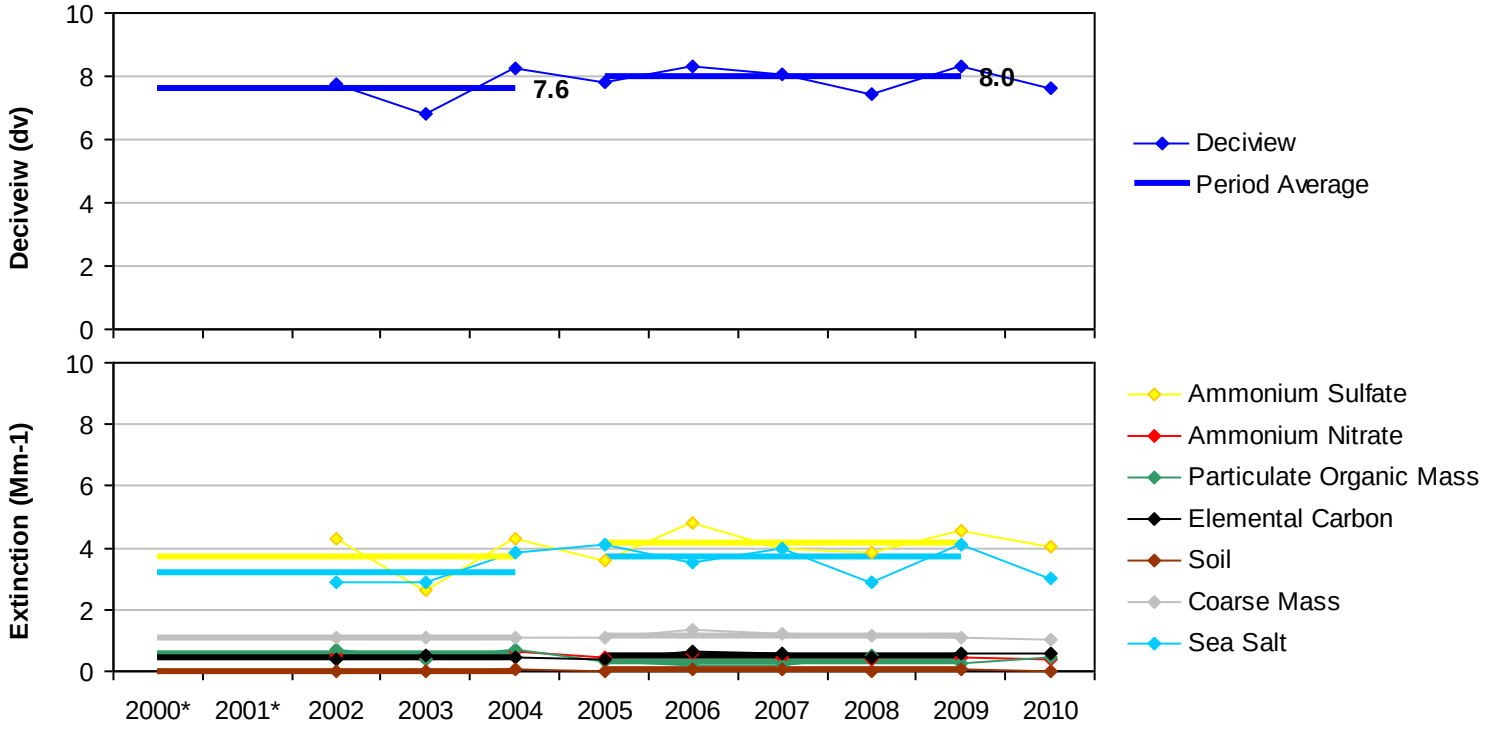
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure A.2-1
Simeonof WA, AK (SIME1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



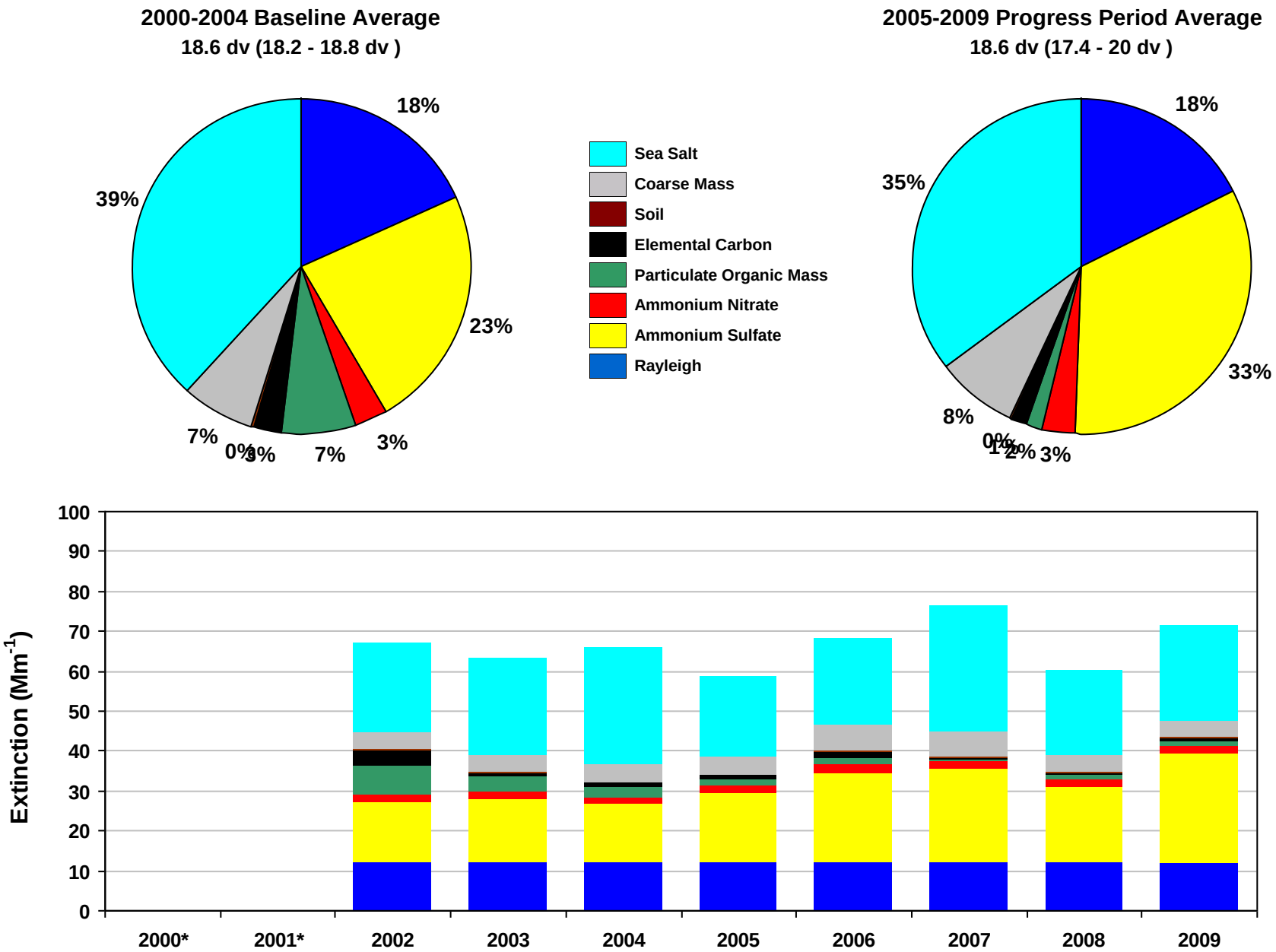
*Missing years did not meet RHR data completeness criteria.

Figure A.2-2
Simeonof WA, AK (SIME1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



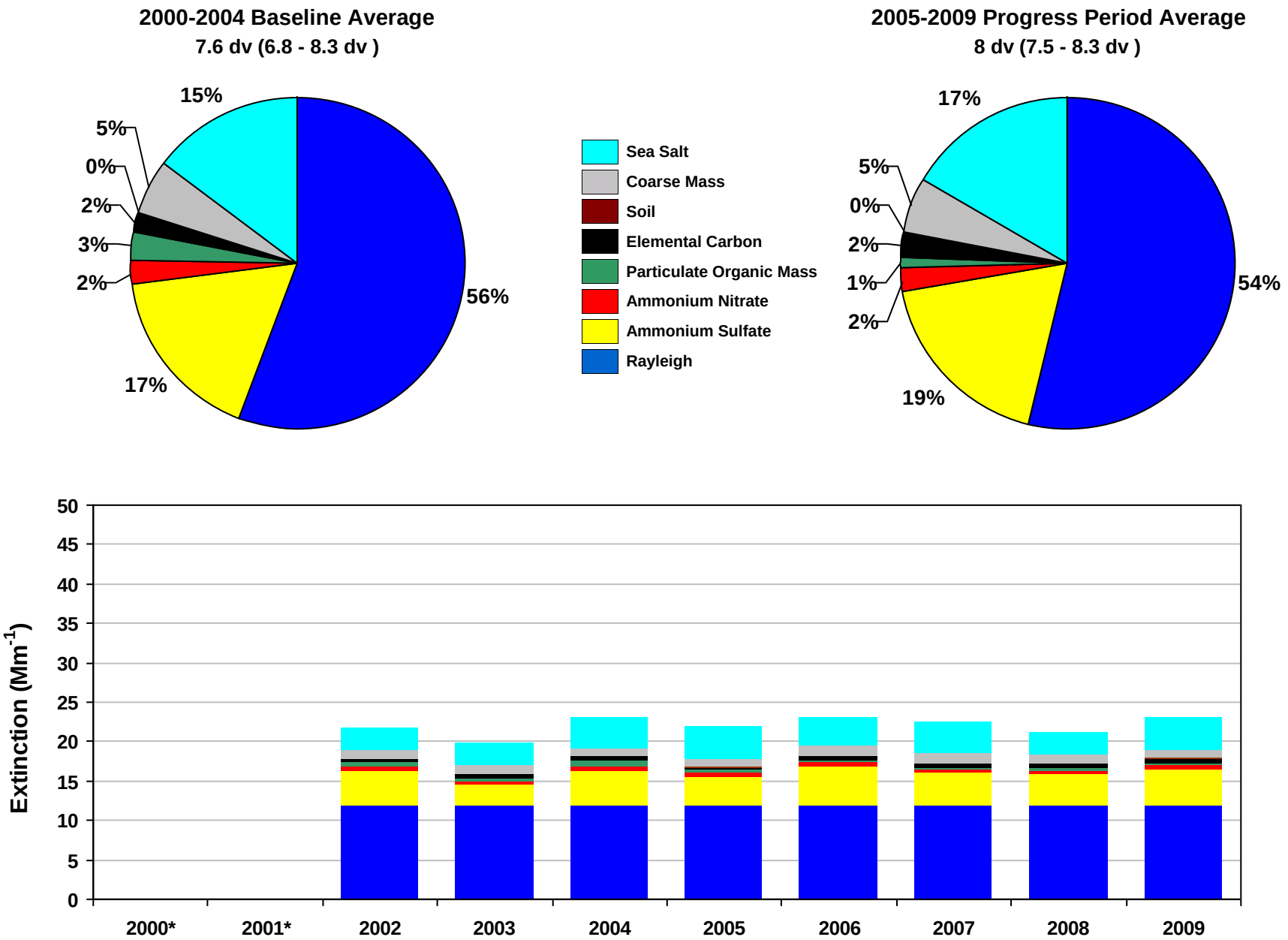
*Missing years did not meet RHR data completeness criteria.

Figure A.2-3
Simeonof WA, AK (SIME1 Site)
20% Most Impaired Visibility Days



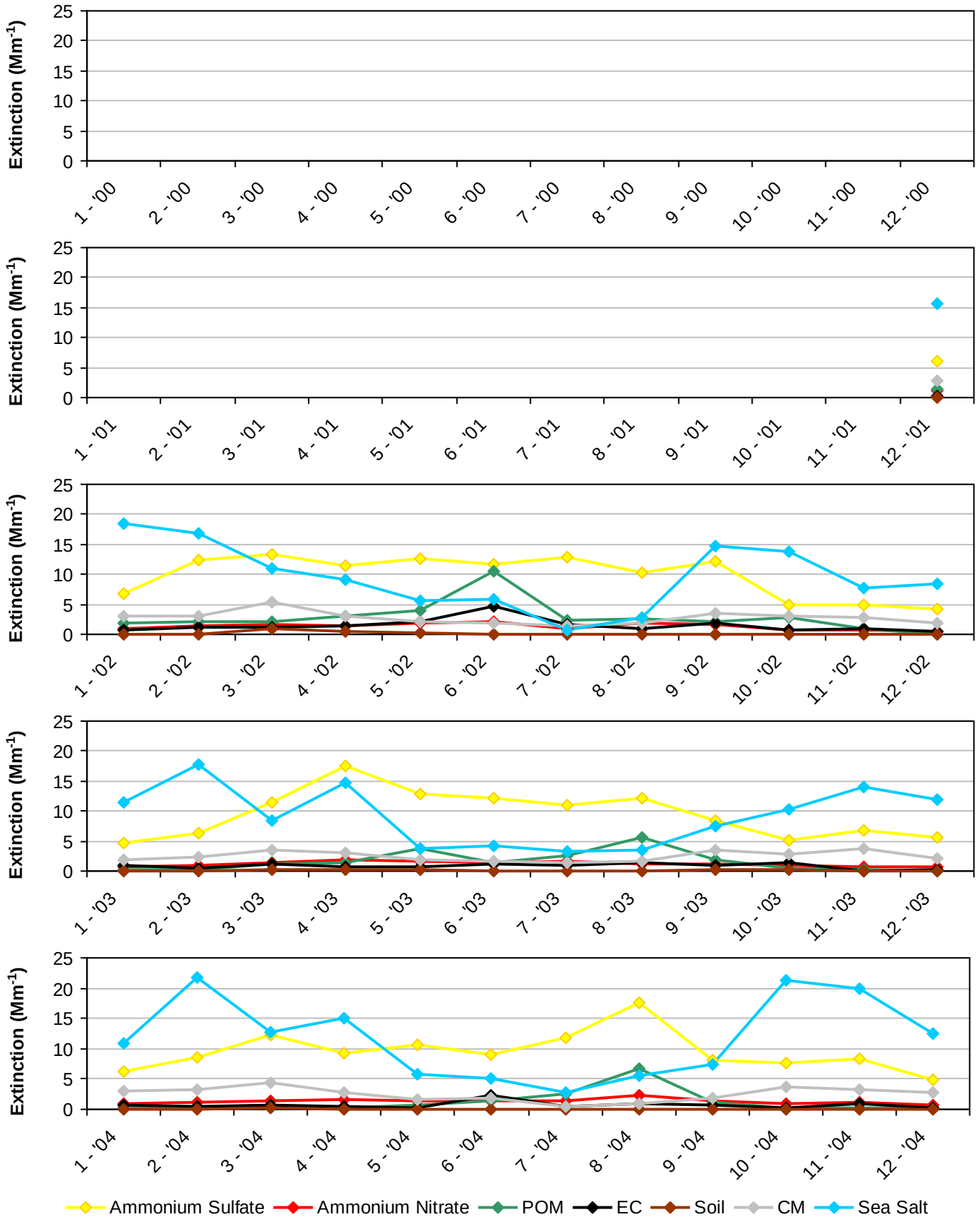
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure A.2-4
Simeonof WA, AK (SIME1 Site)
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure A.2-5
Simeonof WA, AK (SIME1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure A.2-6
Simeonof WA, AK (SIME1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

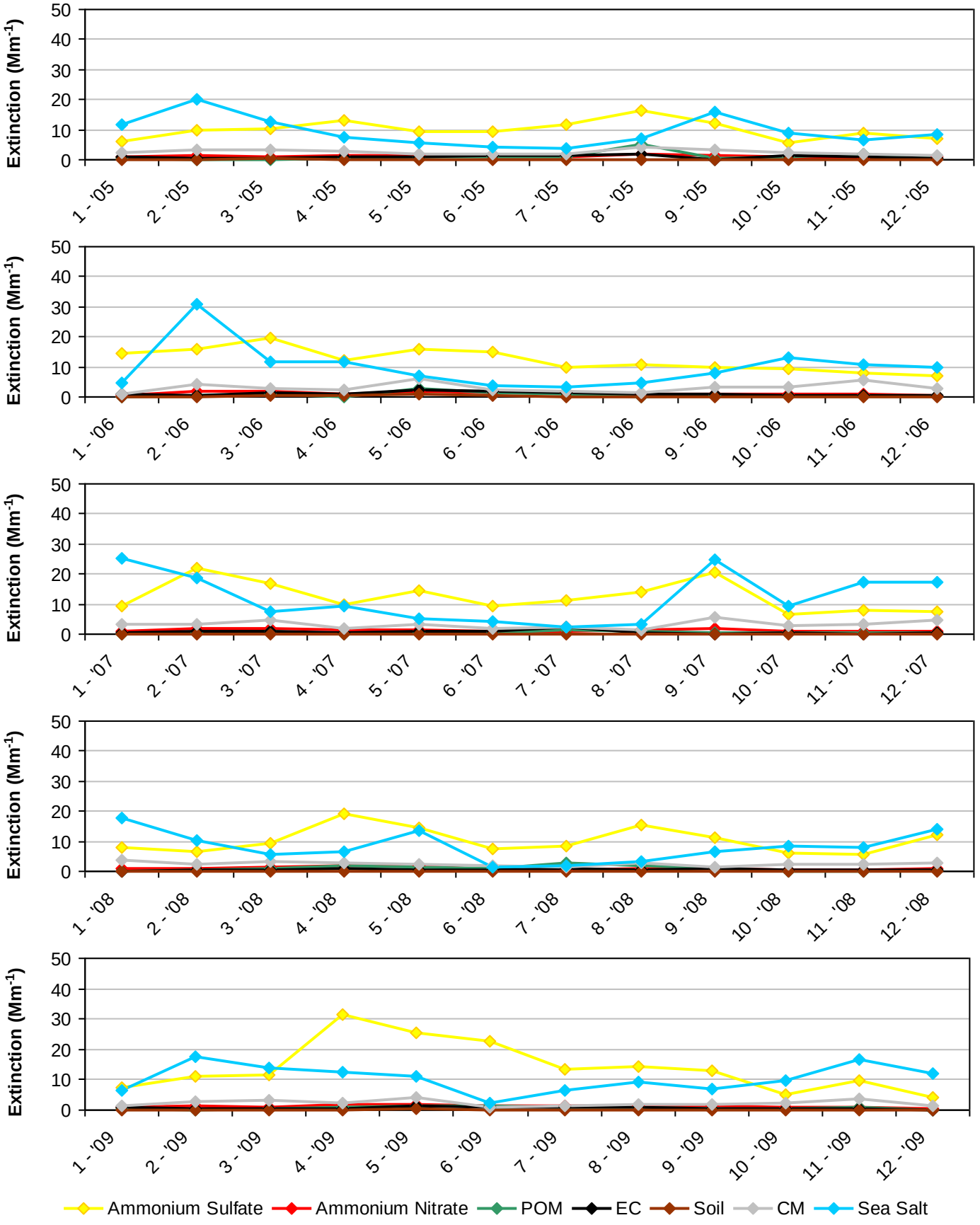
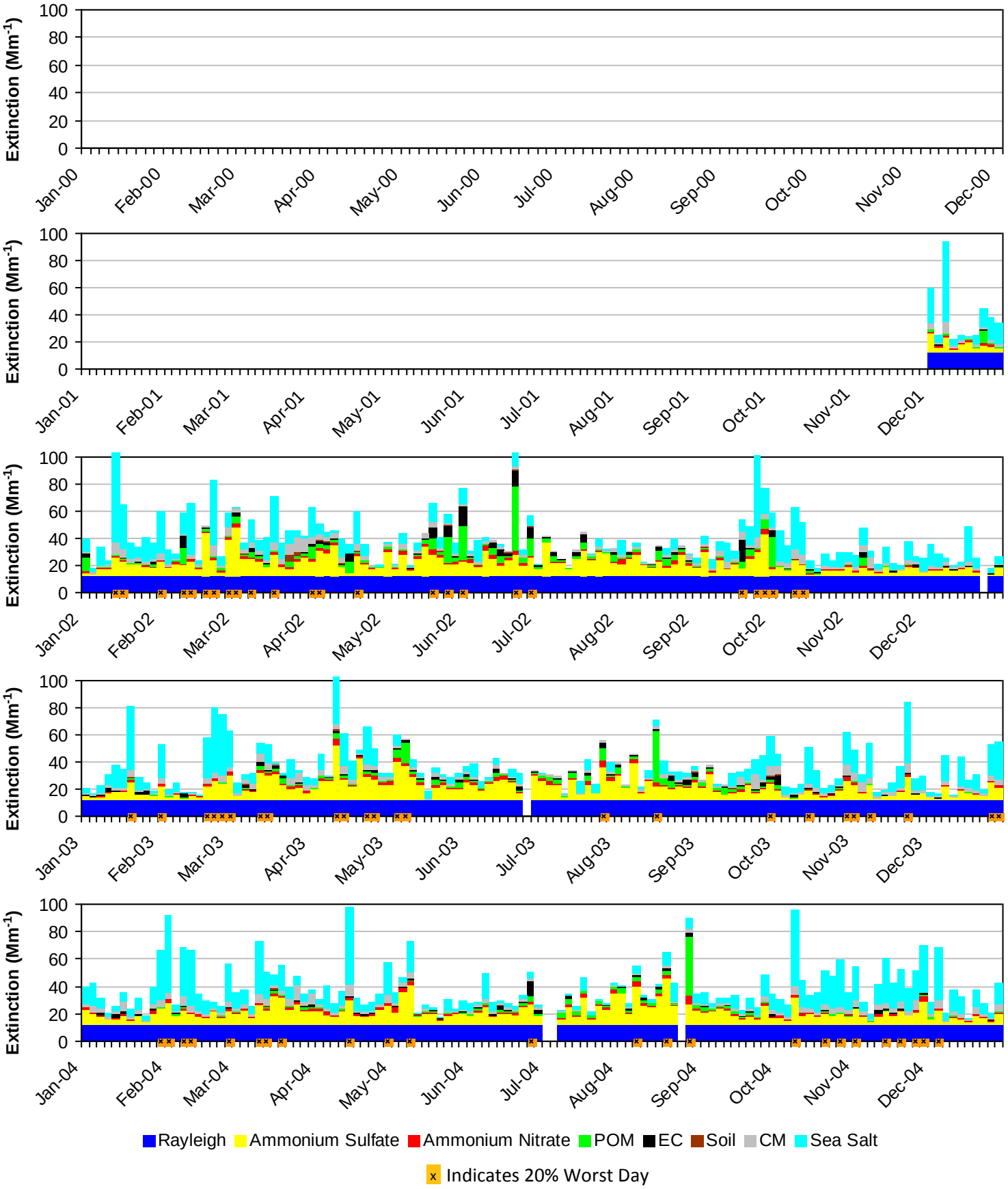
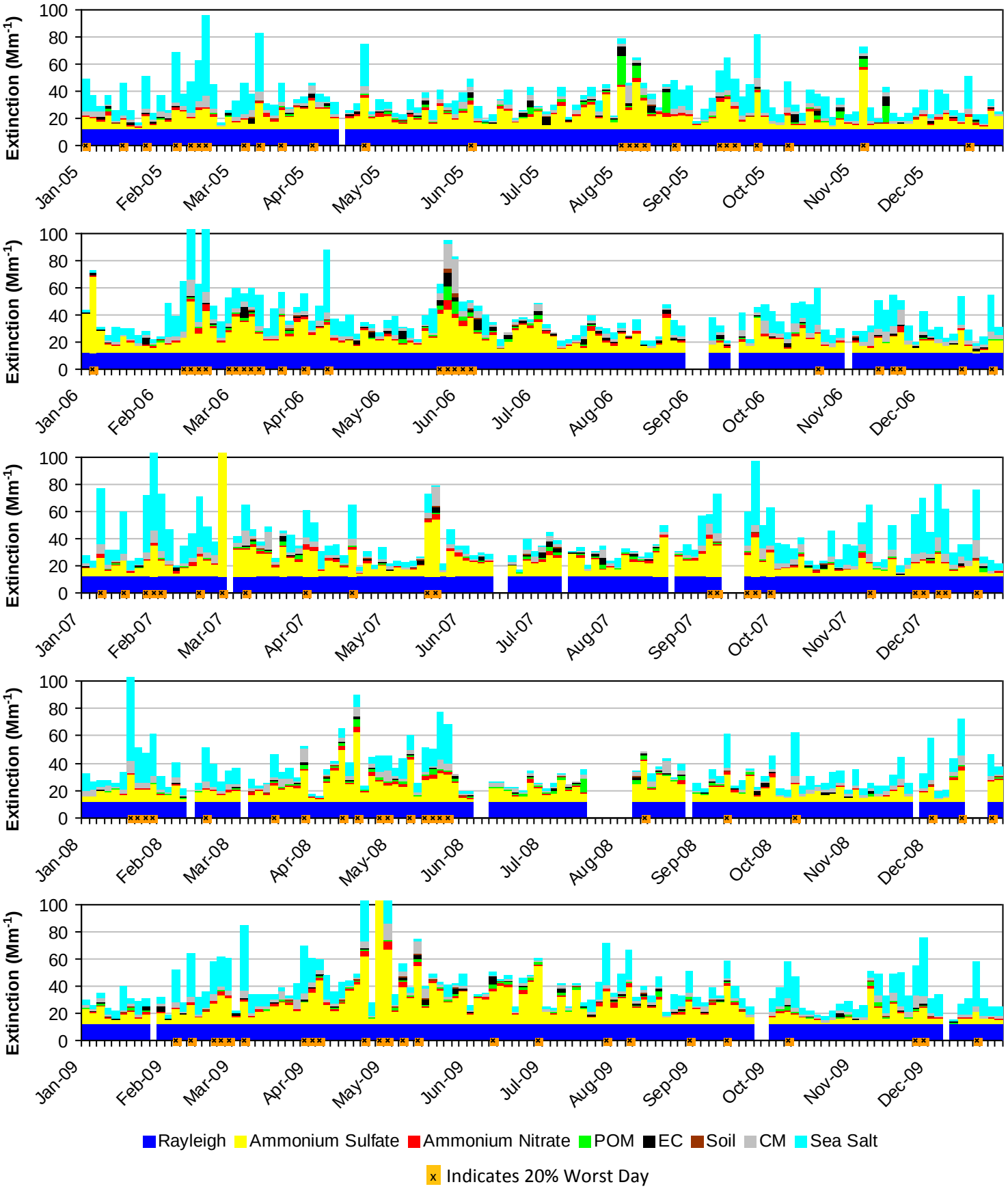


Figure A.2-7
Simeonof WA, AK (SIME1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure A.2-8
Simeonof WA, AK (SIME1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



A.3. TRAPPER CREEK (TRCR1)

The following tables and figures are presented in this section for Trapper Creek represented by the TRCR1 IMPROVE Monitor:

- **Table A.3-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure A.3-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure A.3-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure A.3-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure A.3-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure A.3-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure A.3-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure A.3-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

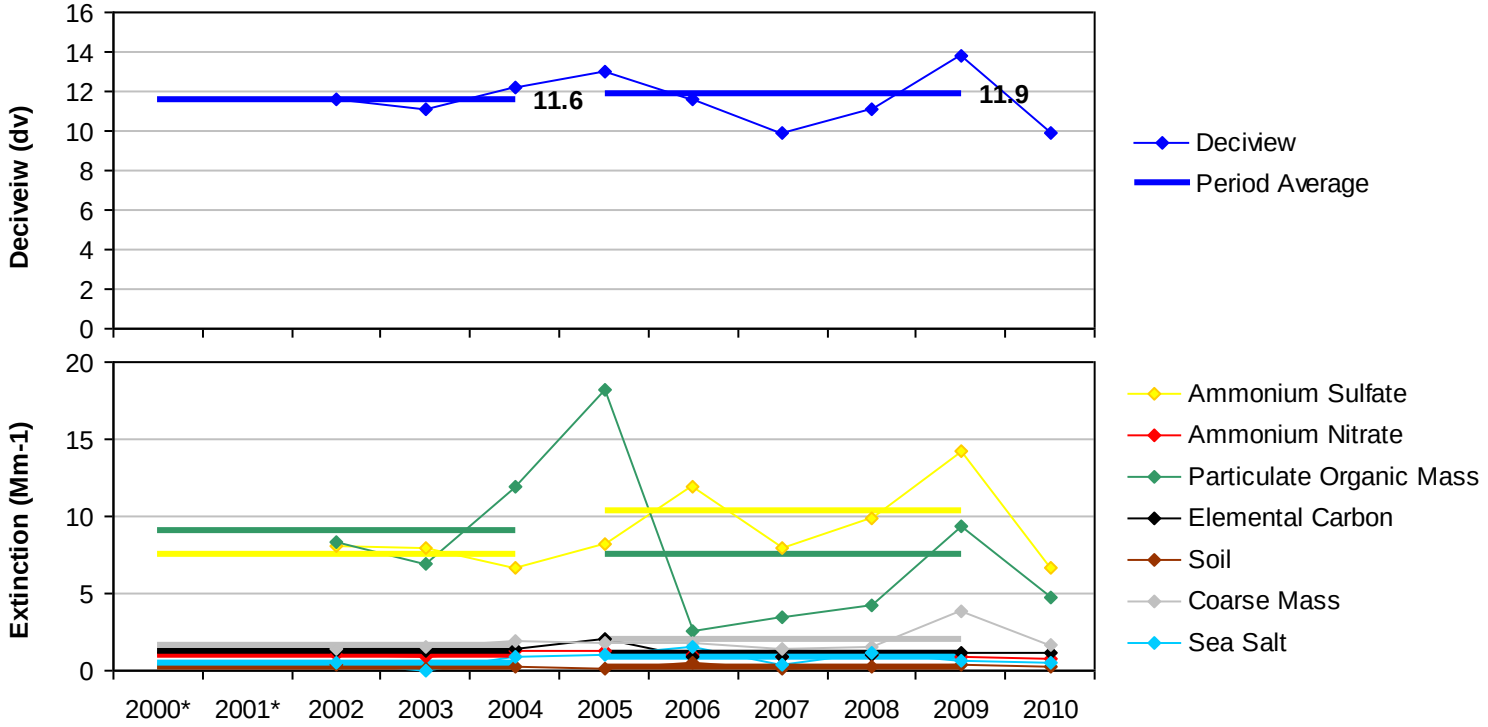
- **Figure A.3-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table A.3-1
Trapper Creek, AK (TRCR1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	---	3.4	3.2	3.7	3.2	4.0	4.0	4.2	4.1	3.6	0.1	0.0	3.5	3.9	0.4	11%
Worst 20% Days	---	---	11.6	11.1	12.2	13.0	11.6	9.9	11.1	13.8	9.9	0.1	0.5	11.6	11.9	0.3	3%
All Days	---	---	6.8	6.6	6.9	7.1	7.5	6.6	7.1	8.1	6.4	0.2	0.1	6.7	7.3	0.6	9%
Total Extinction (Mm-1)																	
Best 20% Days	---	---	14.1	13.8	14.5	13.8	14.9	15.0	15.2	15.2	14.4	0.2	0.0	14.1	14.8	0.7	5%
Worst 20% Days	---	---	33.0	30.7	36.4	44.7	32.3	27.2	31.2	42.7	27.8	0.0	0.6	33.4	35.6	2.2	7%
All Days	---	---	20.8	20.2	21.4	23.2	22.0	19.7	21.1	24.6	19.7	0.3	0.2	20.8	22.1	1.3	6%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	---	1.0	0.8	1.0	0.9	1.5	1.4	1.4	1.7	1.2	0.1	0.0	0.9	1.4	0.5	56%
Worst 20% Days	---	---	8.0	7.9	6.6	8.2	12.0	7.9	9.9	14.3	6.7	0.7	0.1	7.5	10.4	2.9	39%
All Days	---	---	3.7	3.5	3.1	3.7	5.5	3.6	4.5	6.0	3.4	0.2	0.1	3.4	4.7	1.3	38%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	---	0.1	0.1	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.0	0.1	0.2	0.2	0.0	0%
Worst 20% Days	---	---	1.1	0.9	1.2	1.2	1.0	0.9	1.0	1.0	0.7	0.0	0.3	1.1	1.0	-0.1	-9%
All Days	---	---	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.0	0.5	0.5	0.5	0.0	0%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	---	0.4	0.3	0.4	0.2	0.5	0.5	0.6	0.5	0.4	0.0	0.0	0.4	0.5	0.1	25%
Worst 20% Days	---	---	8.3	6.9	12.0	18.3	2.6	3.4	4.3	9.4	4.8	-0.5	0.5	9.1	7.6	-1.5	-17%
All Days	---	---	2.6	2.4	3.5	4.7	1.5	1.7	2.0	3.0	1.9	-0.1	0.5	2.8	2.6	-0.2	-7%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	---	0.2	0.3	0.4	0.1	0.2	0.2	0.2	0.2	0.2	0.0	0.5	0.3	0.2	-0.1	-33%
Worst 20% Days	---	---	1.3	1.3	1.4	2.1	0.9	0.9	1.0	1.2	1.1	0.0	0.4	1.3	1.2	-0.1	-8%
All Days	---	---	0.6	0.7	0.7	0.8	0.6	0.5	0.5	0.6	0.5	0.0	0.1	0.6	0.6	0.0	0%
Soil Extinction (Mm-1)																	
Best 20% Days	---	---	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0%
Worst 20% Days	---	---	0.4	0.2	0.3	0.1	0.6	0.2	0.3	0.4	0.3	0.0	0.4	0.3	0.3	0.0	0%
All Days	---	---	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.2	0.0	0.3	0.2	0.2	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	---	0.3	0.2	0.3	0.2	0.4	0.5	0.5	0.3	0.3	0.0	0.1	0.3	0.4	0.1	33%
Worst 20% Days	---	---	1.4	1.5	2.0	1.8	1.8	1.4	1.6	3.8	1.6	0.1	0.3	1.6	2.1	0.5	31%
All Days	---	---	0.9	0.9	0.9	1.0	1.1	0.9	1.0	1.8	1.0	0.0	0.0	0.9	1.2	0.3	33%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	---	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.3	0.1	0.1	0.0	0%
Worst 20% Days	---	---	0.5	0.0	0.9	1.0	1.5	0.4	1.2	0.7	0.5	0.1	0.2	0.5	1.0	0.5	100%
All Days	---	---	0.2	0.2	0.5	0.4	0.5	0.3	0.5	0.4	0.3	0.0	0.2	0.3	0.4	0.1	33%

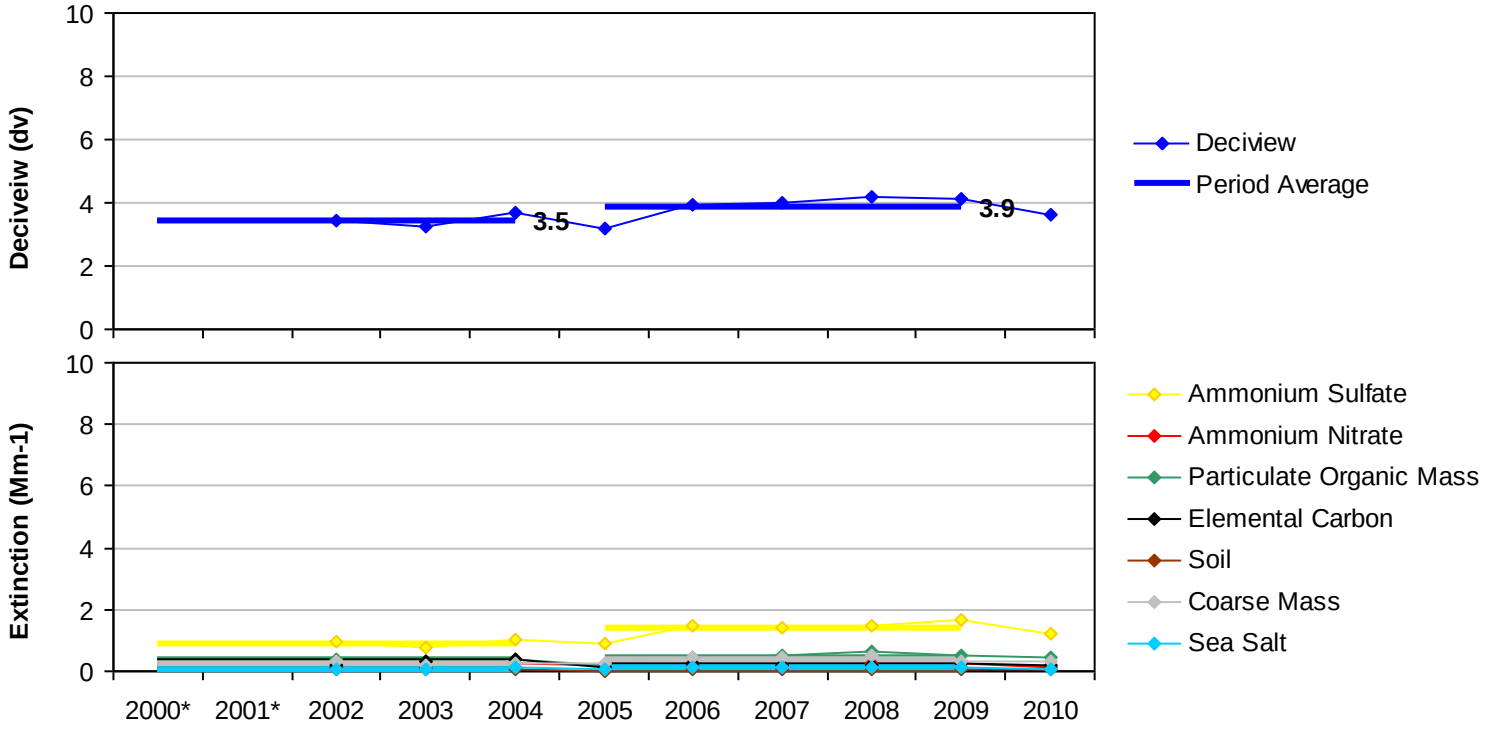
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure A.3-1
Trapper Creek, AK (TRCR1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



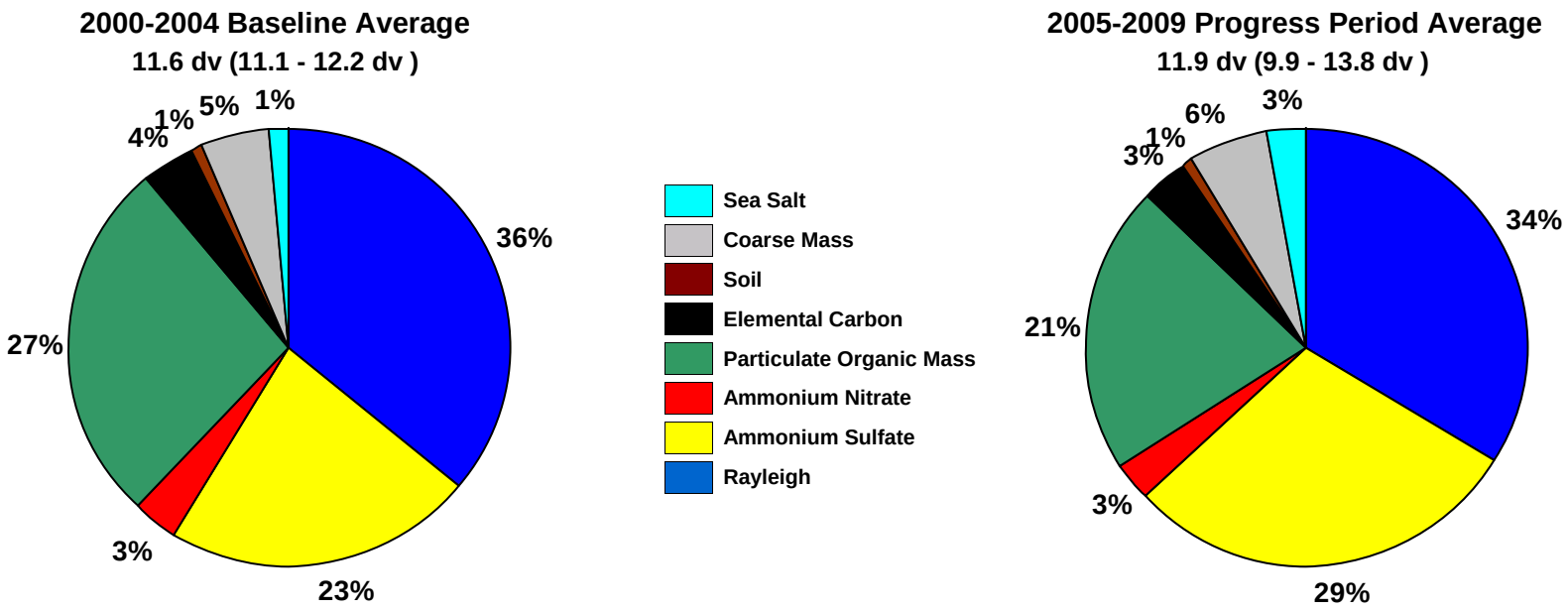
*Missing years did not meet RHR data completeness criteria.

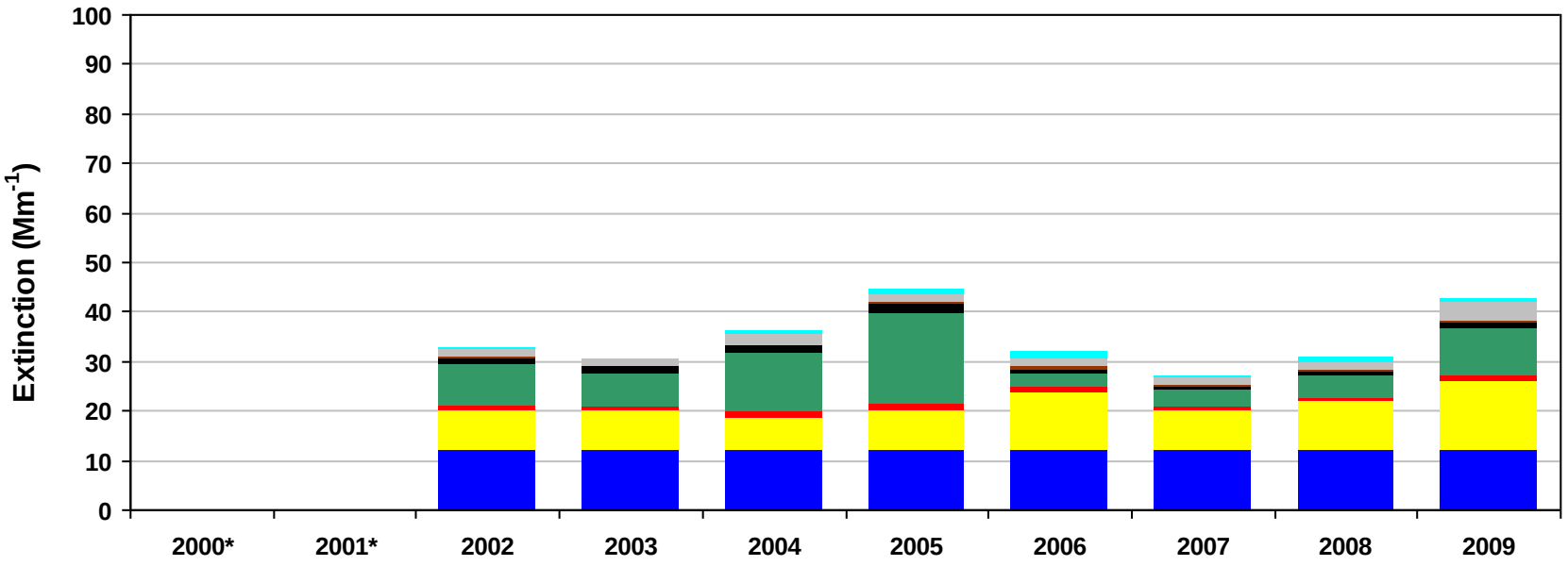
Figure A.3-2
Trapper Creek, AK (TRCR1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

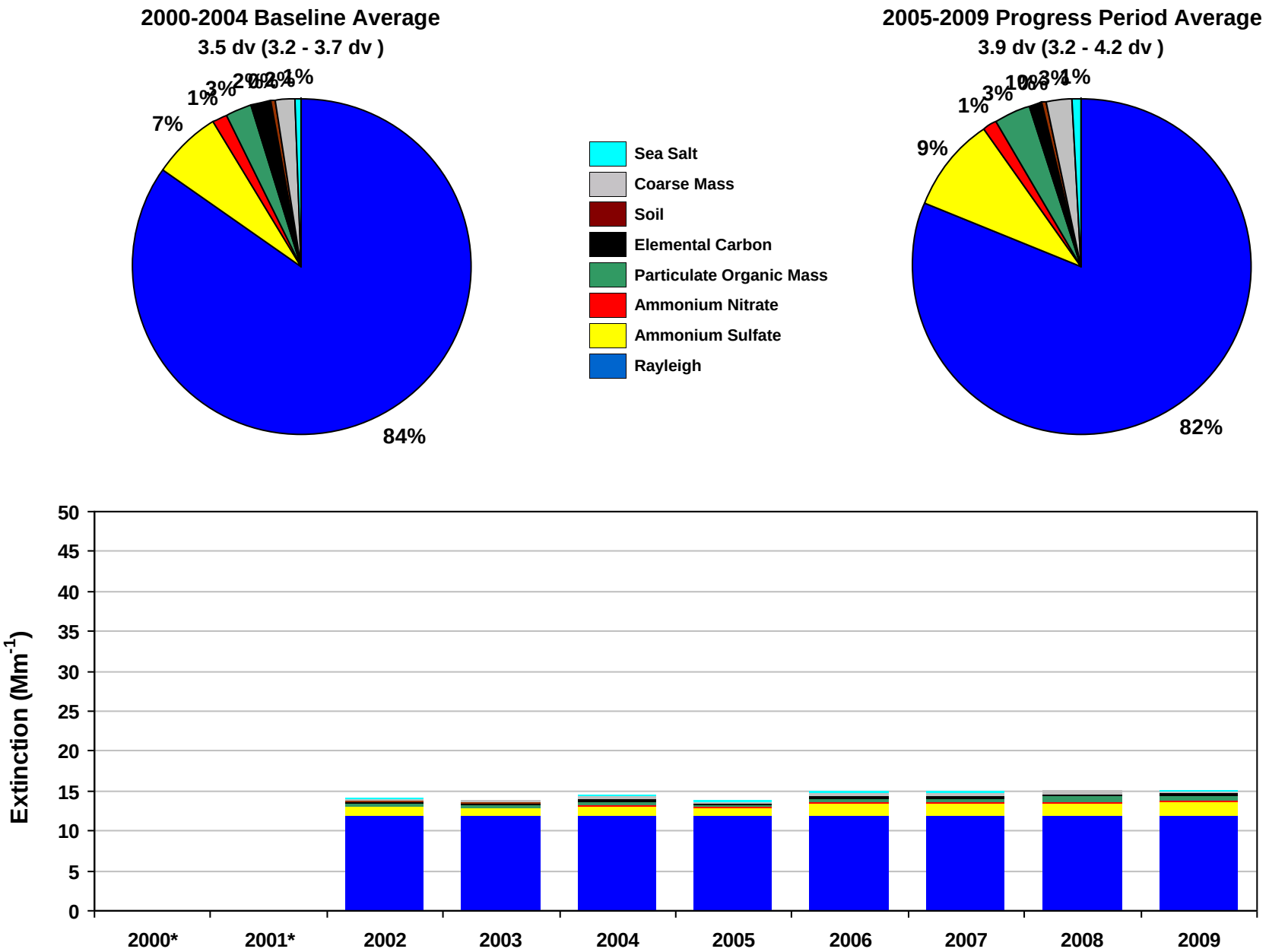
Figure A.3-3
Trapper Creek, AK (TRCR1 Site)
20% Most Impaired Visibility Days





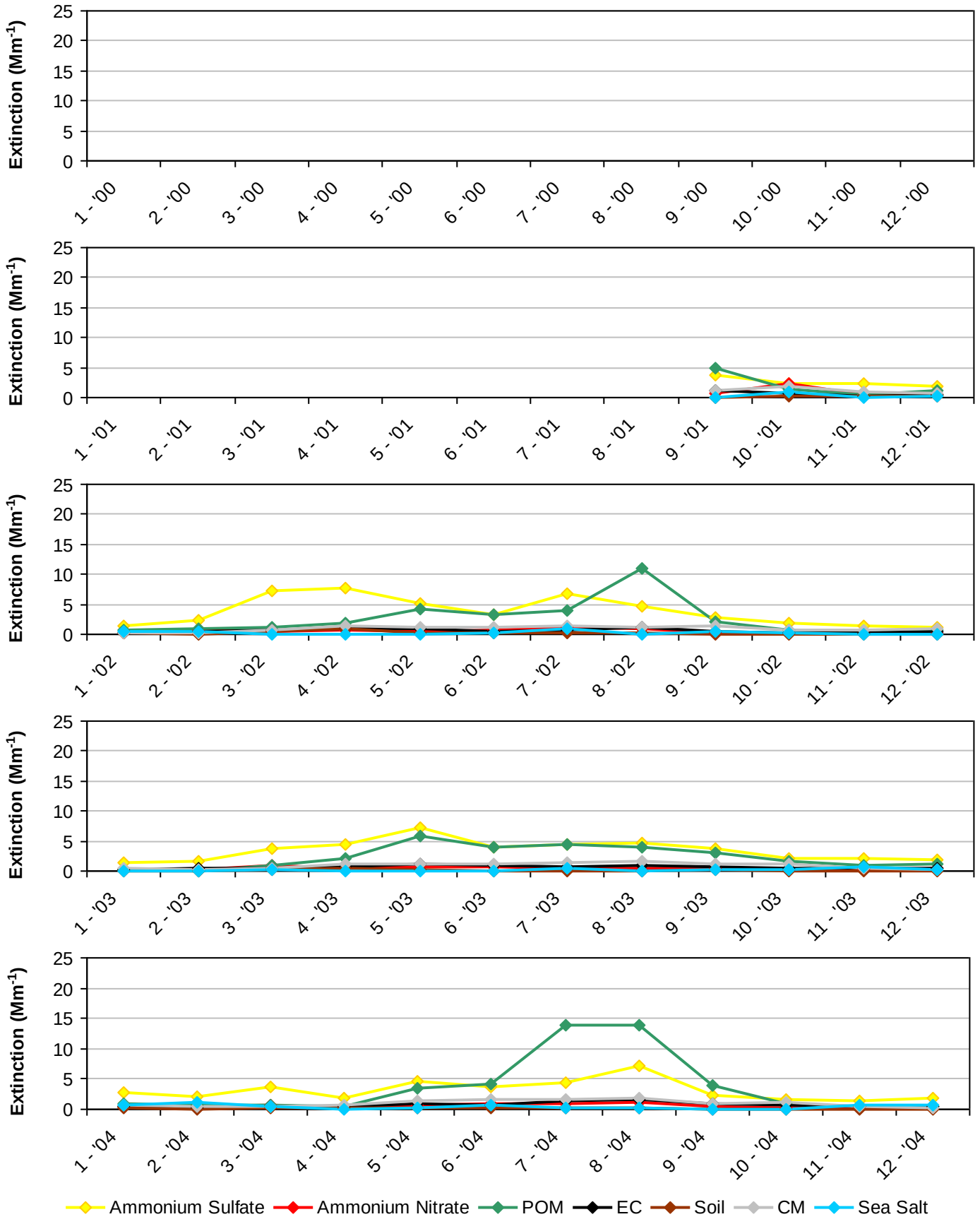
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure A.3-4
Trapper Creek, AK (TRCR1 Site)
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure A.3-5
Trapper Creek, AK (TRCR1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure A.3-6
Trapper Creek, AK (TRCR1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

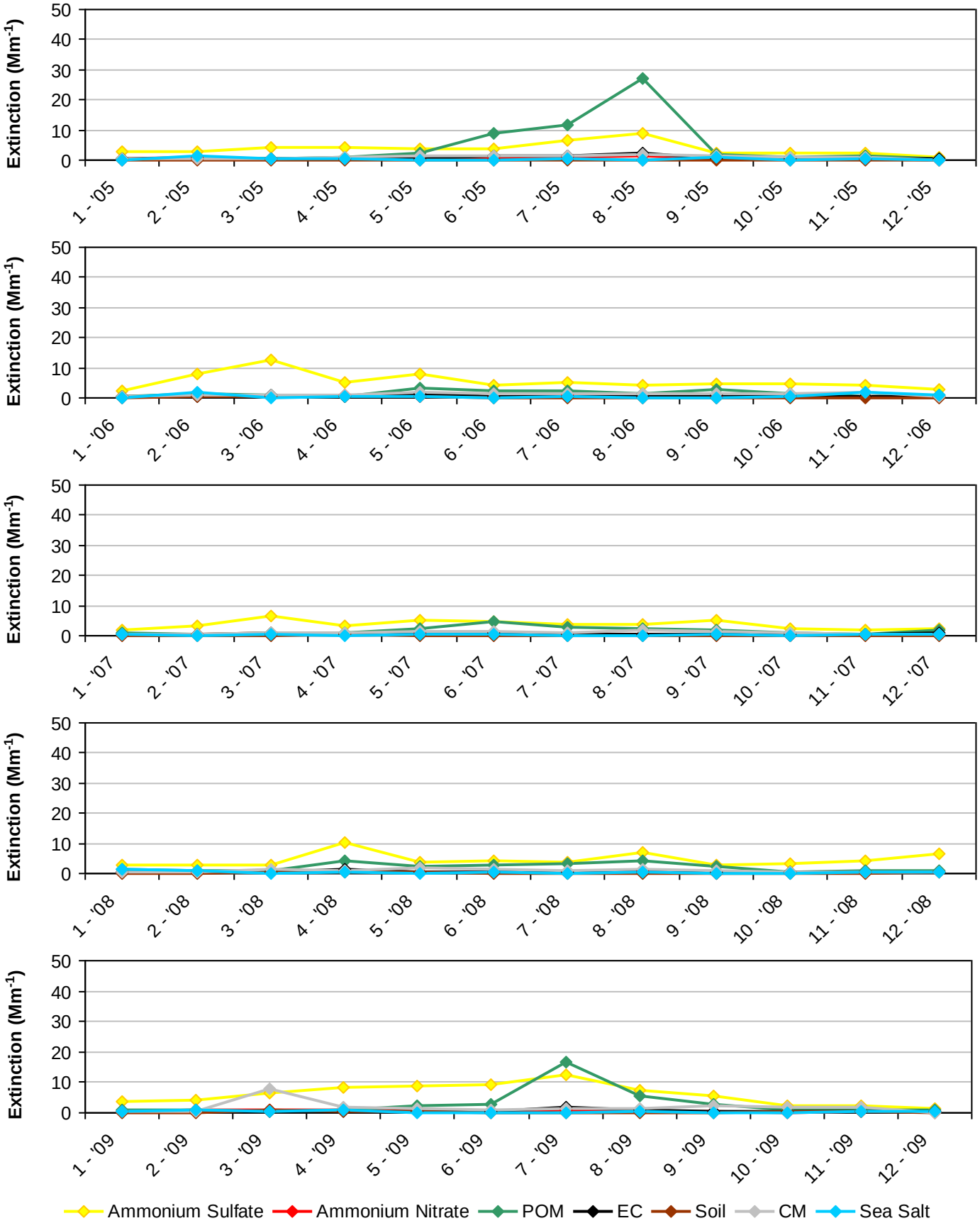
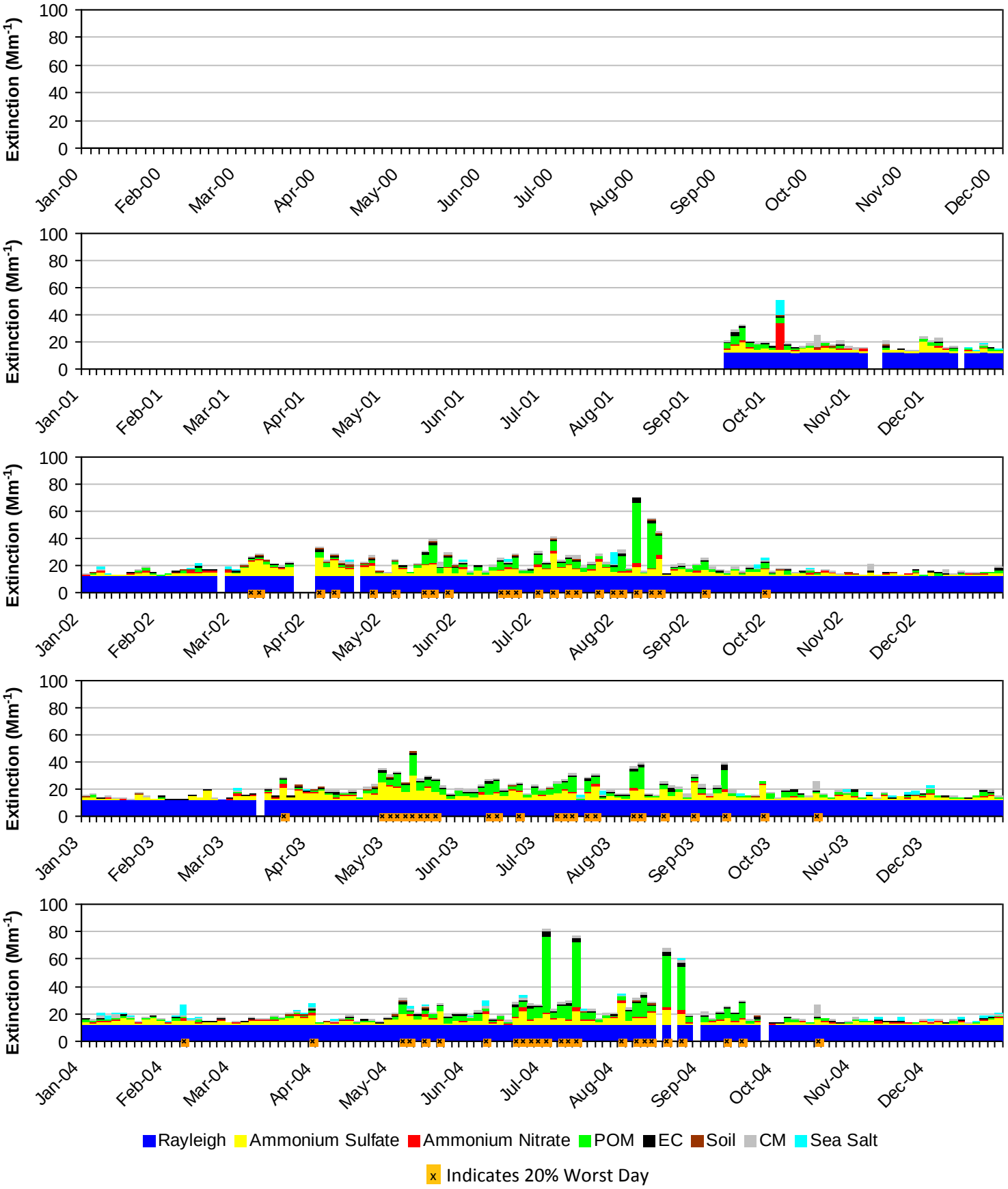
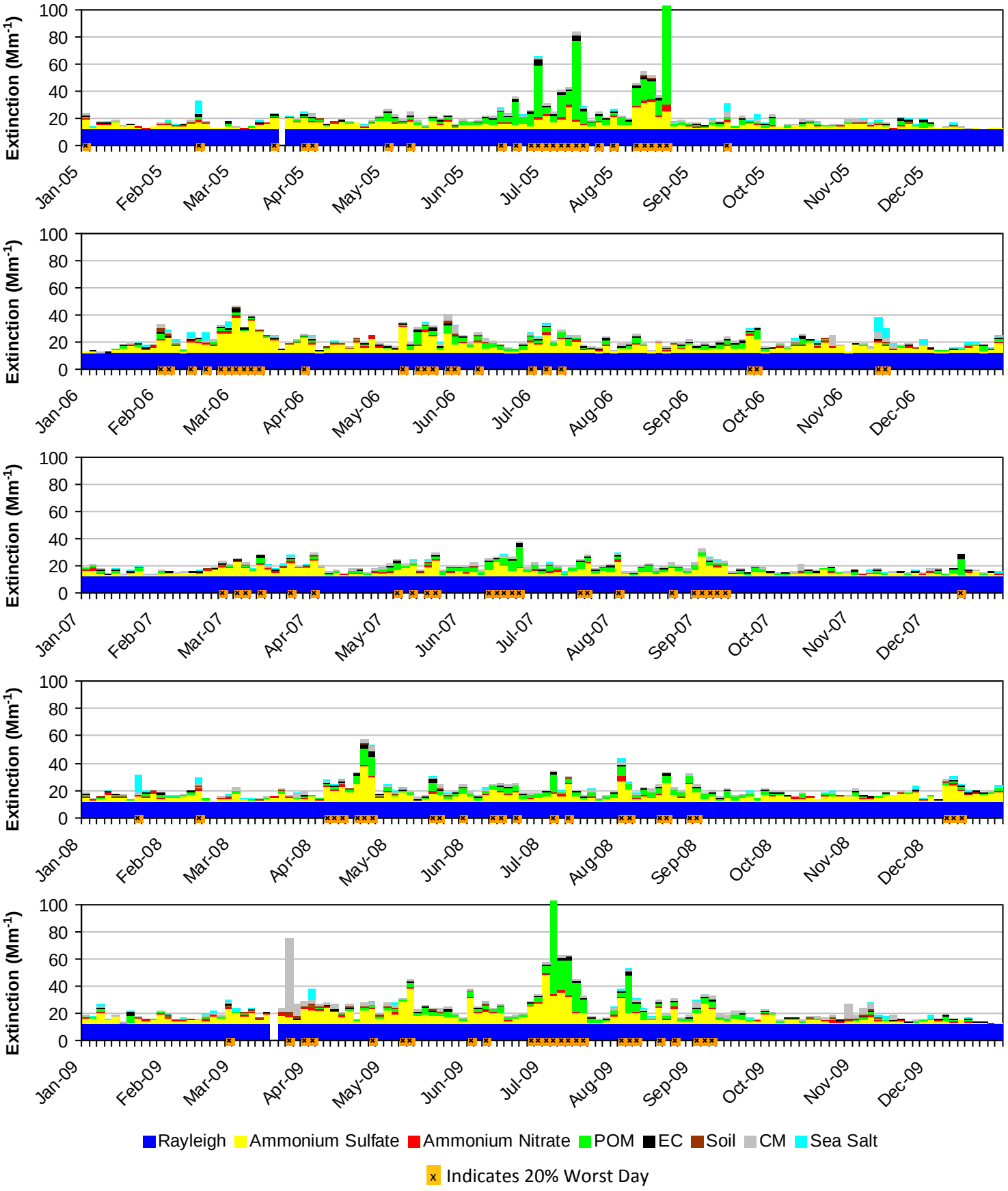


Figure A.3-7
Trapper Creek, AK (TRCR1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure A.3-8
Trapper Creek, AK (TRCR1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



A.4. TUXEDNI WA (TUXE1)

The following tables and figures are presented in this section for the Tuxedni Wilderness Area represented by the TUXE1 IMPROVE Monitor:

- **Table A.4-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure A.4-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure A.4-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure A.4-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure A.4-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure A.4-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure A.4-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure A.4-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

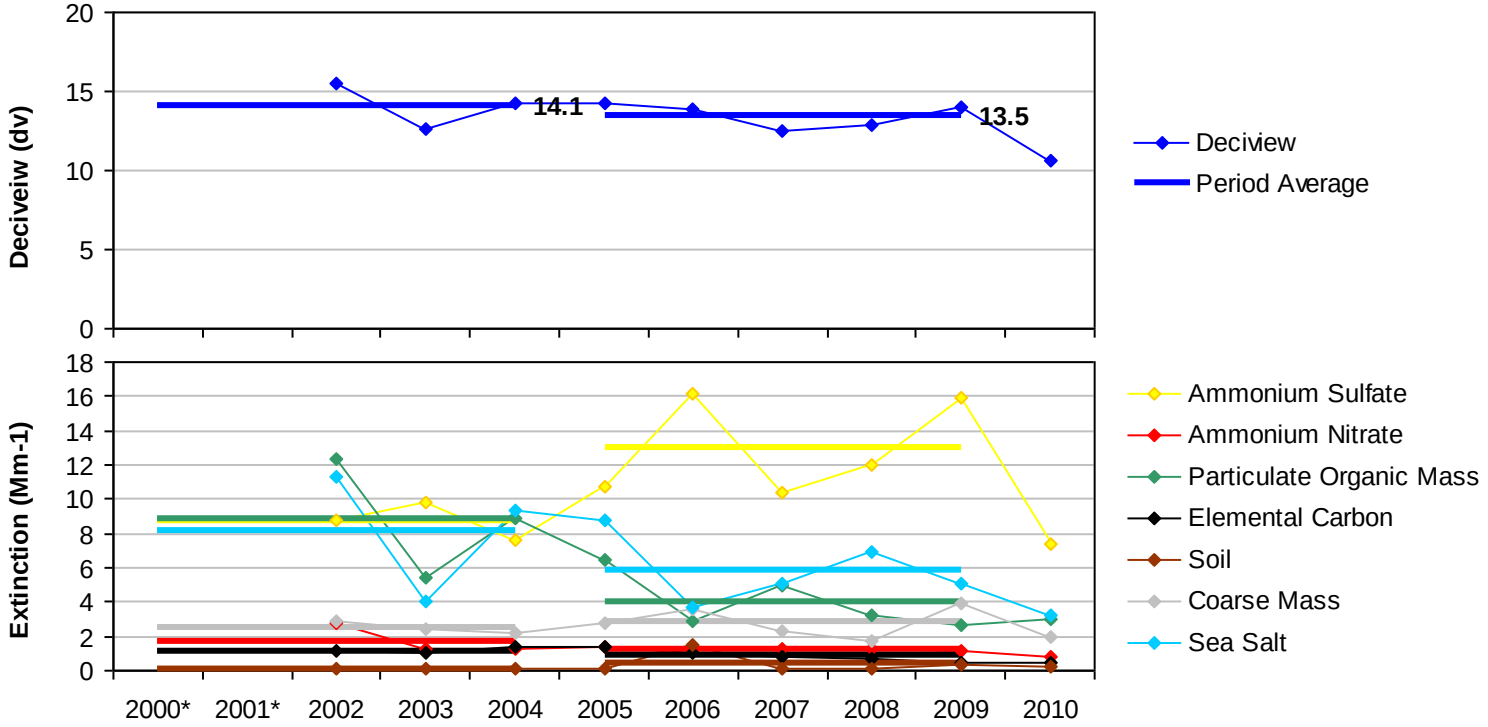
- **Figure A.4-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table A.4-1
Tuxedni WA, AK (TUXE1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	---	4.2	3.8	4.0	3.9	4.4	3.6	4.1	4.3	3.8	0.0	0.4	4.0	4.1	0.1	3%
Worst 20% Days	---	---	15.5	12.6	14.2	14.2	13.9	12.6	12.9	14.0	10.6	-0.2	0.1	14.1	13.5	-0.6	-4%
All Days	---	---	8.8	7.6	8.4	8.2	8.6	7.6	7.8	8.7	7.0	0.0	0.5	8.3	8.2	-0.1	-1%
Total Extinction (Mm-1)																	
Best 20% Days	---	---	15.3	14.6	14.9	14.8	15.6	14.4	15.1	15.5	14.6	0.1	0.4	14.9	15.1	0.2	1%
Worst 20% Days	---	---	51.3	36.2	42.9	43.5	42.1	37.0	38.1	41.5	29.1	-0.8	0.2	43.5	40.4	-3.1	-7%
All Days	---	---	27.0	22.7	25.0	24.7	25.4	22.8	23.2	25.6	20.8	-0.1	0.6	24.9	24.3	-0.6	-2%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	---	1.1	1.0	1.1	1.2	1.4	1.1	1.4	1.7	1.4	0.1	0.0	1.1	1.4	0.3	27%
Worst 20% Days	---	---	8.7	9.8	7.7	10.7	16.2	10.3	12.0	15.9	7.4	1.0	0.0	8.7	13.0	4.3	49%
All Days	---	---	4.7	4.4	3.8	5.0	6.9	4.8	5.5	7.1	4.2	0.3	0.0	4.3	5.9	1.6	37%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	---	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.3	0.2	0.0	0.0	0.4	0.3	-0.1	-25%
Worst 20% Days	---	---	2.7	1.3	1.3	1.4	1.3	1.3	1.3	1.1	0.8	0.0	0.0	1.8	1.3	-0.5	-28%
All Days	---	---	1.2	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.5	0.0	0.0	0.9	0.7	-0.2	-22%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	---	0.5	0.3	0.3	0.3	0.4	0.2	0.3	0.1	0.1	0.0	0.0	0.4	0.3	-0.1	-25%
Worst 20% Days	---	---	12.3	5.5	8.8	6.5	2.9	4.9	3.3	2.6	3.0	-1.2	0.0	8.9	4.0	-4.9	-55%
All Days	---	---	3.8	2.2	3.2	2.2	1.2	1.5	1.2	1.1	1.1	-0.3	0.0	3.0	1.5	-1.5	-50%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	---	0.1	0.2	0.3	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.2	0.1	-0.1	-50%
Worst 20% Days	---	---	1.1	1.0	1.4	1.4	1.0	0.9	0.6	0.5	0.4	-0.1	0.0	1.2	0.9	-0.3	-25%
All Days	---	---	0.7	0.5	0.8	0.6	0.5	0.3	0.3	0.3	0.2	-0.1	0.0	0.7	0.4	-0.3	-43%
Soil Extinction (Mm-1)																	
Best 20% Days	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.5	0.0	0.0	0.0	0%
Worst 20% Days	---	---	0.2	0.1	0.1	0.1	1.5	0.2	0.2	0.3	0.2	0.0	0.3	0.1	0.4	0.3	>100%
All Days	---	---	0.1	0.1	0.1	0.1	0.4	0.1	0.1	0.1	0.1	0.0	0.4	0.1	0.2	0.1	100%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	---	0.4	0.3	0.3	0.4	0.6	0.3	0.4	0.5	0.3	0.0	0.2	0.3	0.5	0.2	67%
Worst 20% Days	---	---	2.9	2.4	2.2	2.8	3.6	2.3	1.7	3.9	1.9	0.0	0.6	2.5	2.9	0.4	16%
All Days	---	---	1.3	1.3	1.1	1.3	1.6	1.1	0.9	1.9	0.9	0.0	0.5	1.2	1.4	0.2	17%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	---	0.7	0.4	0.5	0.5	0.7	0.5	0.7	0.8	0.5	0.0	0.2	0.5	0.6	0.1	20%
Worst 20% Days	---	---	11.3	4.0	9.4	8.7	3.7	5.1	7.0	5.1	3.3	-0.7	0.2	8.2	5.9	-2.3	-28%
All Days	---	---	3.3	1.5	3.2	2.7	2.1	2.2	2.5	2.4	1.6	-0.1	0.3	2.7	2.4	-0.3	-11%

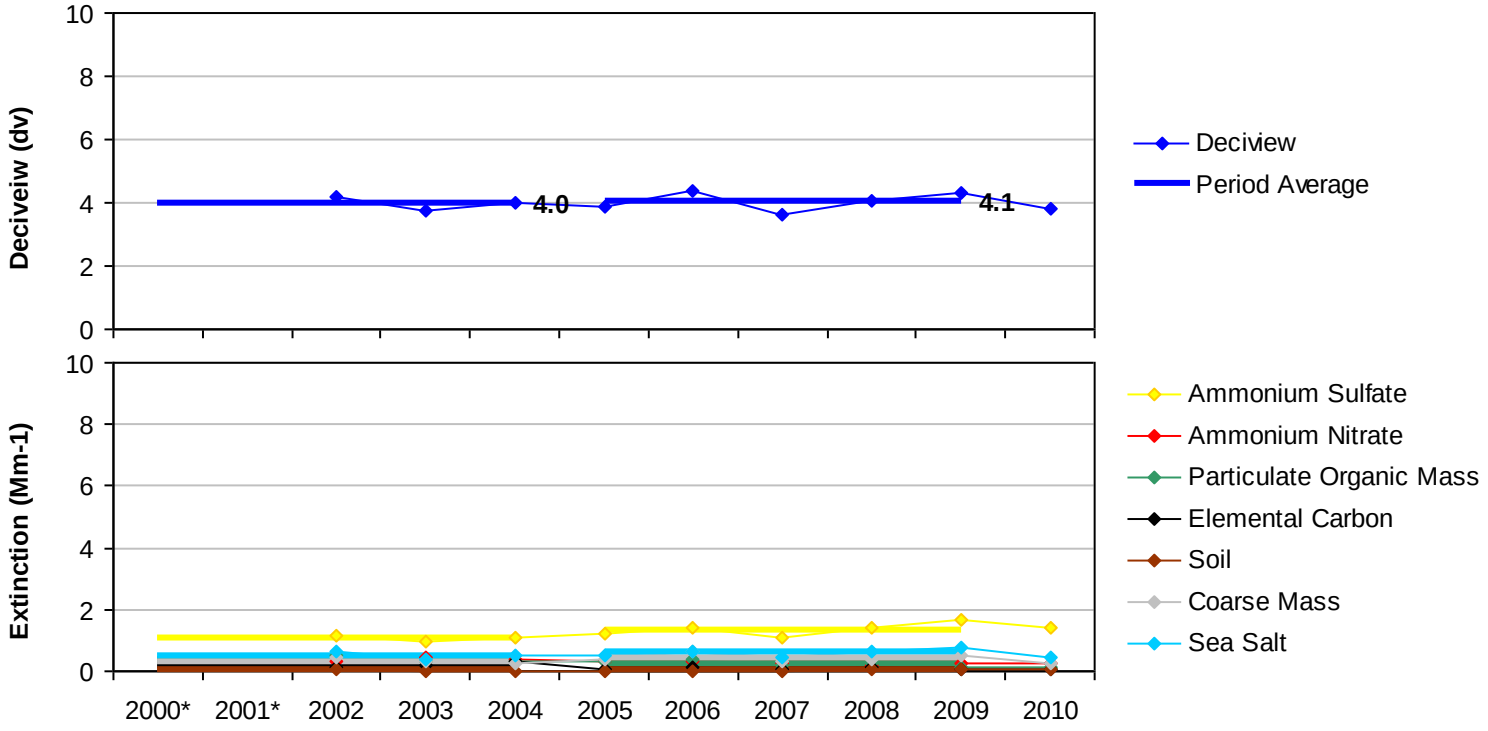
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure A.4-1
Tuxedni WA, AK (TUXE1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



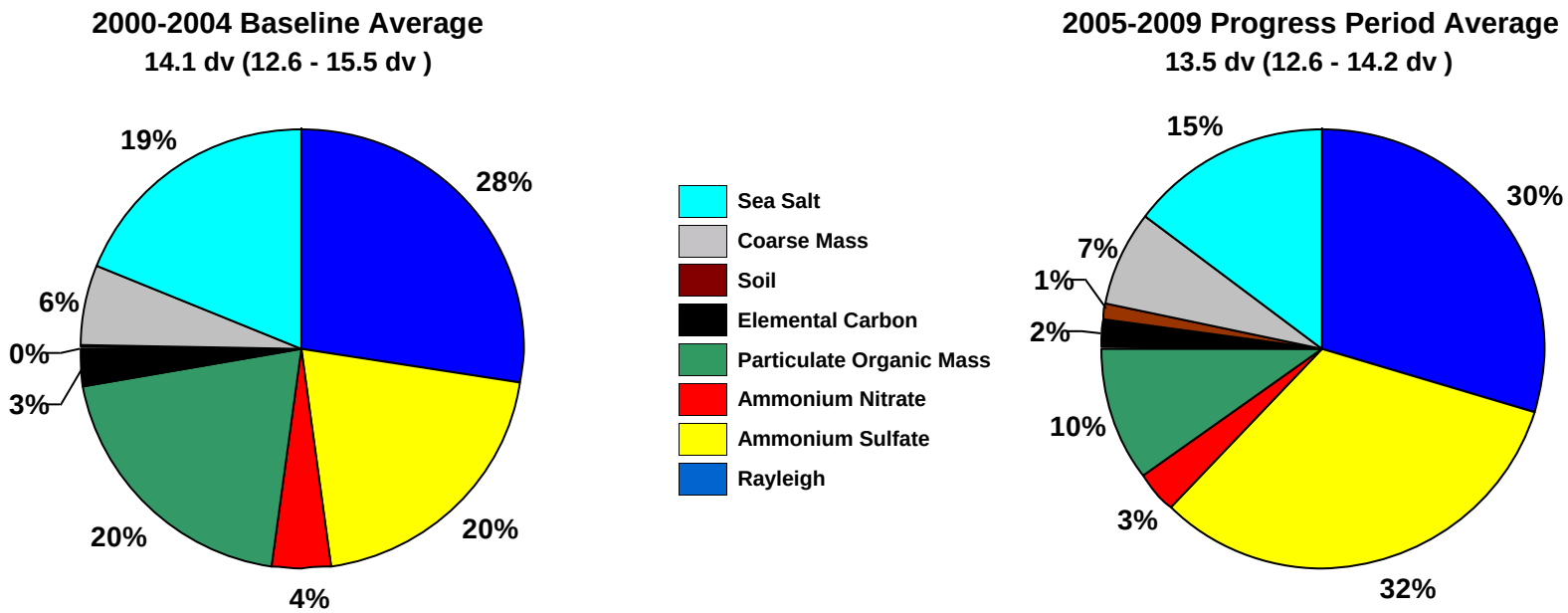
*Missing years did not meet RHR data completeness criteria.

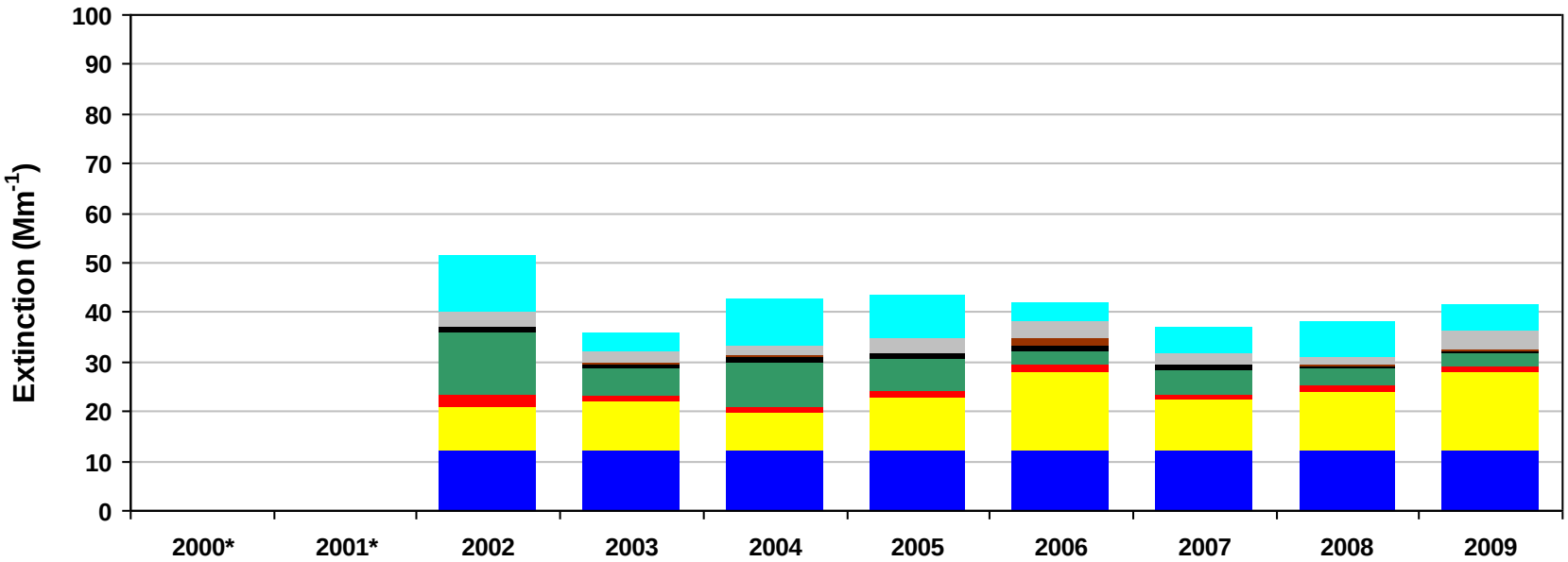
Figure A.4-2
Tuxedni WA, AK (TUXE1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

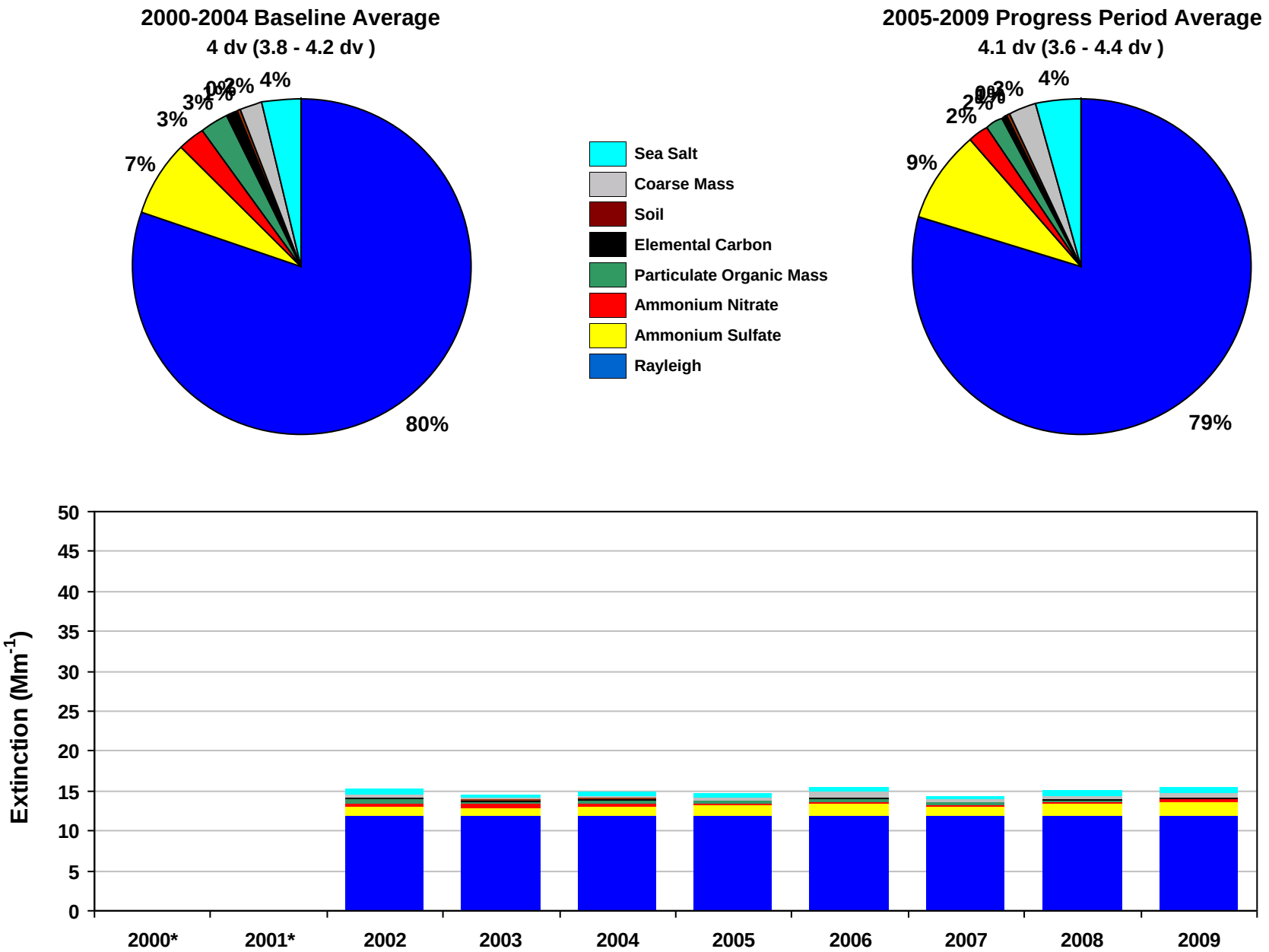
Figure A.4-3
Tuxedni WA, AK (TUXE1 Site)
20% Most Impaired Visibility Days





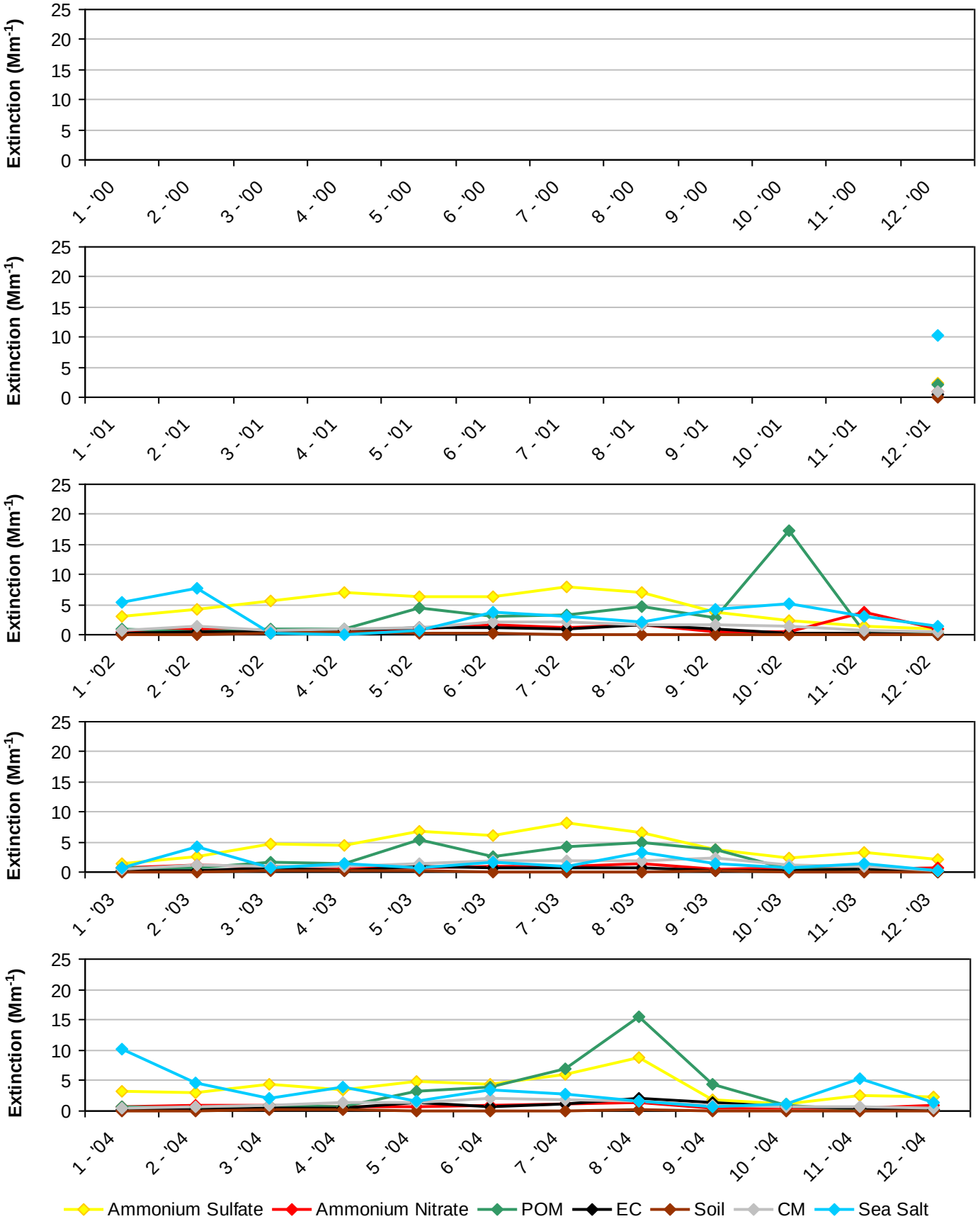
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure A.4-4
Tuxedni WA, AK (TUXE1 Site)
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure A.4-5
Tuxedni WA, AK (TUXE1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure A.4-6
Tuxedni WA, AK (TUXE1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

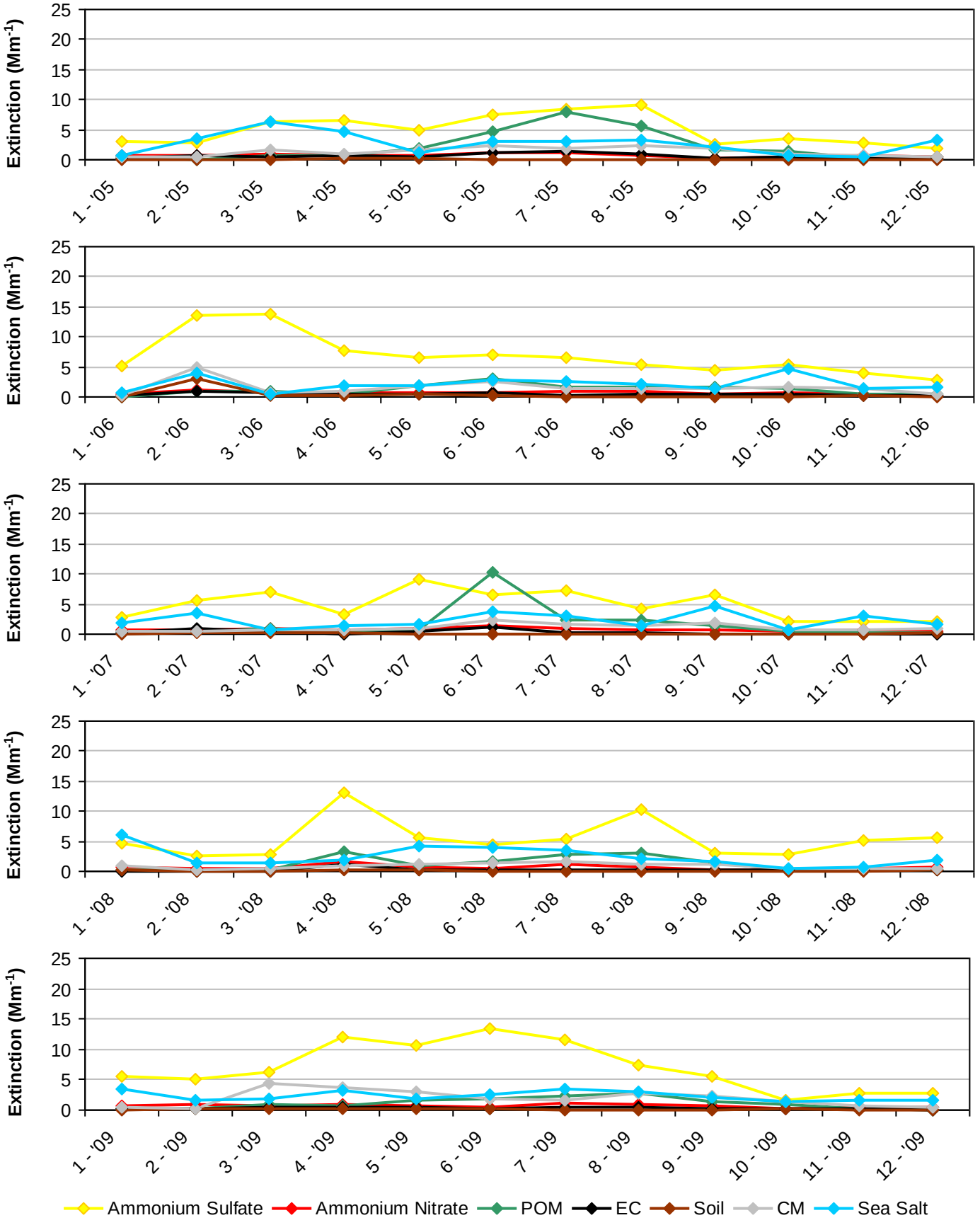
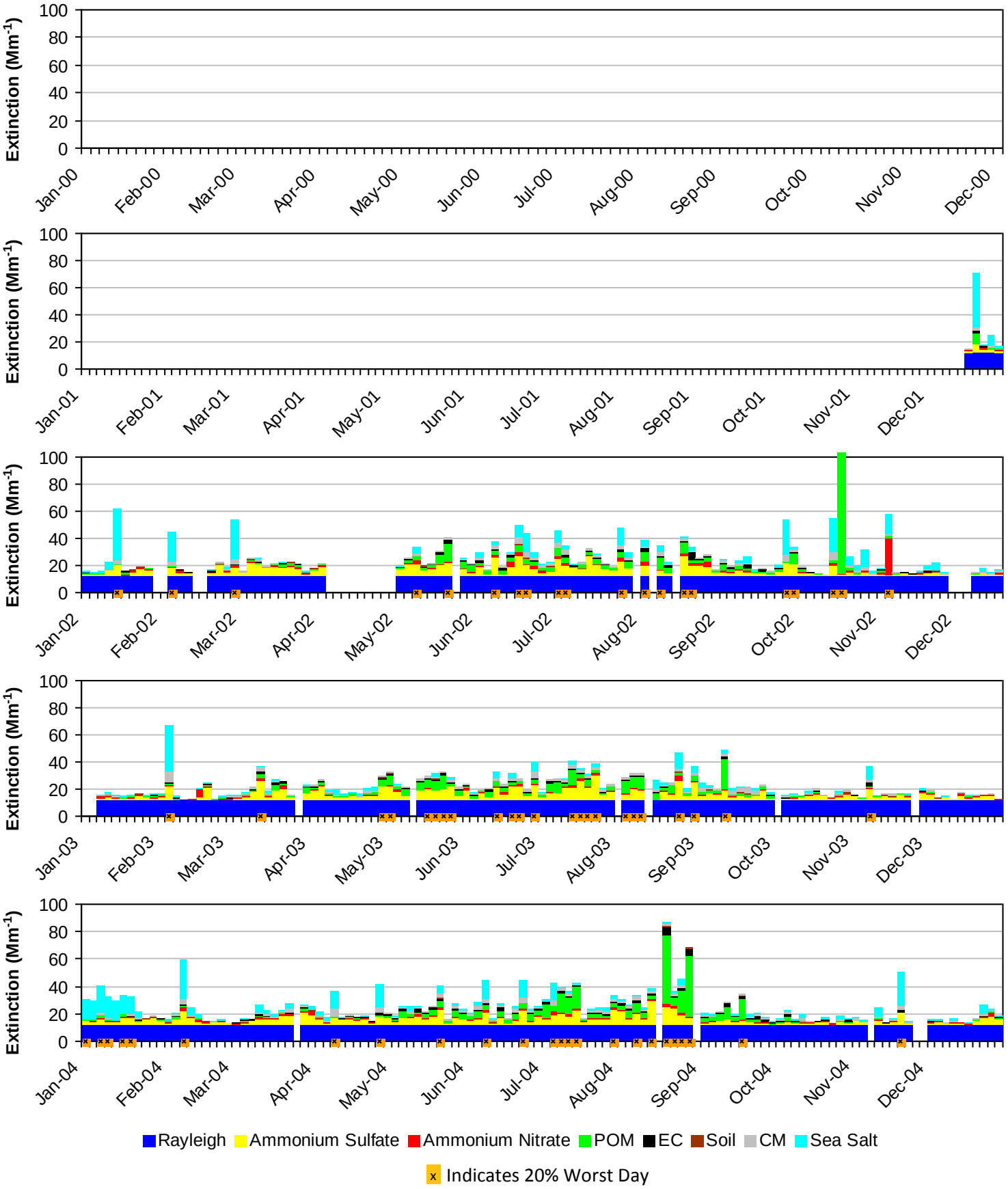
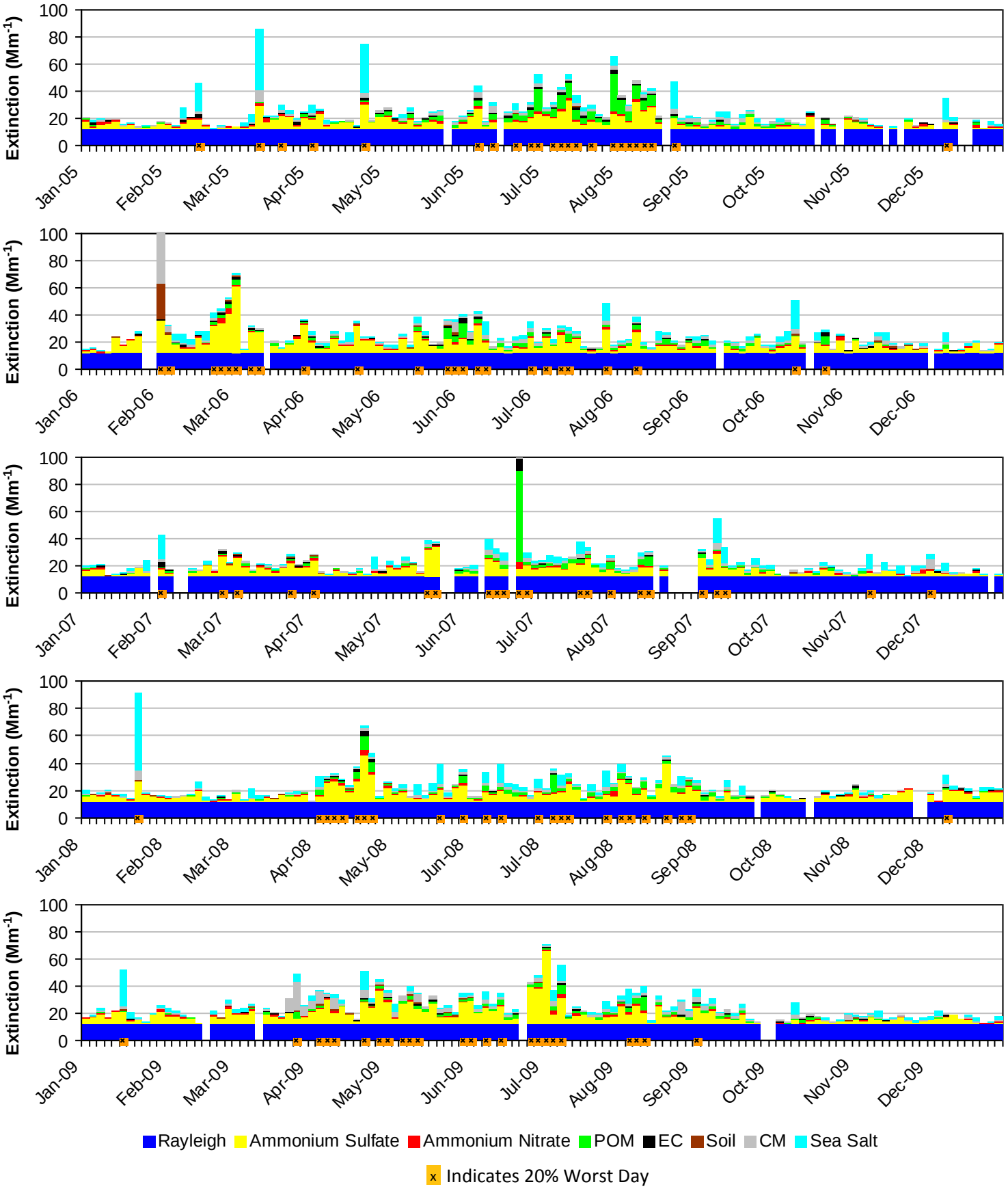


Figure A.4-7
Tuxedni WA, AK (TUXE1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure A.4-8
Tuxedni WA, AK (TUXE1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



APPENDIX B:

Arizona Class I Area Monitoring Data Summary Tables and Charts

Includes the following subsections:

Subsection	IMPROVE Monitor	Class I Area(s) Represented
B.1	BALD1	Mount Baldy WA
B.2	CHIR1	Chiricahua NM, Chiricahua WA, and Galiuro WA
B.3	GRCA2	Grand Canyon NP
B.4	IKBA1	Mazatzal WA and Pine Mountain WA
B.5	PEFO1	Petrified Forest NP
B.6	SAGU1	Saguaro WA
B.7	SAWE1	Saguaro WA
B.8	SIAN1	Sierra Ancha WA
B.9	SYCA1	Sycamore Canyon WA
B.10	TONT1	Superstition WA

B.1. MOUNT BALDY WA (BALD1)

The following tables and figures are presented in this section for Mount Baldy Wilderness Area represented by the BALD1 IMPROVE Monitor:

- **Table B.1-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure B.1-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure B.1-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure B.1-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure B.1-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure B.1-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure B.1-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure B.1-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

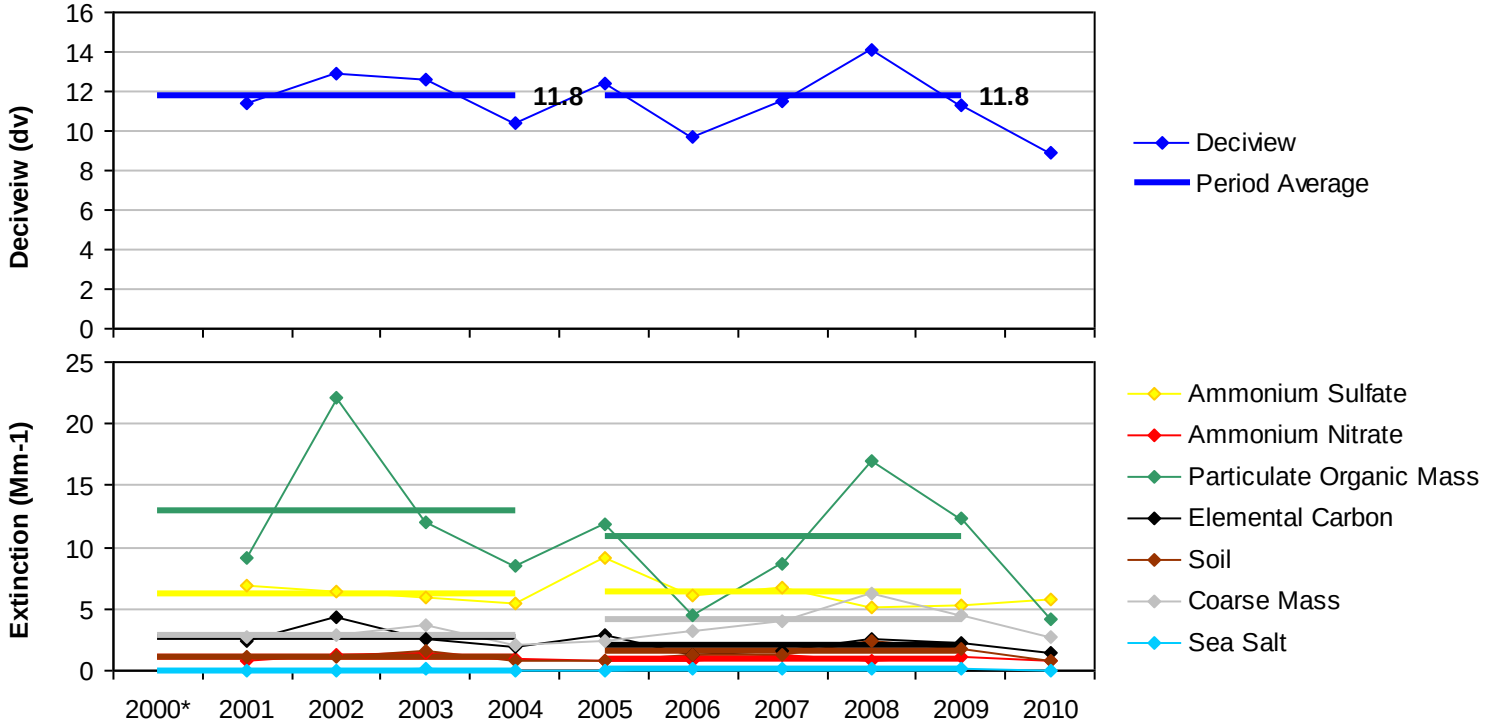
- **Figure B.1-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table B.1-1
Mount Baldy WA, AZ (BALD1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	3.7	2.9	2.6	2.8	3.0	3.2	2.7	2.7	3.0	2.8	0.0	0.3	3.0	2.9	-0.1	-3%
Worst 20% Days	---	11.4	12.9	12.6	10.4	12.4	9.7	11.5	14.1	11.3	8.9	-0.1	0.4	11.8	11.8	0.0	0%
All Days	---	7.2	7.3	7.3	6.5	7.4	6.4	6.9	8.0	6.6	5.9	0.0	0.5	7.1	7.0	-0.1	-1%
Total Extinction (Mm-1)																	
Best 20% Days	---	14.5	13.4	13.0	13.3	13.6	13.7	13.1	13.1	13.6	13.3	0.0	0.4	13.6	13.5	-0.1	-1%
Worst 20% Days	---	31.9	47.1	36.5	28.9	36.9	26.4	32.8	43.2	36.3	24.7	0.1	0.5	36.1	35.1	-1.0	-3%
All Days	---	21.5	24.3	22.2	19.9	22.6	19.4	21.1	24.4	21.2	18.4	0.0	0.5	22.0	21.7	-0.3	-1%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	2.1	1.4	1.4	1.7	1.7	1.7	1.4	1.2	1.9	1.7	0.0	0.5	1.6	1.6	0.0	0%
Worst 20% Days	---	6.8	6.5	5.9	5.5	9.2	6.0	6.8	5.1	5.3	5.8	-0.2	0.1	6.2	6.5	0.3	5%
All Days	---	4.2	3.8	3.7	3.6	5.0	3.8	4.0	3.7	3.3	3.4	-0.1	0.1	3.8	3.9	0.1	3%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.0	0.1	0.4	0.3	-0.1	-25%
Worst 20% Days	---	0.9	1.2	1.4	1.0	0.7	0.9	1.3	0.8	1.2	0.8	0.0	0.5	1.1	1.0	-0.1	-9%
All Days	---	0.8	0.9	0.9	0.7	0.7	0.6	0.7	0.7	0.7	0.6	0.0	0.0	0.8	0.7	-0.1	-13%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	1.3	1.2	1.2	1.2	1.2	1.3	1.0	1.3	1.0	0.8	0.0	0.2	1.2	1.2	0.0	0%
Worst 20% Days	---	9.1	22.2	12.1	8.5	11.9	4.5	8.6	17.0	12.3	4.1	0.0	0.5	13.0	10.9	-2.1	-16%
All Days	---	3.8	6.4	4.6	3.5	4.3	2.6	3.6	6.2	4.3	2.3	0.0	0.5	4.6	4.2	-0.4	-9%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.7	0.7	0.6	0.5	0.7	0.7	0.6	0.5	0.5	0.4	0.0	0.0	0.6	0.6	0.0	0%
Worst 20% Days	---	2.4	4.3	2.6	1.9	2.8	1.3	1.7	2.5	2.2	1.4	-0.1	0.2	2.8	2.1	-0.7	-25%
All Days	---	1.2	1.6	1.3	1.0	1.5	1.0	1.0	1.2	1.1	0.8	0.0	0.2	1.3	1.2	-0.1	-8%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.3	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.0	0.5	0.2	0.2	0.0	0%
Worst 20% Days	---	1.1	1.1	1.6	0.8	0.8	1.3	1.3	2.4	1.8	0.7	0.1	0.0	1.1	1.5	0.4	36%
All Days	---	0.7	0.8	0.8	0.6	0.5	0.6	0.7	1.0	0.8	0.5	0.0	0.3	0.7	0.7	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.5	0.6	0.4	0.3	0.6	0.6	0.7	0.6	0.6	0.8	0.0	0.1	0.5	0.6	0.1	20%
Worst 20% Days	---	2.7	2.8	3.8	2.1	2.4	3.3	4.0	6.2	4.5	2.7	0.3	0.0	2.8	4.1	1.3	46%
All Days	---	1.7	1.8	2.0	1.5	1.5	1.8	2.0	2.4	2.0	1.7	0.1	0.1	1.7	1.9	0.2	12%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
Worst 20% Days	---	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0%
All Days	---	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0%

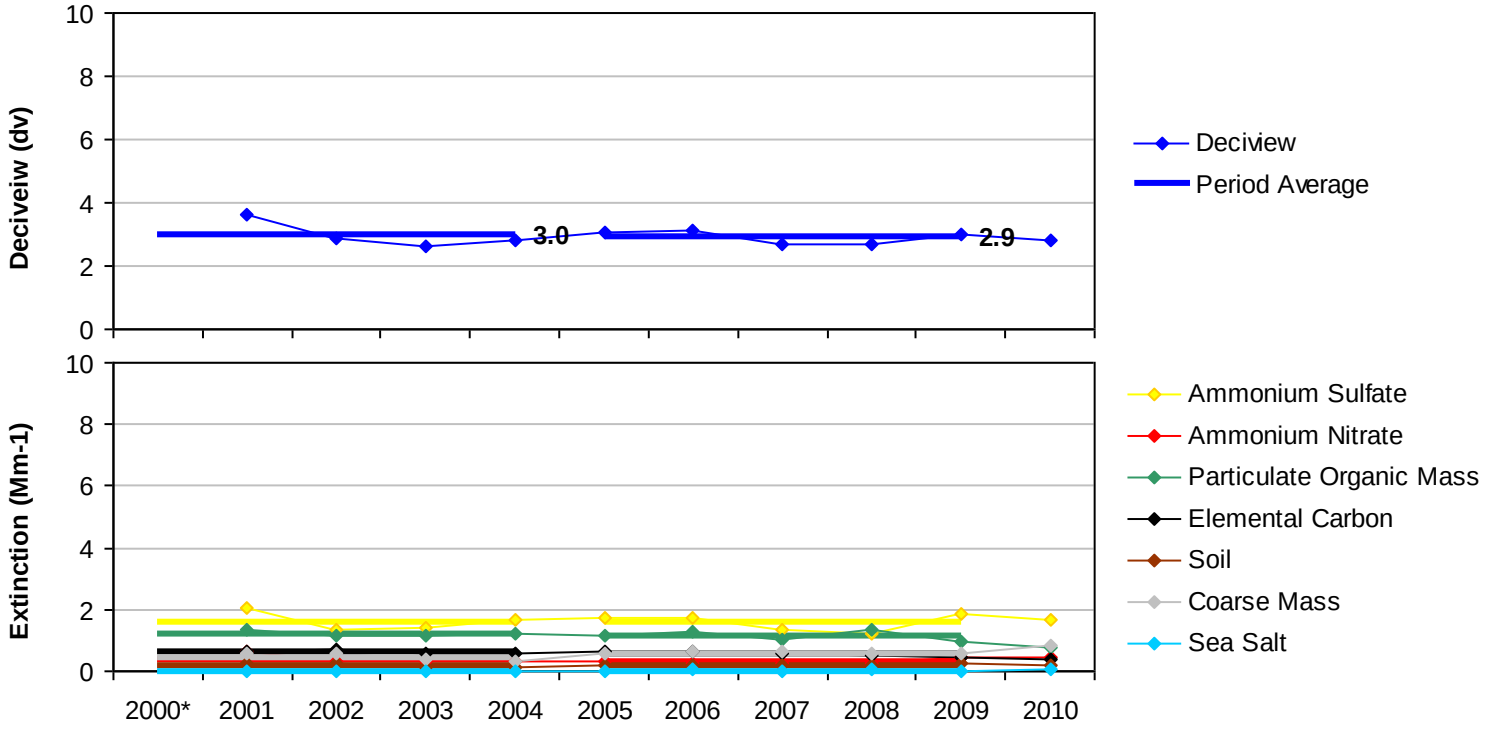
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure B.1-1
Mount Baldy WA, AZ (BALD1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



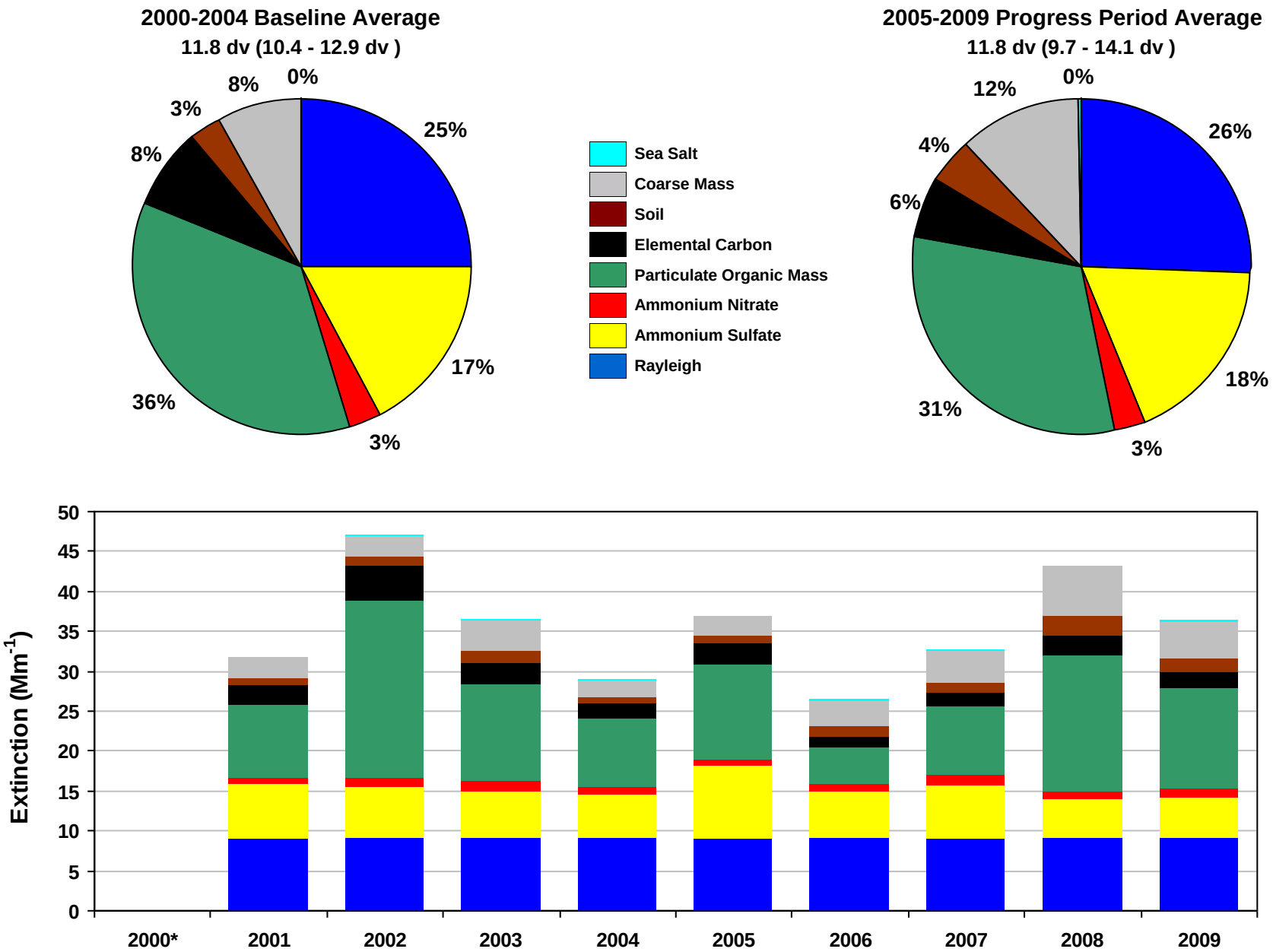
*Missing years did not meet RHR data completeness criteria.

Figure B.1-2
Mount Baldy WA, AZ (BALD1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



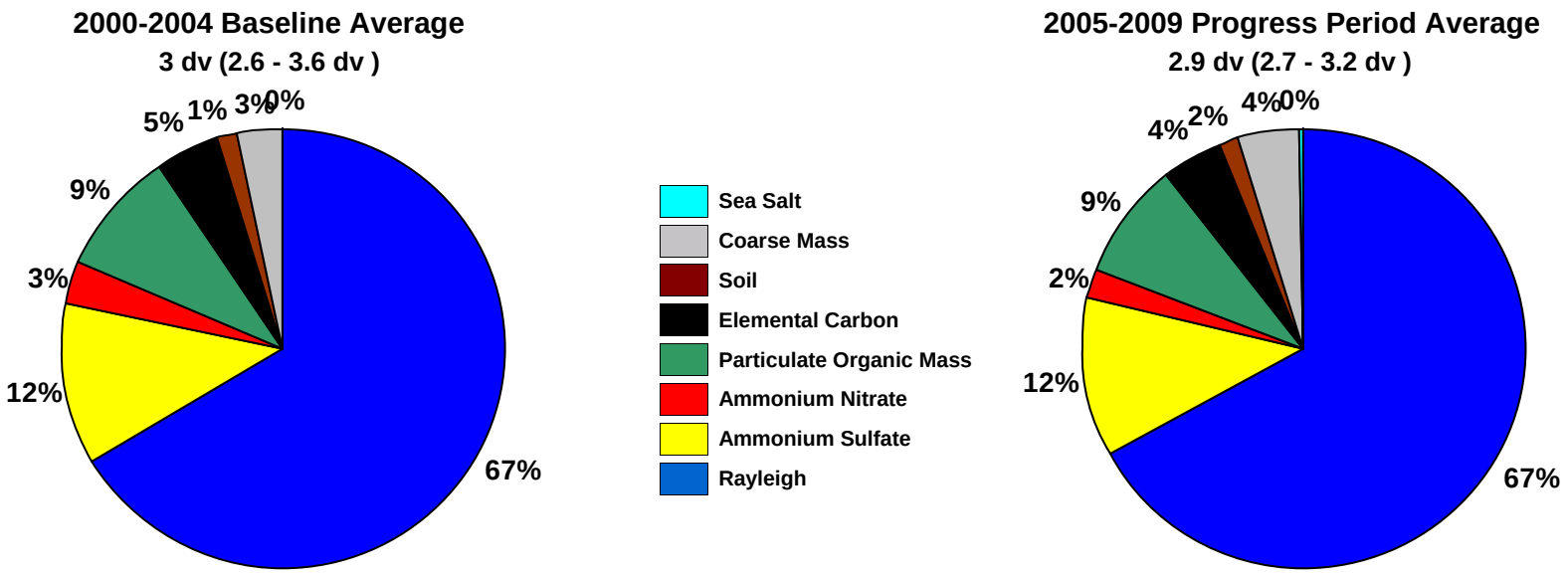
*Missing years did not meet RHR data completeness criteria.

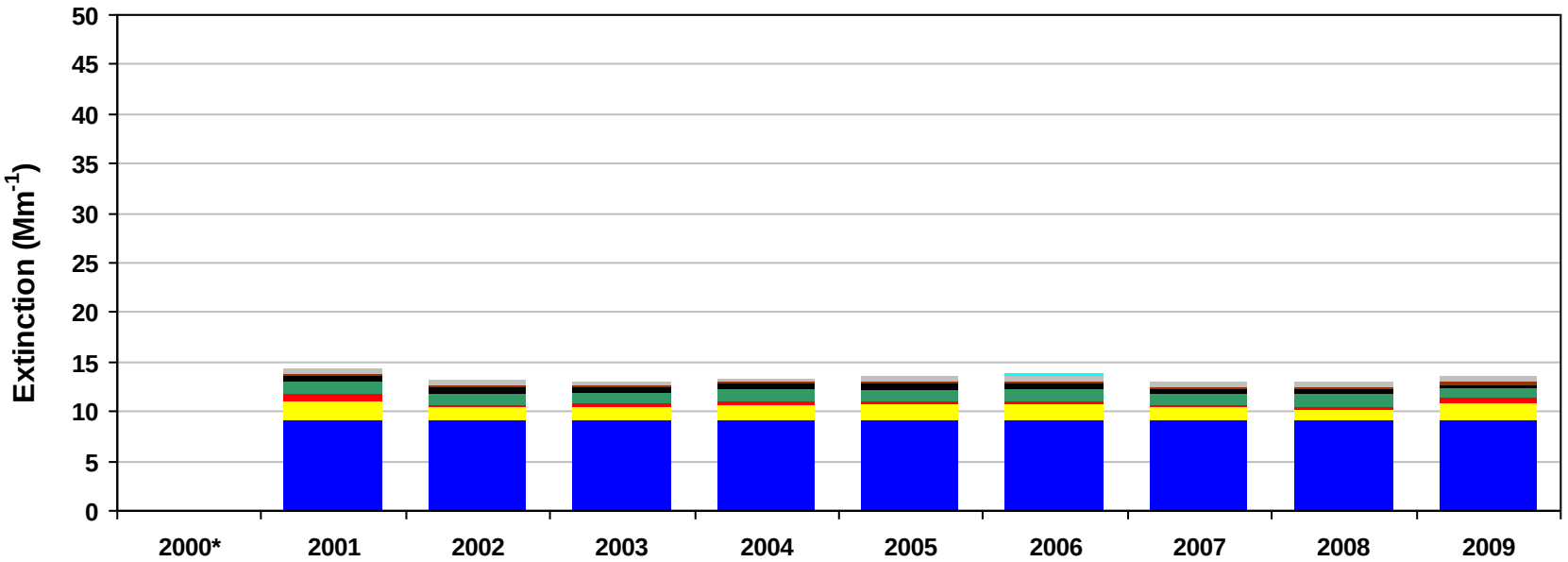
Figure B.1-3
Mount Baldy WA, AZ (BALD1 Site)
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

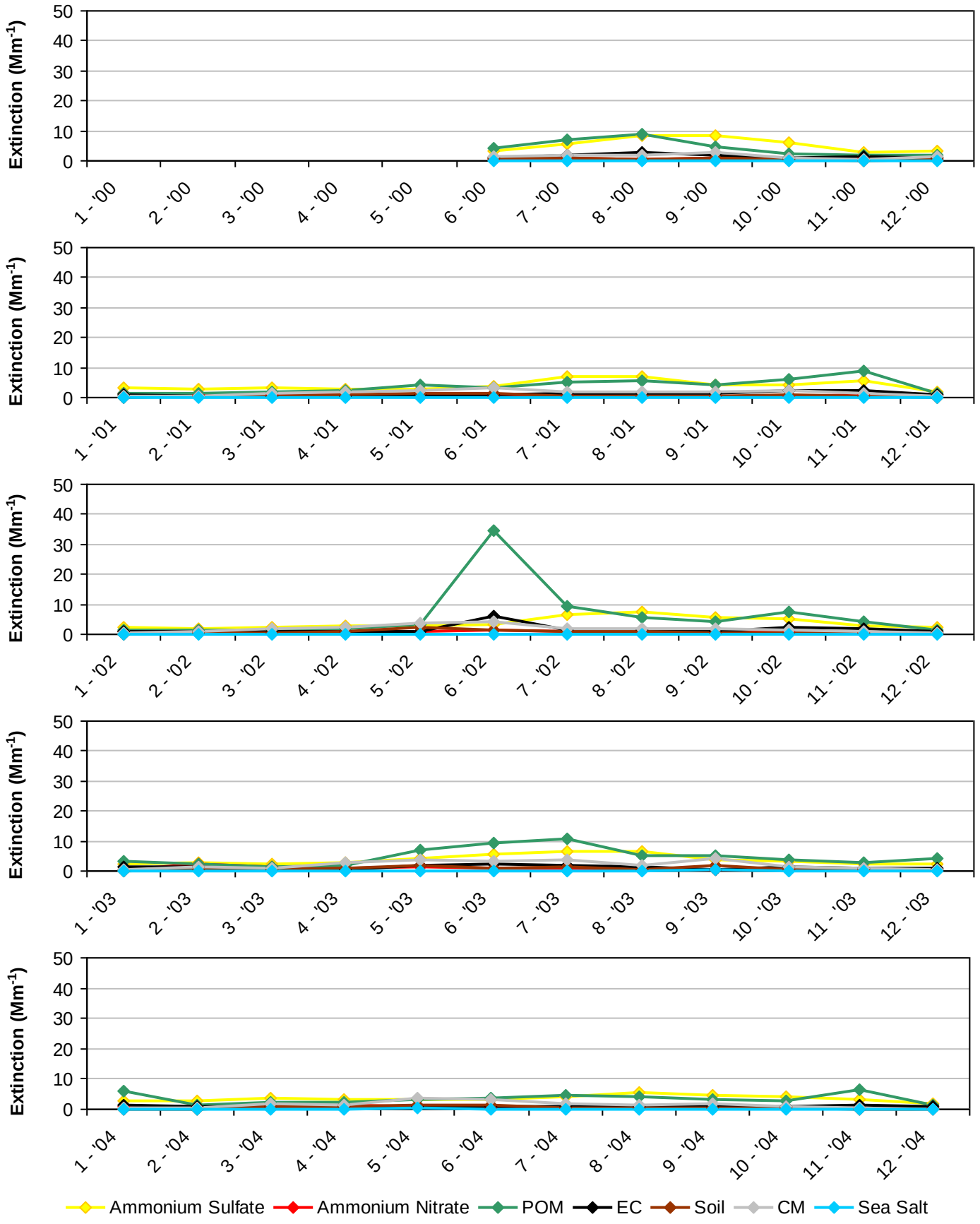
Figure B.1-4
Mount Baldy WA, AZ (BALD1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure B.1-5
Mount Baldy WA, AZ (BALD1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure B.1-6
Mount Baldy WA, AZ (BALD1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

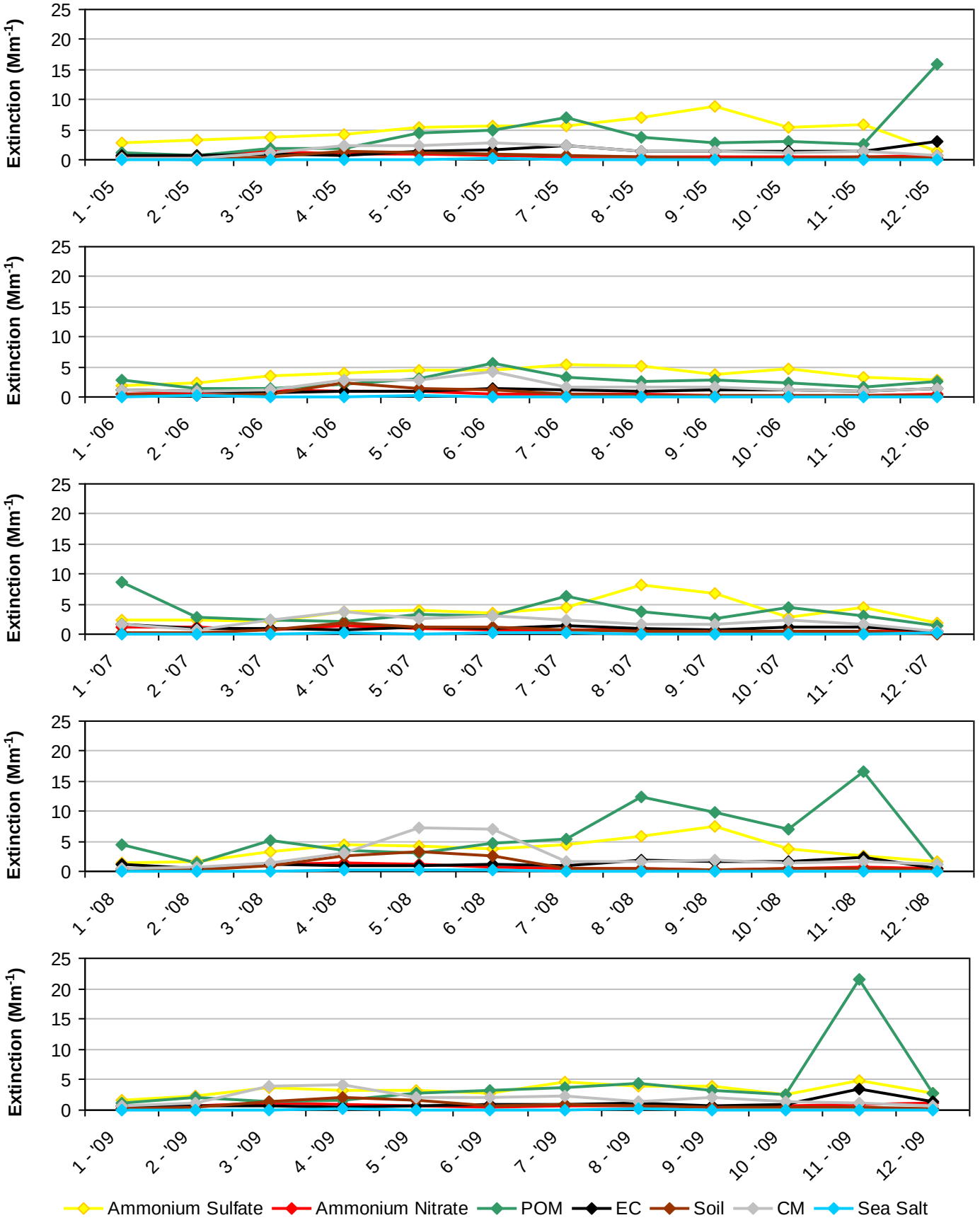
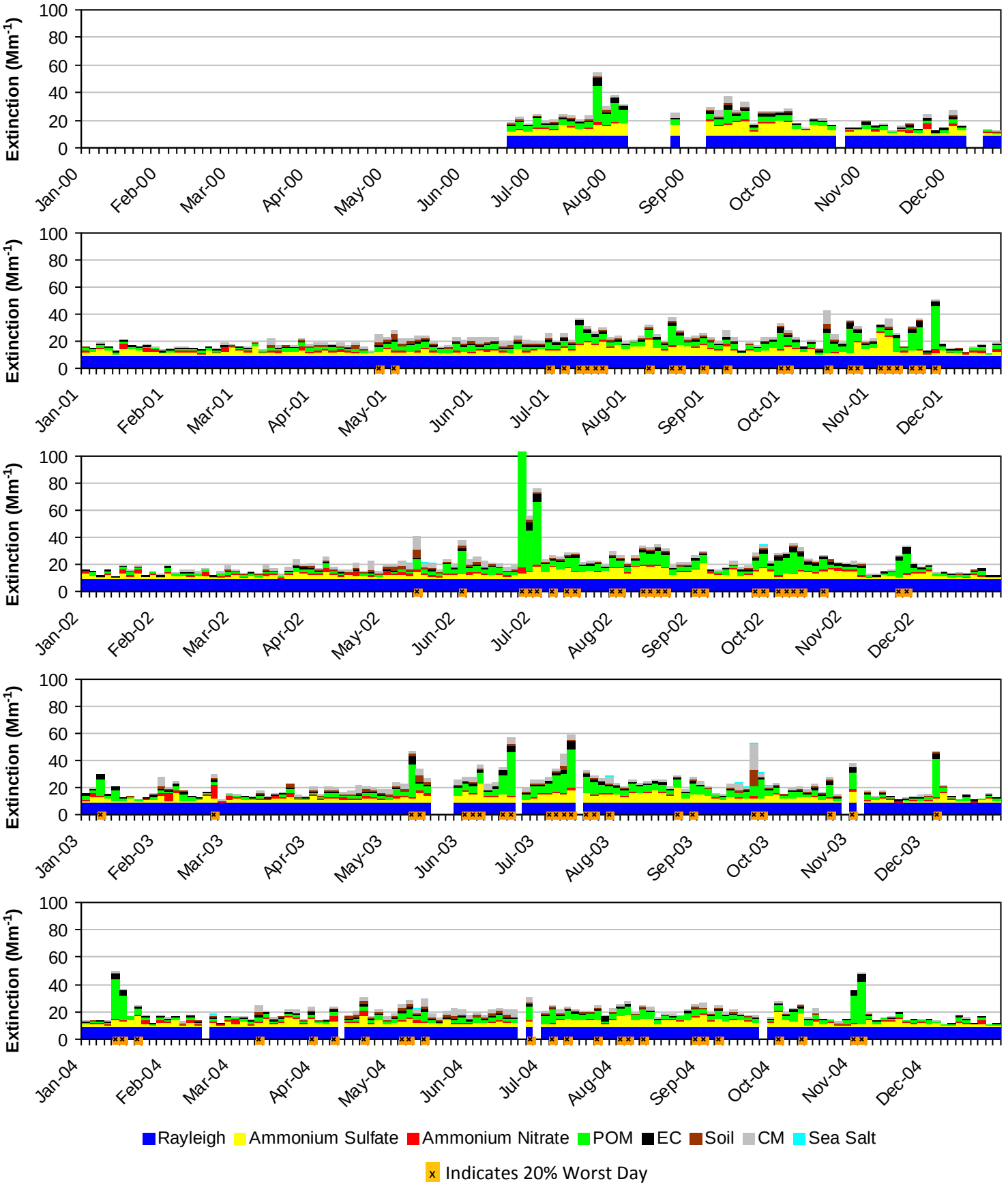
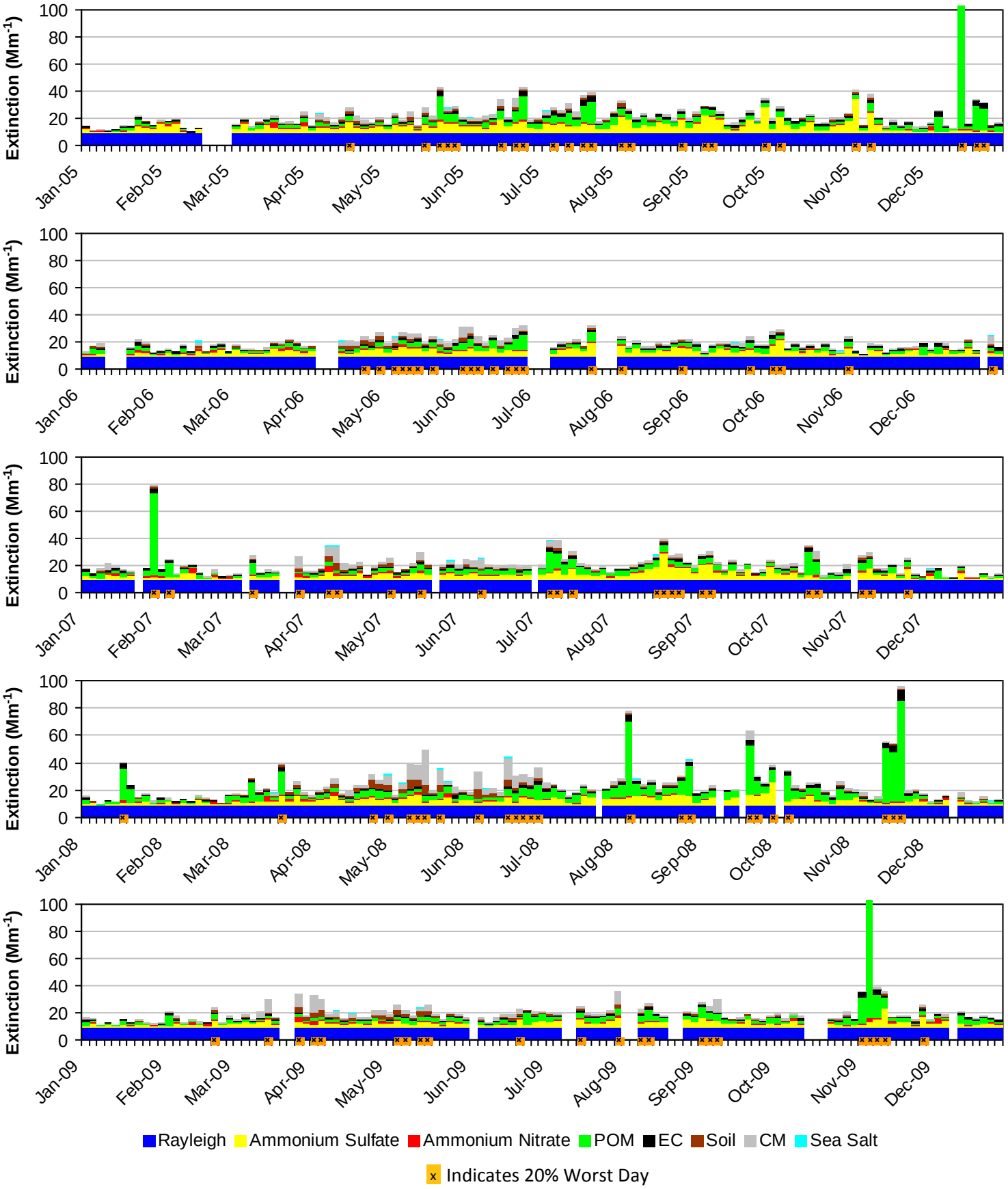


Figure B.1-7
Mount Baldy WA, AZ (BALD1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure B.1-8
Mount Baldy WA, AZ (BALD1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



B.2. CHIRICAHUA NM, CHIRICAHUA WA, AND GALIURO WA (CHIR1)

The following tables and figures are presented in this section for the Chiricahua National Monument, Chiricahua Wilderness Area, and Galiuro Wilderness Area represented by the CHIR1 IMPROVE Monitor:

- **Table B.2-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure B.2-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure B.2-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure B.2-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure B.2-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure B.2-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure B.2-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure B.2-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure B.2-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table B.2-1
Chiricahua NM, Chiricahua WA and Galiuro WA, AZ (CHIR1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	5.1	4.9	5.6	4.7	4.2	4.8	5.2	4.2	3.6	4.1	3.8	-0.1	0.0	4.9	4.4	-0.5	-10%
Worst 20% Days	14.0	12.5	14.5	14.9	11.2	12.6	13.4	12.3	12.1	10.7	10.5	-0.3	0.0	13.4	12.2	-1.2	-9%
All Days	9.3	8.3	9.6	9.0	7.5	8.2	8.8	8.1	7.8	7.4	6.9	-0.2	0.0	8.8	8.1	-0.7	-8%
Total Extinction (Mm-1)																	
Best 20% Days	16.8	16.4	17.7	16.1	15.3	16.2	16.9	15.3	14.5	15.2	14.7	-0.2	0.0	16.4	15.6	-0.8	-5%
Worst 20% Days	42.1	36.4	43.2	46.3	31.2	35.4	41.2	35.2	34.3	29.3	29.0	-1.0	0.0	39.9	35.1	-4.8	-12%
All Days	26.9	24.2	27.5	26.6	22.0	23.7	25.7	23.5	22.8	21.5	20.6	-0.6	0.0	25.4	23.5	-1.9	-8%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	2.5	2.2	2.5	2.2	2.1	2.4	2.3	2.0	1.7	2.3	2.0	0.0	0.1	2.3	2.1	-0.2	-9%
Worst 20% Days	8.7	8.5	7.8	8.6	7.0	10.6	8.3	10.7	9.0	7.0	7.9	0.0	0.5	8.1	9.1	1.0	12%
All Days	5.6	5.1	5.3	5.1	4.6	5.7	5.0	5.4	4.9	4.5	4.4	-0.1	0.1	5.1	5.1	0.0	0%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.5	0.6	0.6	0.5	0.6	0.5	0.4	0.4	0.3	0.4	0.4	0.0	0.0	0.5	0.4	-0.1	-20%
Worst 20% Days	1.1	0.9	1.9	1.5	1.4	1.0	1.7	1.1	1.1	1.4	1.2	0.0	0.5	1.3	1.3	0.0	0%
All Days	0.9	0.7	1.2	0.9	0.9	0.8	0.9	0.9	0.6	0.7	0.7	0.0	0.1	0.9	0.8	-0.1	-11%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.6	1.5	1.6	1.3	1.0	1.1	1.1	1.0	0.7	0.8	0.7	-0.1	0.0	1.4	0.9	-0.5	-36%
Worst 20% Days	8.5	4.5	9.3	9.8	4.3	5.4	4.5	3.8	4.1	2.5	2.5	-0.7	0.0	7.3	4.0	-3.3	-45%
All Days	3.8	2.7	3.7	3.7	2.3	2.5	2.5	2.3	2.3	1.8	1.6	-0.2	0.0	3.2	2.3	-0.9	-28%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.7	0.7	0.9	0.6	0.5	0.7	0.8	0.6	0.4	0.4	0.4	0.0	0.1	0.7	0.6	-0.1	-14%
Worst 20% Days	2.2	1.2	1.8	2.2	1.0	1.9	1.3	1.1	0.9	0.8	0.9	-0.1	0.0	1.7	1.2	-0.5	-29%
All Days	1.3	1.0	1.2	1.1	0.8	1.1	1.1	0.8	0.7	0.7	0.7	-0.1	0.0	1.1	0.9	-0.2	-18%
Soil Extinction (Mm-1)																	
Best 20% Days	0.4	0.2	0.5	0.3	0.2	0.3	0.5	0.3	0.3	0.4	0.3	0.0	0.3	0.3	0.3	0.0	0%
Worst 20% Days	2.8	2.5	2.4	3.8	1.9	1.4	3.6	2.4	2.6	2.0	1.2	-0.1	0.2	2.7	2.4	-0.3	-11%
All Days	1.2	1.0	1.3	1.5	0.8	0.8	1.4	1.0	1.1	1.0	0.8	0.0	0.2	1.2	1.1	-0.1	-8%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	1.2	1.2	1.6	1.3	0.9	1.2	1.8	1.0	1.0	1.0	0.9	0.0	0.2	1.2	1.2	0.0	0%
Worst 20% Days	8.8	8.8	9.9	10.4	5.3	4.9	11.4	5.8	6.4	5.3	5.0	-0.4	0.2	8.6	6.8	-1.8	-21%
All Days	4.0	3.5	4.8	4.4	2.4	2.7	4.6	3.0	3.1	2.7	2.4	-0.1	0.2	3.8	3.2	-0.6	-16%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0%
Worst 20% Days	0.0	0.1	0.3	0.0	0.2	0.2	0.4	0.2	0.3	0.2	0.2	0.0	0.0	0.1	0.3	0.2	>100%
All Days	0.0	0.0	0.2	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure B.2-1
Chiricahua NM, Chiricahua WA and Galiuro WA, AZ (CHIR1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

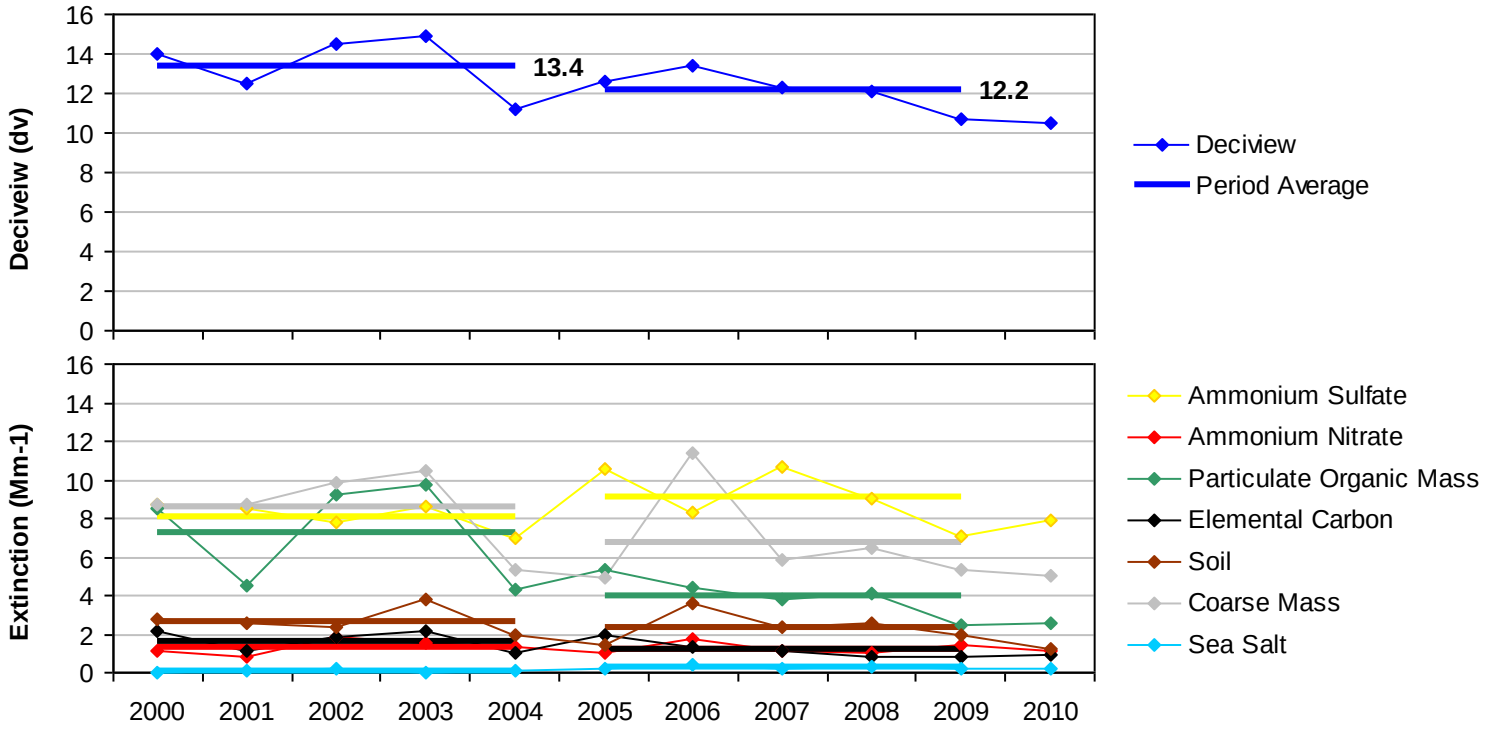


Figure B.2-2
Chiricahua NM, Chiricahua WA and Galiuro WA, AZ (CHIR1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

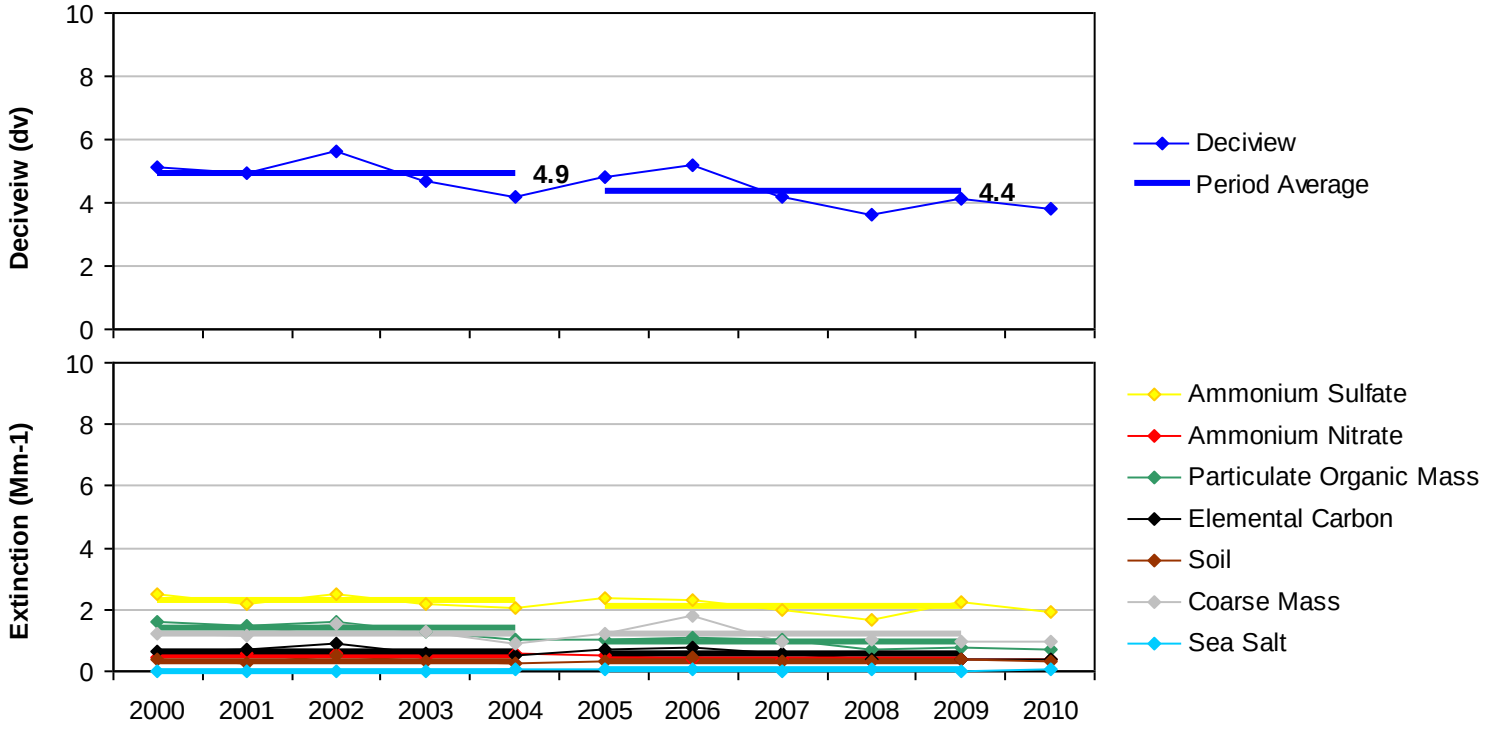


Figure B.2-3

Chiricahua NM, Chiricahua WA and Galiuro WA, AZ (CHIR1 Site)

20% Most Impaired Visibility Days

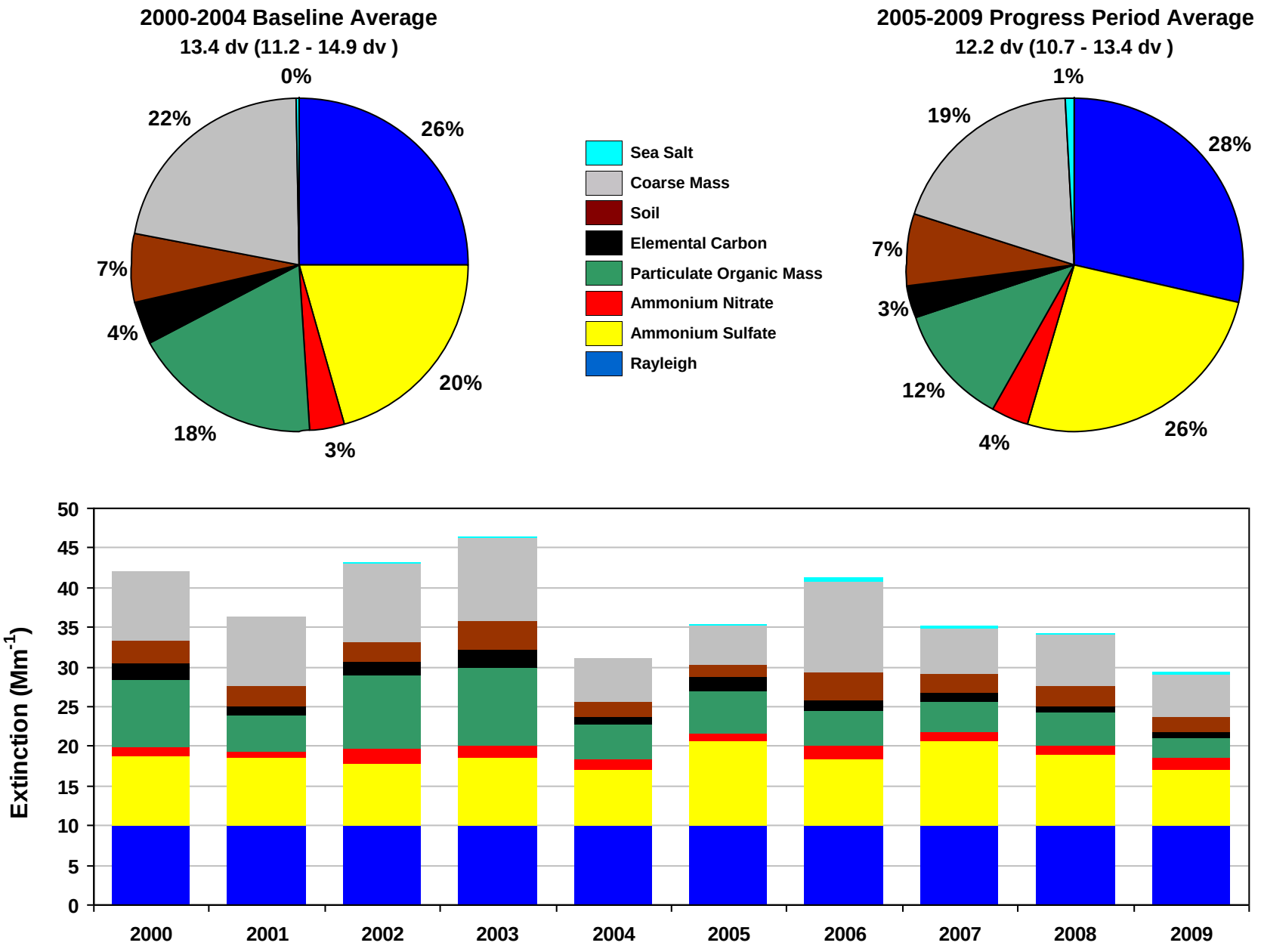
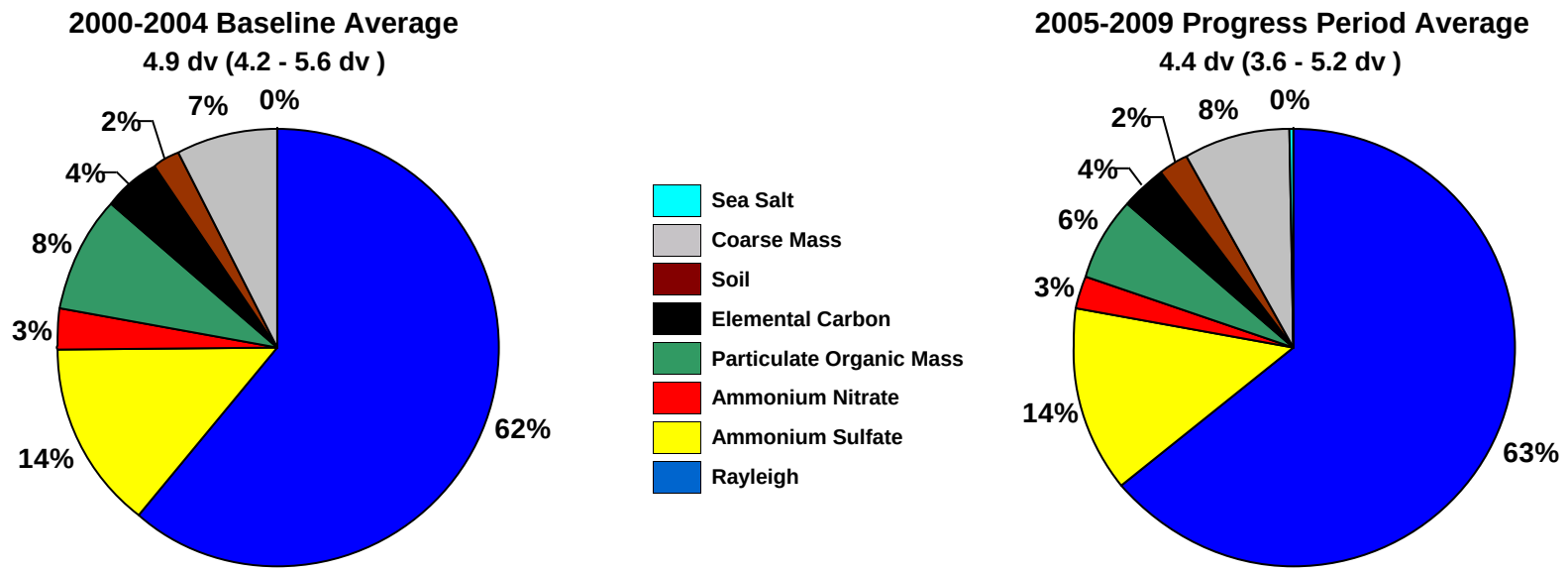


Figure B.2-4

Chiricahua NM, Chiricahua WA and Galiuro WA, AZ (CHIR1 Site)

20% Least Impaired Visibility Days



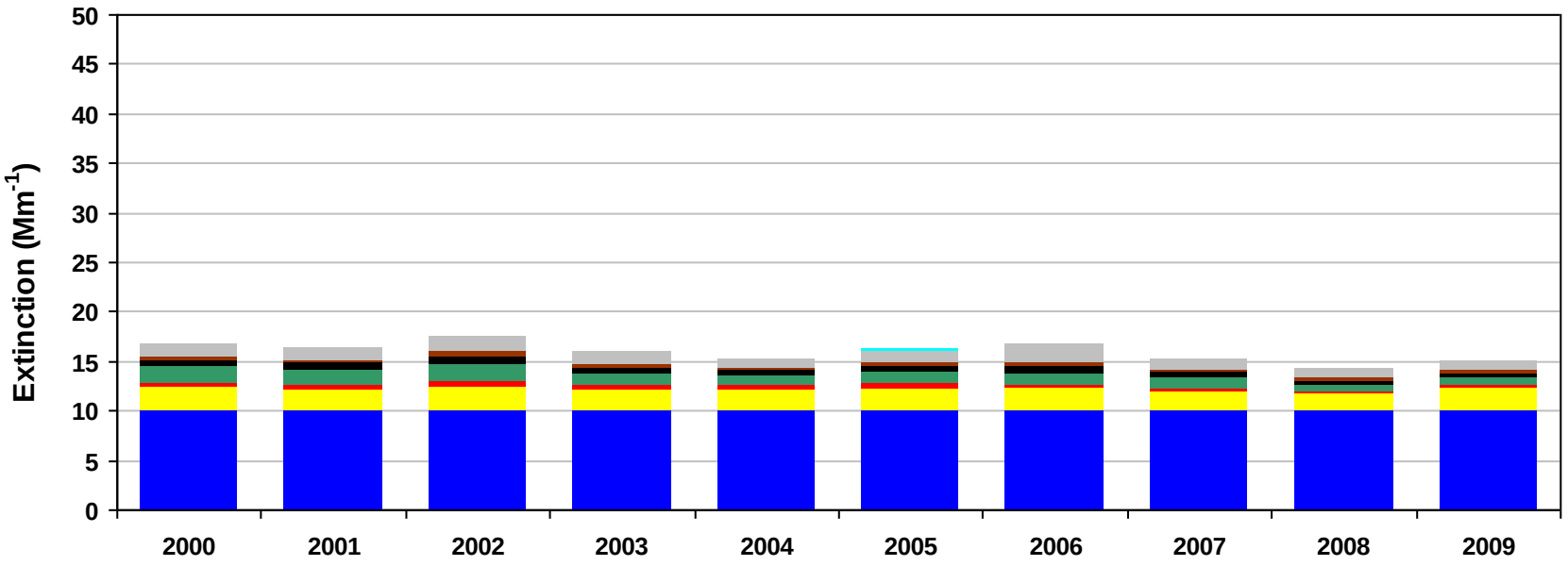


Figure B.2-5
Chiricahua NM, Chiricahua WA and Galiuro WA, AZ (CHIR1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

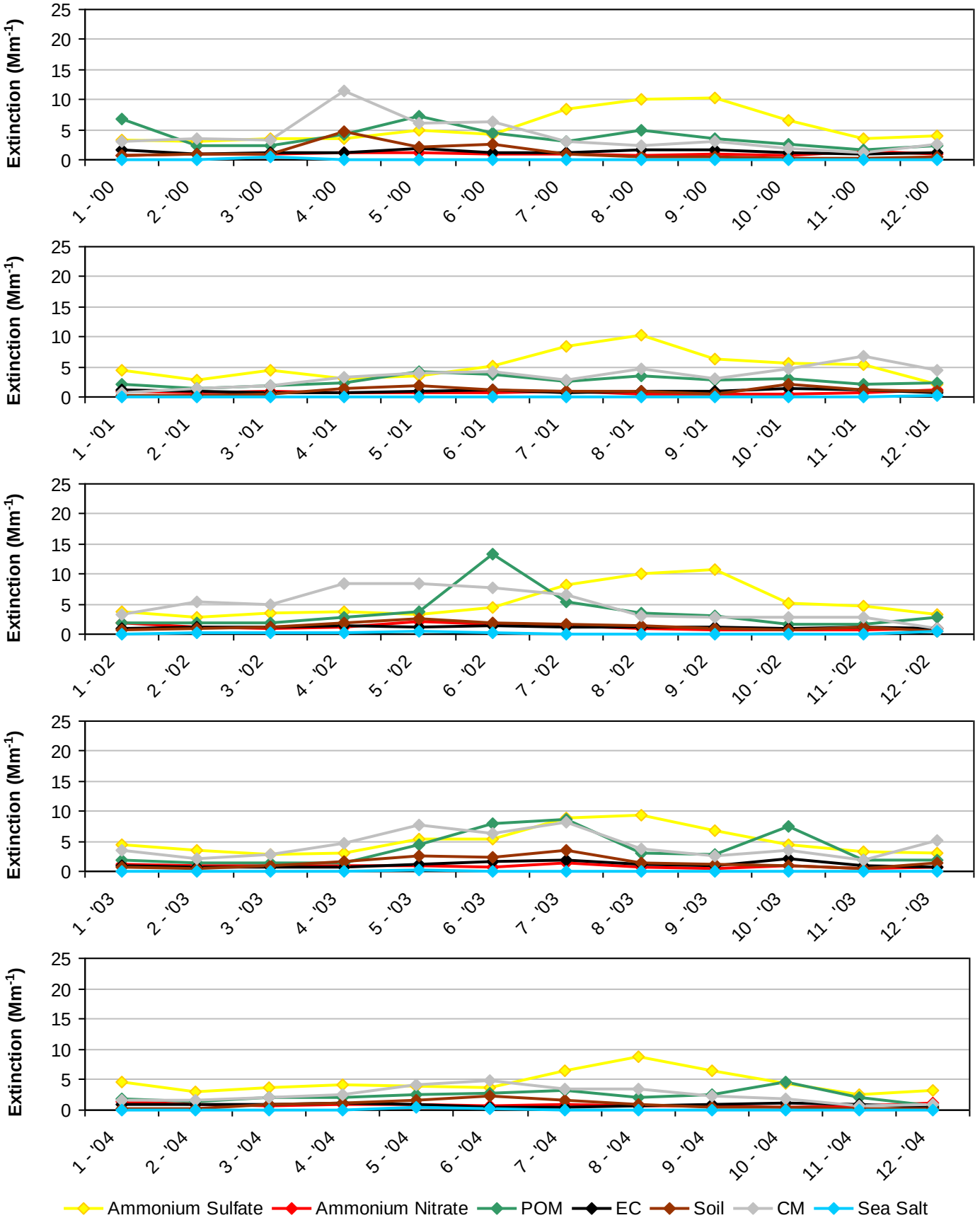


Figure B.2-6
Chiricahua NM, Chiricahua WA and Galiuro WA, AZ (CHIR1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

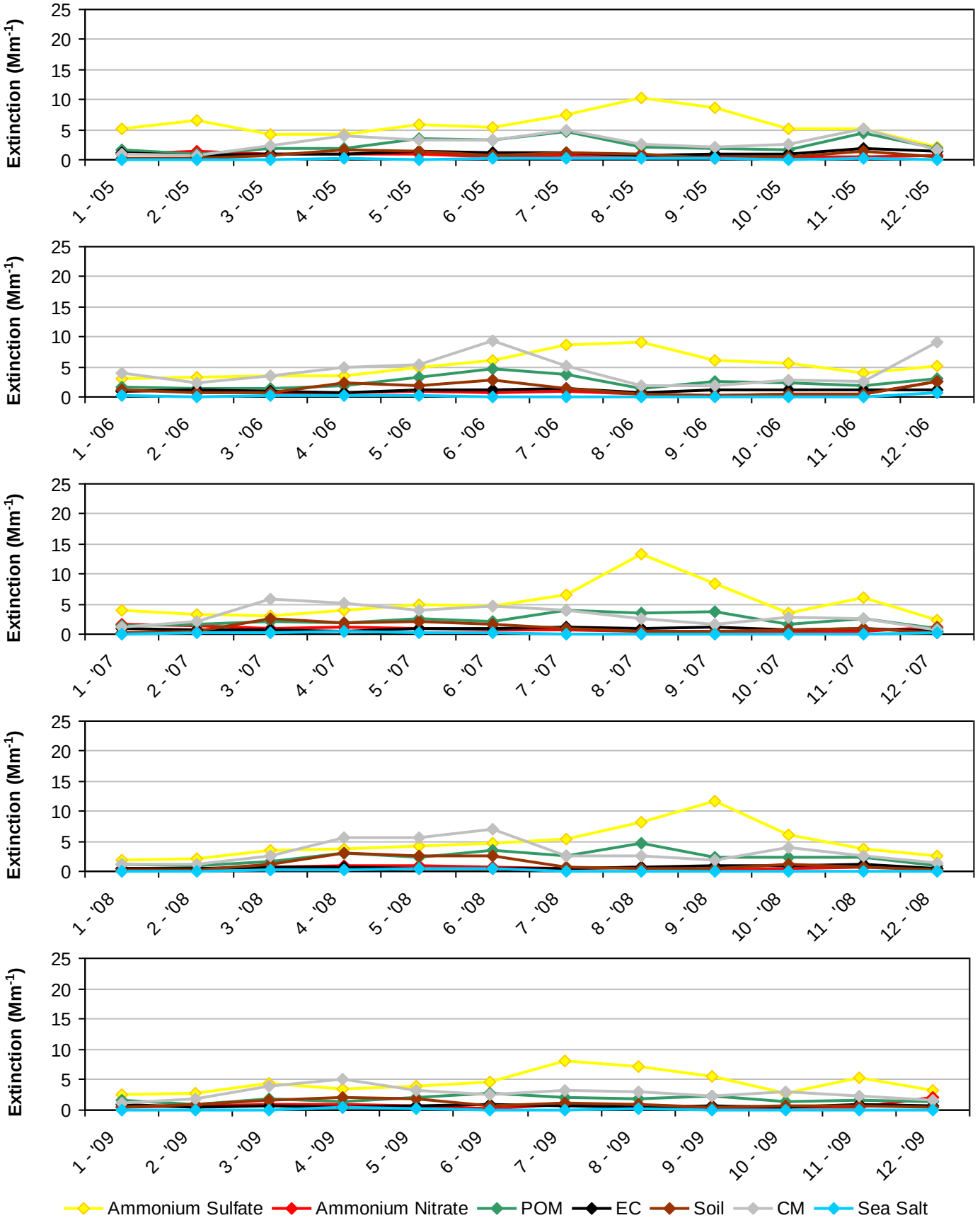


Figure B.2-7
Chiricahua NM, Chiricahua WA and Galiuro WA, AZ (CHIR1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

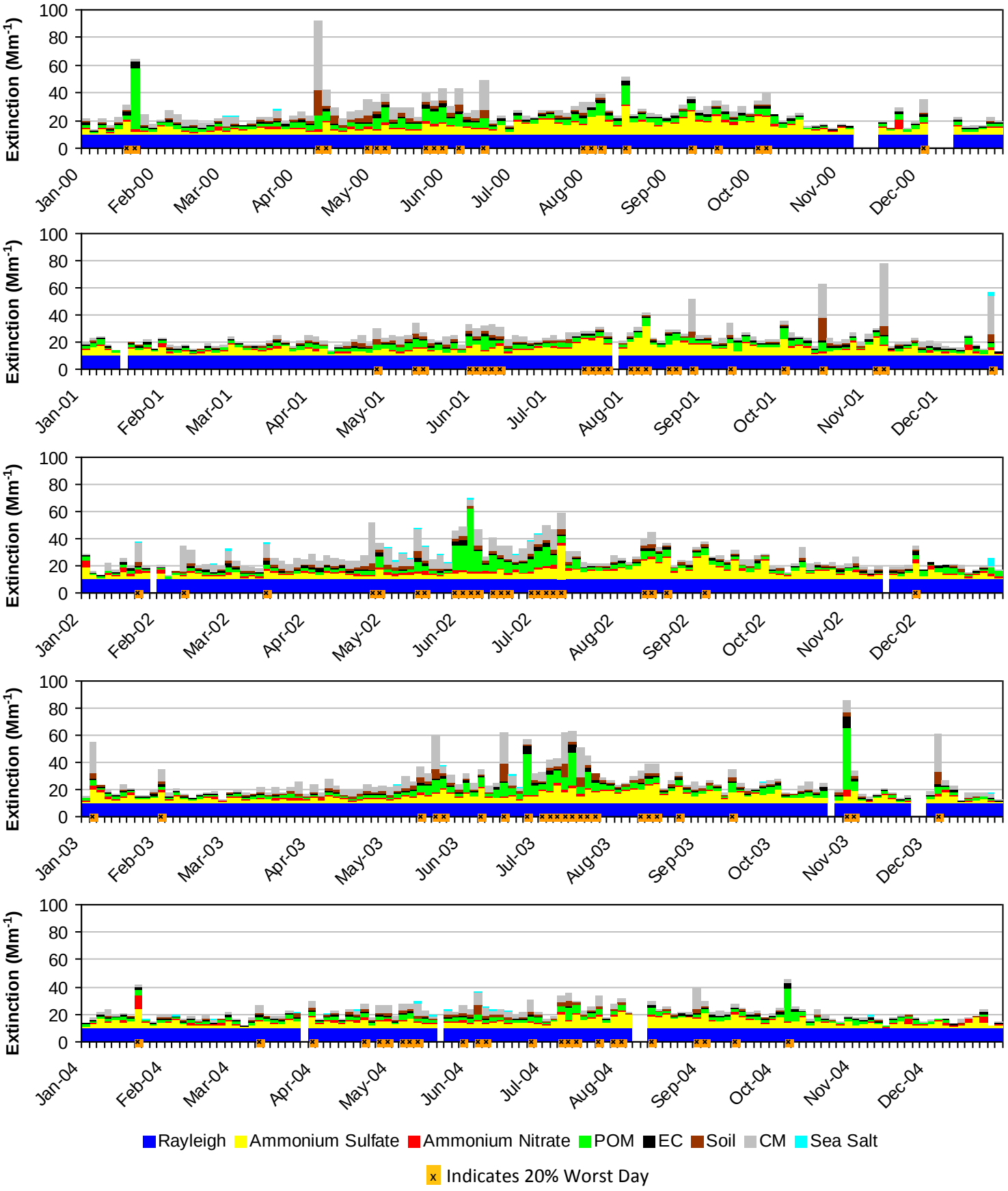
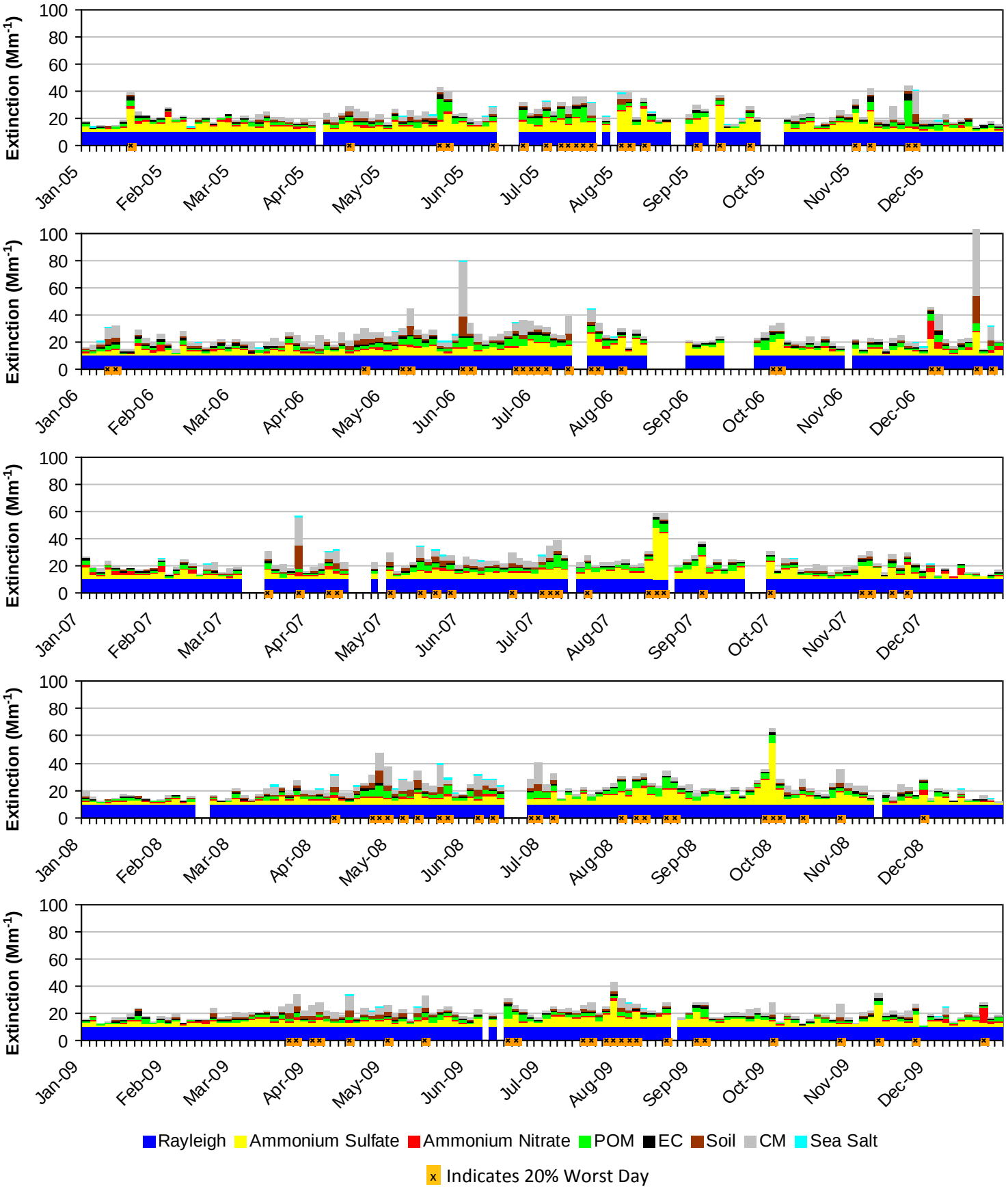


Figure B.2-8
Chiricahua NM, Chiricahua WA and Galiuro WA, AZ (CHIR1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



B.3. GRAND CANYON NP (GRCA2)

The following tables and figures are presented in this section for the Grand Canyon National Park represented by the GRCA2 IMPROVE Monitor:

- **Table B.3-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure B.3-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure B.3-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure B.3-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure B.3-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure B.3-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure B.3-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure B.3-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

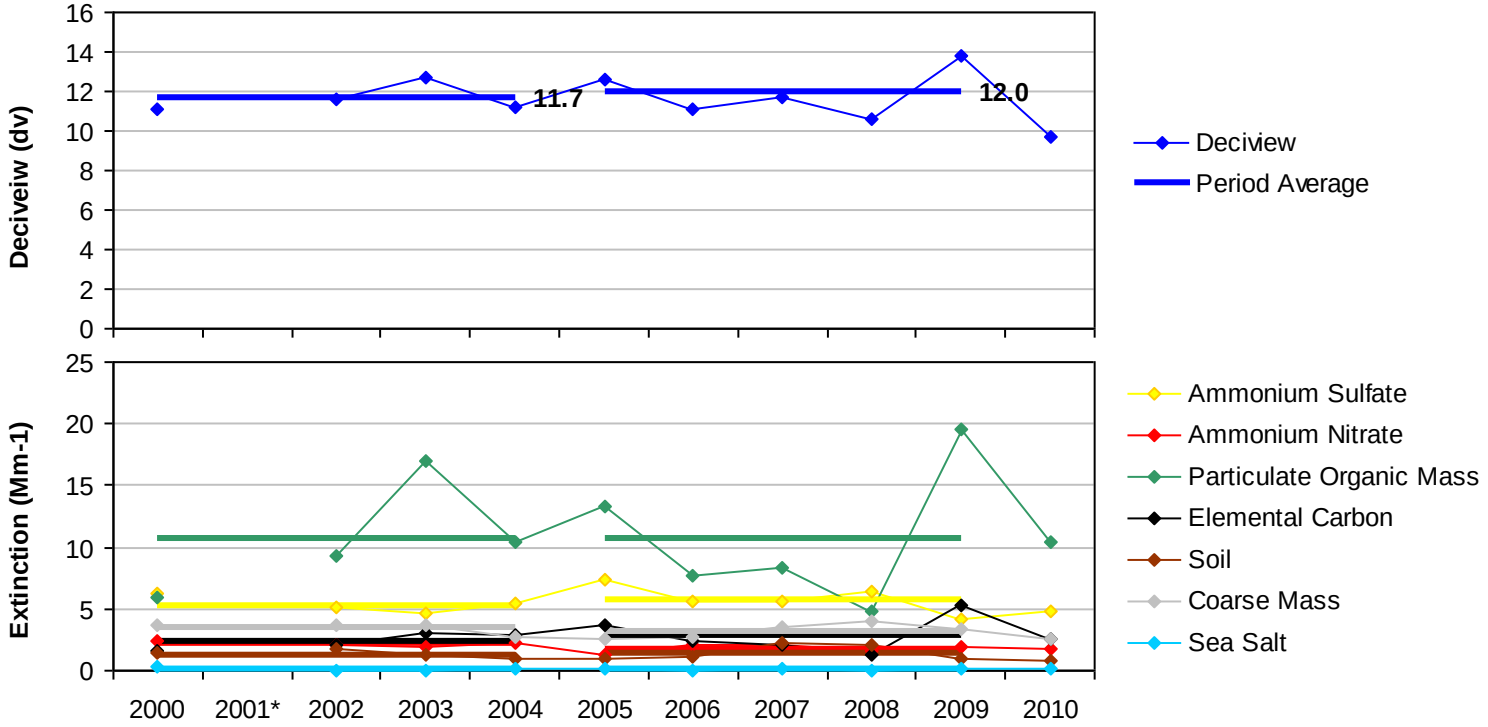
- **Figure B.3-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table B.3-1
Grand Canyon NP, AZ (GRCA2 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	2.9	---	2.0	1.8	2.0	2.1	2.4	2.5	1.6	2.2	1.7	0.0	0.5	2.2	2.2	0.0	0%
Worst 20% Days	11.1	---	11.6	12.7	11.2	12.6	11.1	11.7	10.6	13.8	9.7	0.0	0.5	11.7	12.0	0.3	3%
All Days	6.9	---	6.5	6.6	6.3	6.8	6.5	7.1	6.0	7.3	5.5	0.0	0.4	6.6	6.7	0.1	2%
Total Extinction (Mm-1)																	
Best 20% Days	13.4	---	12.2	12.0	12.2	12.4	12.8	12.9	11.8	12.5	11.9	0.0	0.5	12.5	12.5	0.0	0%
Worst 20% Days	30.6	---	33.1	40.8	33.8	38.2	30.7	33.1	29.4	44.1	32.1	0.2	0.5	34.6	35.1	0.5	1%
All Days	20.8	---	20.4	21.9	20.4	21.6	20.1	21.5	19.3	23.2	19.1	0.0	0.5	20.9	21.2	0.3	1%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	1.7	---	1.5	1.2	1.4	1.6	1.8	1.6	1.2	1.6	1.3	0.0	0.5	1.5	1.6	0.1	7%
Worst 20% Days	6.3	---	5.1	4.7	5.4	7.4	5.6	5.7	6.4	4.1	4.8	0.0	0.5	5.4	5.8	0.4	7%
All Days	3.8	---	3.3	3.1	3.5	4.5	3.7	3.8	3.8	3.4	3.2	0.0	0.5	3.4	3.8	0.4	12%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.5	---	0.5	0.4	0.4	0.4	0.3	0.5	0.3	0.6	0.3	0.0	0.5	0.4	0.4	0.0	0%
Worst 20% Days	2.4	---	2.1	2.0	2.3	1.3	2.1	2.0	1.6	1.8	1.7	-0.1	0.0	2.2	1.8	-0.4	-18%
All Days	1.3	---	1.1	1.1	1.1	0.9	1.0	1.3	0.9	1.1	1.0	0.0	0.1	1.2	1.1	-0.1	-8%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.0	---	0.4	0.5	0.6	0.5	0.6	0.6	0.4	0.4	0.5	0.0	0.3	0.6	0.5	-0.1	-17%
Worst 20% Days	5.9	---	9.3	17.1	10.4	13.3	7.7	8.4	4.9	19.5	10.5	0.3	0.5	10.7	10.7	0.0	0%
All Days	3.0	---	3.3	5.0	3.6	3.9	3.0	3.4	2.4	5.5	3.1	0.0	0.4	3.7	3.6	-0.1	-3%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.4	---	0.3	0.4	0.3	0.3	0.4	0.4	0.2	0.2	0.3	0.0	0.1	0.3	0.3	0.0	0%
Worst 20% Days	1.6	---	2.1	3.1	2.8	3.7	2.4	2.1	1.3	5.3	2.6	0.1	0.4	2.4	2.9	0.5	21%
All Days	1.0	---	1.0	1.3	1.1	1.4	1.1	1.1	0.7	1.6	0.9	0.0	0.3	1.1	1.2	0.1	9%
Soil Extinction (Mm-1)																	
Best 20% Days	0.2	---	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.0	0.5	0.1	0.2	0.1	100%
Worst 20% Days	1.4	---	1.7	1.3	1.0	1.0	1.1	2.3	2.1	0.9	0.9	0.0	0.3	1.3	1.5	0.2	15%
All Days	0.6	---	0.8	0.6	0.6	0.5	0.6	0.9	0.8	0.7	0.6	0.0	0.4	0.6	0.7	0.1	17%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	0.6	---	0.4	0.4	0.4	0.4	0.5	0.6	0.4	0.4	0.4	0.0	0.3	0.4	0.5	0.1	25%
Worst 20% Days	3.7	---	3.8	3.7	2.8	2.5	2.8	3.5	3.9	3.3	2.6	0.0	0.4	3.5	3.2	-0.3	-9%
All Days	2.0	---	1.8	1.8	1.5	1.3	1.7	2.0	1.7	2.0	1.3	0.0	0.5	1.8	1.7	-0.1	-6%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.0	---	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0%
Worst 20% Days	0.4	---	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.0	0.2	0.1	0.1	0.0	0%
All Days	0.1	---	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.5	0.1	0.1	0.0	0%

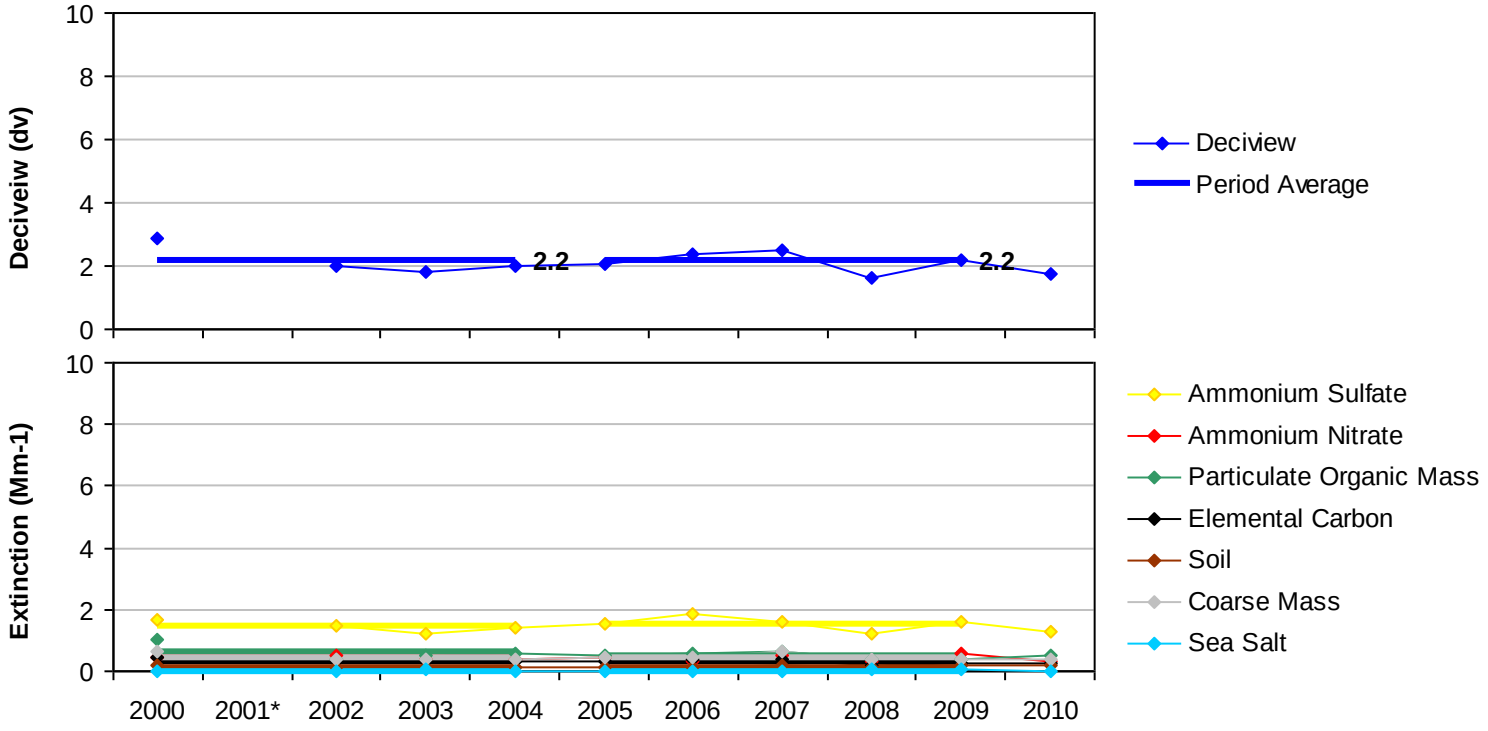
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure B.3-1
Grand Canyon NP, AZ (GRCA2 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



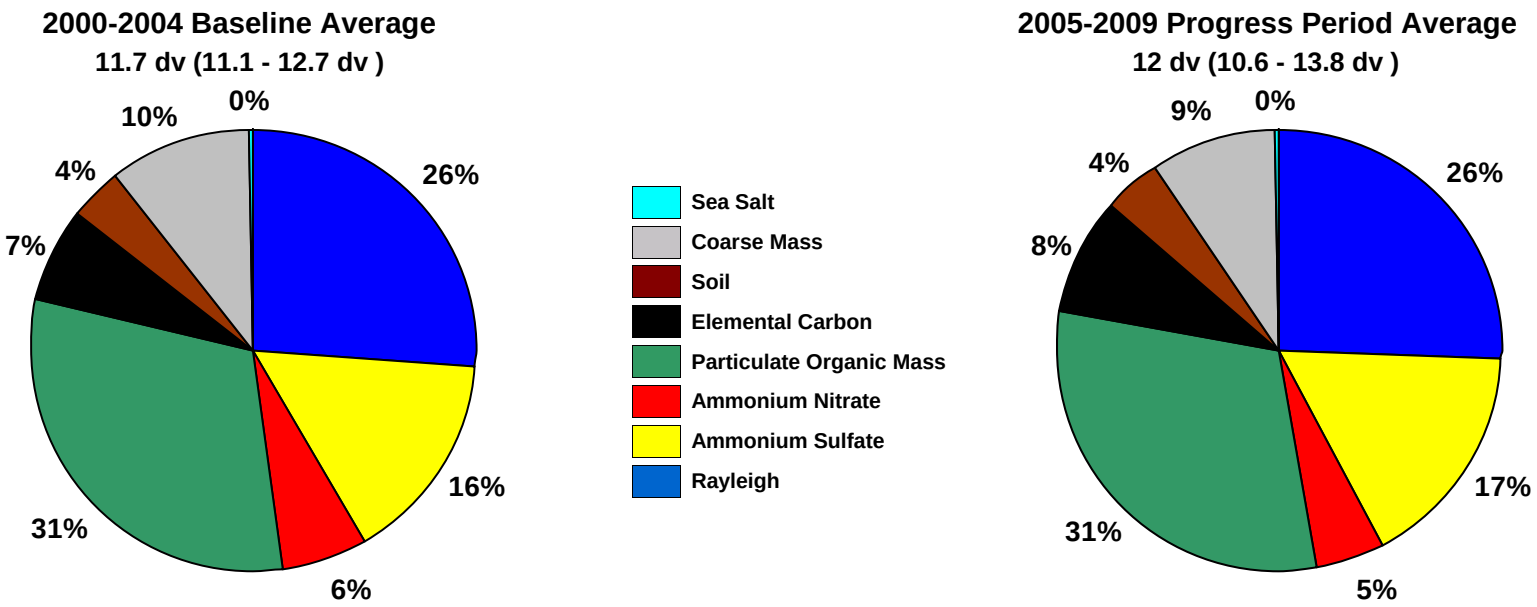
*Missing years did not meet RHR data completeness criteria.

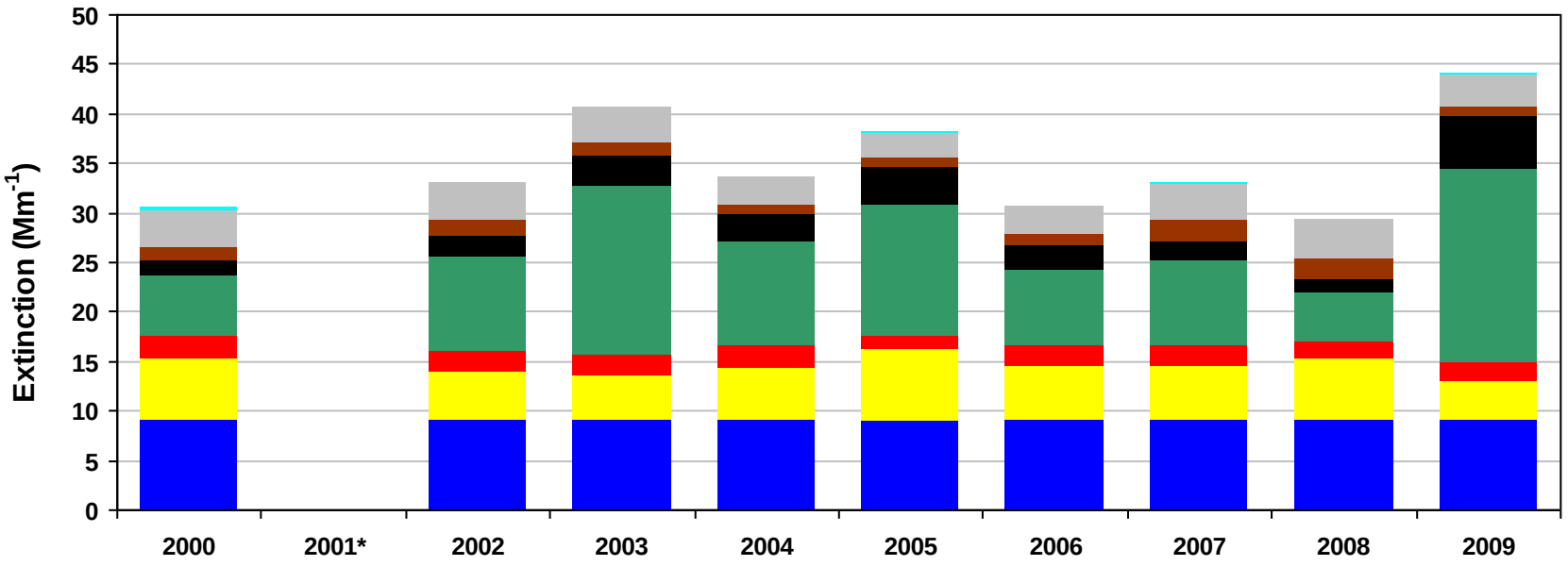
Figure B.3-2
Grand Canyon NP, AZ (GRCA2 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

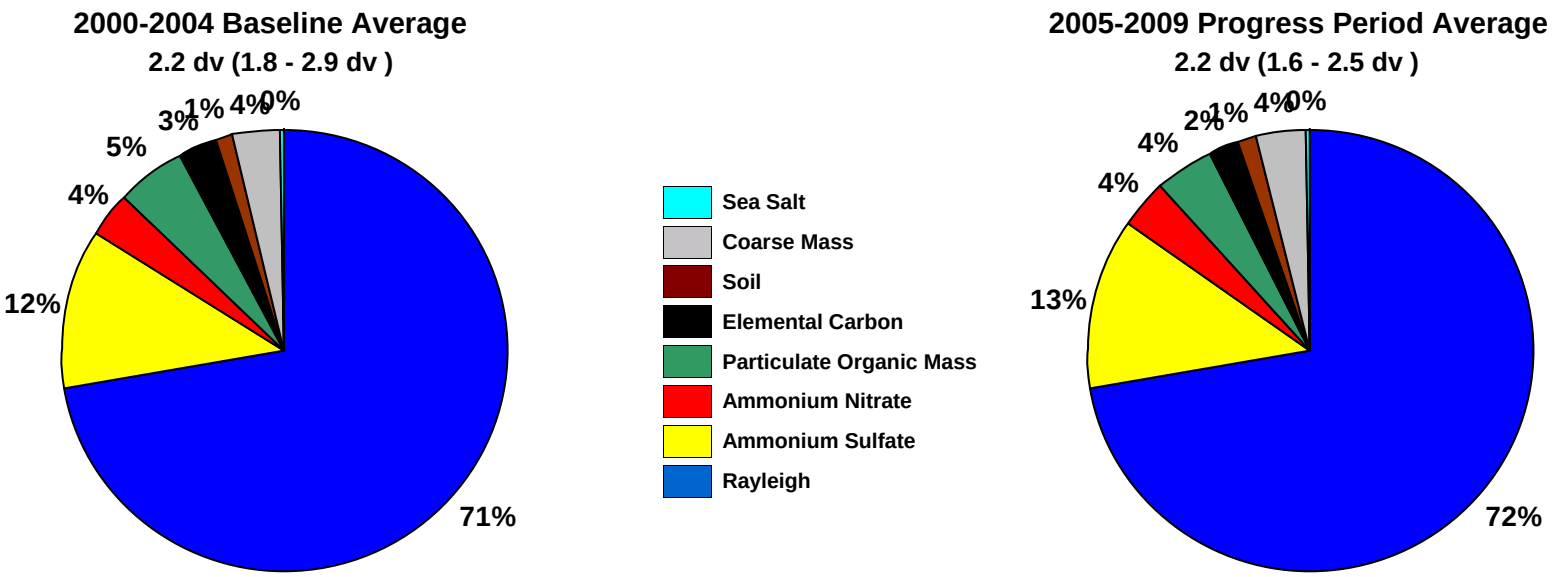
Figure B.3-3
Grand Canyon NP, AZ (GRCA2 Site)
20% Most Impaired Visibility Days

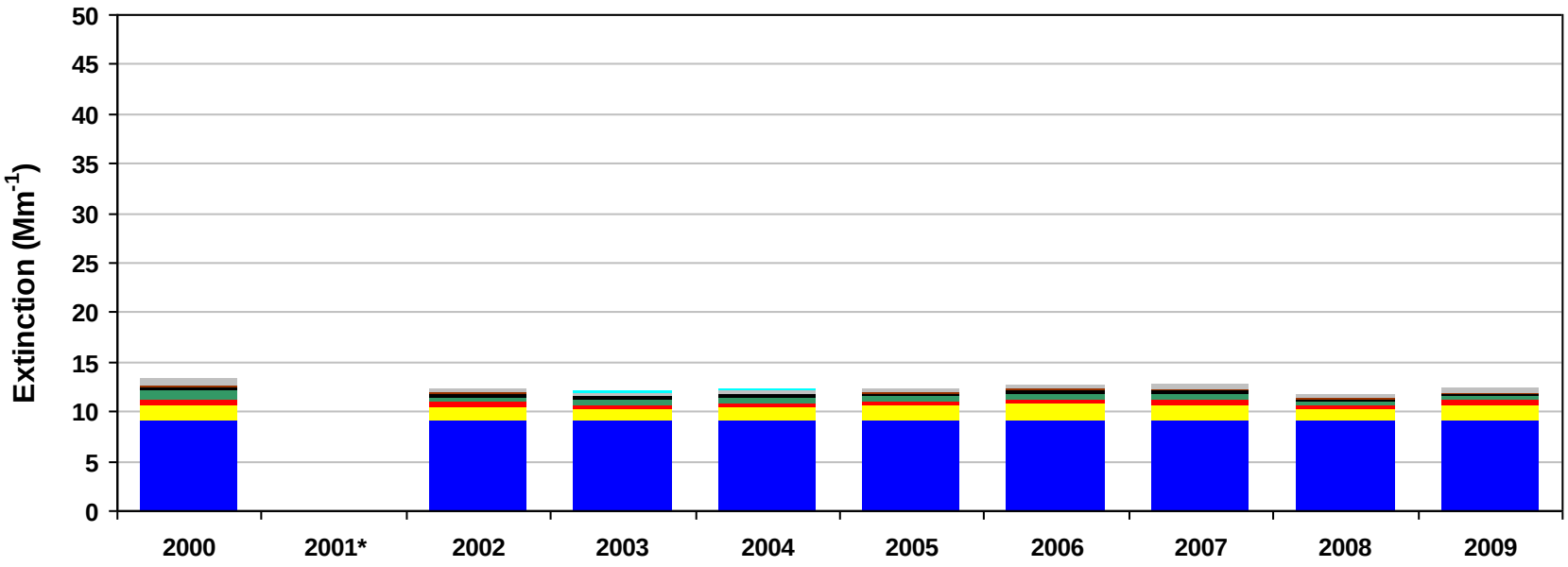




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

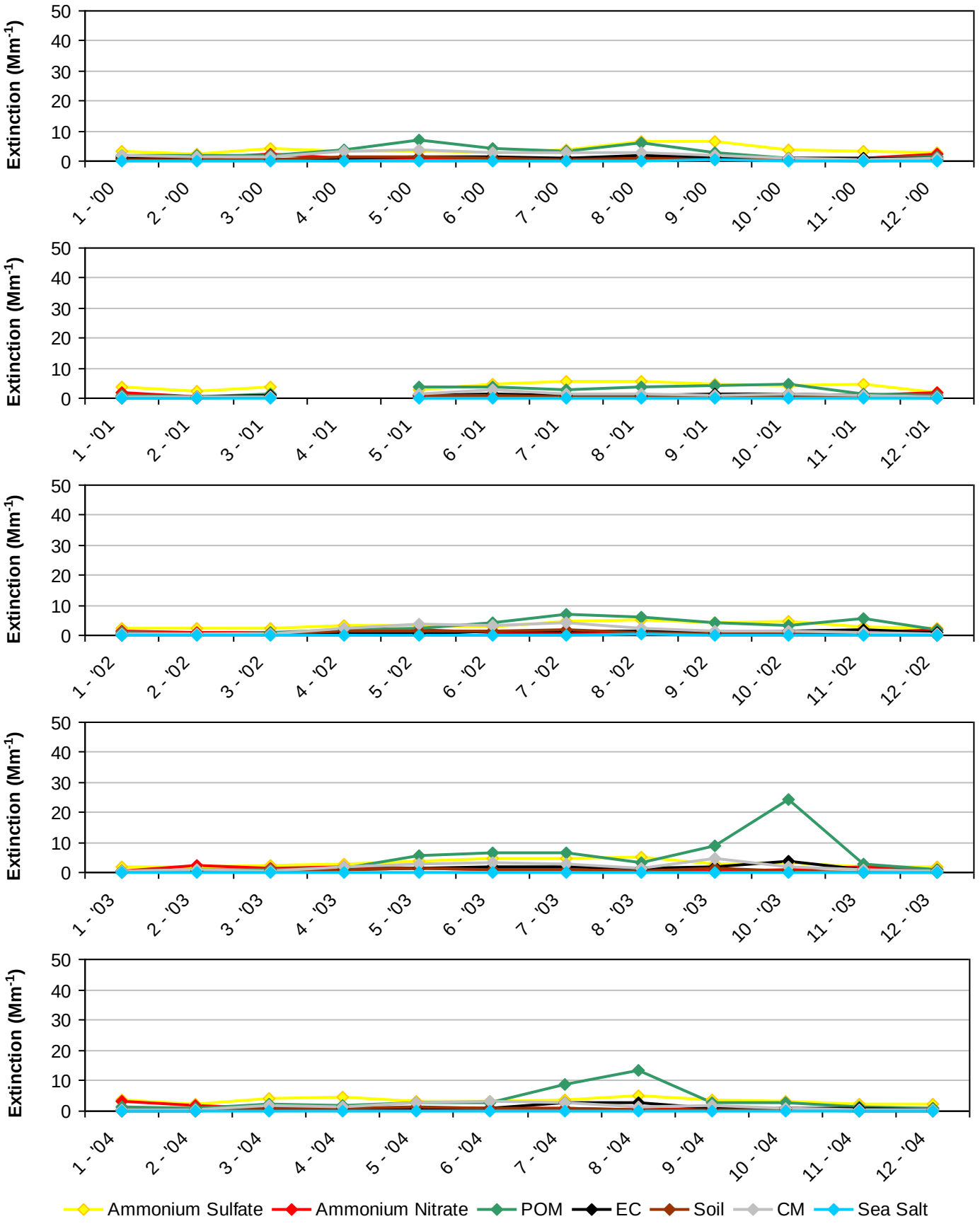
Figure B.3-4
Grand Canyon NP, AZ (GRCA2 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure B.3-5
Grand Canyon NP, AZ (GRCA2 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2001 are shown here, but this year did not meet RHR data completeness criteria.

Figure B.3-6
Grand Canyon NP, AZ (GRCA2 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

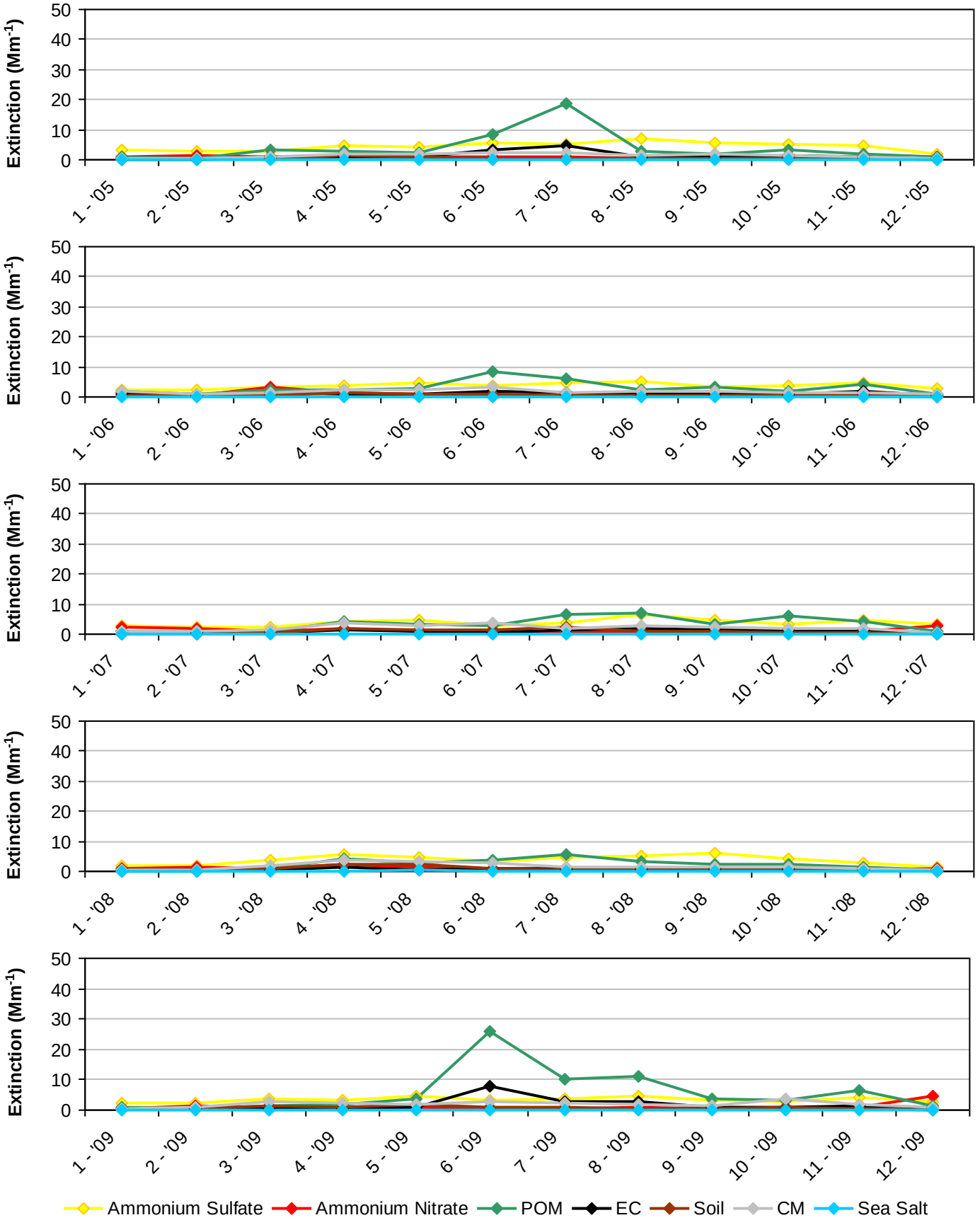
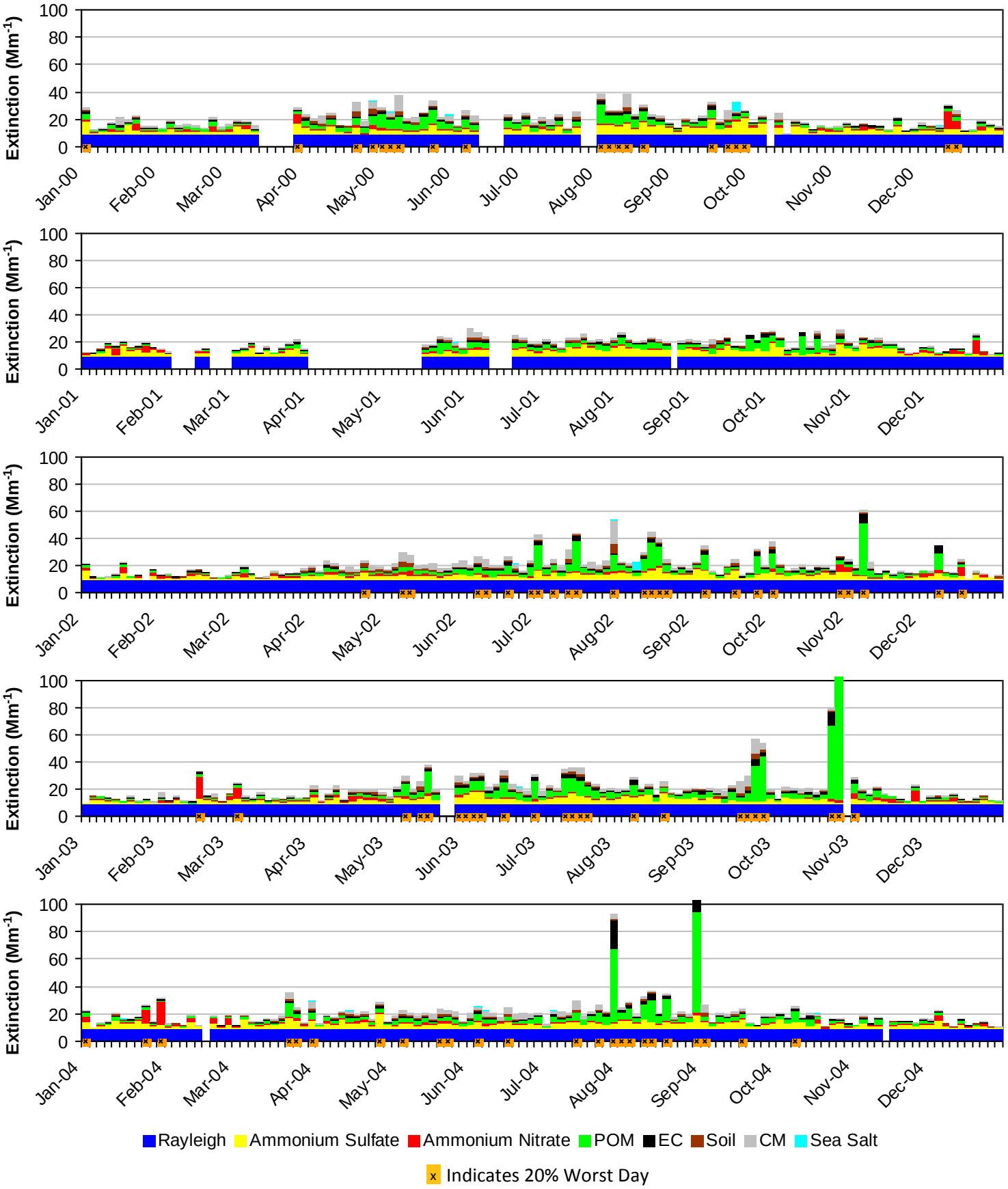
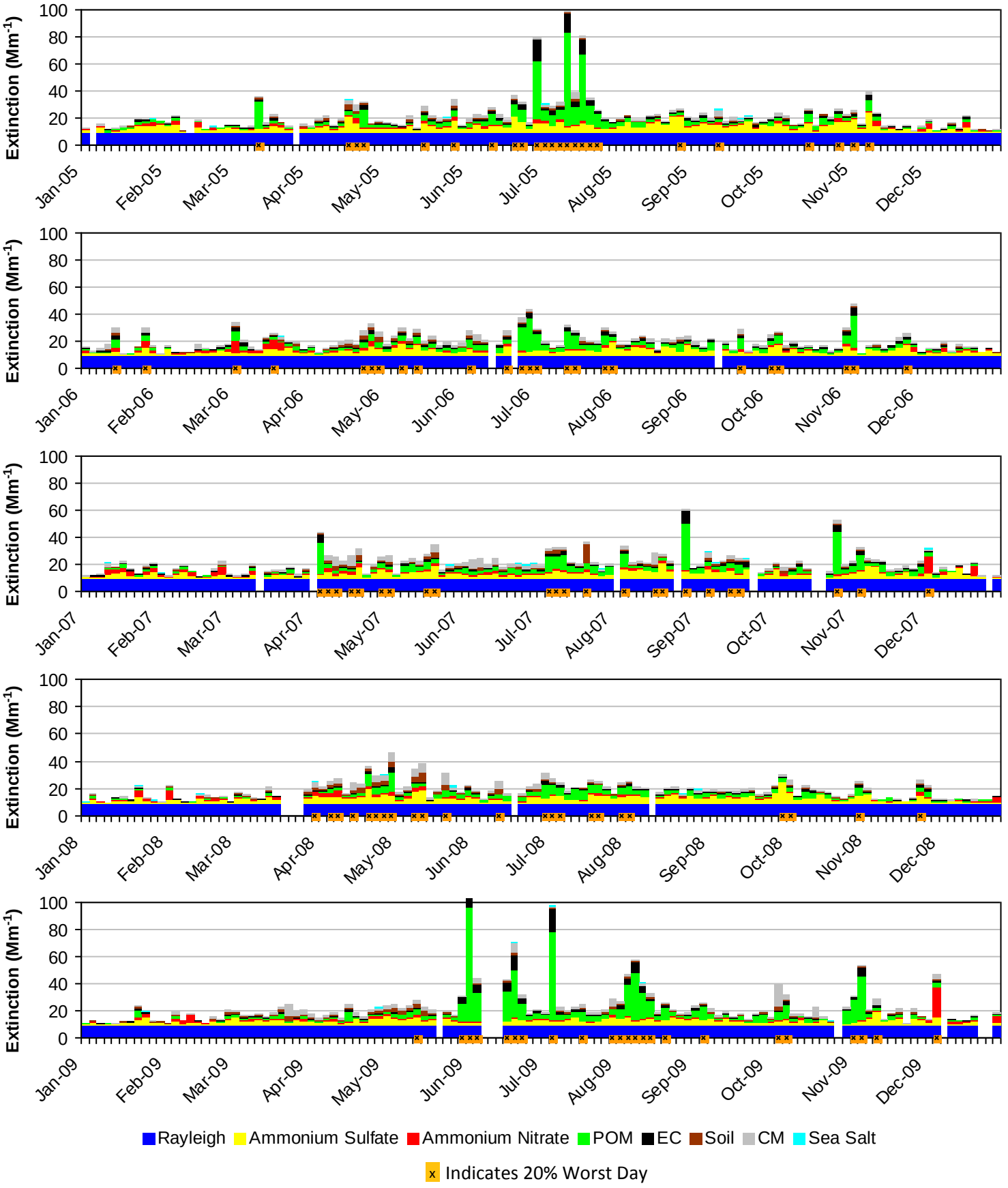


Figure B.3-7
Grand Canyon NP, AZ (GRCA2 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2001 are shown here, but this year did not meet RHR data completeness criteria.

Figure B.3-8
Grand Canyon NP, AZ (GRCA2 Site)
2005-2009 Progress Period Extinction, All Sampled Days



B.4. MAZATZAL WA AND PINE MOUNTAIN WA (IKBA1)

The following tables and figures are presented in this section for the Mazatzal Wilderness Area and Pine Mountain Wilderness Area represented by the IKBA1 IMPROVE Monitor:

- **Table B.4-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure B.4-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure B.4-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure B.4-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure B.4-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure B.4-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure B.4-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure B.4-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

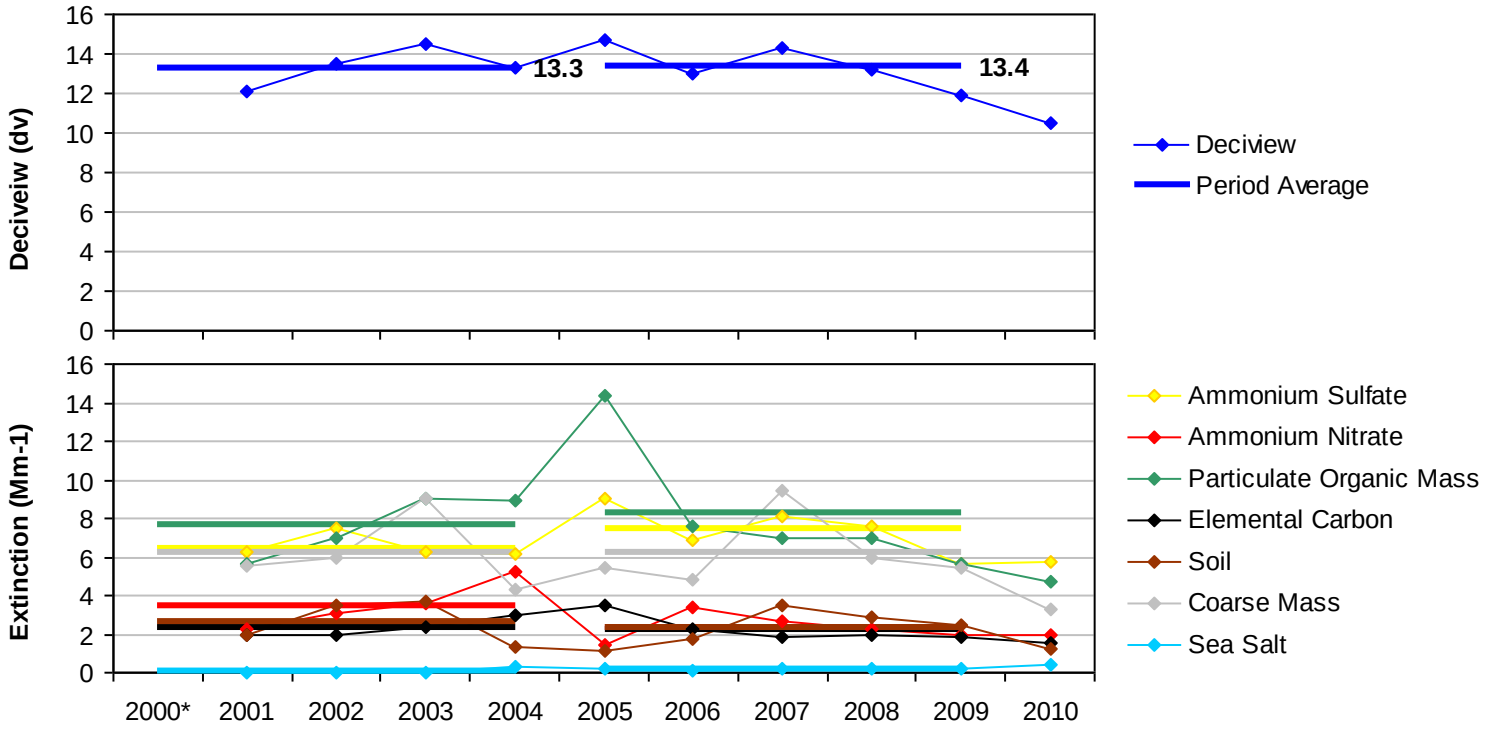
- **Figure B.4-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table B.4-1
Mazatzal WA and Pine Mountain WA, AZ (IKBA1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period						2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	5.9	5.5	4.9	5.3	5.0	6.5	5.2	4.3	4.4	4.4	-0.2	0.1	5.4	5.1	-0.3	-6%
Worst 20% Days	---	12.1	13.5	14.5	13.3	14.7	13.0	14.3	13.2	11.9	10.5	-0.1	0.3	13.3	13.4	0.1	1%
All Days	---	9.0	9.3	9.5	9.1	9.7	9.6	9.4	8.7	8.1	7.4	-0.1	0.3	9.2	9.1	-0.1	-1%
Total Extinction (Mm-1)																	
Best 20% Days	---	18.0	17.6	16.5	17.0	16.6	19.2	17.0	15.5	15.6	15.7	-0.3	0.1	17.3	16.8	-0.5	-3%
Worst 20% Days	---	33.6	39.0	43.9	39.1	45.3	36.8	42.7	37.8	33.3	28.7	-0.2	0.4	38.9	39.2	0.3	1%
All Days	---	25.2	26.5	27.5	26.1	28.2	26.9	27.2	25.1	23.2	21.5	-0.2	0.3	26.3	26.1	-0.2	-1%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	2.5	2.2	1.8	2.4	2.1	2.5	1.9	1.5	1.8	1.8	-0.1	0.1	2.2	2.0	-0.2	-9%
Worst 20% Days	---	6.3	7.4	6.2	6.1	9.1	6.9	8.1	7.6	5.7	5.7	0.0	0.5	6.5	7.5	1.0	15%
All Days	---	4.7	4.3	4.1	4.5	5.1	4.7	4.9	4.6	3.9	3.8	0.0	0.5	4.4	4.6	0.2	5%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	1.1	0.9	0.8	0.6	0.8	1.0	0.8	0.6	0.4	0.5	-0.1	0.0	0.9	0.7	-0.2	-22%
Worst 20% Days	---	2.2	3.1	3.6	5.2	1.4	3.4	2.7	2.2	2.0	1.9	-0.1	0.2	3.5	2.3	-1.2	-34%
All Days	---	1.9	1.8	1.9	2.2	1.2	1.6	1.7	1.4	1.2	1.1	-0.1	0.0	2.0	1.4	-0.6	-30%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	1.9	1.8	1.8	1.8	1.9	2.8	1.7	1.5	1.5	1.6	0.0	0.1	1.8	1.9	0.1	6%
Worst 20% Days	---	5.6	7.0	9.0	8.9	14.4	7.6	7.0	7.0	5.7	4.8	-0.2	0.3	7.6	8.3	0.7	9%
All Days	---	3.4	3.7	4.6	4.2	6.6	4.7	3.7	3.8	3.1	2.7	0.0	0.5	4.0	4.4	0.4	10%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	1.0	0.9	0.9	0.8	0.8	1.2	0.8	0.6	0.7	0.6	0.0	0.0	0.9	0.8	-0.1	-11%
Worst 20% Days	---	2.0	2.0	2.4	3.0	3.5	2.3	1.9	1.9	1.8	1.5	0.0	0.1	2.3	2.3	0.0	0%
All Days	---	1.4	1.4	1.6	1.5	1.7	1.6	1.3	1.1	1.1	1.0	0.0	0.1	1.5	1.4	-0.1	-7%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.3	0.5	0.4	0.4	0.2	0.4	0.4	0.3	0.3	0.3	0.0	0.1	0.4	0.3	-0.1	-25%
Worst 20% Days	---	2.0	3.5	3.7	1.4	1.2	1.7	3.5	2.9	2.4	1.2	0.0	0.5	2.6	2.3	-0.3	-12%
All Days	---	0.9	1.9	1.5	0.9	0.7	1.1	1.4	1.2	1.1	0.7	0.0	0.5	1.3	1.1	-0.2	-15%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	1.2	1.2	0.8	1.0	0.7	1.3	1.3	0.8	0.8	0.8	0.0	0.4	1.0	1.0	0.0	0%
Worst 20% Days	---	5.5	6.0	9.0	4.3	5.5	4.9	9.4	5.9	5.4	3.2	0.0	0.5	6.2	6.2	0.0	0%
All Days	---	2.9	3.3	3.8	2.7	2.8	3.1	4.0	2.8	2.7	2.0	0.0	0.4	3.2	3.1	-0.1	-3%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0%
Worst 20% Days	---	0.0	0.0	0.0	0.3	0.2	0.1	0.2	0.2	0.3	0.4	0.0	0.1	0.1	0.2	0.1	100%
All Days	---	0.0	0.0	0.0	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0%

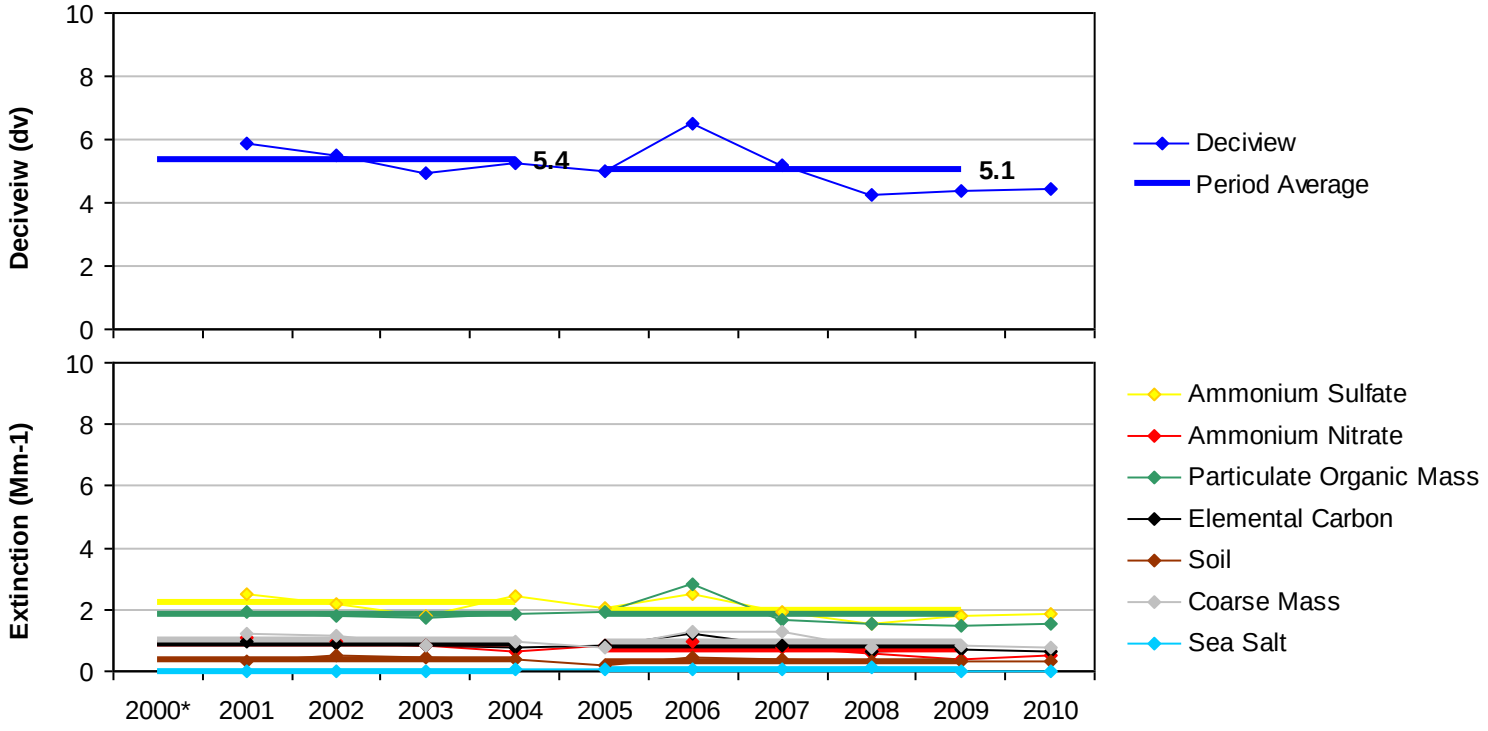
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure B.4-1
Mazatzal WA and Pine Mountain WA, AZ (IKBA1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure B.4-2
Mazatzal WA and Pine Mountain WA, AZ (IKBA1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

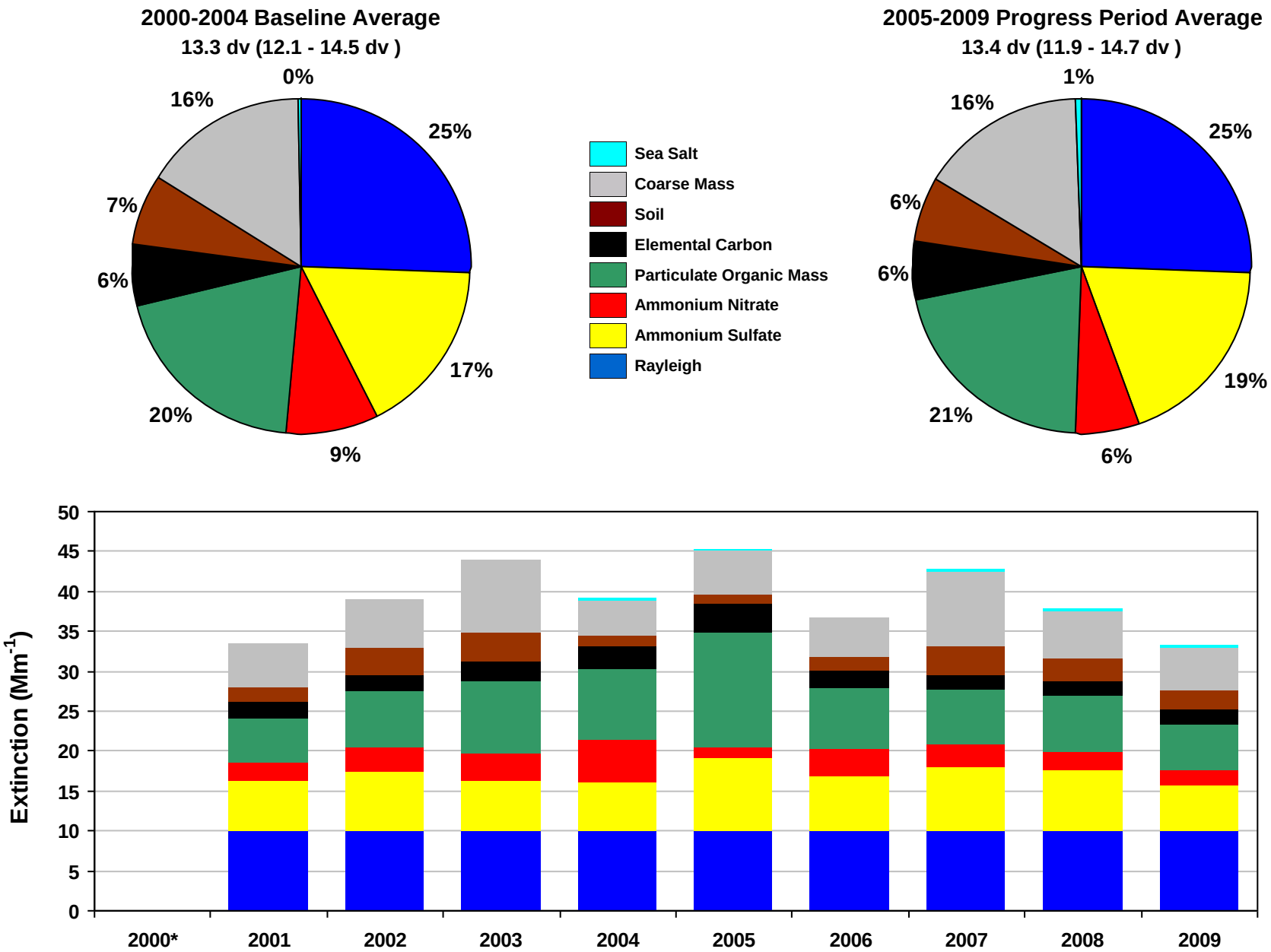


*Missing years did not meet RHR data completeness criteria.

Figure B.4-3

Mazatzal WA and Pine Mountain WA, AZ (IKBA1 Site)

20% Most Impaired Visibility Days

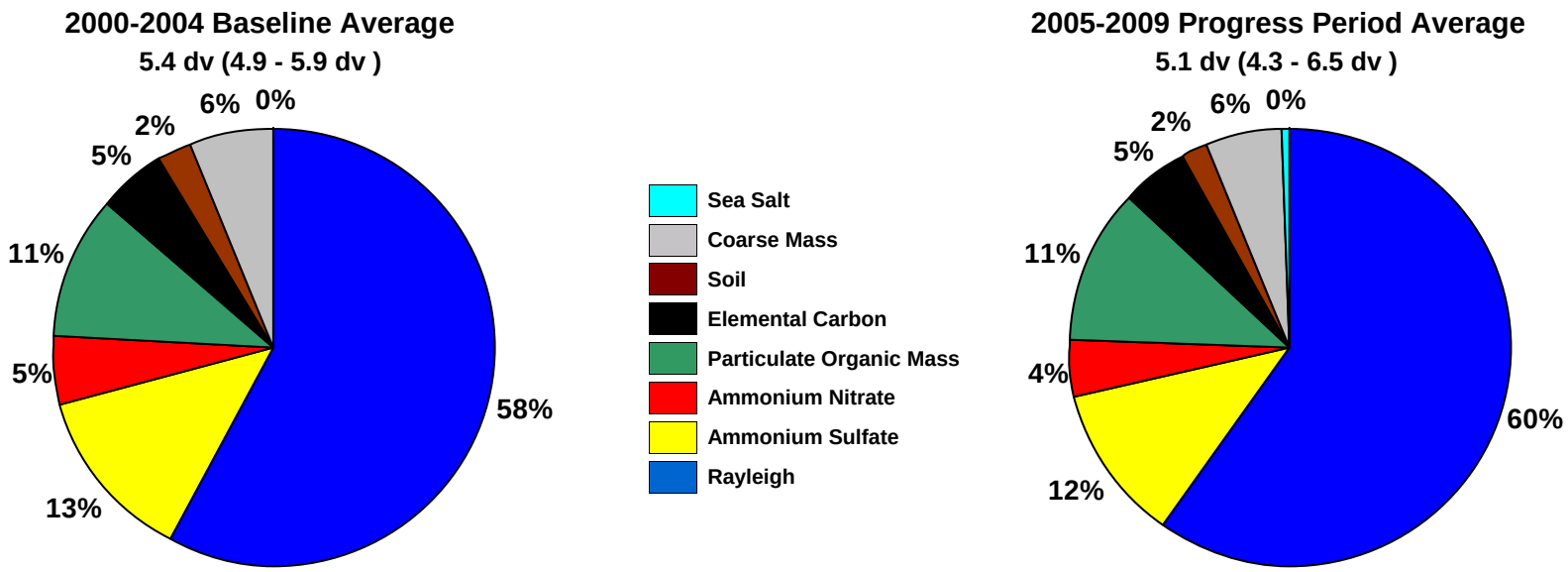


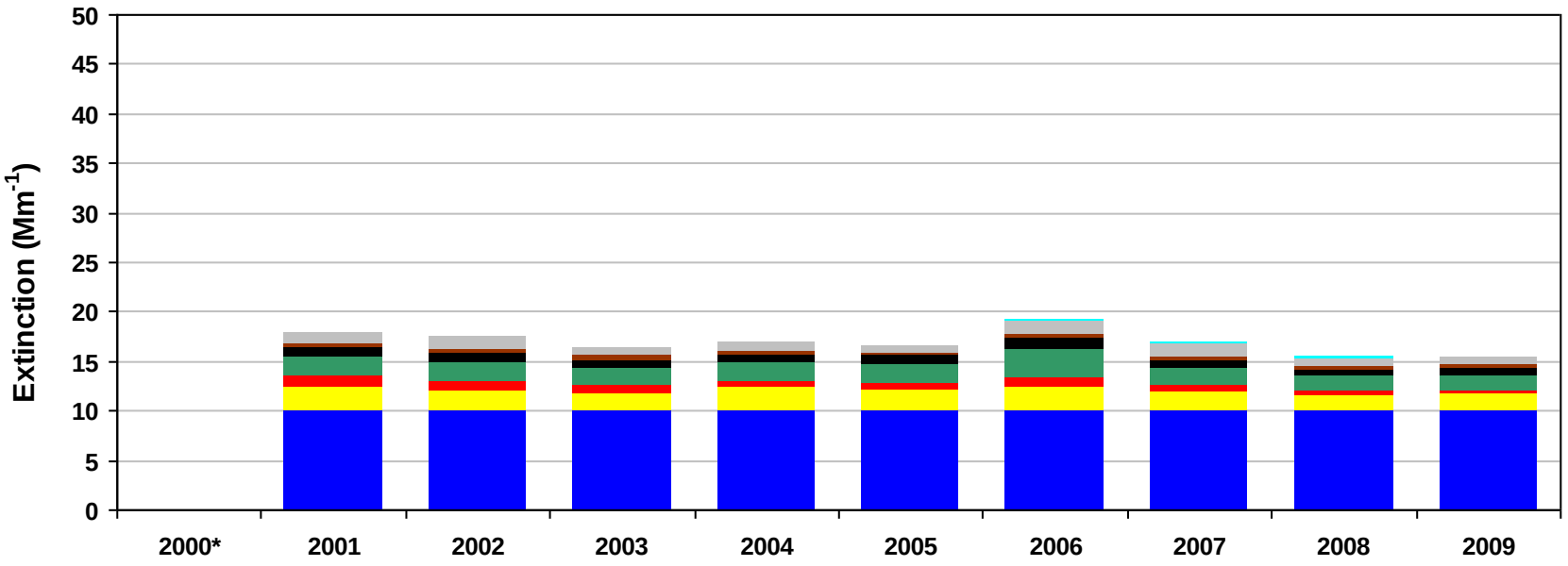
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure B.4-4

Mazatzal WA and Pine Mountain WA, AZ (IKBA1 Site)

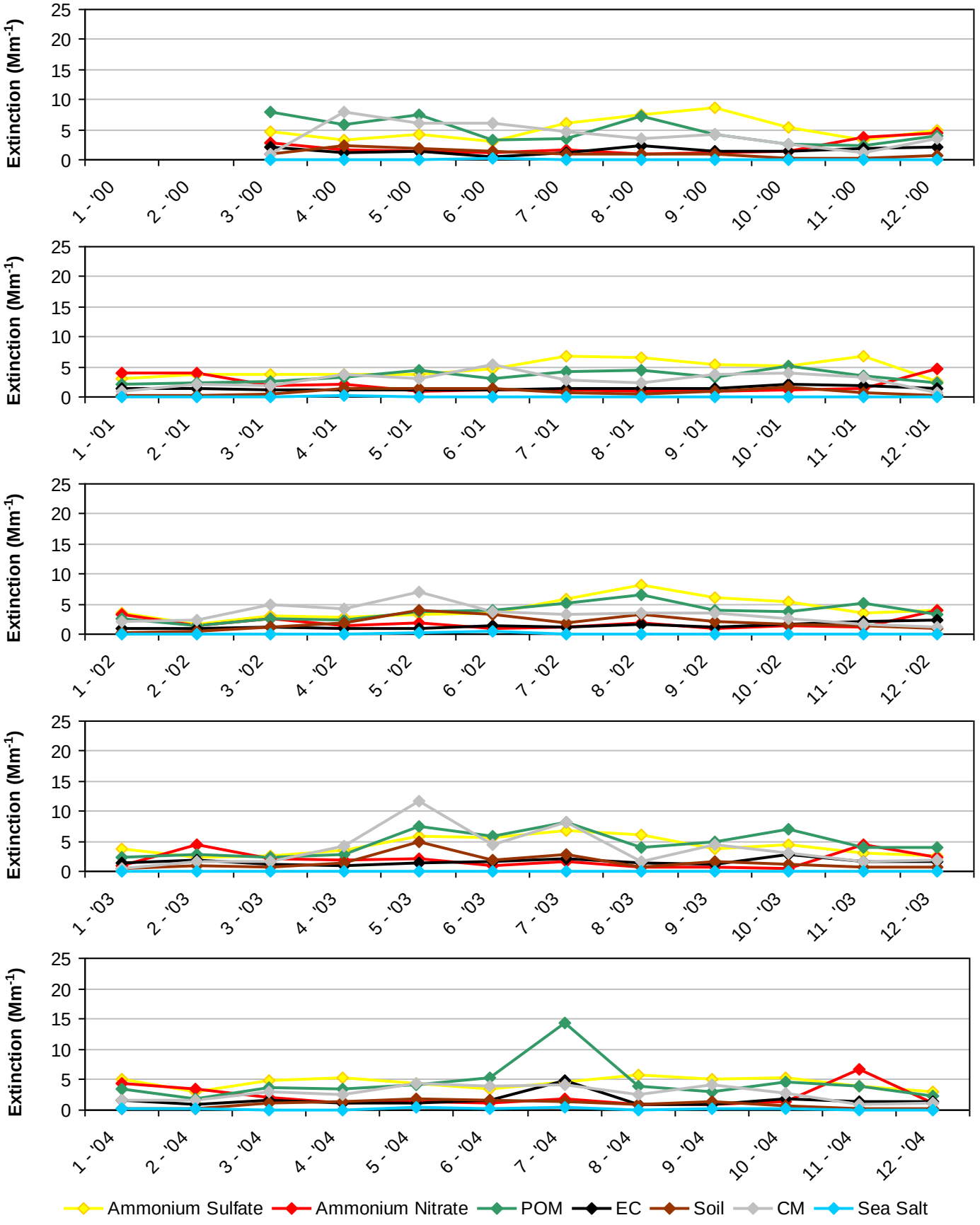
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure B.4-5
Mazatzal WA and Pine Mountain WA, AZ (IKBA1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure B.4-6
Mazatzal WA and Pine Mountain WA, AZ (IKBA1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

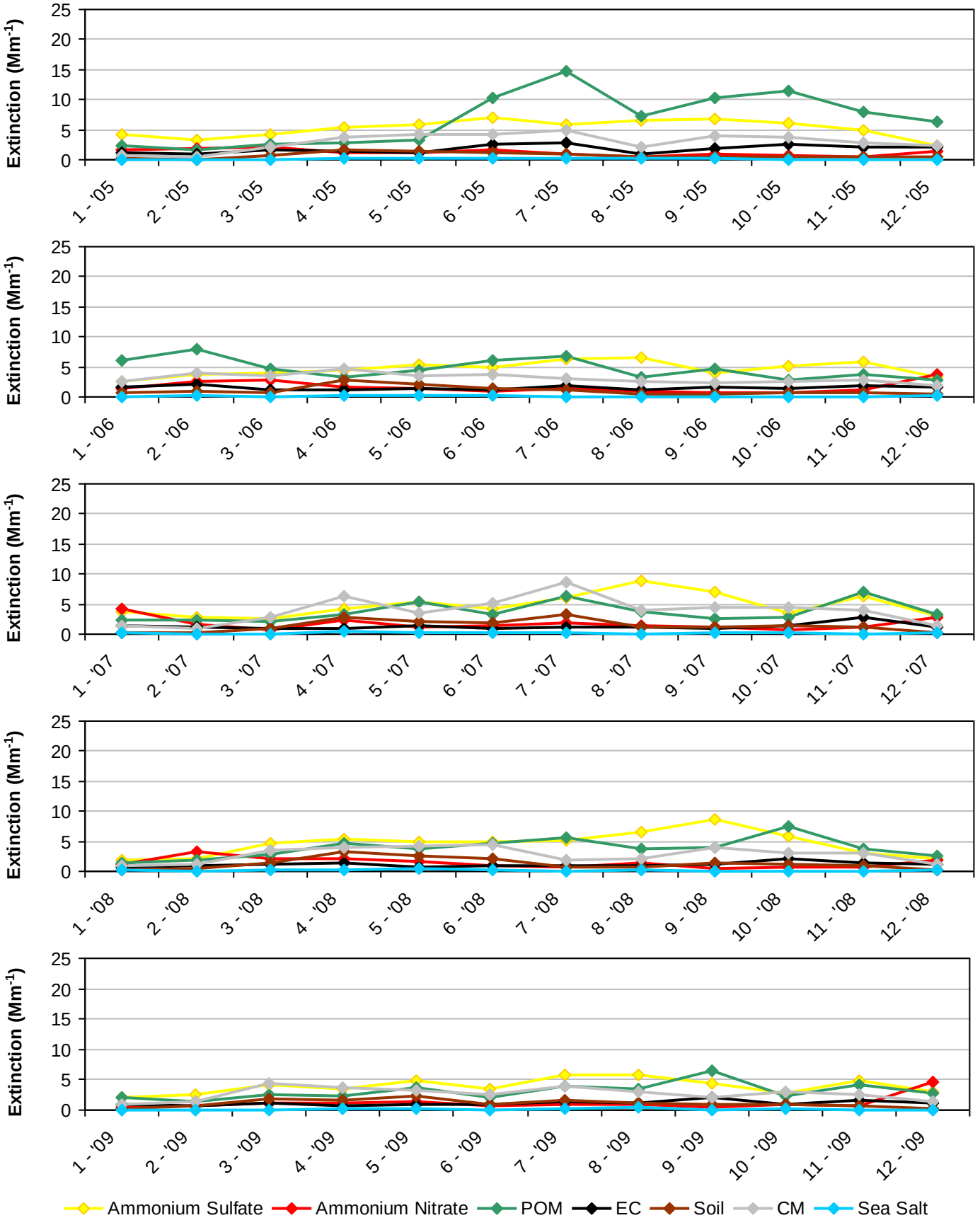
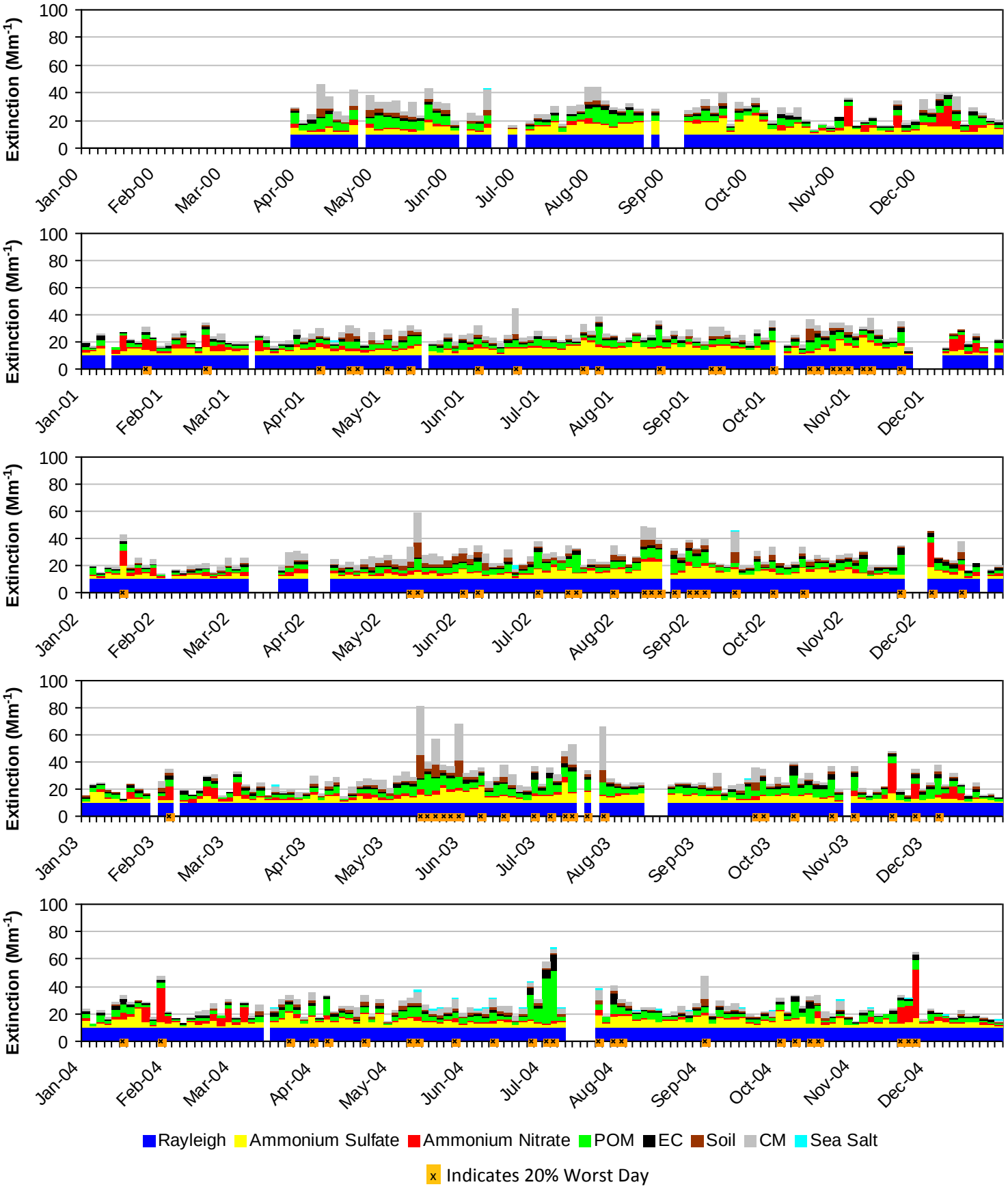
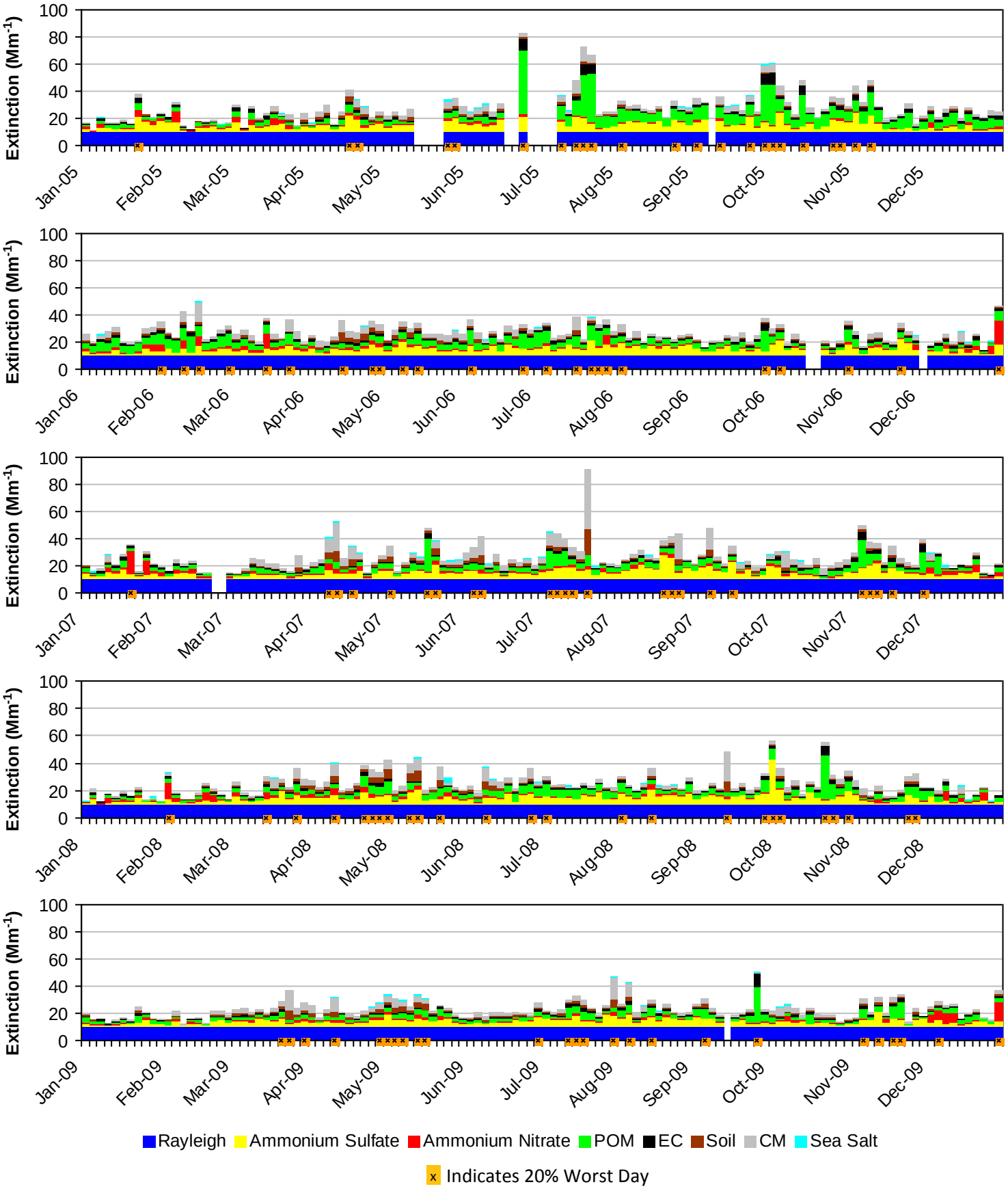


Figure B.4-7
Mazatzal WA and Pine Mountain WA, AZ (IKBA1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure B.4-8
Mazatzal WA and Pine Mountain WA, AZ (IKBA1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



B.5. PETRIFIED FOREST NP (PEFO1)

The following tables and figures are presented in this section for the Petrified Forest National Park represented by the PEFO1 IMPROVE Monitor:

- **Table B.5-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure B.5-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure B.5-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure B.5-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure B.5-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure B.5-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure B.5-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure B.5-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure B.5-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table B.5-1
Petrified Forest NP, AZ (PEFO1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	5.0	5.0	5.1	5.4	4.6	4.5	5.4	4.9	4.1	4.2	4.1	-0.1	0.1	5.0	4.6	-0.4	-8%
Worst 20% Days	12.7	10.8	13.5	16.1	12.9	14.0	12.1	12.7	12.3	14.0	11.4	0.0	0.4	13.2	13.0	-0.2	-2%
All Days	8.8	7.9	8.8	10.0	8.4	8.8	8.5	8.7	8.1	8.2	7.6	-0.1	0.1	8.8	8.4	-0.4	-5%
Total Extinction (Mm-1)																	
Best 20% Days	16.6	16.5	16.7	17.3	15.9	15.8	17.1	16.4	15.1	15.3	15.2	-0.2	0.1	16.6	16.0	-0.6	-4%
Worst 20% Days	36.0	29.9	40.4	52.5	44.5	47.2	33.8	35.9	34.6	46.8	32.1	0.5	0.4	40.6	39.7	-0.9	-2%
All Days	25.1	22.5	25.5	29.8	25.7	26.7	24.1	24.7	23.4	25.4	22.2	-0.1	0.4	25.7	24.9	-0.8	-3%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	2.2	2.4	2.3	2.1	2.2	2.3	2.4	2.3	1.6	2.1	1.9	0.0	0.2	2.3	2.1	-0.2	-9%
Worst 20% Days	6.8	6.8	6.4	6.8	6.5	8.9	6.1	7.9	6.4	6.5	5.2	0.0	0.5	6.6	7.2	0.6	9%
All Days	4.4	4.3	4.3	4.3	4.3	5.2	4.4	4.6	4.2	3.9	3.7	0.0	0.2	4.3	4.5	0.2	5%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.7	1.0	0.9	0.7	0.8	0.6	0.7	0.6	0.6	0.6	0.7	0.0	0.0	0.8	0.6	-0.2	-25%
Worst 20% Days	1.8	1.3	2.2	1.7	2.2	1.3	1.5	1.7	1.4	1.7	1.8	0.0	0.4	1.8	1.5	-0.3	-17%
All Days	1.3	1.2	1.5	1.4	1.4	1.0	1.0	1.2	0.9	1.2	1.1	0.0	0.1	1.4	1.1	-0.3	-21%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	2.2	1.5	1.7	2.6	1.5	1.5	1.8	1.5	1.5	1.1	1.1	-0.1	0.1	1.9	1.5	-0.4	-21%
Worst 20% Days	8.8	5.0	10.0	13.2	17.4	14.3	6.4	7.0	5.2	14.3	4.3	0.2	0.4	10.9	9.5	-1.4	-13%
All Days	5.1	3.1	4.2	5.9	5.6	5.0	3.4	3.7	3.3	4.7	2.5	-0.1	0.2	4.8	4.0	-0.8	-17%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	1.4	1.1	1.4	1.5	1.2	1.3	1.7	1.4	1.1	0.9	0.9	0.0	0.4	1.3	1.3	0.0	0%
Worst 20% Days	2.9	2.4	2.7	3.3	3.4	5.0	2.8	3.2	2.2	3.9	2.2	0.1	0.2	2.9	3.4	0.5	17%
All Days	2.2	1.7	2.0	2.3	2.2	2.9	2.4	2.2	1.8	2.1	1.6	0.0	0.4	2.1	2.3	0.2	10%
Soil Extinction (Mm-1)																	
Best 20% Days	0.3	0.5	0.5	0.3	0.3	0.4	0.6	0.4	0.3	0.4	0.5	0.0	0.2	0.4	0.4	0.0	0%
Worst 20% Days	1.7	1.6	2.5	3.0	1.3	2.7	2.2	2.1	3.0	2.9	1.9	0.1	0.2	2.0	2.6	0.6	30%
All Days	0.8	0.9	1.3	1.3	0.8	1.1	1.2	1.1	1.2	1.2	1.0	0.0	0.1	1.0	1.2	0.2	20%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	0.8	1.1	1.0	1.0	0.8	0.6	1.0	1.2	0.8	1.2	1.1	0.0	0.4	1.0	1.0	0.0	0%
Worst 20% Days	5.0	3.8	7.6	15.5	4.6	5.7	5.7	4.8	7.1	8.4	7.4	0.3	0.2	7.3	6.3	-1.0	-14%
All Days	2.3	2.2	3.2	5.6	2.4	2.4	2.7	2.7	2.8	3.2	3.1	0.1	0.1	3.2	2.8	-0.4	-13%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
Worst 20% Days	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.0	0.0	0.0	0.2	0.2	0%
All Days	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.0	0.1	0.1	0%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure B.5-1
Petrified Forest NP, AZ (PEFO1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

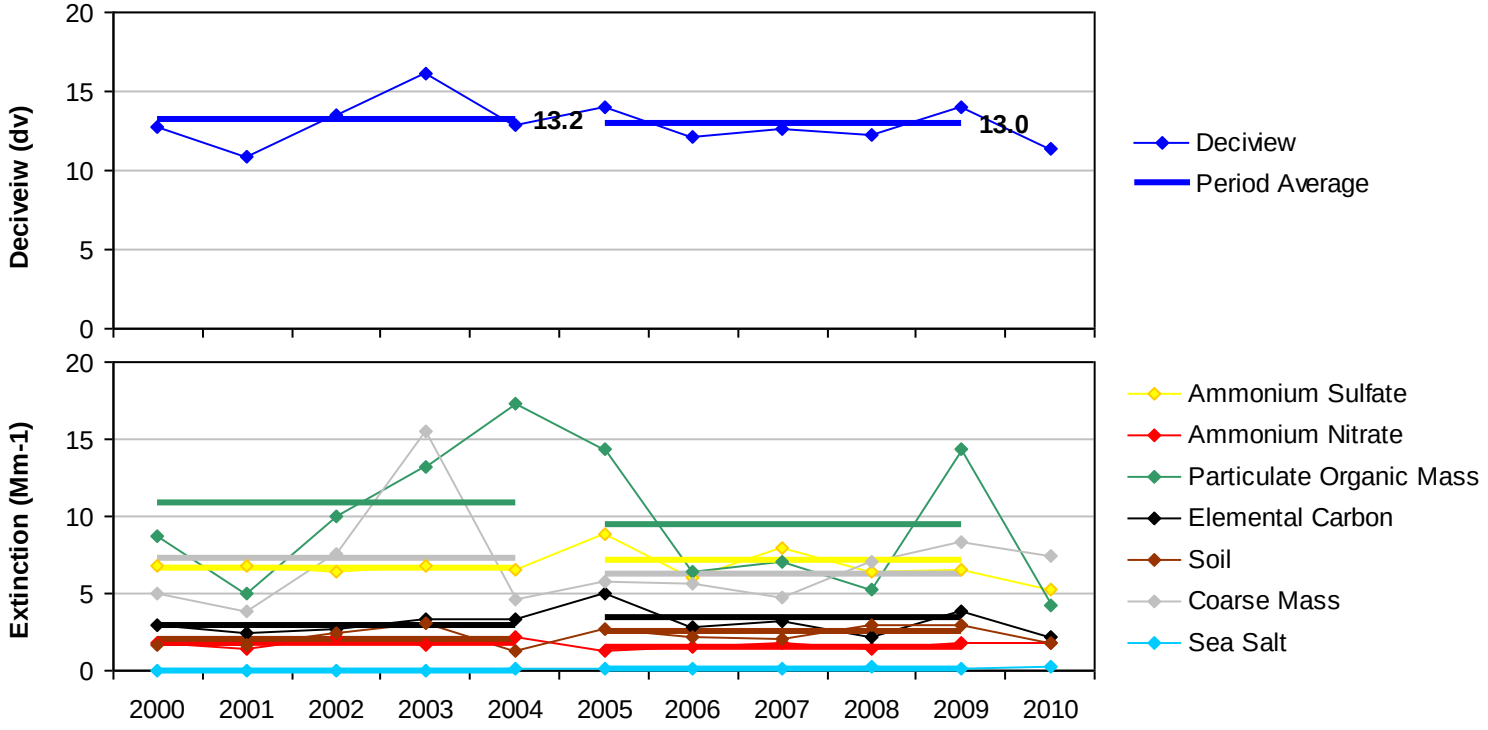


Figure B.5-2
Petrified Forest NP, AZ (PEFO1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

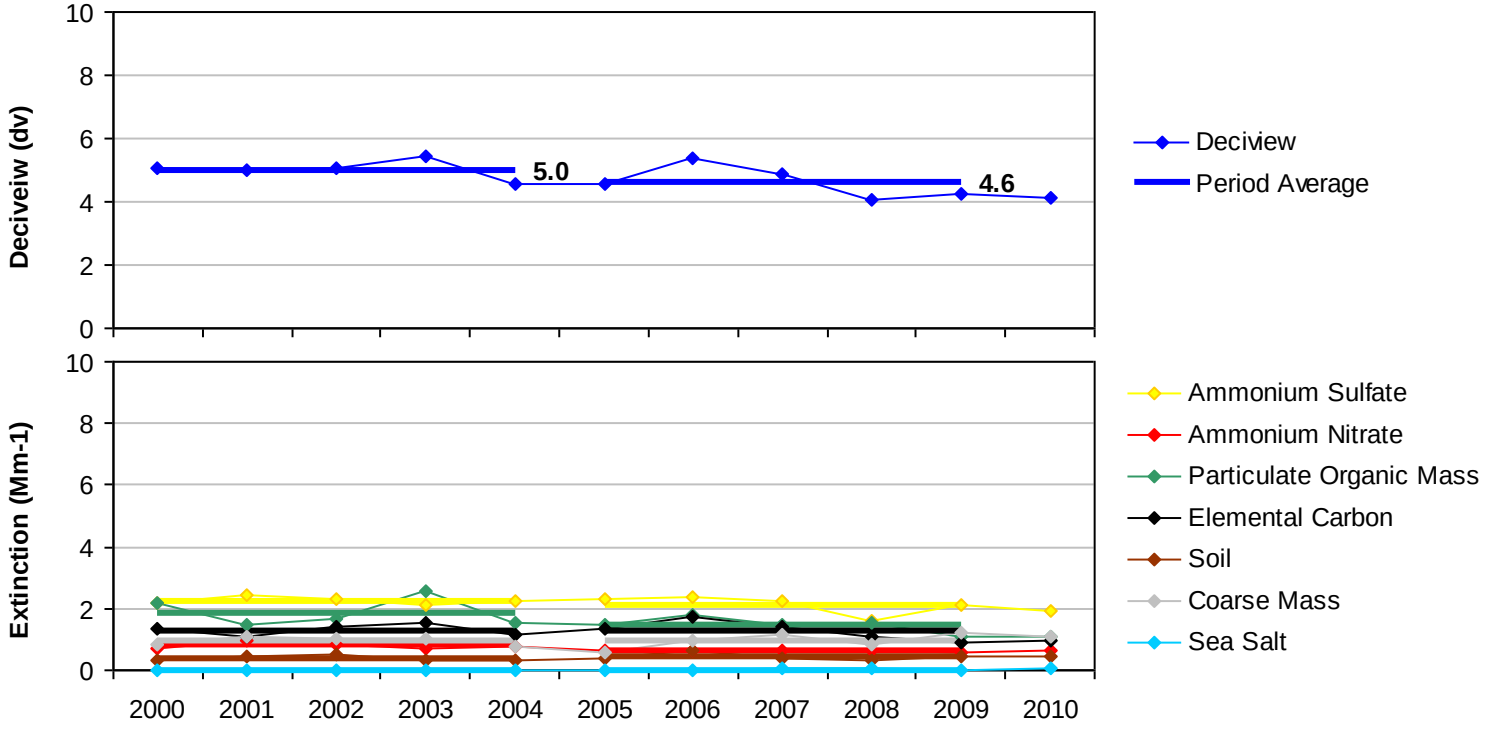
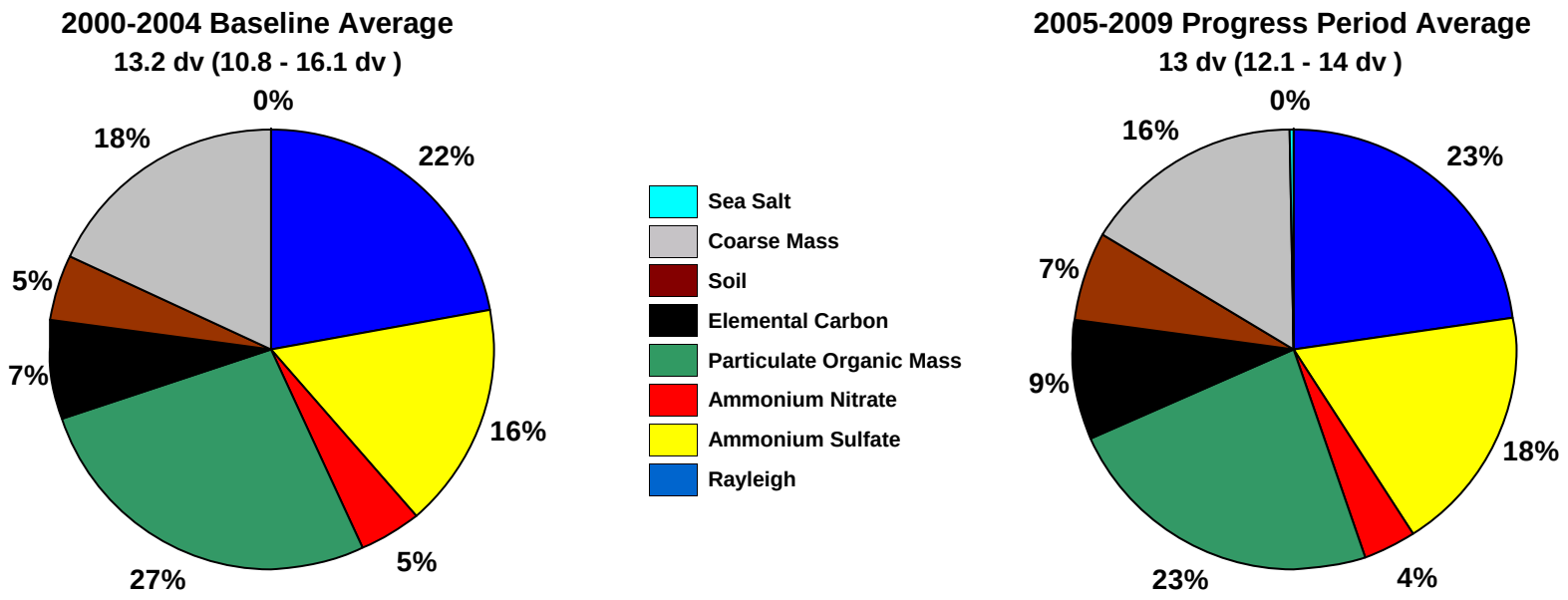


Figure B.5-3
Petrified Forest NP, AZ (PEFO1 Site)
20% Most Impaired Visibility Days



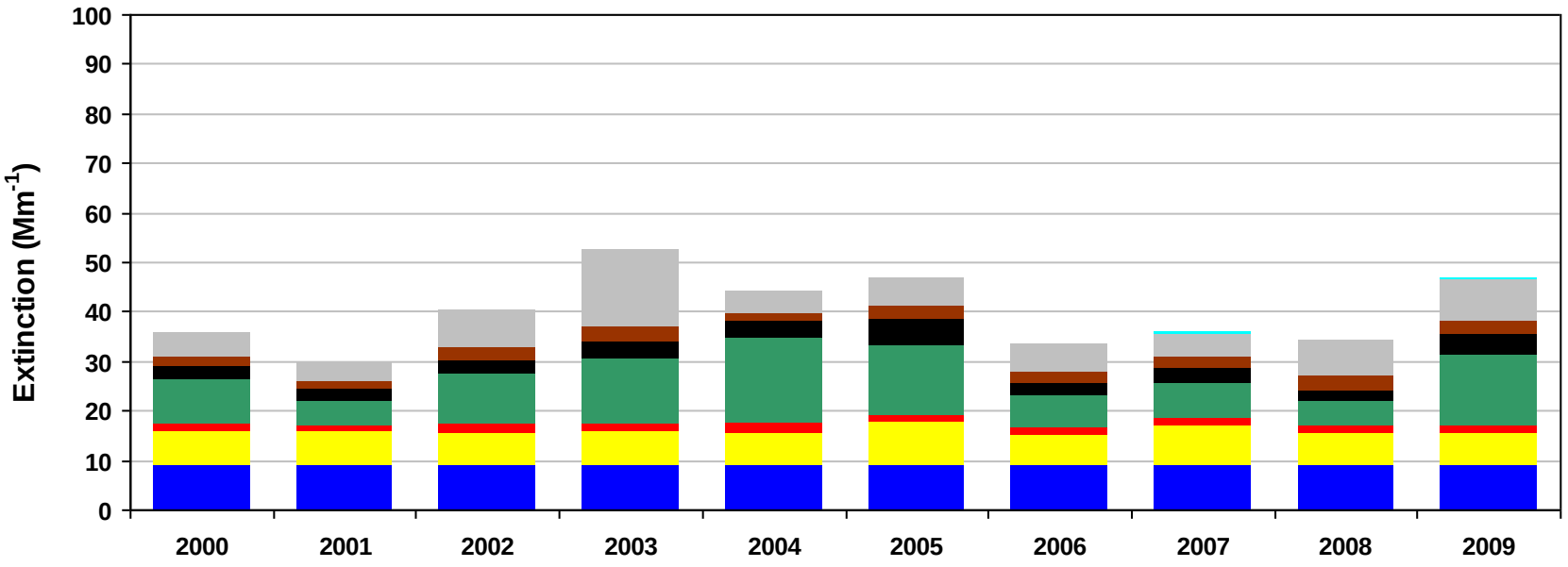
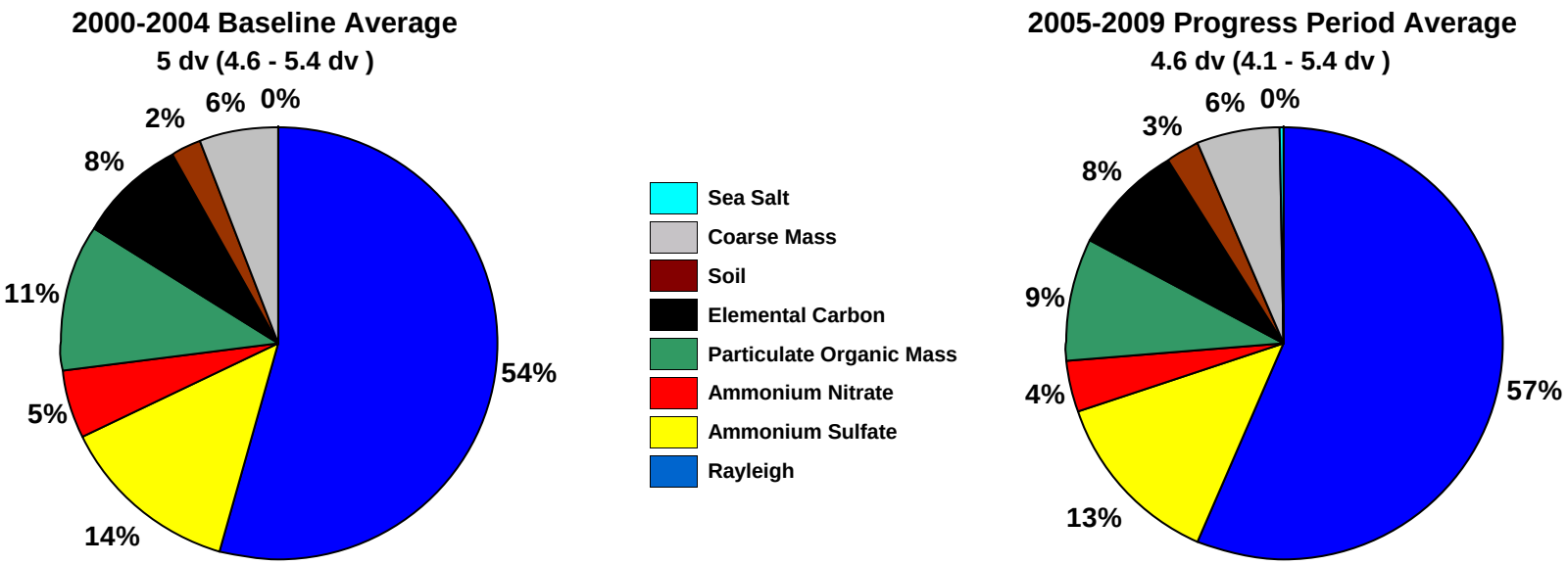


Figure B.5-4
Petrified Forest NP, AZ (PEFO1 Site)
20% Least Impaired Visibility Days



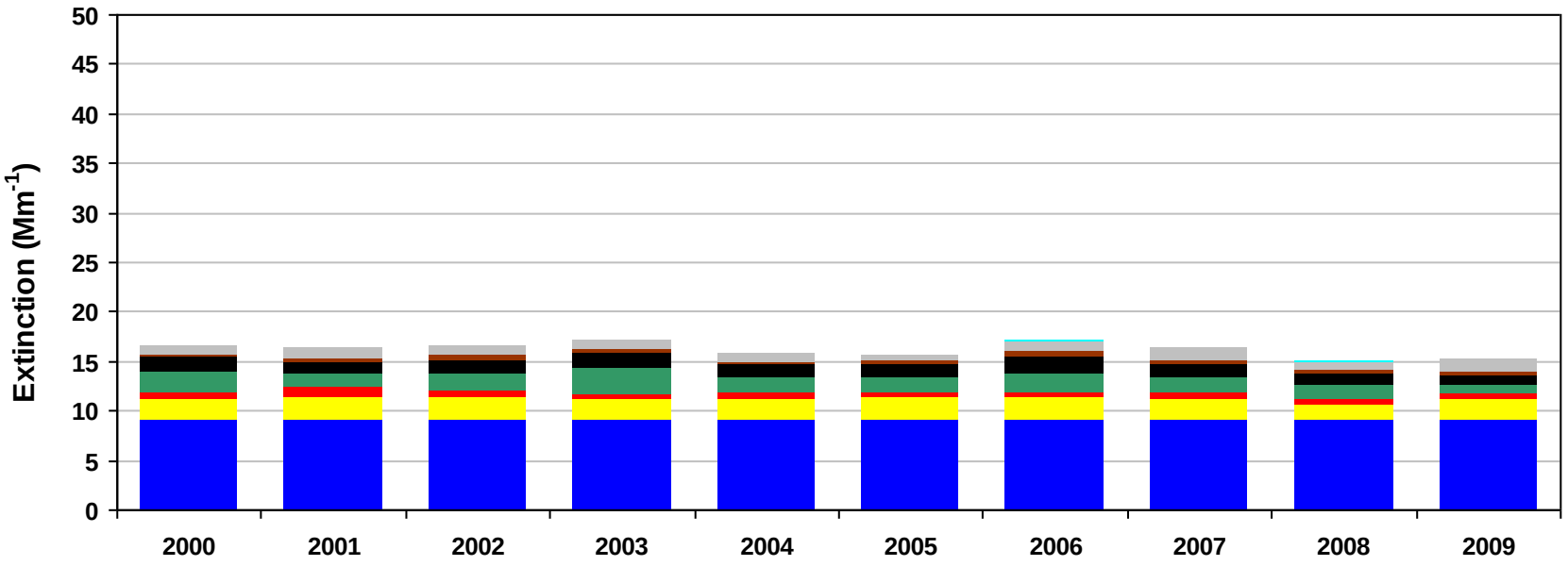


Figure B.5-5
Petrified Forest NP, AZ (PEFO1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

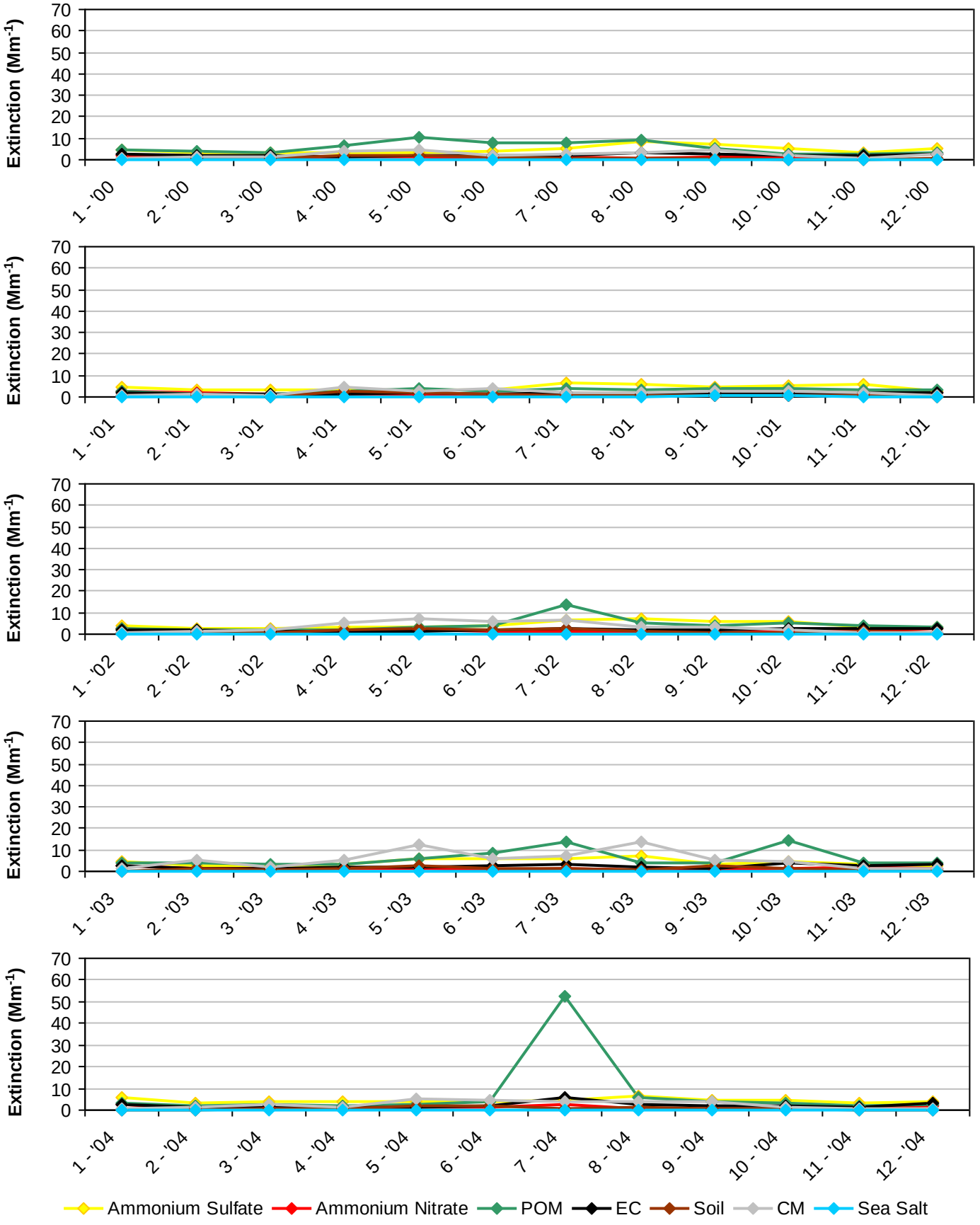


Figure B.5-6
Petrified Forest NP, AZ (PEFO1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

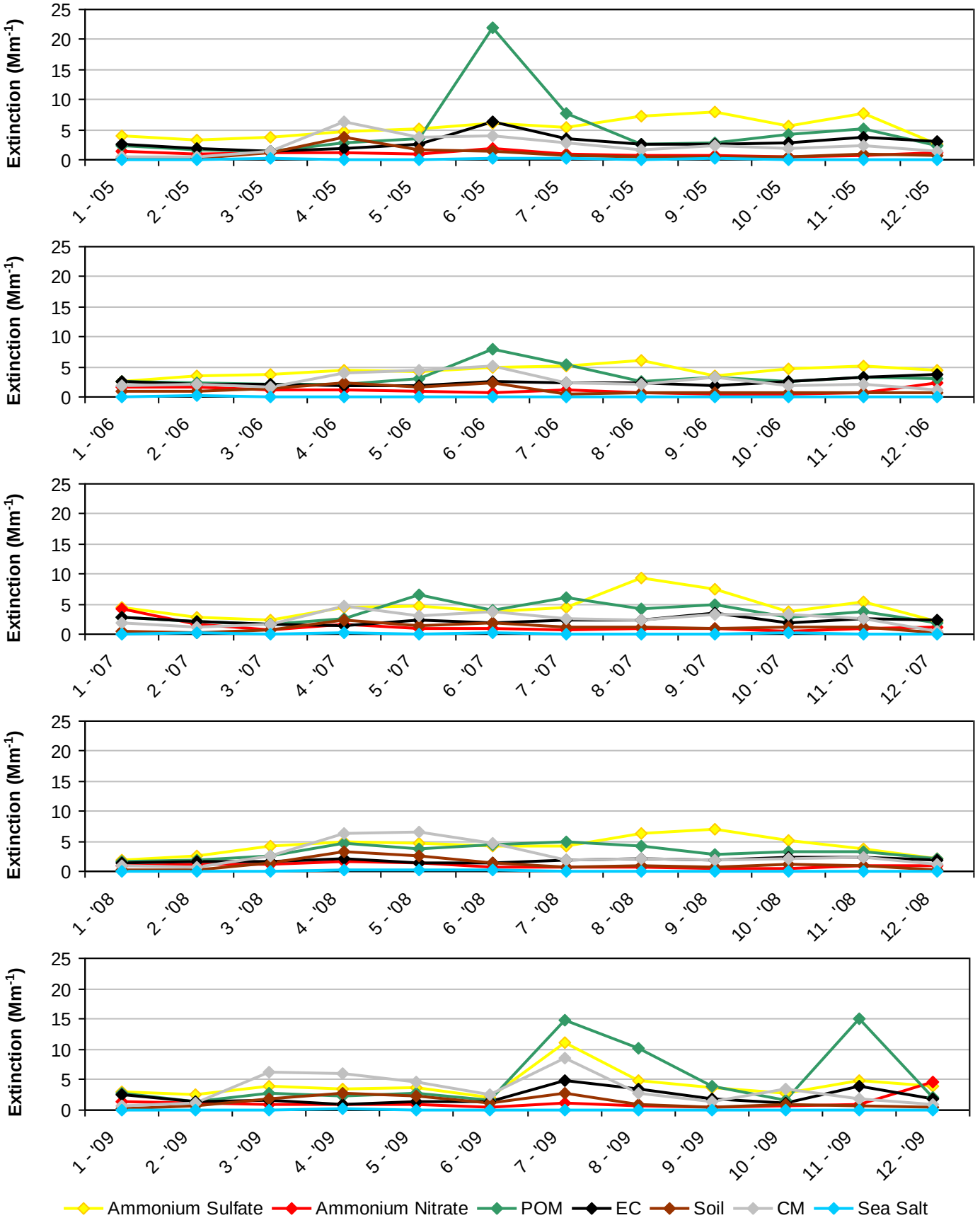


Figure B.5-7
Petrified Forest NP, AZ (PEFO1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

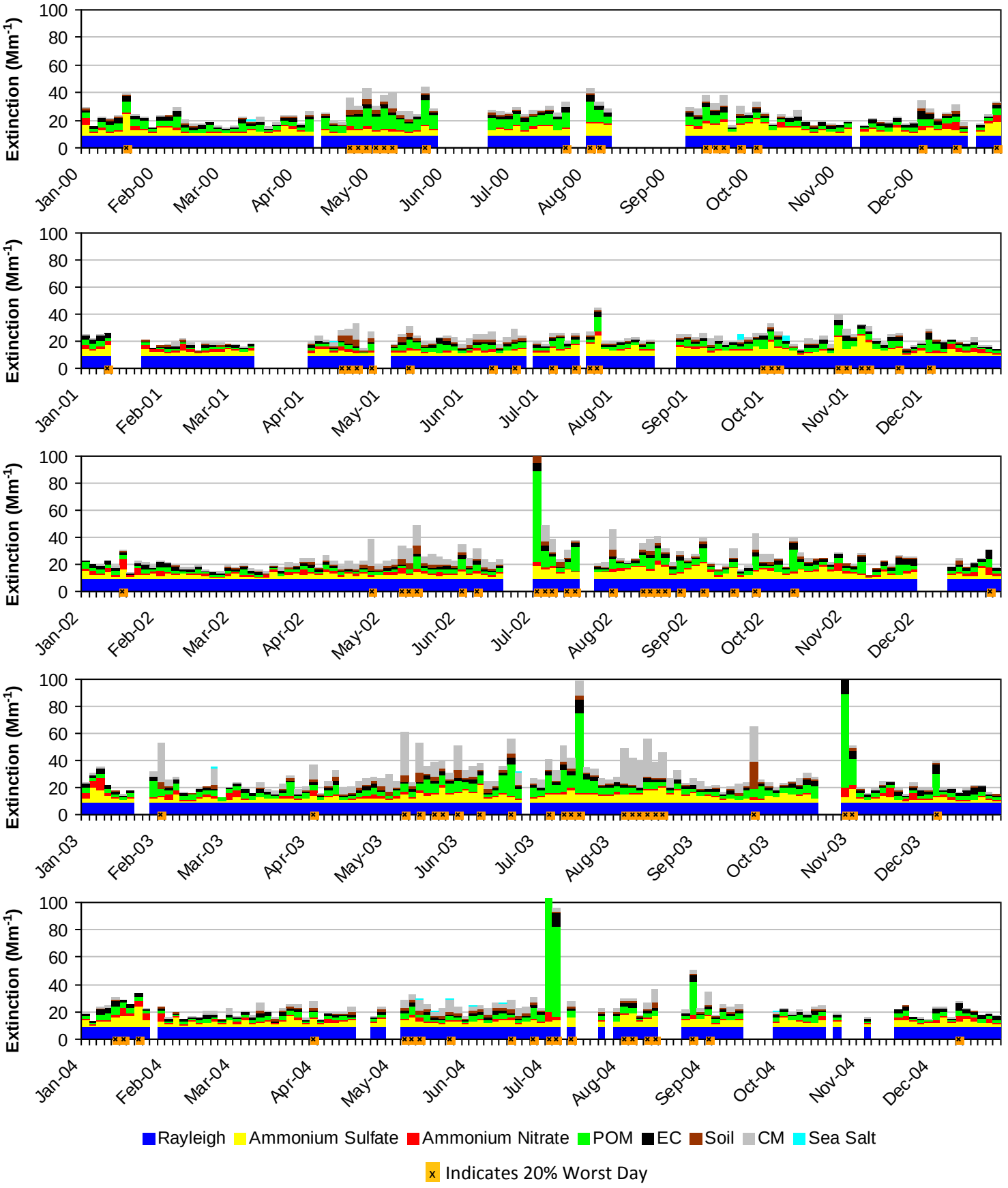
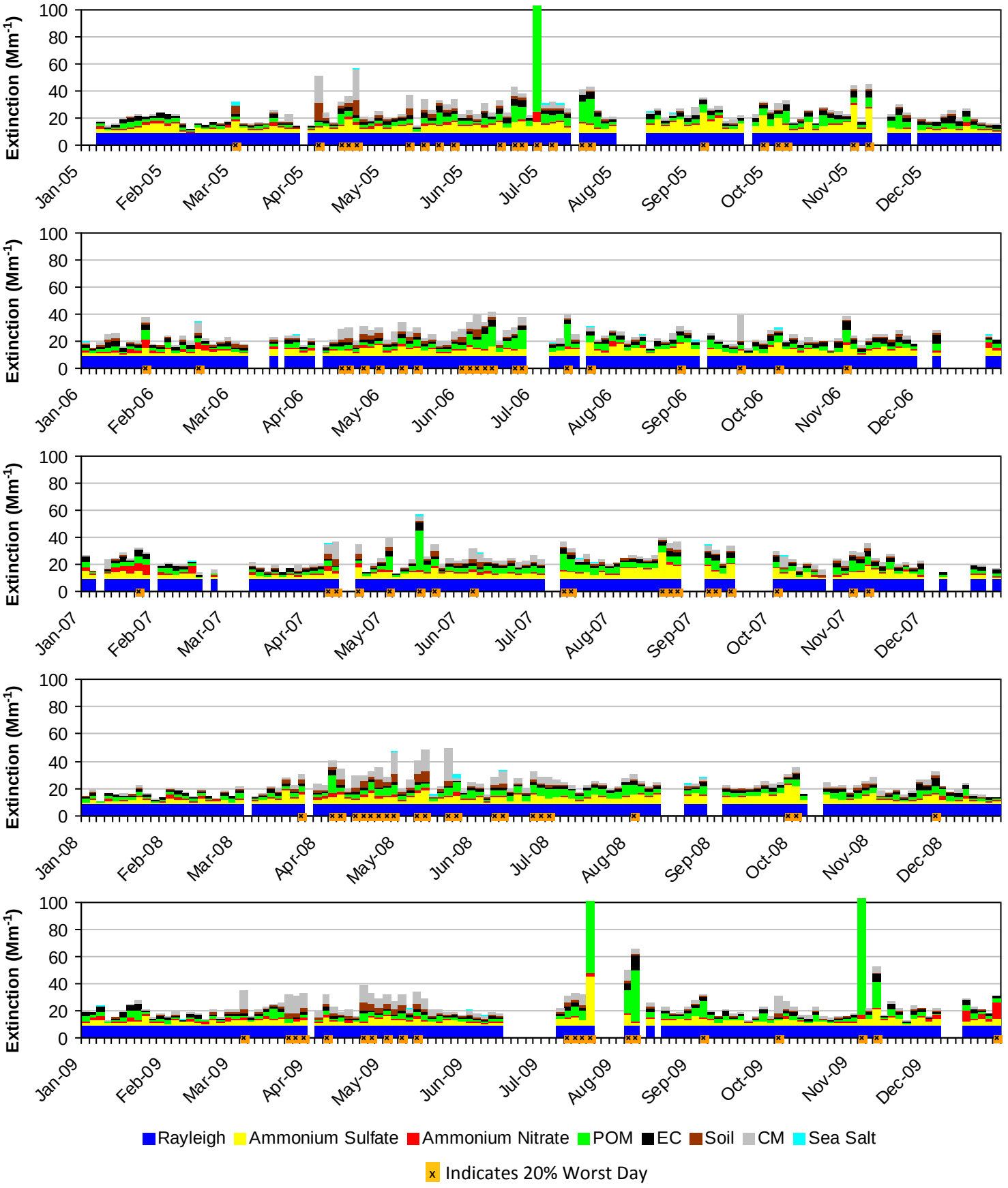


Figure B.5-8
Petrified Forest NP, AZ (PEFO1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



B.6. SAGUARO NP (SAGU1)

The following tables and figures are presented in this section for the Saguaro Wilderness Area represented by the SAGU1 IMPROVE Monitor:

- **Table B.6-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure B.6-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure B.6-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure B.6-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure B.6-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure B.6-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure B.6-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure B.6-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

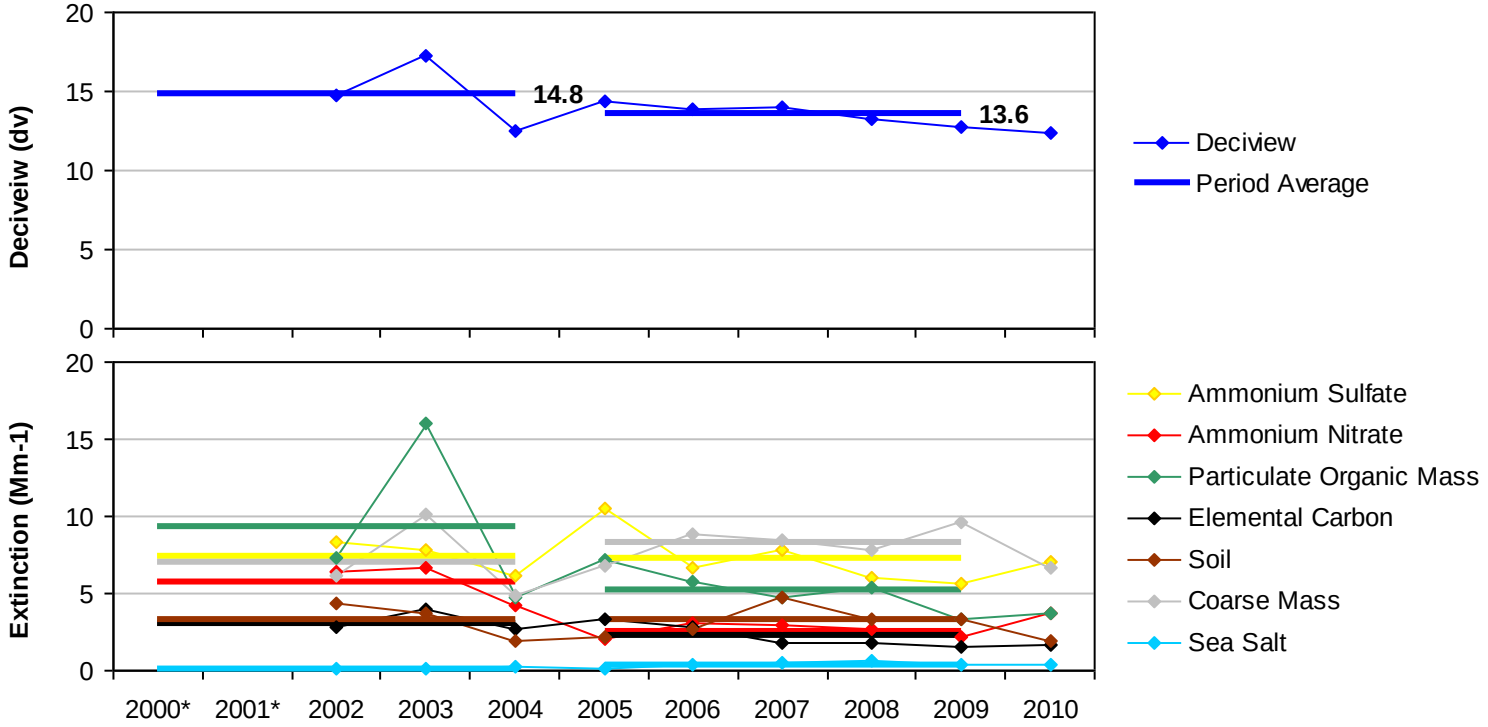
- **Figure B.6-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table B.6-1
Saguaro NP, AZ (SAGU1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	---	7.4	7.1	6.4	7.2	7.8	6.6	5.9	6.2	5.7	-0.2	0.1	6.9	6.7	-0.2	-3%
Worst 20% Days	---	---	14.8	17.2	12.5	14.3	13.9	14.1	13.2	12.7	12.4	-0.3	0.1	14.8	13.6	-1.2	-8%
All Days	---	---	10.6	11.5	9.6	10.7	10.8	10.4	9.8	9.3	9.0	-0.2	0.1	10.6	10.2	-0.4	-4%
Total Extinction (Mm-1)																	
Best 20% Days	---	---	21.0	20.4	19.0	20.9	21.9	19.5	18.1	18.7	17.8	-0.3	0.1	20.1	19.8	-0.3	-2%
Worst 20% Days	---	---	45.5	58.3	35.0	42.3	40.2	41.1	37.6	36.0	35.2	-1.4	0.1	46.3	39.5	-6.8	-15%
All Days	---	---	30.2	34.2	26.6	30.3	30.3	29.4	27.4	26.1	25.3	-0.9	0.1	30.3	28.7	-1.6	-5%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	---	3.0	2.3	2.7	3.5	3.4	2.3	2.0	2.6	2.0	-0.1	0.2	2.7	2.8	0.1	4%
Worst 20% Days	---	---	8.3	7.8	6.1	10.6	6.6	7.9	6.1	5.7	7.0	-0.4	0.1	7.4	7.4	0.0	0%
All Days	---	---	5.2	5.2	4.5	6.1	5.1	5.1	4.4	4.1	4.3	-0.1	0.0	5.0	5.0	0.0	0%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	---	0.8	1.2	0.9	1.0	0.8	0.8	0.7	0.6	0.7	-0.1	0.0	1.0	0.8	-0.2	-20%
Worst 20% Days	---	---	6.4	6.7	4.2	2.0	3.1	3.0	2.7	2.2	3.7	-0.5	0.0	5.8	2.6	-3.2	-55%
All Days	---	---	2.4	2.4	1.9	1.5	1.7	1.6	1.5	1.3	1.6	-0.1	0.0	2.2	1.5	-0.7	-32%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	---	2.2	2.3	2.0	2.4	2.2	2.1	1.8	1.5	1.7	-0.1	0.1	2.2	2.0	-0.2	-9%
Worst 20% Days	---	---	7.3	16.0	4.8	7.2	5.8	4.7	5.4	3.4	3.7	-0.6	0.0	9.4	5.3	-4.1	-44%
All Days	---	---	3.8	6.6	3.5	4.4	3.8	3.5	3.5	2.7	2.6	-0.2	0.0	4.7	3.6	-1.1	-23%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	---	1.3	1.3	1.2	1.4	1.4	1.3	0.8	0.8	0.9	-0.1	0.2	1.3	1.2	-0.1	-8%
Worst 20% Days	---	---	2.8	3.9	2.7	3.3	2.9	1.8	1.8	1.5	1.7	-0.3	0.0	3.1	2.2	-0.9	-29%
All Days	---	---	1.9	2.5	1.8	2.3	2.2	1.7	1.5	1.3	1.4	-0.1	0.0	2.1	1.8	-0.3	-14%
Soil Extinction (Mm-1)																	
Best 20% Days	---	---	1.7	1.0	0.6	0.6	0.9	1.1	0.8	0.8	0.5	0.0	0.2	1.1	0.8	-0.3	-27%
Worst 20% Days	---	---	4.4	3.7	2.0	2.2	2.7	4.8	3.4	3.4	1.9	0.0	0.6	3.4	3.3	-0.1	-3%
All Days	---	---	2.9	2.1	1.3	1.4	1.7	2.9	1.7	1.7	1.2	0.0	0.6	2.1	1.9	-0.2	-10%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	---	2.0	2.0	1.5	1.8	2.9	1.8	1.7	2.3	1.7	0.0	0.5	1.8	2.1	0.3	17%
Worst 20% Days	---	---	6.2	10.1	4.9	6.8	8.9	8.4	7.8	9.6	6.7	0.4	0.2	7.1	8.3	1.2	17%
All Days	---	---	3.8	5.2	3.3	4.3	5.5	4.3	4.5	4.8	4.1	0.1	0.2	4.1	4.7	0.6	15%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	---	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.0	0.2	0.1	0.2	0.1	100%
Worst 20% Days	---	---	0.1	0.1	0.3	0.2	0.4	0.6	0.6	0.3	0.4	0.1	0.0	0.2	0.4	0.2	100%
All Days	---	---	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.1	0.1	0.2	0.1	100%

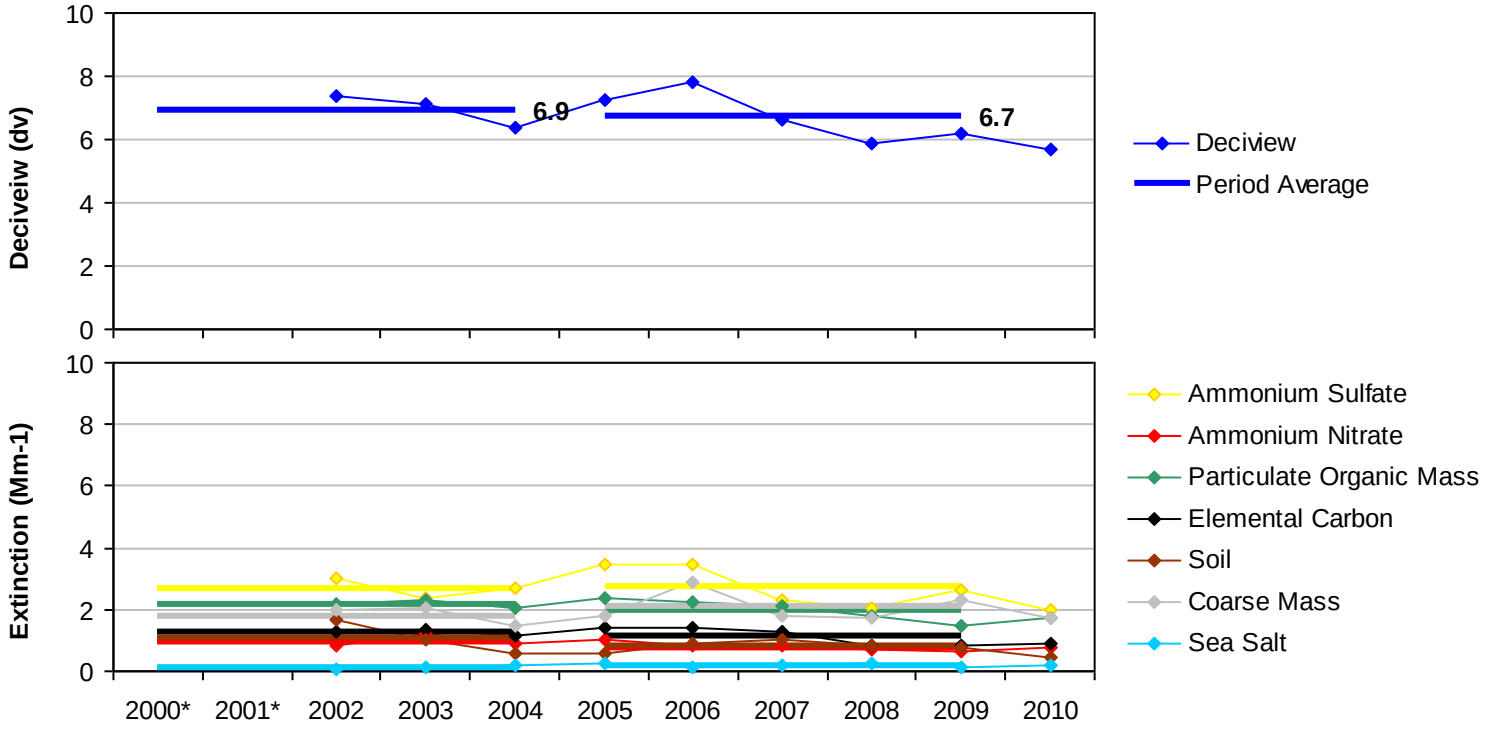
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure B.6-1
Saguaro NP, AZ (SAGU1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



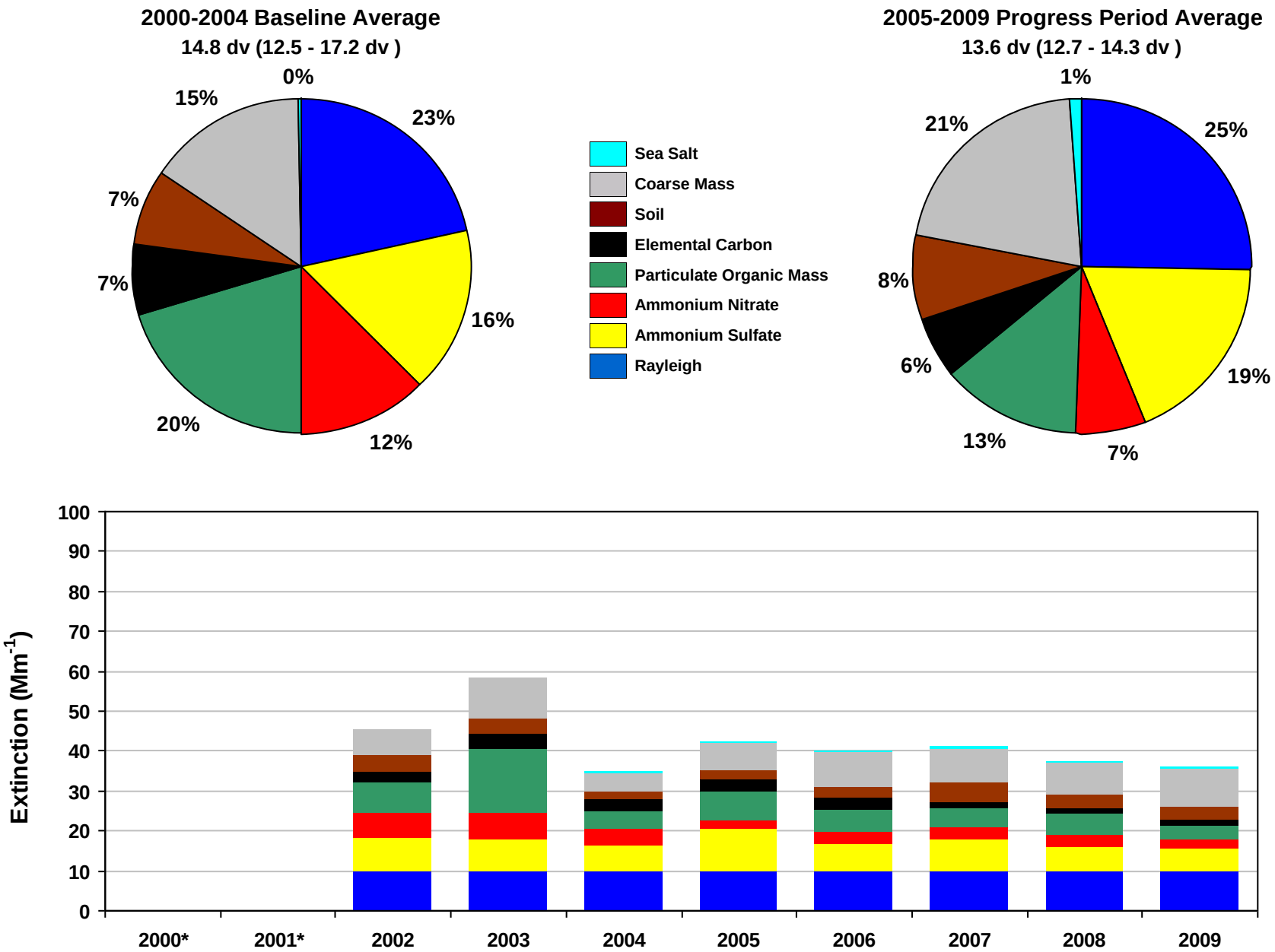
*Missing years did not meet RHR data completeness criteria.

Figure B.6-2
Saguaro NP, AZ (SAGU1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



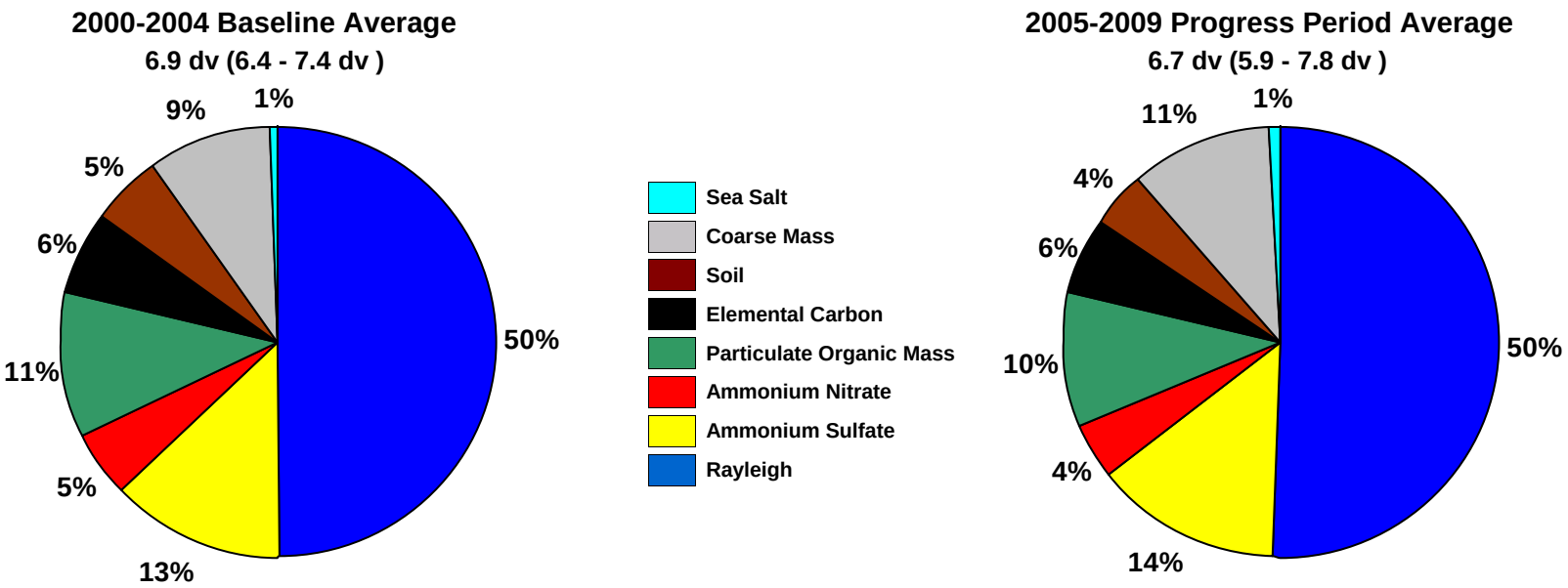
*Missing years did not meet RHR data completeness criteria.

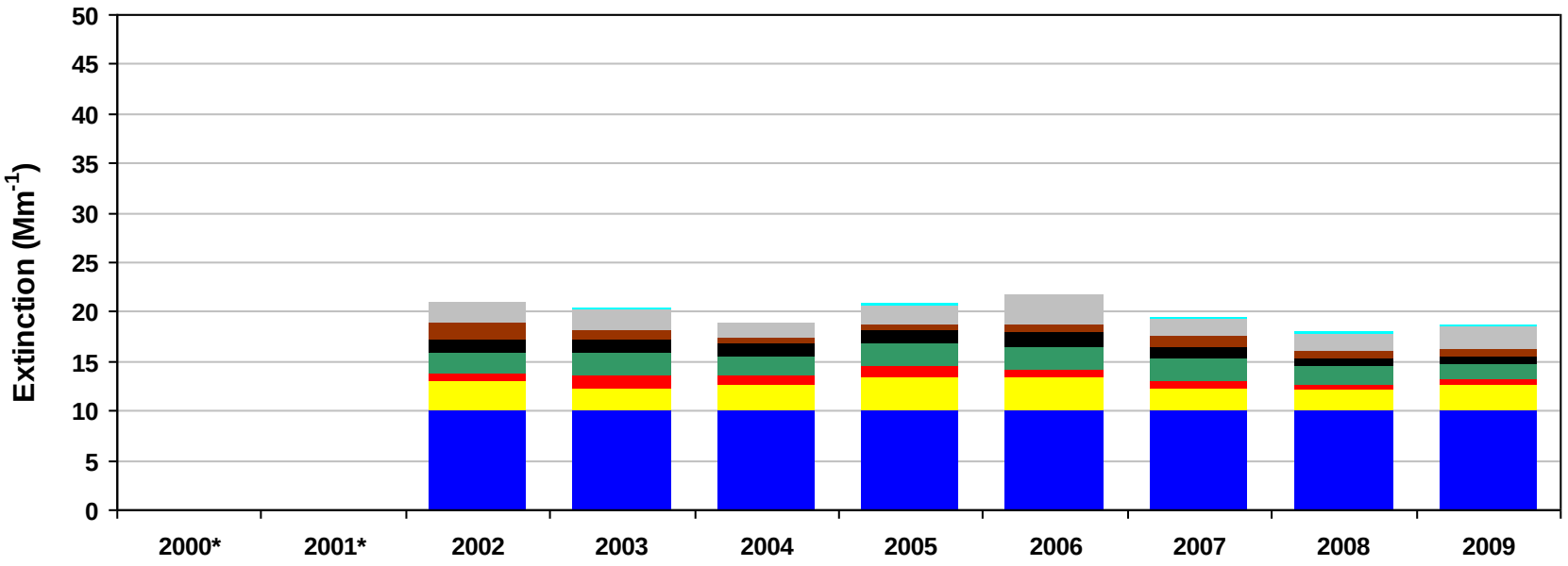
Figure B.6-3
Saguaro NP, AZ (SAGU1 Site)
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

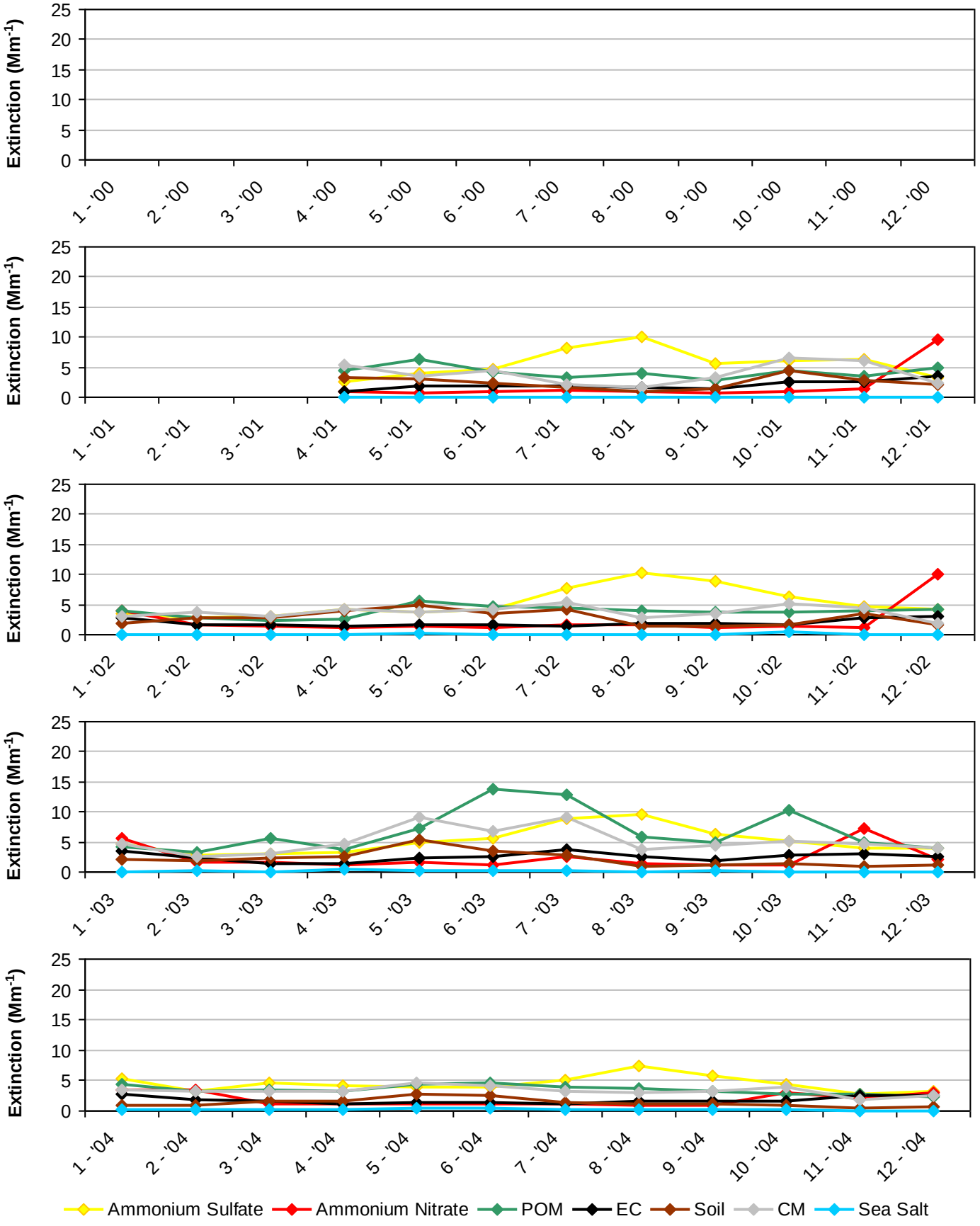
Figure B.6-4
Saguaro NP, AZ (SAGU1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure B.6-5
Saguaro NP, AZ (SAGU1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure B.6-6
Saguaro NP, AZ (SAGU1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

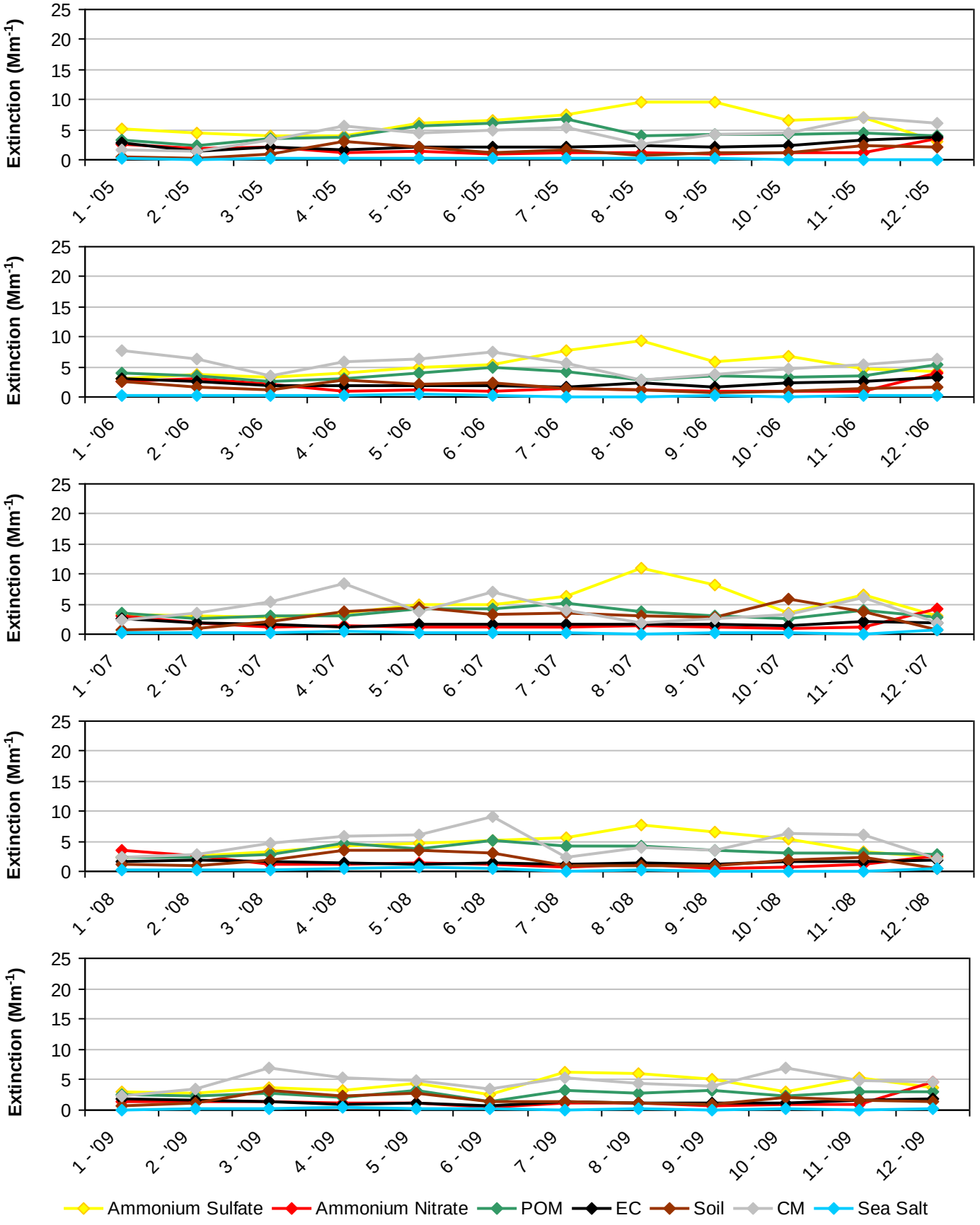
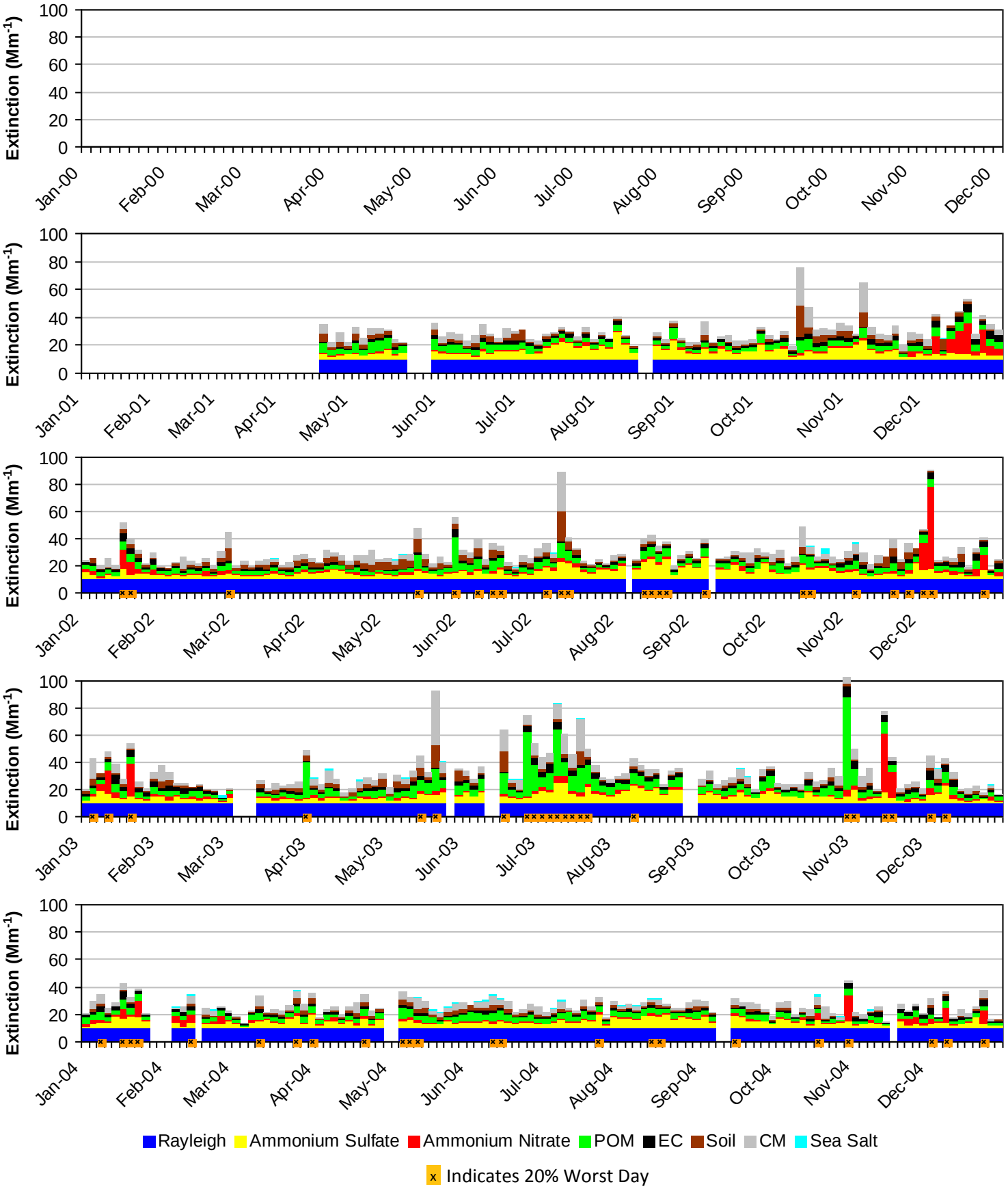
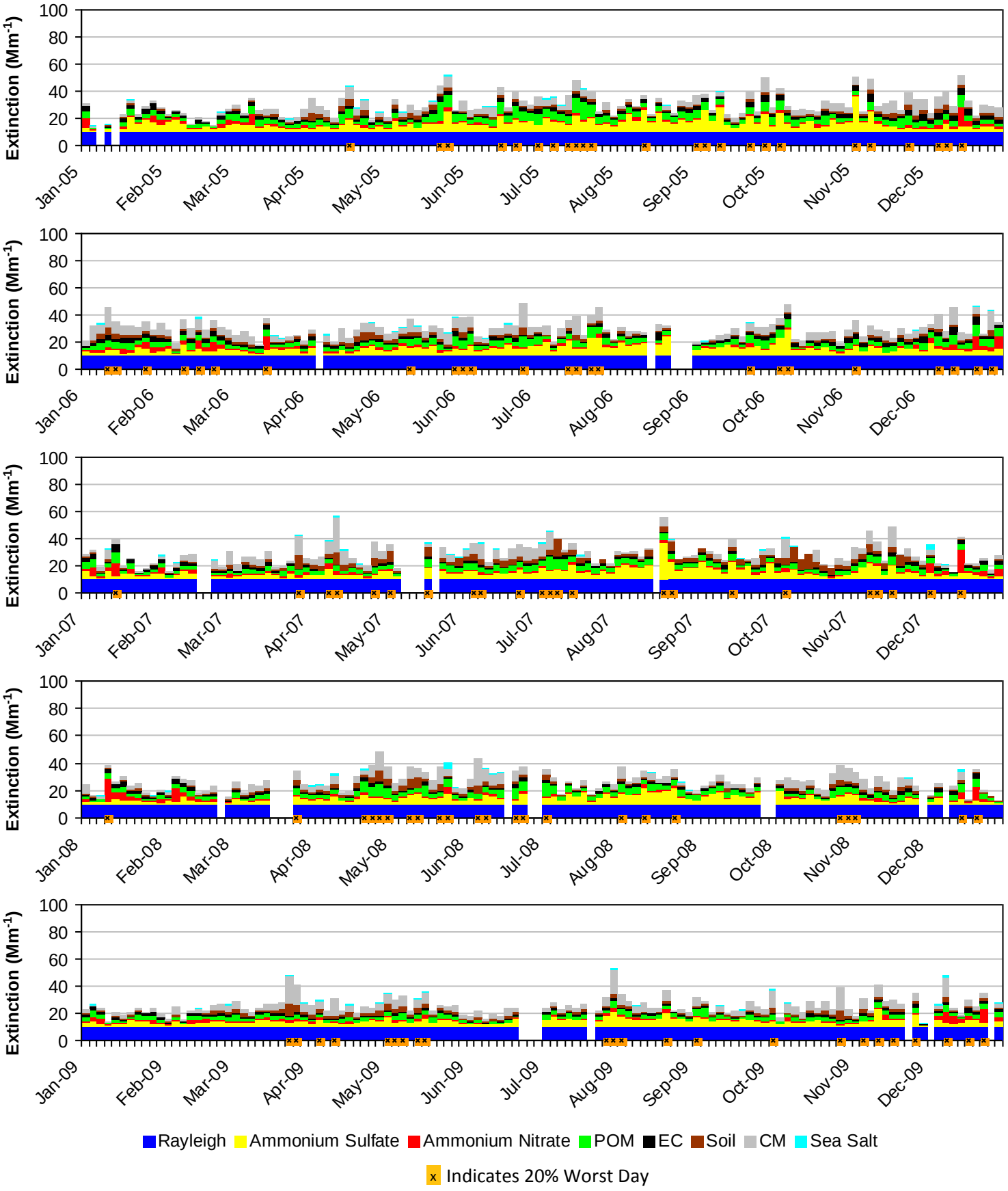


Figure B.6-7
Saguaro NP, AZ (SAGU1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure B.6-8
Saguaro NP, AZ (SAGU1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



B.7. SAGUARO WA (SAWE1)

The following tables and figures are presented in this section for the Saguaro Wilderness Area represented by the SAWE1 IMPROVE Monitor:

- **Table B.7-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure B.7-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure B.7-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure B.7-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure B.7-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure B.7-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure B.7-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure B.7-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

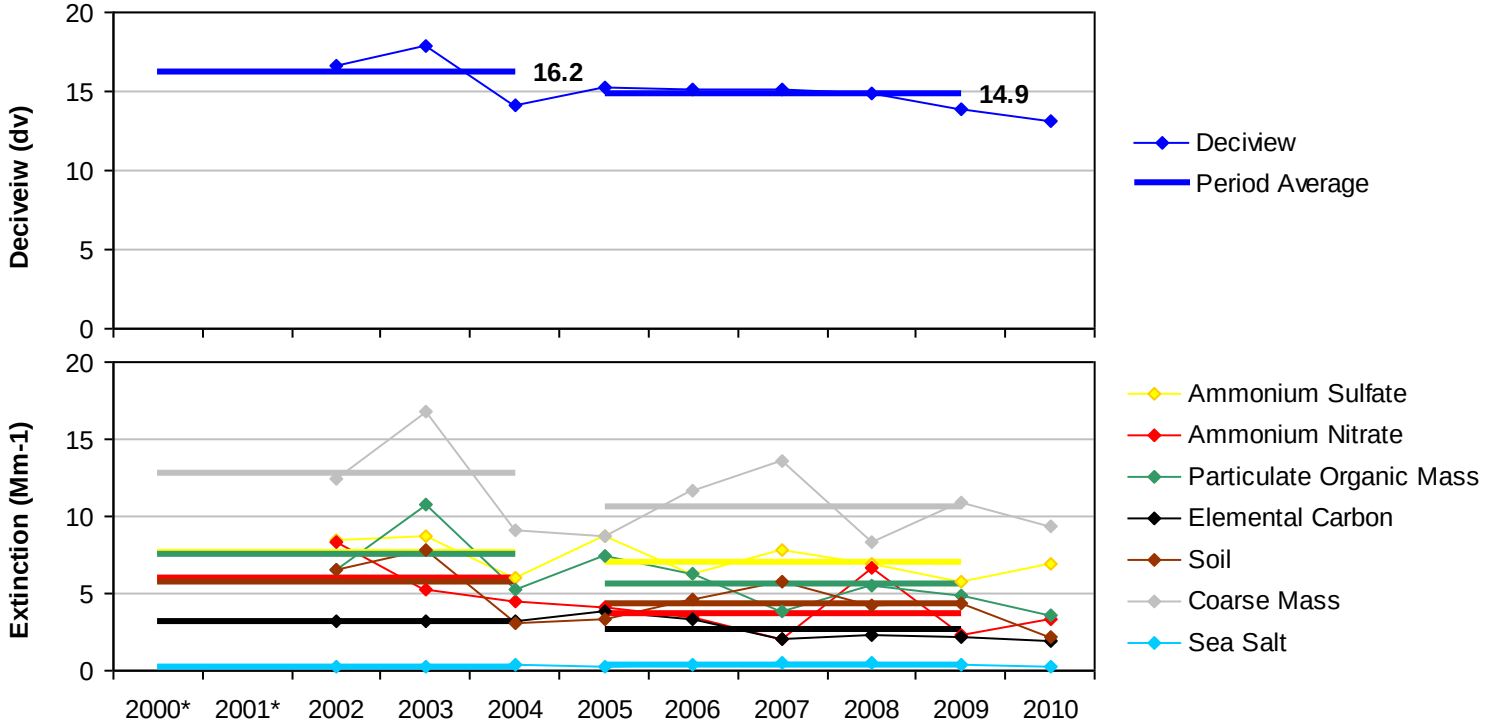
- **Figure B.7-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table B.7-1
Saguaro NP, AZ (SAWE1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	---	9.2	8.7	7.8	7.9	9.0	8.2	7.6	7.5	0.8	-0.2	0.0	8.6	8.0	-0.6	-7%
Worst 20% Days	---	---	16.6	17.9	14.2	15.3	15.2	15.1	14.9	13.9	3.4	-0.3	0.0	16.2	14.9	-1.3	-8%
All Days	---	---	12.5	12.7	11.1	11.9	12.1	11.6	11.3	10.7	1.5	-0.2	0.0	12.1	11.5	-0.6	-5%
Total Extinction (Mm-1)																	
Best 20% Days	---	---	25.3	24.0	22.0	22.2	24.9	22.9	21.6	21.2	2.4	-0.5	0.0	23.7	22.6	-1.1	-5%
Worst 20% Days	---	---	55.7	62.7	41.6	46.3	45.8	45.6	44.5	40.6	6.9	-1.8	0.0	53.3	44.6	-8.7	-16%
All Days	---	---	36.7	38.1	31.0	33.9	34.5	33.1	32.1	29.8	4.4	-1.0	0.0	35.3	32.7	-2.6	-7%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	---	3.3	3.3	3.2	3.3	3.7	2.7	2.4	3.2	19.4	0.0	0.1	3.3	3.0	-0.3	-9%
Worst 20% Days	---	---	8.5	8.7	6.1	8.7	6.2	7.8	7.0	5.7	37.5	-0.3	0.1	7.7	7.1	-0.6	-8%
All Days	---	---	5.6	5.6	4.7	6.1	5.4	5.3	5.2	4.4	27.5	-0.1	0.1	5.3	5.3	0.0	0%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	---	1.1	1.3	1.1	1.2	1.1	1.1	1.1	0.8	2.5	0.0	0.0	1.2	1.0	-0.2	-17%
Worst 20% Days	---	---	8.3	5.2	4.5	4.1	3.4	2.0	6.6	2.3	9.3	-0.6	0.0	6.0	3.7	-2.3	-38%
All Days	---	---	3.1	2.4	2.2	2.1	1.8	1.9	2.6	1.7	5.4	-0.1	0.0	2.6	2.0	-0.6	-23%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	---	2.8	2.8	2.6	2.6	2.7	2.4	1.9	1.7	6.6	-0.1	0.0	2.7	2.3	-0.4	-15%
Worst 20% Days	---	---	6.5	10.8	5.3	7.4	6.3	3.9	5.5	4.9	13.1	-0.5	0.1	7.5	5.6	-1.9	-25%
All Days	---	---	4.1	5.8	4.1	4.8	4.4	3.4	3.9	3.0	9.8	-0.3	0.1	4.7	3.9	-0.8	-17%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	---	1.7	1.9	1.6	1.3	1.6	1.6	1.2	1.0	1.0	-0.1	0.0	1.8	1.3	-0.5	-28%
Worst 20% Days	---	---	3.2	3.2	3.3	3.8	3.3	2.0	2.3	2.2	1.9	-0.1	0.3	3.2	2.7	-0.5	-16%
All Days	---	---	2.4	2.7	2.2	2.6	2.4	1.9	1.8	1.6	1.5	-0.1	0.0	2.4	2.1	-0.3	-13%
Soil Extinction (Mm-1)																	
Best 20% Days	---	---	2.0	1.7	0.9	0.8	1.5	1.3	1.4	1.2	1.7	-0.1	0.1	1.5	1.2	-0.3	-20%
Worst 20% Days	---	---	6.5	7.8	3.1	3.3	4.6	5.7	4.2	4.3	3.6	-0.2	0.4	5.8	4.4	-1.4	-24%
All Days	---	---	3.6	3.6	2.1	2.1	2.8	3.0	2.5	2.7	2.6	-0.1	0.2	3.1	2.6	-0.5	-16%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	---	4.4	2.7	2.3	2.7	4.0	3.5	3.3	3.1	0.2	-0.1	0.5	3.1	3.3	0.2	7%
Worst 20% Days	---	---	12.4	16.9	9.1	8.7	11.6	13.6	8.4	10.8	0.3	-0.2	0.2	12.8	10.6	-2.2	-17%
All Days	---	---	7.6	8.0	5.4	5.9	7.4	7.2	5.7	6.1	0.2	-0.2	0.2	7.0	6.4	-0.6	-9%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	---	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.2	0.8	0.0	0.0	0.2	0.3	0.1	50%
Worst 20% Days	---	---	0.2	0.2	0.4	0.3	0.4	0.5	0.5	0.4	2.1	0.0	0.0	0.3	0.4	0.1	33%
All Days	---	---	0.1	0.2	0.3	0.3	0.3	0.4	0.4	0.3	1.8	0.0	0.0	0.2	0.3	0.1	50%

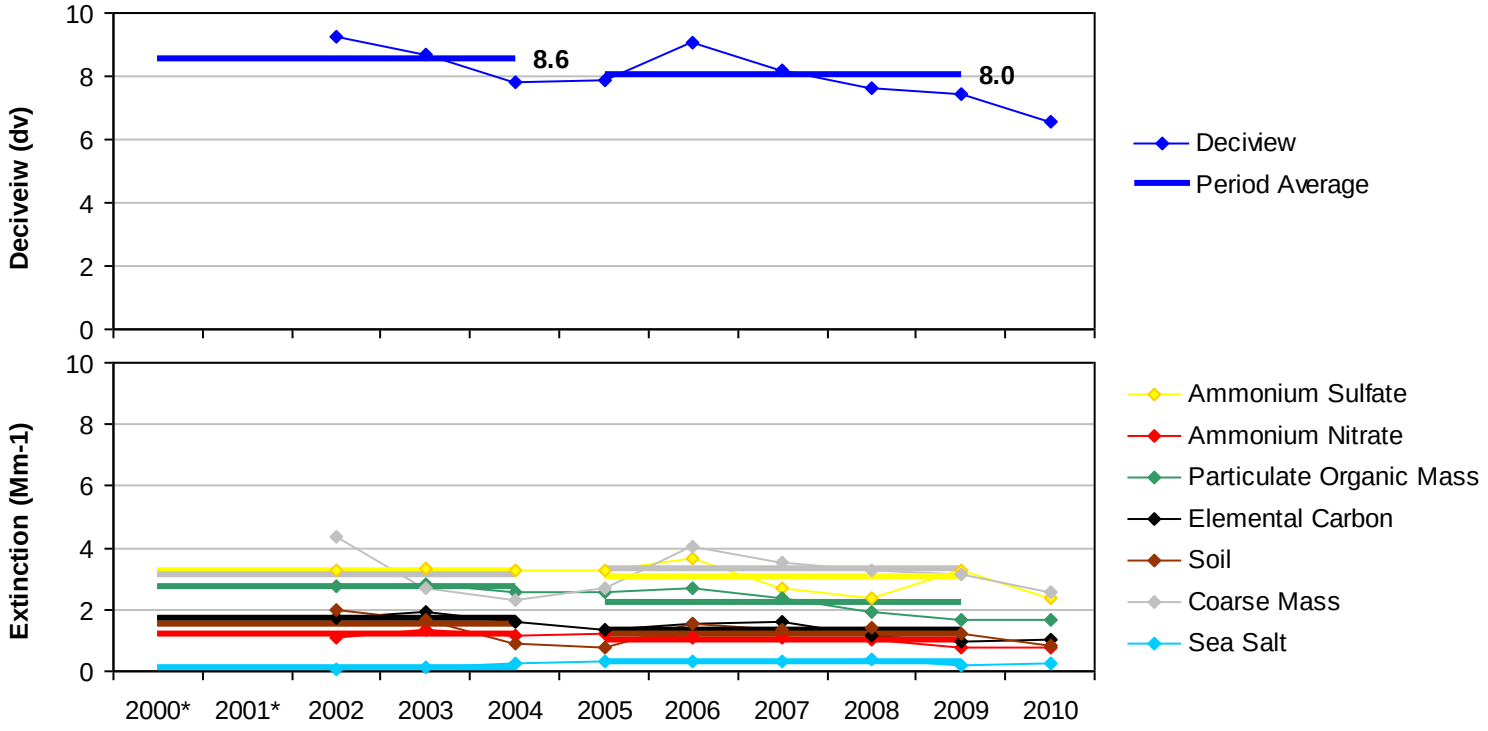
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure B.7-1
Saguaro NP, AZ (SAWE1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



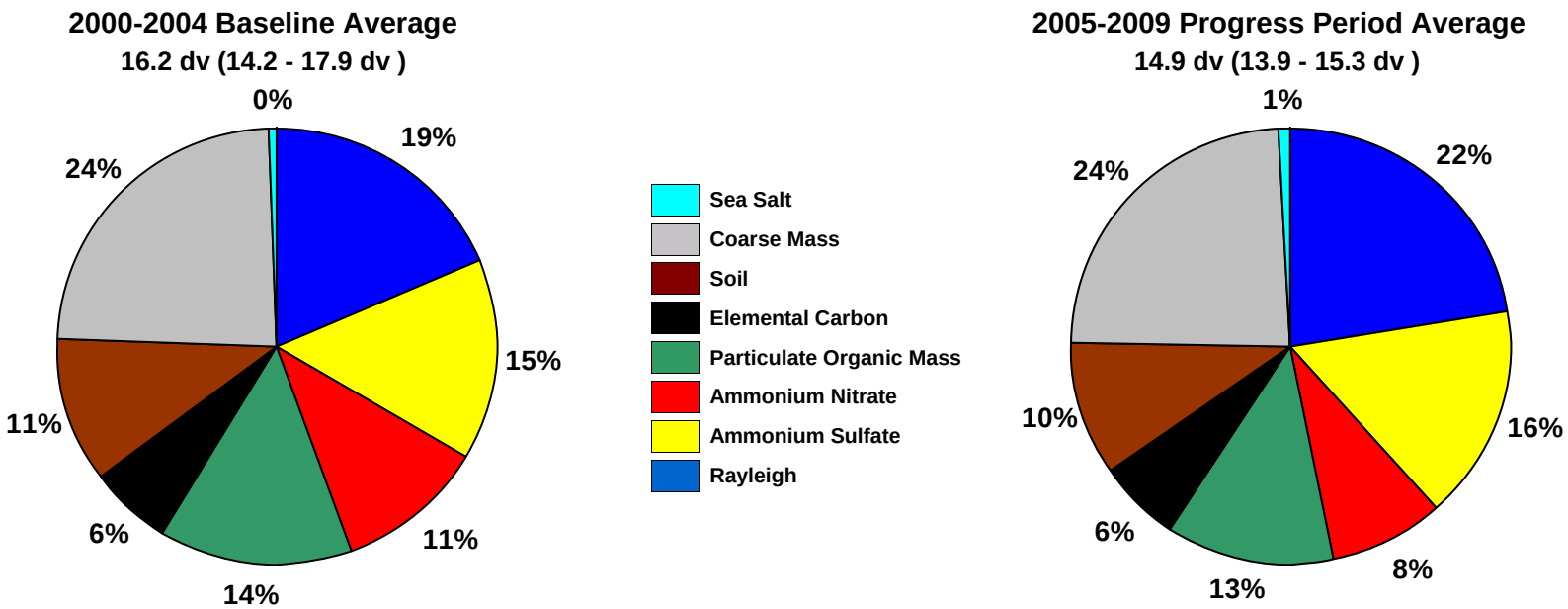
*Missing years did not meet RHR data completeness criteria.

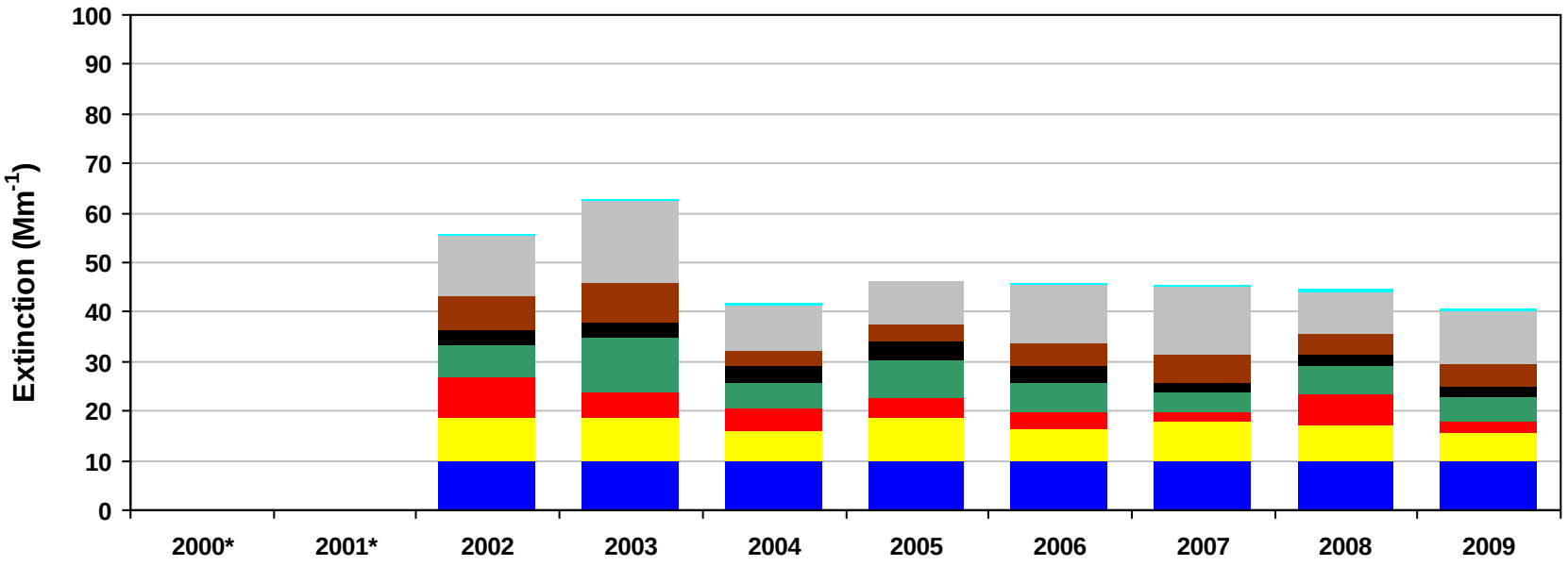
Figure B.7-2
Saguaro NP, AZ (SAWE1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

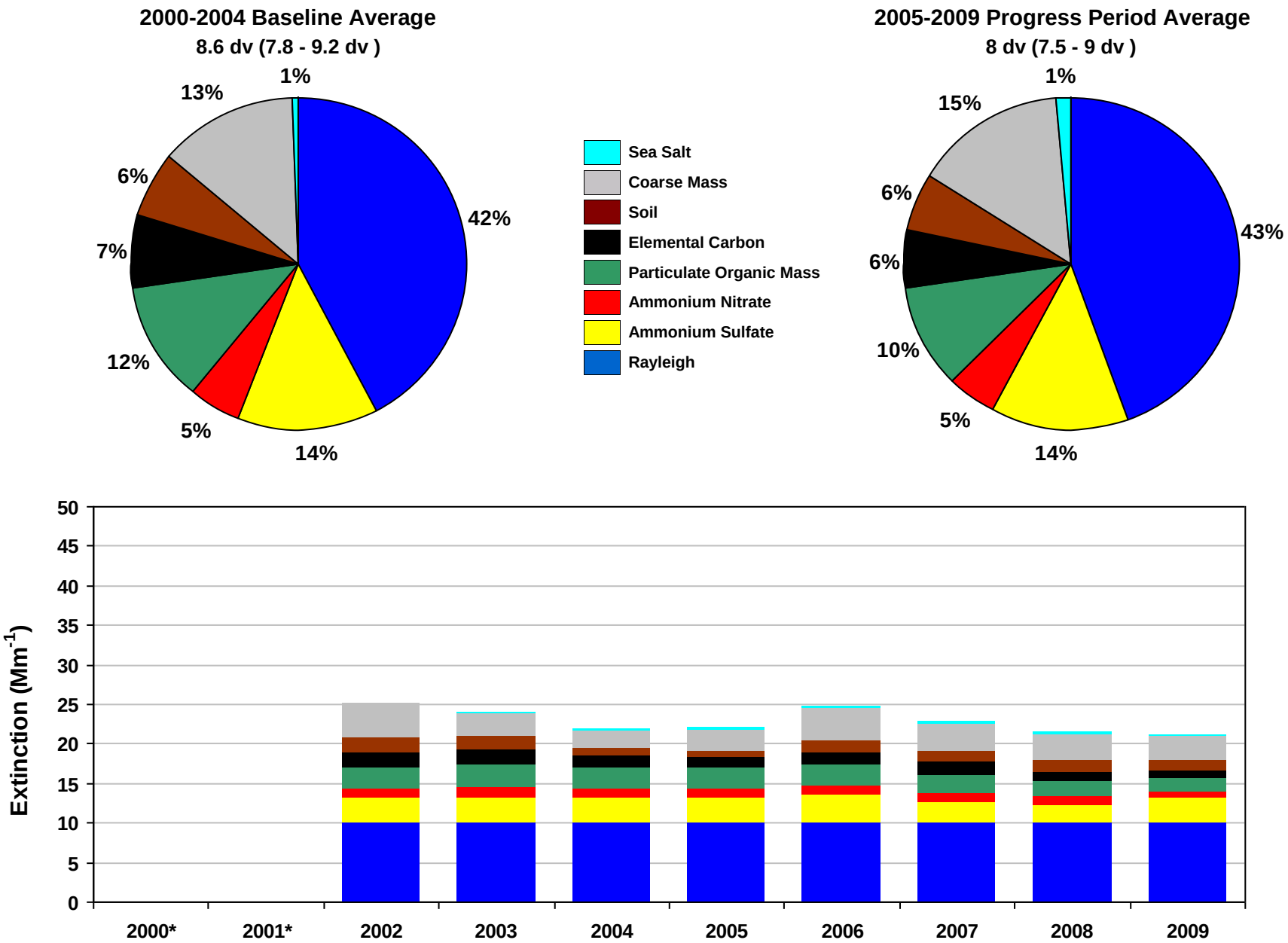
Figure B.7-3
Saguaro NP, AZ (SAWE1 Site)
20% Most Impaired Visibility Days





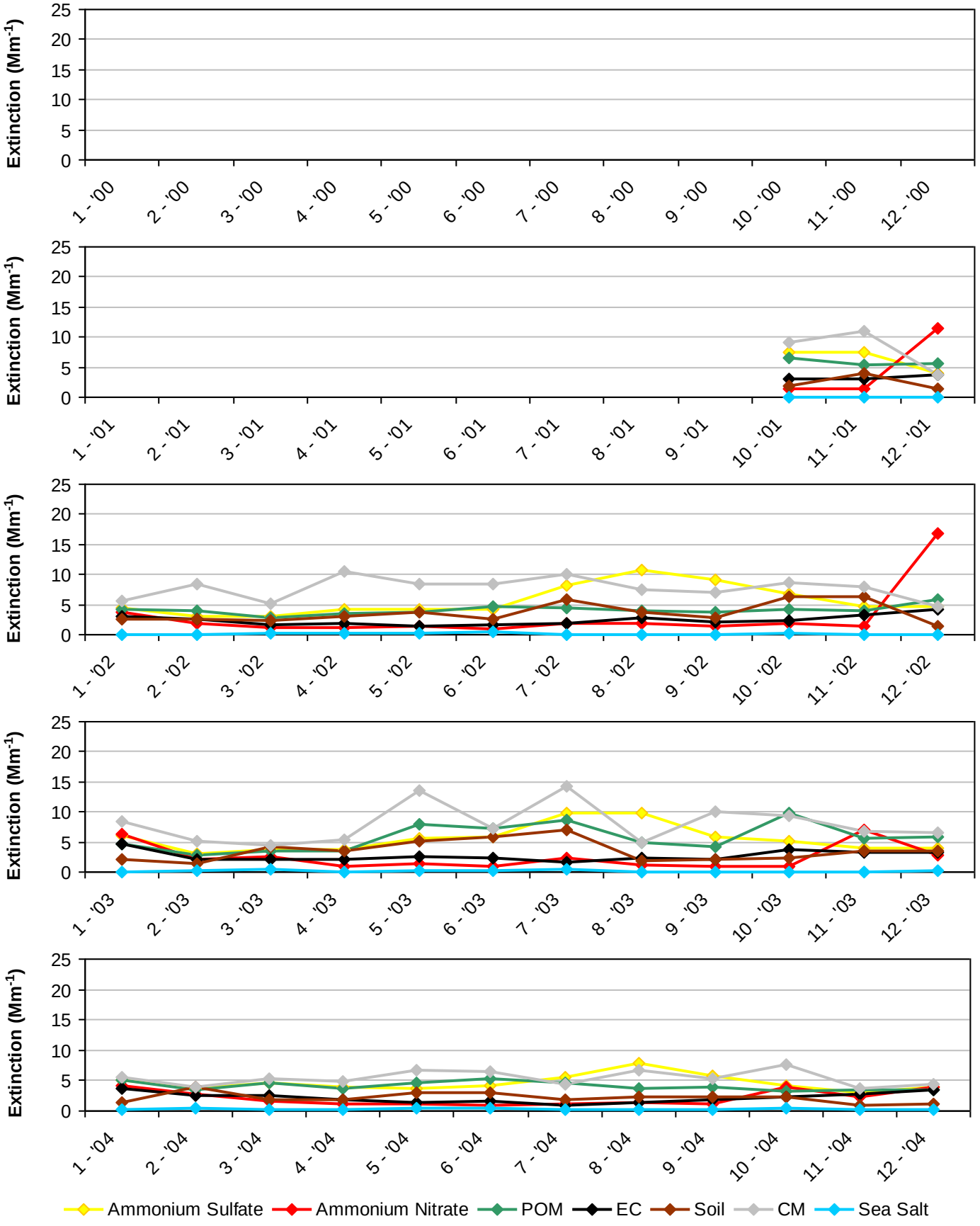
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure B.7-4
Saguaro NP, AZ (SAWE1 Site)
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure B.7-5
Saguaro NP, AZ (SAWE1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure B.7-6
Saguaro NP, AZ (SAWE1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

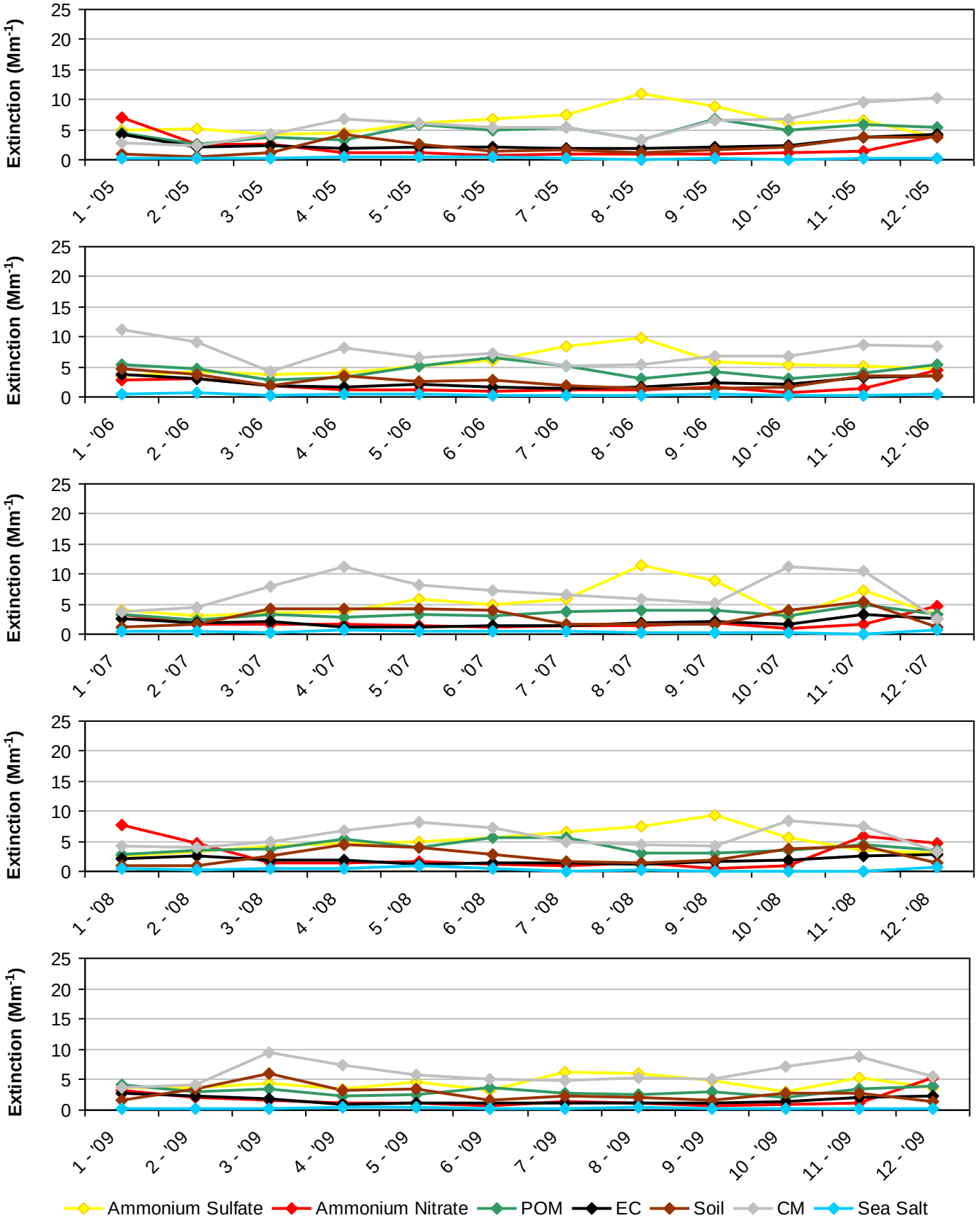
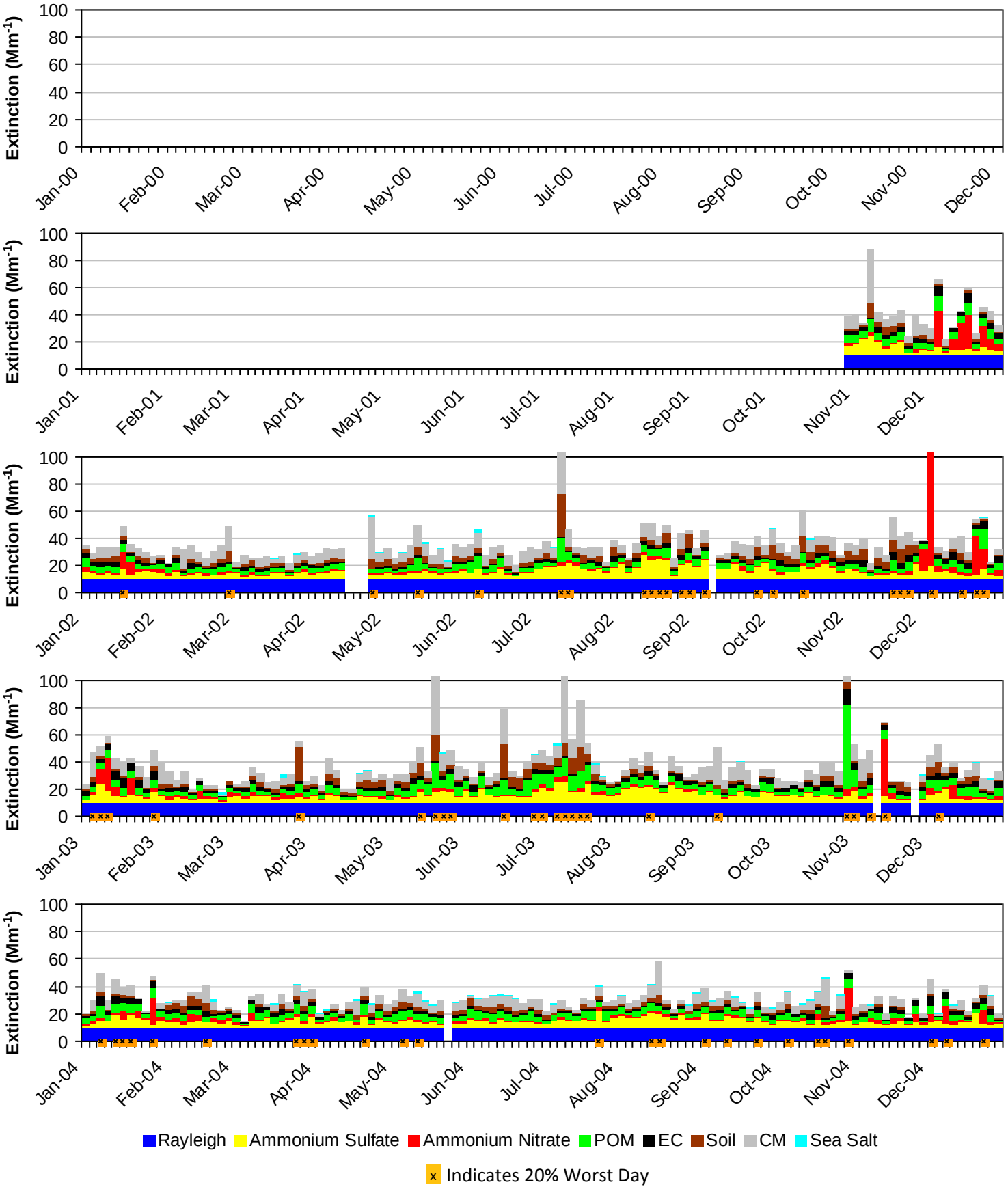
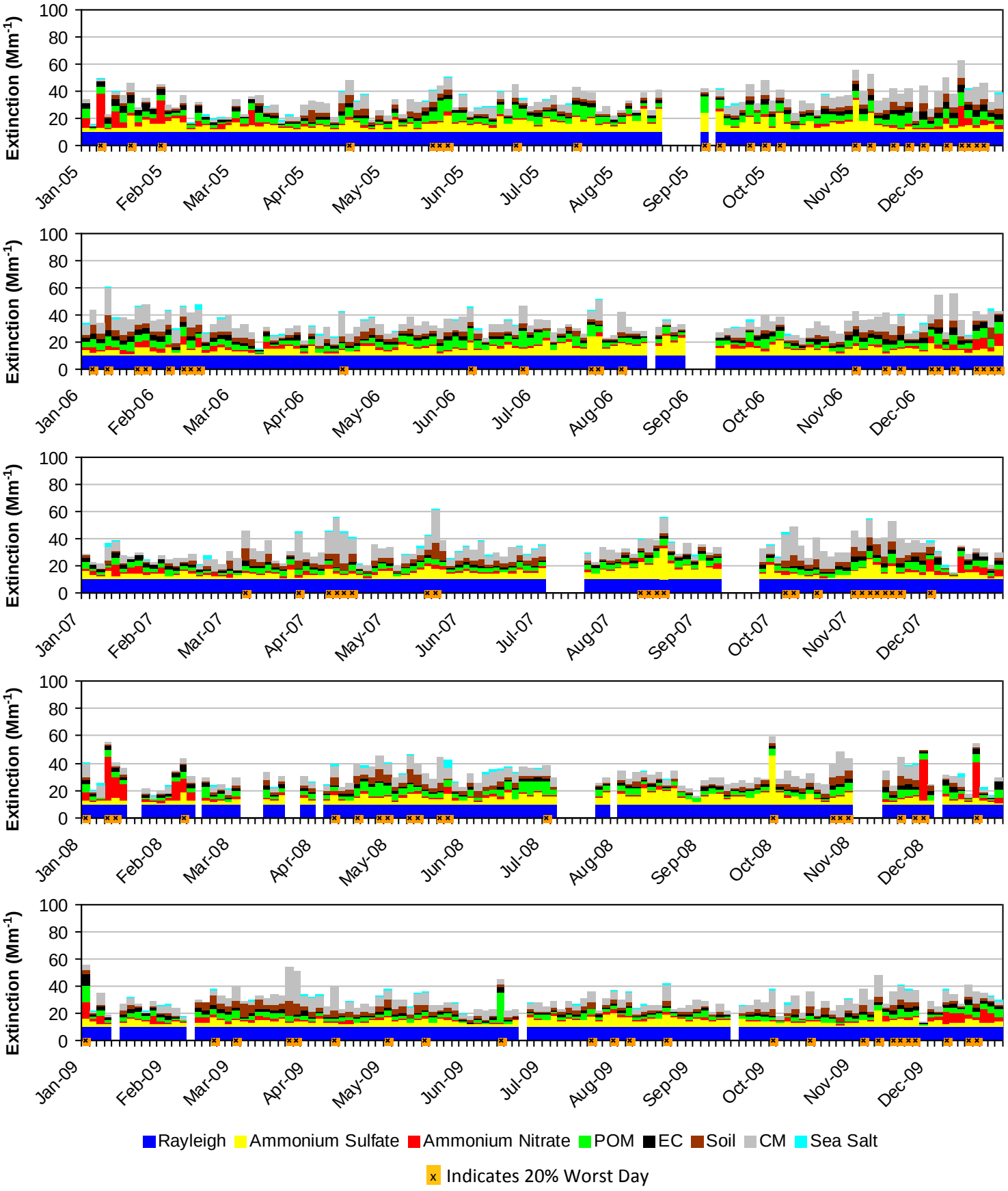


Figure B.7-7
Saguaro NP, AZ (SAWE1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure B.7-8
Saguaro NP, AZ (SAWE1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



B.8. SIERRA ANCHA WA (SIAN1)

The following tables and figures are presented in this section for the Sierra Ancha Wilderness Area represented by the SIAN1 IMPROVE Monitor:

- **Table B.8-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure B.8-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure B.8-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure B.8-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure B.8-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure B.8-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure B.8-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure B.8-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

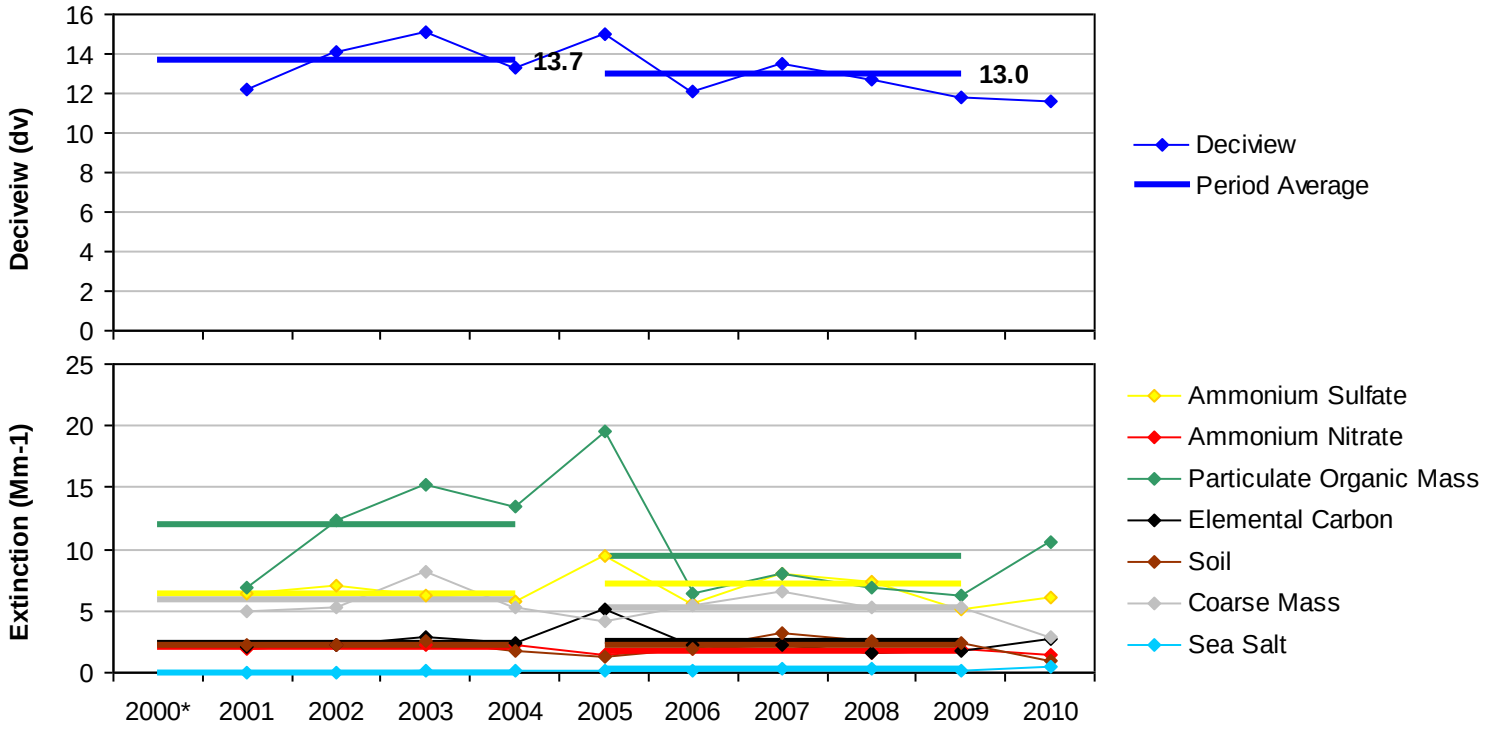
- **Figure B.8-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table B.8-1
Sierra Ancha WA, AZ (SIAN1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	6.2	6.5	6.1	5.9	5.3	6.1	5.5	5.1	4.6	5.5	-0.2	0.0	6.2	5.3	-0.9	-15%
Worst 20% Days	---	12.2	14.1	15.1	13.3	15.0	12.1	13.5	12.7	11.8	11.6	-0.2	0.1	13.7	13.0	-0.7	-5%
All Days	---	9.2	10.3	10.2	9.1	9.6	9.1	9.2	8.9	8.2	8.0	-0.2	0.0	9.7	9.0	-0.7	-7%
Total Extinction (Mm-1)																	
Best 20% Days	---	18.7	19.2	18.4	18.0	17.1	18.5	17.5	16.7	15.9	17.4	-0.3	0.0	18.6	17.1	-1.5	-8%
Worst 20% Days	---	34.4	41.5	47.6	41.1	51.2	33.7	40.5	35.9	32.9	34.9	-0.6	0.1	41.1	38.8	-2.3	-6%
All Days	---	25.7	29.0	29.5	26.3	29.1	25.6	26.5	25.2	23.5	23.4	-0.5	0.1	27.6	26.0	-1.6	-6%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	2.3	2.3	1.8	2.3	2.0	2.3	1.8	1.6	1.7	2.2	-0.1	0.0	2.2	1.9	-0.3	-14%
Worst 20% Days	---	6.4	7.1	6.3	5.8	9.5	5.6	8.0	7.4	5.2	6.0	-0.1	0.3	6.4	7.2	0.8	13%
All Days	---	4.4	4.2	4.0	4.0	5.3	4.4	4.6	4.4	3.8	3.8	0.0	0.5	4.1	4.5	0.4	10%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.9	0.8	0.8	0.9	0.4	0.4	0.5	0.5	0.4	0.8	-0.1	0.0	0.8	0.5	-0.3	-38%
Worst 20% Days	---	1.9	2.3	2.2	2.2	1.5	1.9	2.2	1.6	1.9	1.4	0.0	0.2	2.1	1.8	-0.3	-14%
All Days	---	1.4	1.6	1.5	1.4	1.0	1.1	1.2	1.1	1.0	0.9	-0.1	0.0	1.5	1.1	-0.4	-27%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	2.7	3.1	3.4	2.6	2.4	2.6	2.3	2.3	1.6	2.0	-0.1	0.0	2.9	2.2	-0.7	-24%
Worst 20% Days	---	6.8	12.4	15.3	13.4	19.5	6.4	8.1	6.8	6.3	10.5	-0.9	0.2	12.0	9.4	-2.6	-22%
All Days	---	4.4	7.0	7.5	6.1	7.1	4.1	4.5	4.4	3.7	4.4	-0.4	0.1	6.2	4.8	-1.4	-23%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	1.5	1.6	1.0	1.1	1.3	1.4	1.2	1.1	0.9	0.9	0.0	0.1	1.3	1.2	-0.1	-8%
Worst 20% Days	---	2.1	2.3	2.9	2.4	5.1	2.2	2.2	1.7	1.7	2.7	-0.1	0.2	2.4	2.6	0.2	8%
All Days	---	1.7	1.7	1.8	1.6	2.4	1.8	1.6	1.4	1.3	1.4	-0.1	0.1	1.7	1.7	0.0	0%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.5	0.3	0.3	0.2	0.4	0.4	0.3	0.3	0.4	0.0	0.2	0.4	0.3	-0.1	-25%
Worst 20% Days	---	2.3	2.2	2.5	1.7	1.3	2.0	3.2	2.6	2.4	0.9	0.0	0.3	2.2	2.3	0.1	5%
All Days	---	1.2	1.3	1.1	0.8	0.7	1.0	1.3	1.2	1.1	0.7	0.0	0.5	1.1	1.1	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	1.0	1.0	1.1	0.7	0.7	1.2	1.2	0.7	0.9	1.0	0.0	0.5	0.9	0.9	0.0	0%
Worst 20% Days	---	4.9	5.3	8.2	5.3	4.1	5.5	6.5	5.4	5.2	2.9	0.0	0.4	5.9	5.3	-0.6	-10%
All Days	---	2.6	3.3	3.5	2.3	2.4	3.0	3.1	2.6	2.6	2.0	-0.1	0.4	2.9	2.7	-0.2	-7%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0%
Worst 20% Days	---	0.0	0.0	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.4	0.0	0.0	0.1	0.3	0.2	>100%
All Days	---	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0%

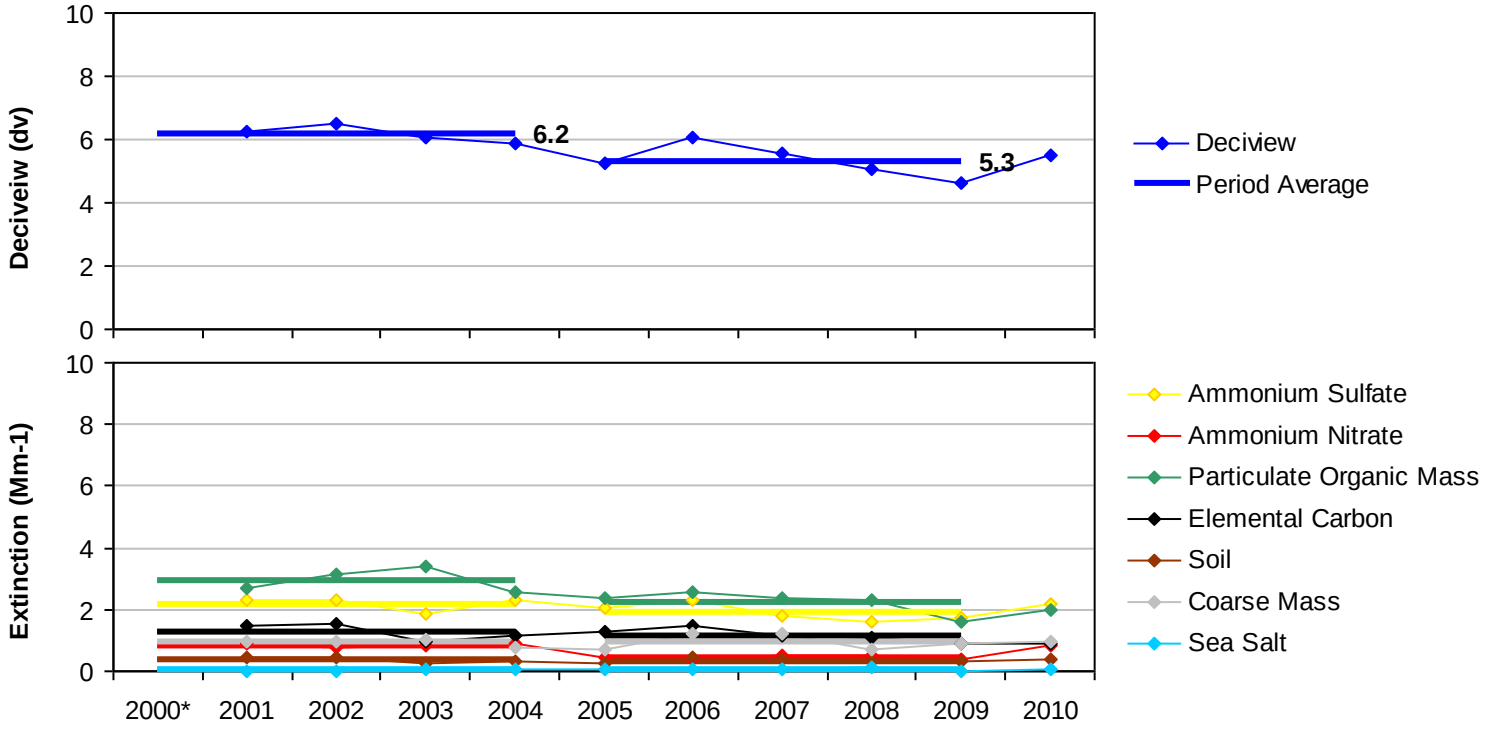
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure B.8-1
Sierra Ancha WA, AZ (SIAN1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



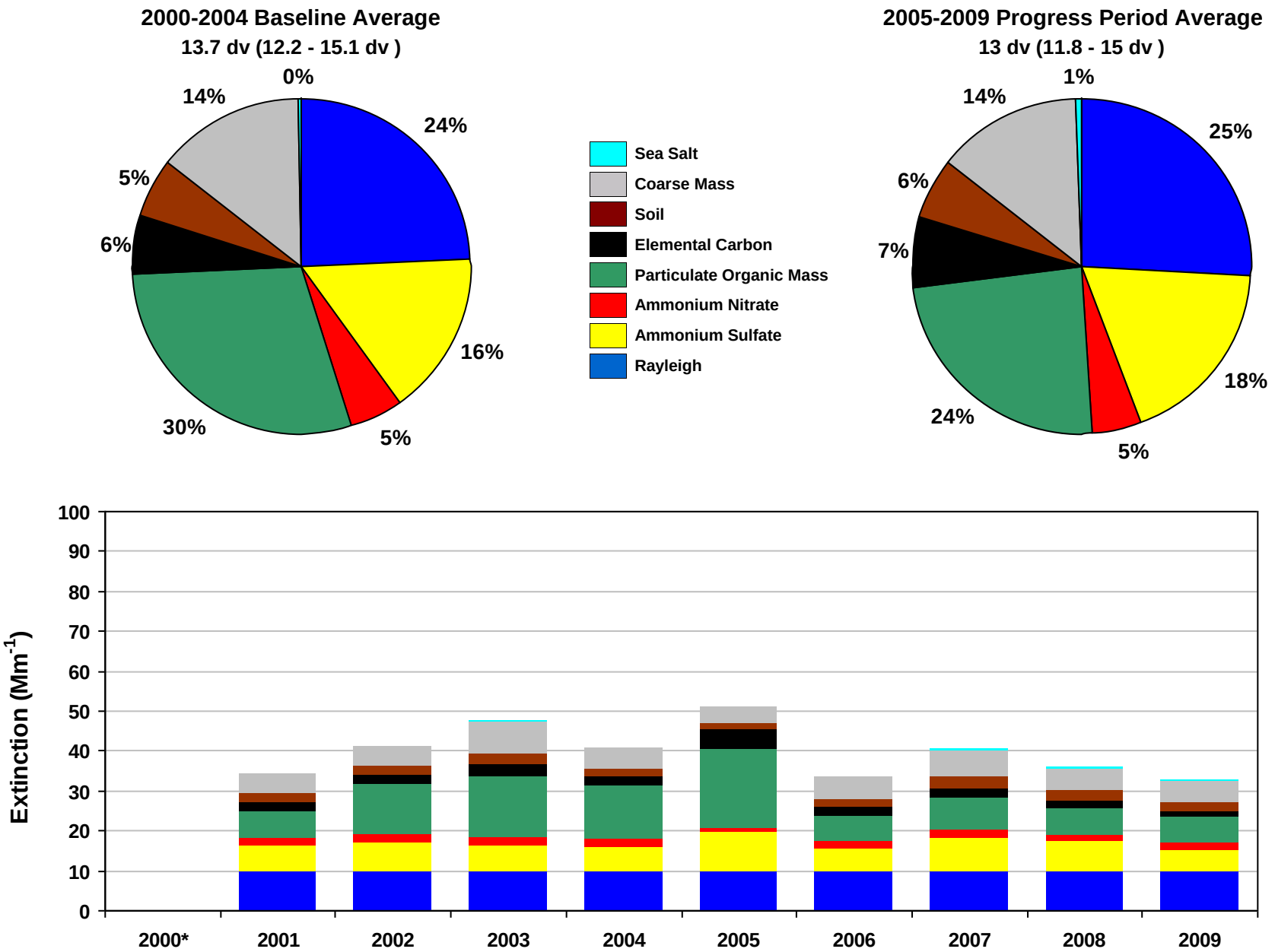
*Missing years did not meet RHR data completeness criteria.

Figure B.8-2
Sierra Ancha WA, AZ (SIAN1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



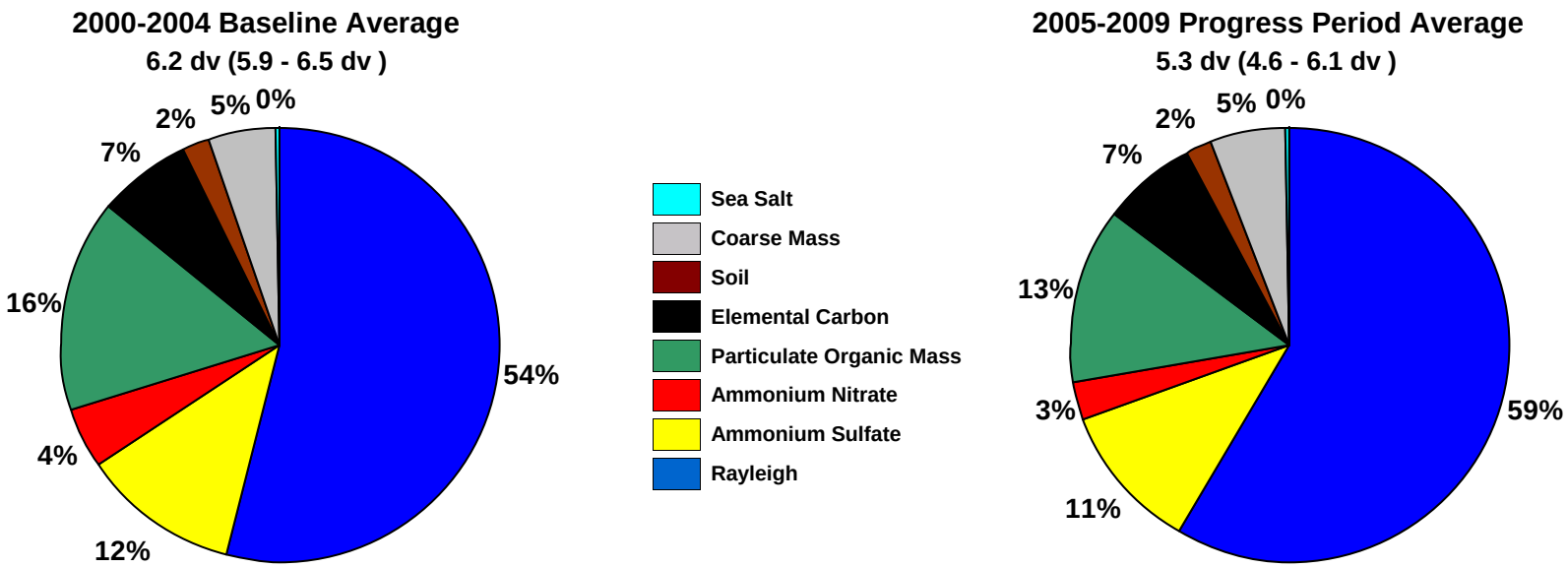
*Missing years did not meet RHR data completeness criteria.

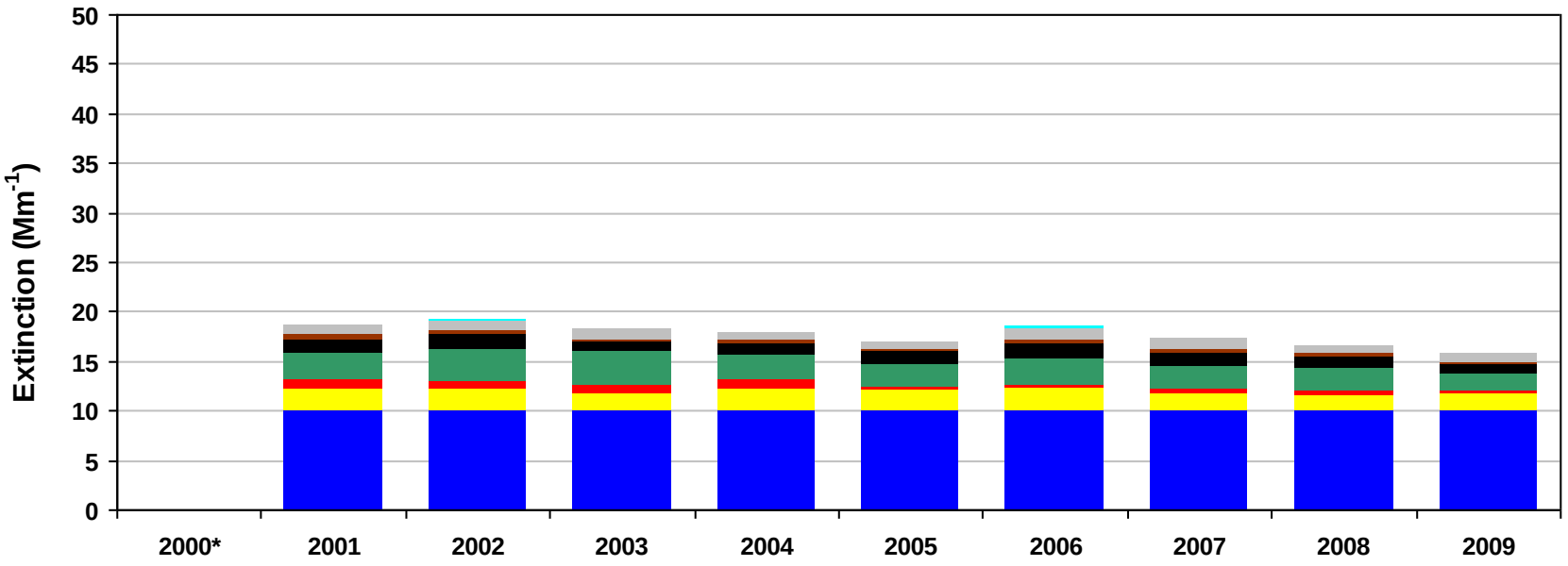
Figure B.8-3
Sierra Ancha WA, AZ (SIAN1 Site)
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

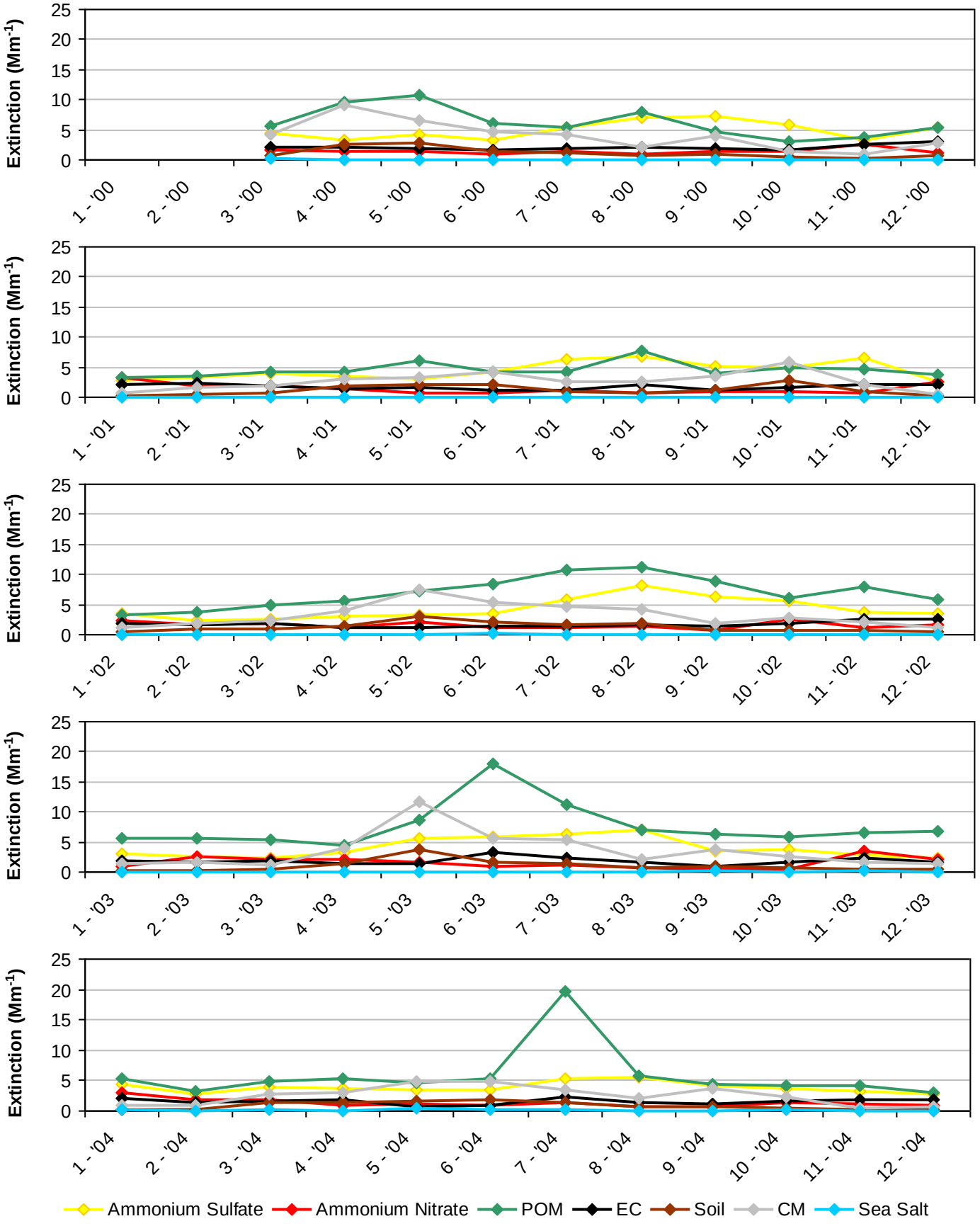
Figure B.8-4
Sierra Ancha WA, AZ (SIAN1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure B.8-5
Sierra Ancha WA, AZ (SIAN1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure B.8-6
Sierra Ancha WA, AZ (SIAN1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

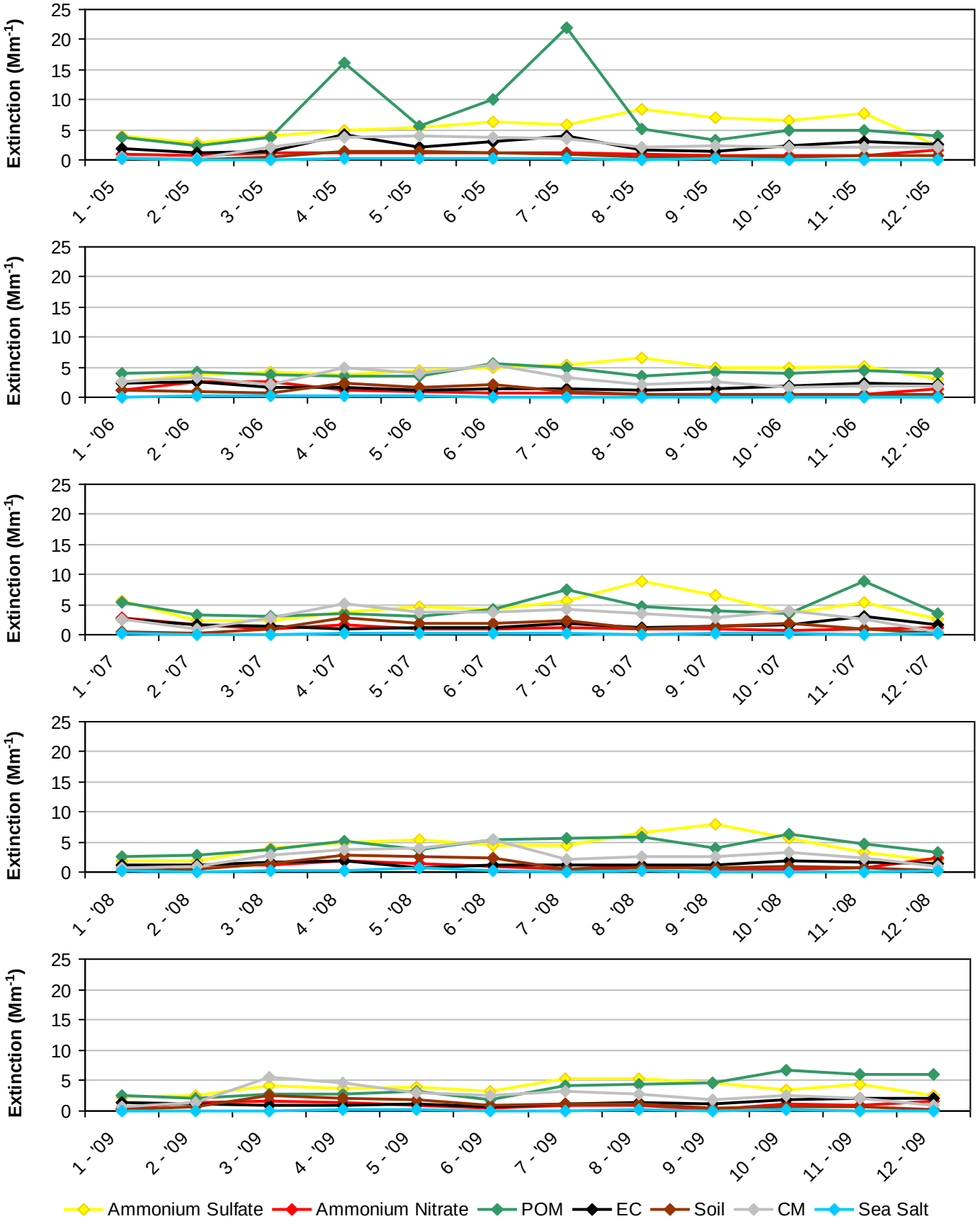
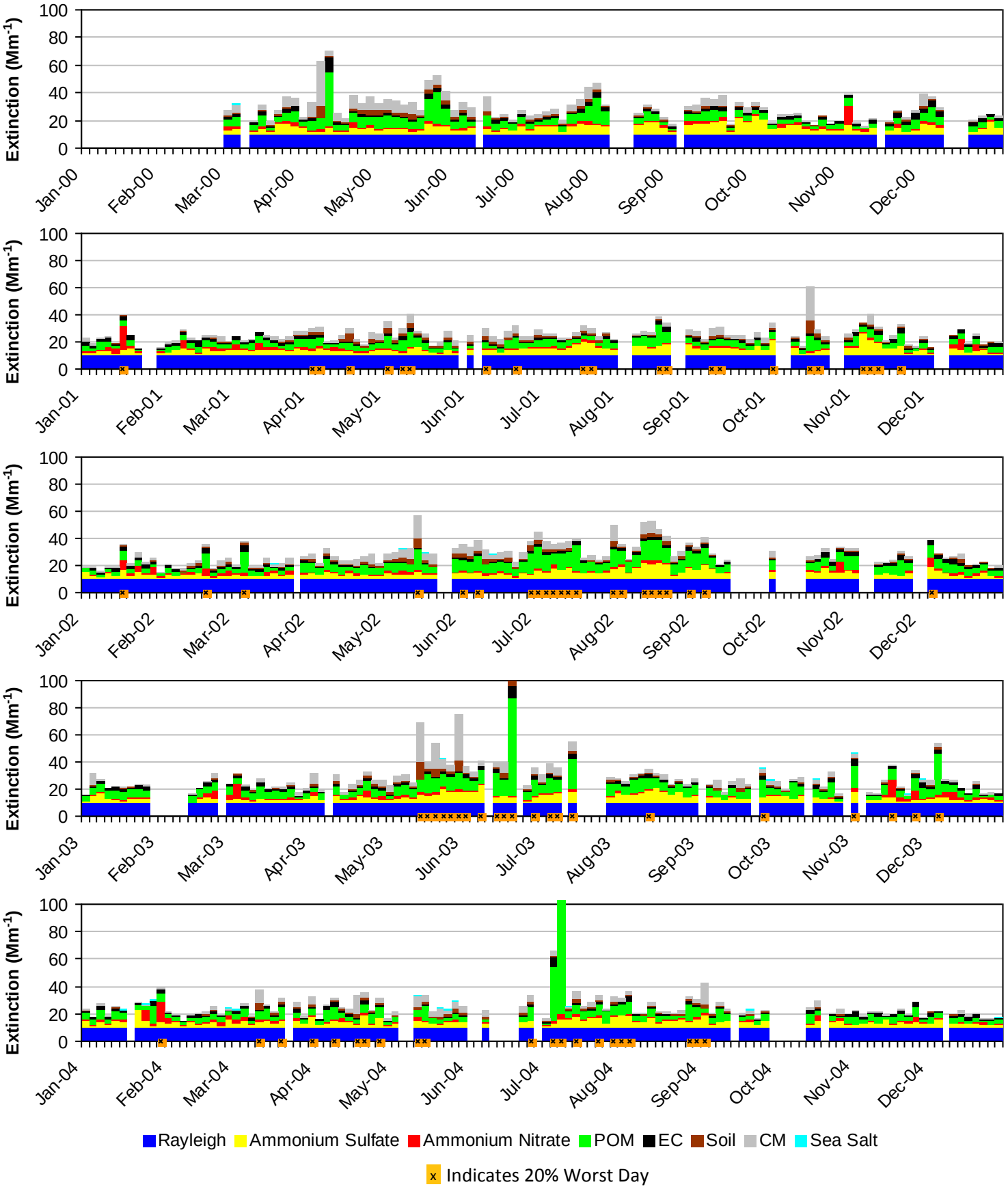
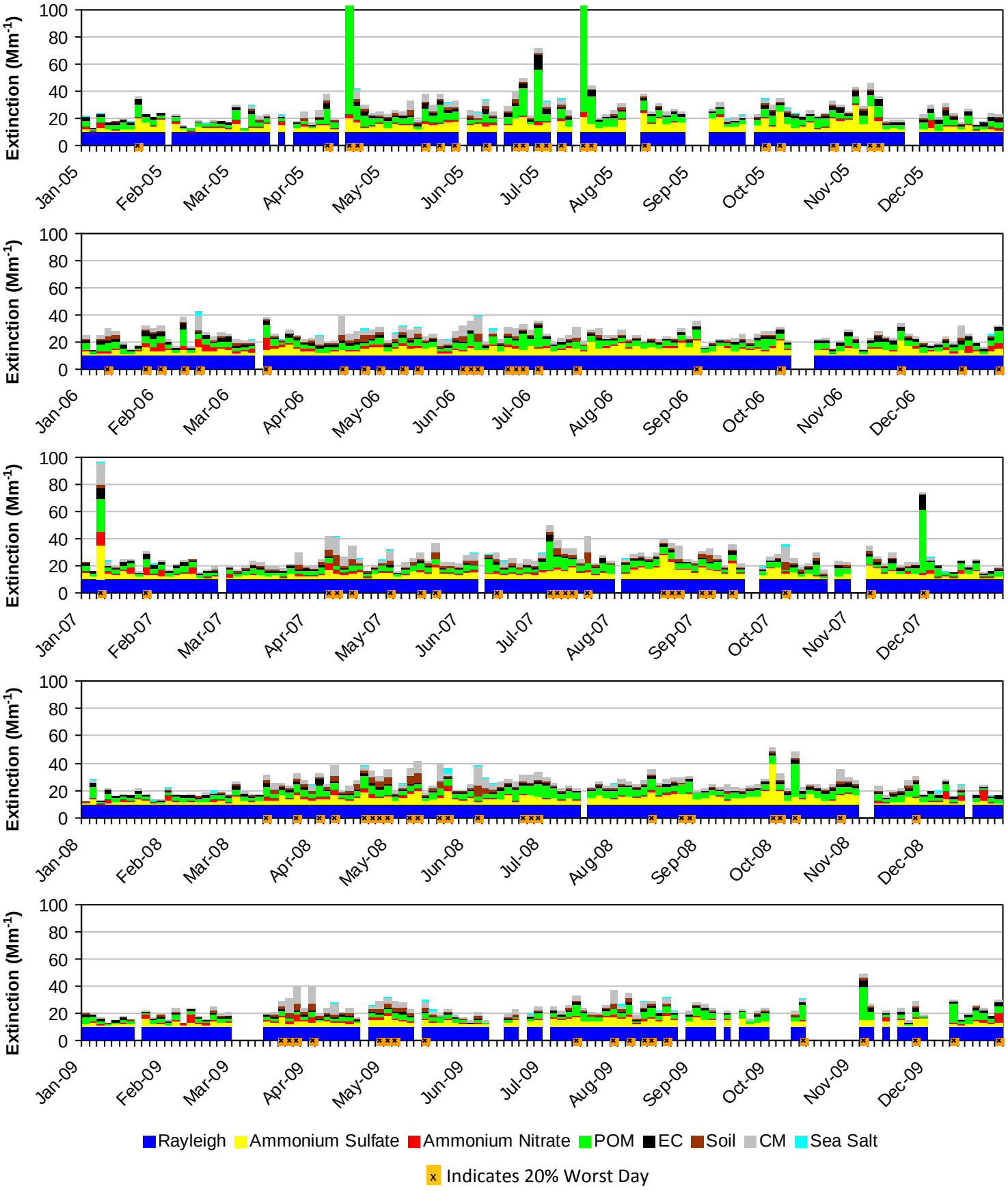


Figure B.8-7
Sierra Ancha WA, AZ (SIAN1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure B.8-8
Sierra Ancha WA, AZ (SIAN1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



B.9. SYCAMORE CANYON WA (SYCA1)

The following tables and figures are presented in this section for the Sycamore Canyon Wilderness Area represented by the SYCA1 IMPROVE Monitor:

- **Table B.9-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure B.9-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure B.9-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure B.9-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure B.9-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure B.9-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure B.9-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure B.9-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

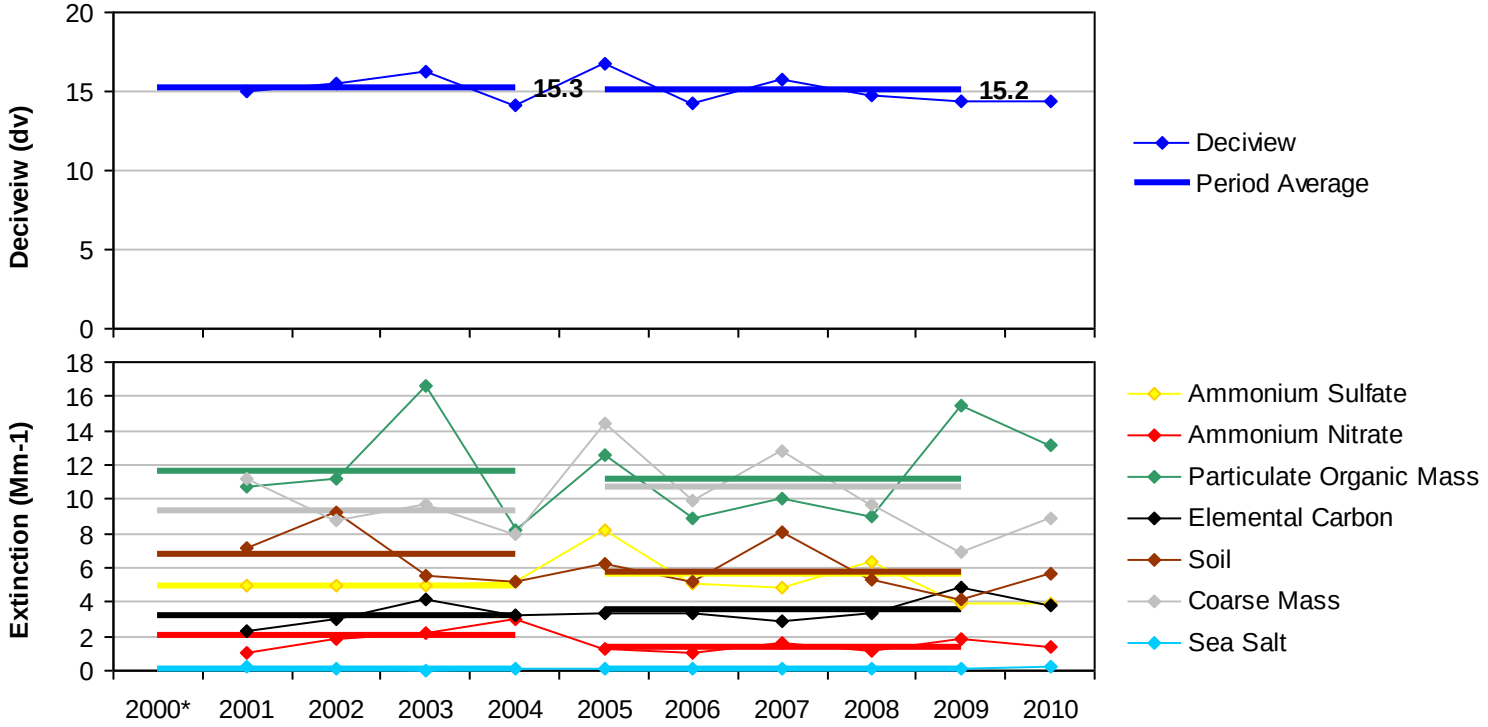
- **Figure B.9-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table B.9-1
Sycamore Canyon WA, AZ (SYCA1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	5.5	6.1	5.9	4.9	4.8	6.3	4.7	4.5	5.4	4.6	-0.1	0.1	5.6	5.1	-0.5	-9%
Worst 20% Days	---	15.0	15.5	16.3	14.2	16.7	14.3	15.8	14.7	14.4	14.4	-0.1	0.4	15.3	15.2	-0.1	-1%
All Days	---	10.0	10.5	10.8	9.6	10.4	10.1	10.2	9.5	9.6	9.0	-0.1	0.1	10.2	10.0	-0.2	-2%
Total Extinction (Mm-1)																	
Best 20% Days	---	17.4	18.6	18.2	16.5	16.4	19.0	16.1	15.9	17.4	16.0	-0.2	0.1	17.7	16.9	-0.8	-5%
Worst 20% Days	---	46.5	48.0	52.4	41.7	55.2	42.5	49.4	43.8	46.2	46.1	-0.1	0.5	47.2	47.4	0.2	0%
All Days	---	29.0	30.4	31.7	27.5	31.1	28.8	30.0	27.6	28.1	26.9	-0.3	0.2	29.6	29.1	-0.5	-2%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	2.4	2.0	1.8	2.0	2.6	2.4	1.7	1.6	2.1	1.9	0.0	0.2	2.0	2.1	0.1	5%
Worst 20% Days	---	4.9	4.9	4.9	5.2	8.2	5.0	4.9	6.3	4.0	3.9	0.0	0.5	5.0	5.7	0.7	14%
All Days	---	4.2	3.9	3.8	4.1	5.4	4.2	4.2	4.3	3.6	3.5	0.0	0.4	4.0	4.3	0.3	8%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	1.2	0.9	0.7	0.7	1.0	0.8	0.8	0.6	0.9	1.3	0.0	0.2	0.9	0.8	-0.1	-11%
Worst 20% Days	---	1.1	1.8	2.2	3.0	1.2	1.0	1.6	1.1	1.9	1.4	0.0	0.5	2.0	1.4	-0.6	-30%
All Days	---	1.5	1.6	1.6	1.7	1.2	1.3	1.5	1.2	1.3	1.2	0.0	0.1	1.6	1.3	-0.3	-19%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	2.4	2.4	2.8	2.1	1.5	2.2	1.6	1.7	2.1	1.7	-0.1	0.1	2.4	1.8	-0.6	-25%
Worst 20% Days	---	10.7	11.1	16.7	8.2	12.6	8.9	10.1	9.0	15.5	13.2	0.0	0.5	11.7	11.2	-0.5	-4%
All Days	---	5.5	5.9	7.8	4.8	5.5	5.0	5.0	4.6	5.8	5.1	-0.1	0.2	6.0	5.2	-0.8	-13%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	1.4	1.5	1.8	1.5	0.9	1.9	1.2	1.4	1.4	0.8	0.0	0.3	1.6	1.4	-0.2	-13%
Worst 20% Days	---	2.3	3.0	4.2	3.2	3.3	3.4	2.8	3.3	4.8	3.8	0.1	0.1	3.2	3.5	0.3	9%
All Days	---	2.0	2.3	2.9	2.4	2.5	2.7	2.2	2.1	2.6	2.1	0.0	0.4	2.4	2.4	0.0	0%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.4	1.0	1.0	0.3	0.5	0.8	0.5	0.5	0.6	0.5	0.0	0.5	0.7	0.6	-0.1	-14%
Worst 20% Days	---	7.1	9.3	5.5	5.2	6.2	5.2	8.1	5.3	4.1	5.7	-0.3	0.1	6.8	5.8	-1.0	-15%
All Days	---	2.9	3.7	2.5	2.1	2.3	2.2	2.9	2.2	2.1	2.3	-0.1	0.1	2.8	2.3	-0.5	-18%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.6	1.7	1.1	0.7	0.8	1.7	1.2	0.9	1.2	0.7	0.0	0.2	1.0	1.2	0.2	20%
Worst 20% Days	---	11.2	8.7	9.7	7.9	14.5	9.9	12.8	9.7	6.9	8.9	-0.2	0.3	9.4	10.8	1.4	15%
All Days	---	3.9	3.9	4.0	3.4	5.0	4.4	5.0	4.1	3.7	3.7	0.0	0.3	3.8	4.5	0.7	18%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0%
Worst 20% Days	---	0.2	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.0	0.3	0.1	0.1	0.0	0%
All Days	---	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.5	0.1	0.1	0.0	0%

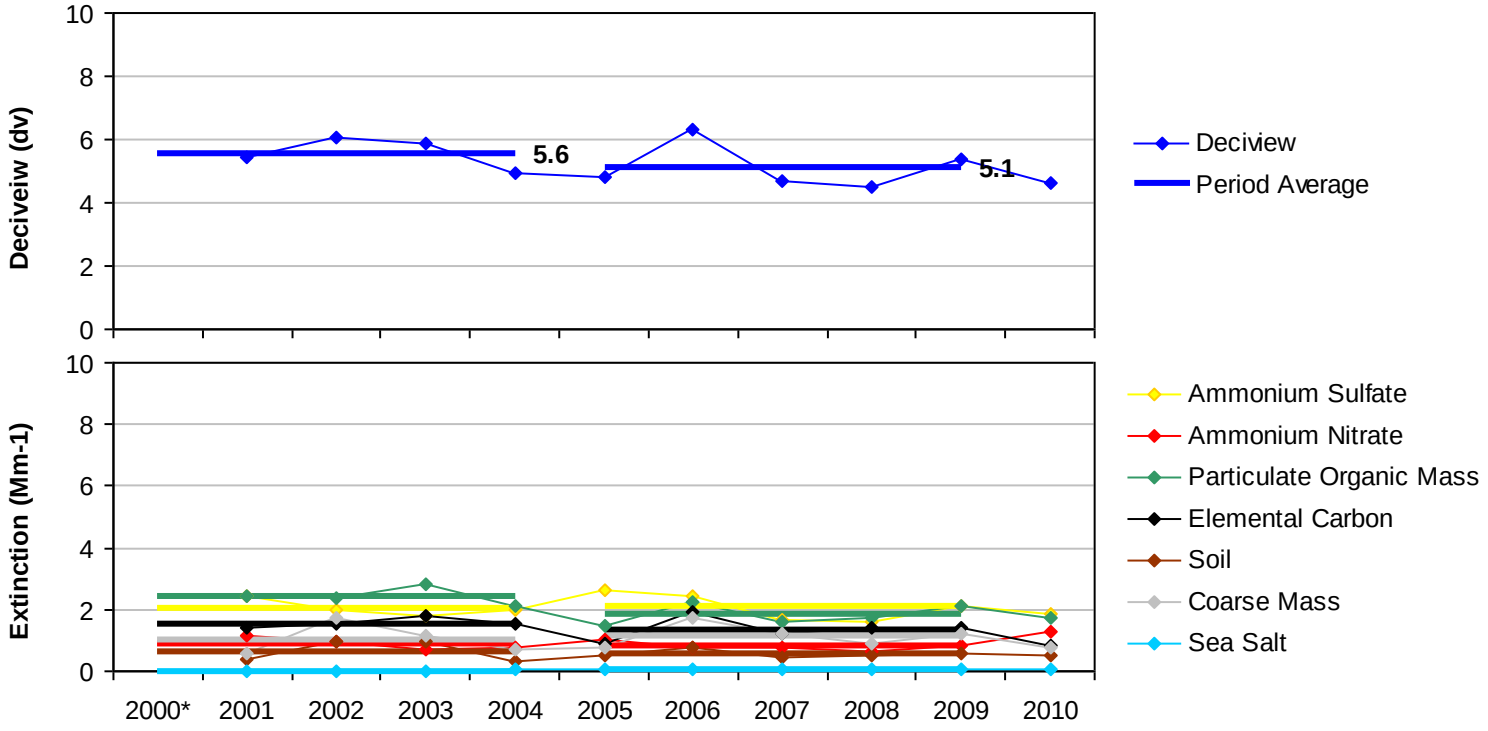
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure B.9-1
Sycamore Canyon WA, AZ (SYCA1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



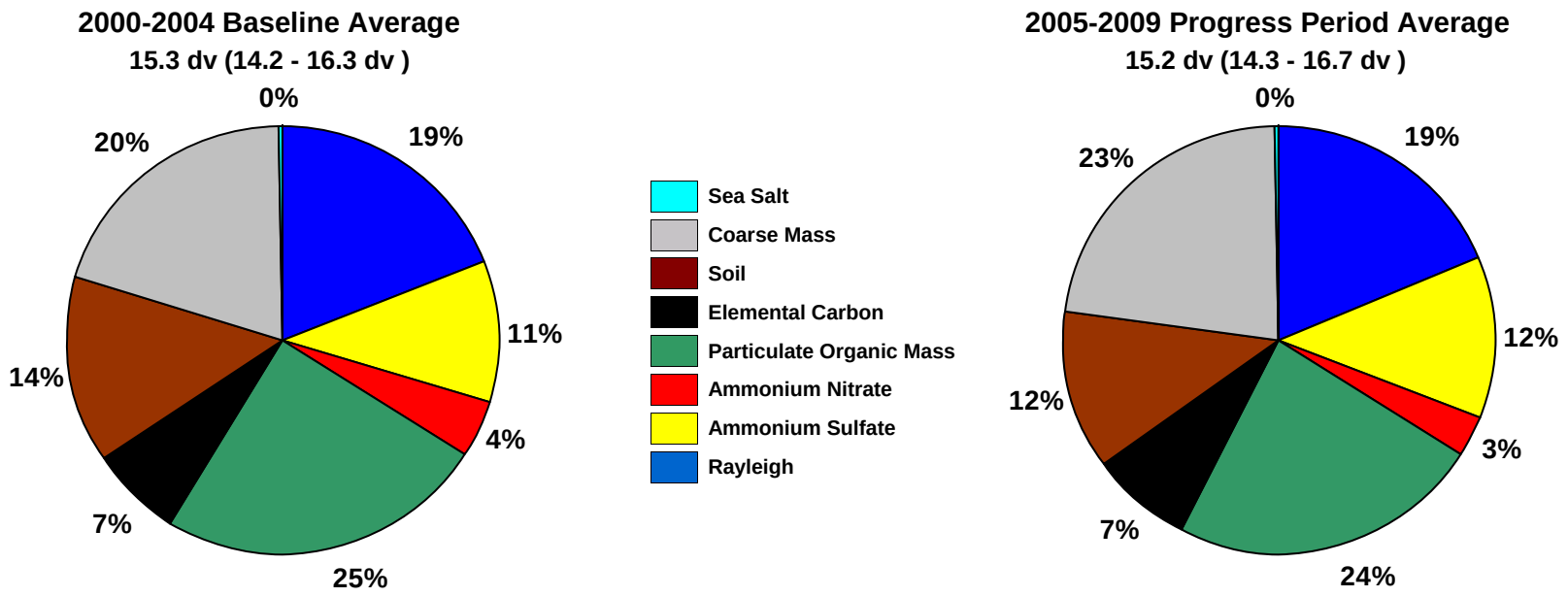
*Missing years did not meet RHR data completeness criteria.

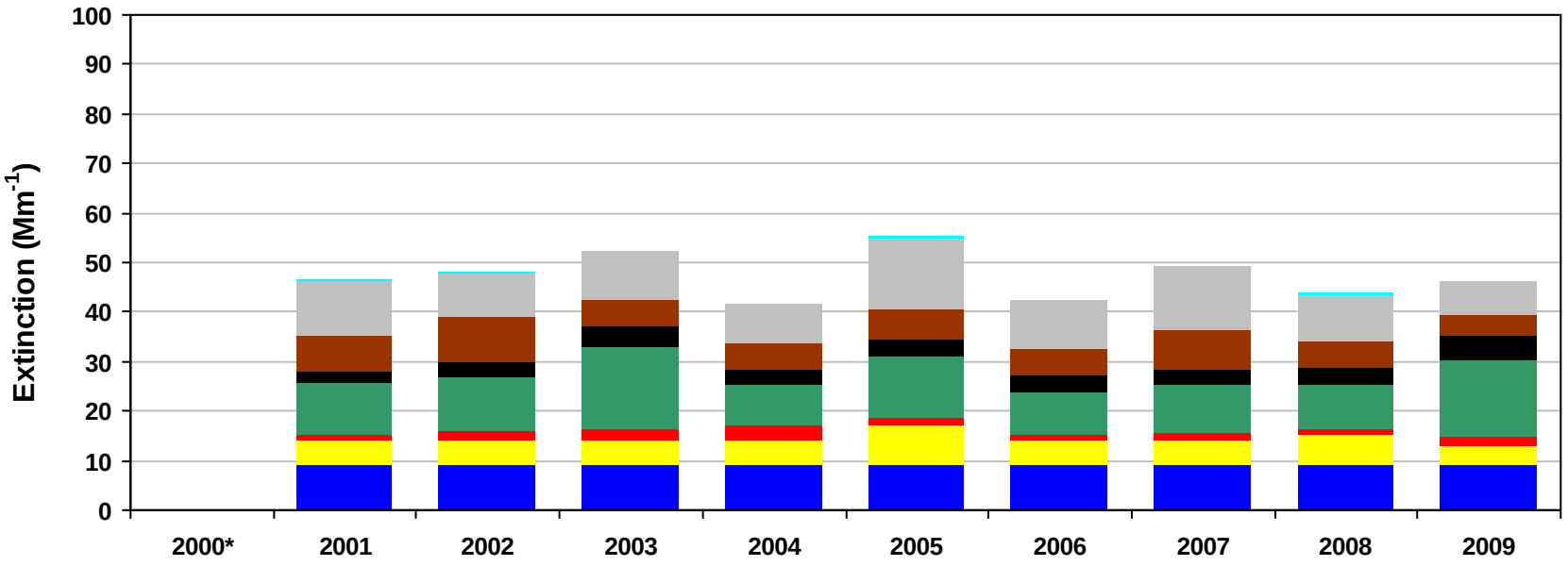
Figure B.9-2
Sycamore Canyon WA, AZ (SYCA1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

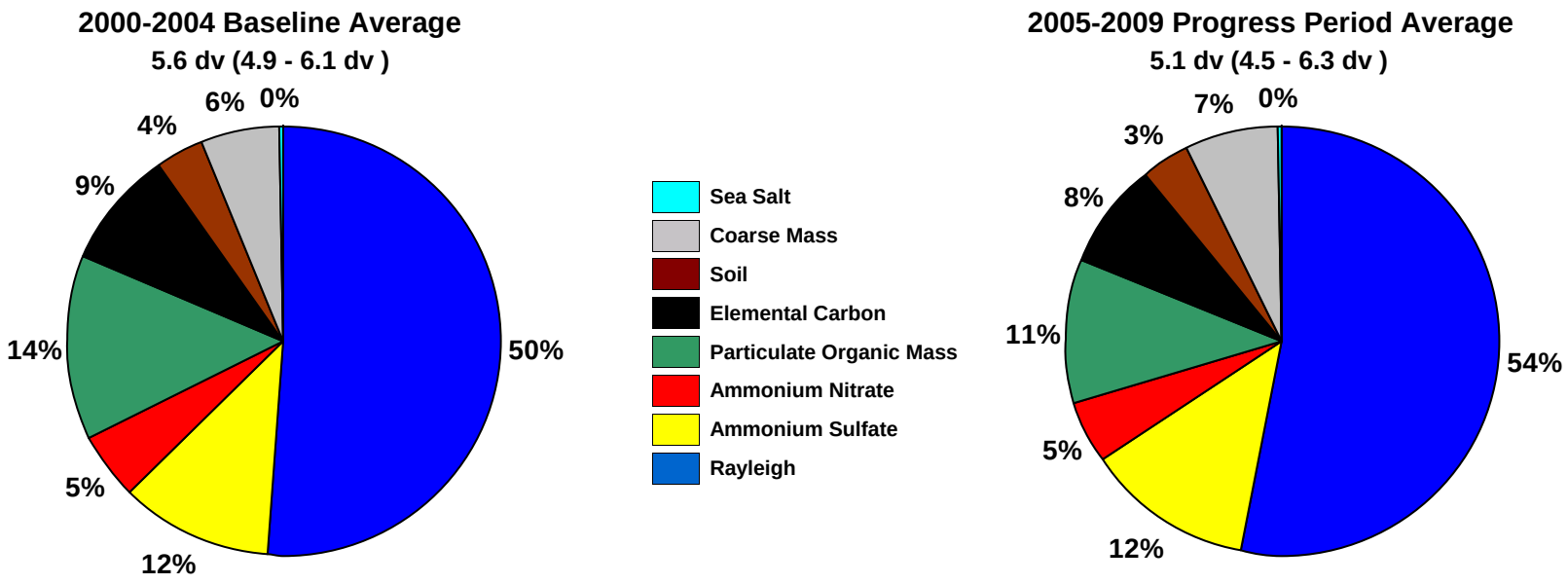
Figure B.9-3
Sycamore Canyon WA, AZ (SYCA1 Site)
20% Most Impaired Visibility Days

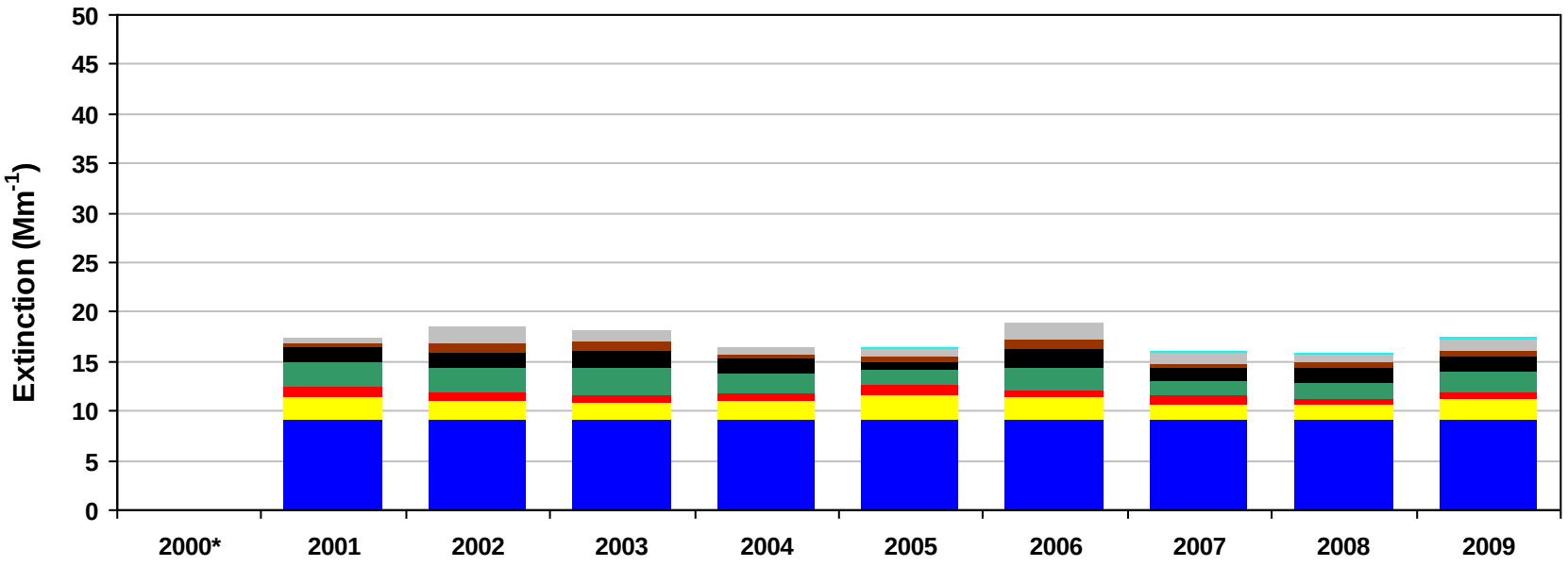




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

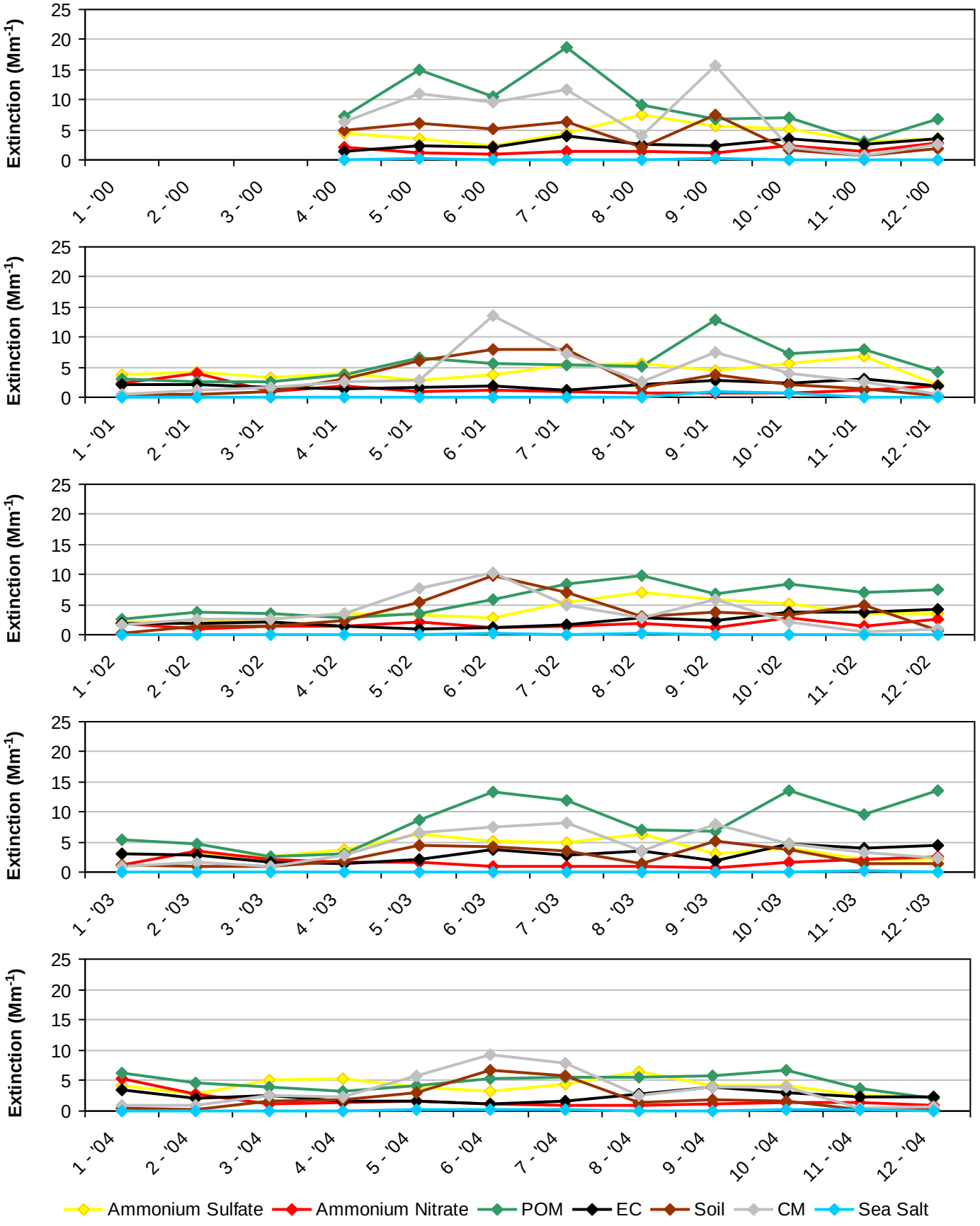
Figure B.9-4
Sycamore Canyon WA, AZ (SYCA1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure B.9-5
Sycamore Canyon WA, AZ (SYCA1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure B.9-6
Sycamore Canyon WA, AZ (SYCA1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

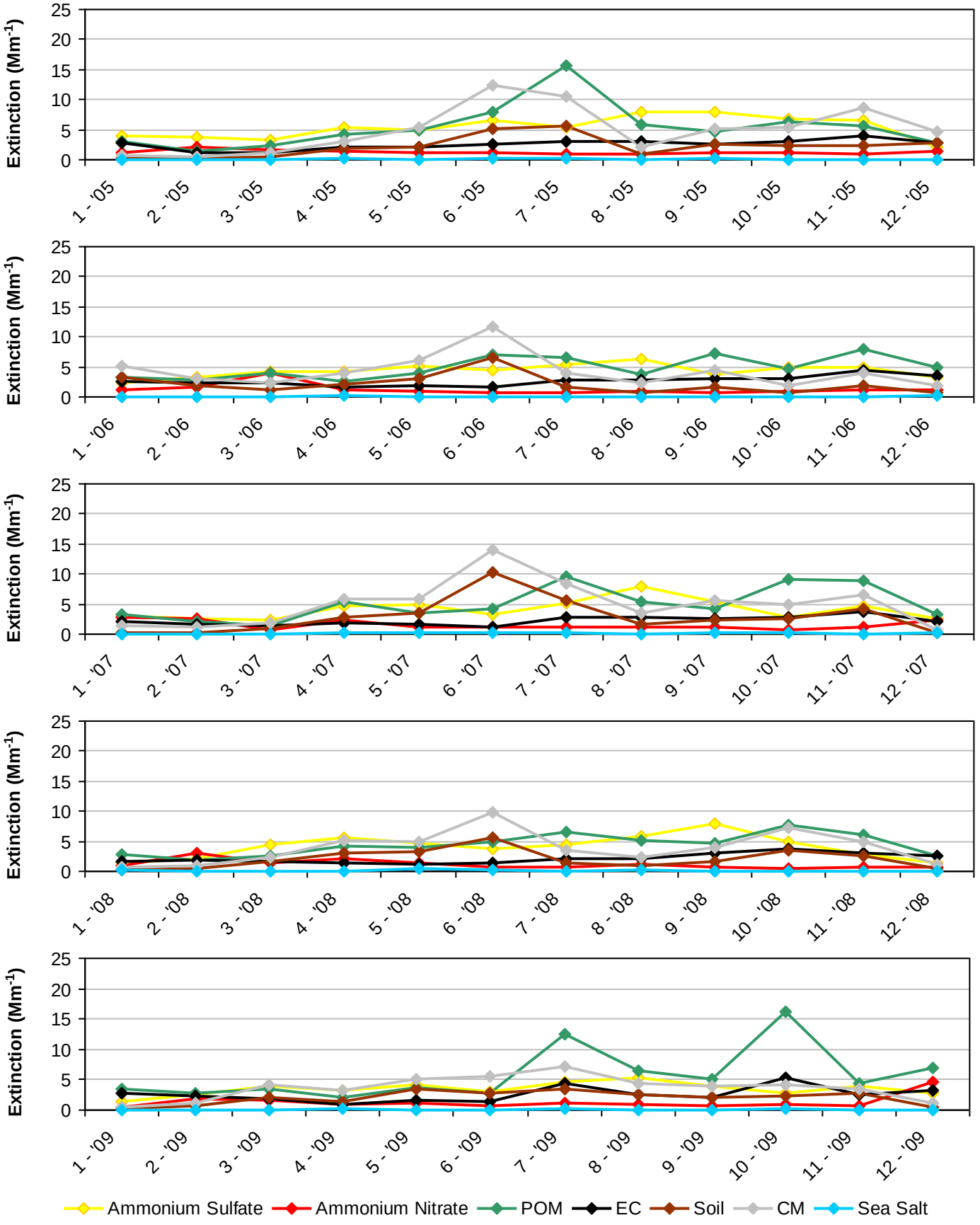
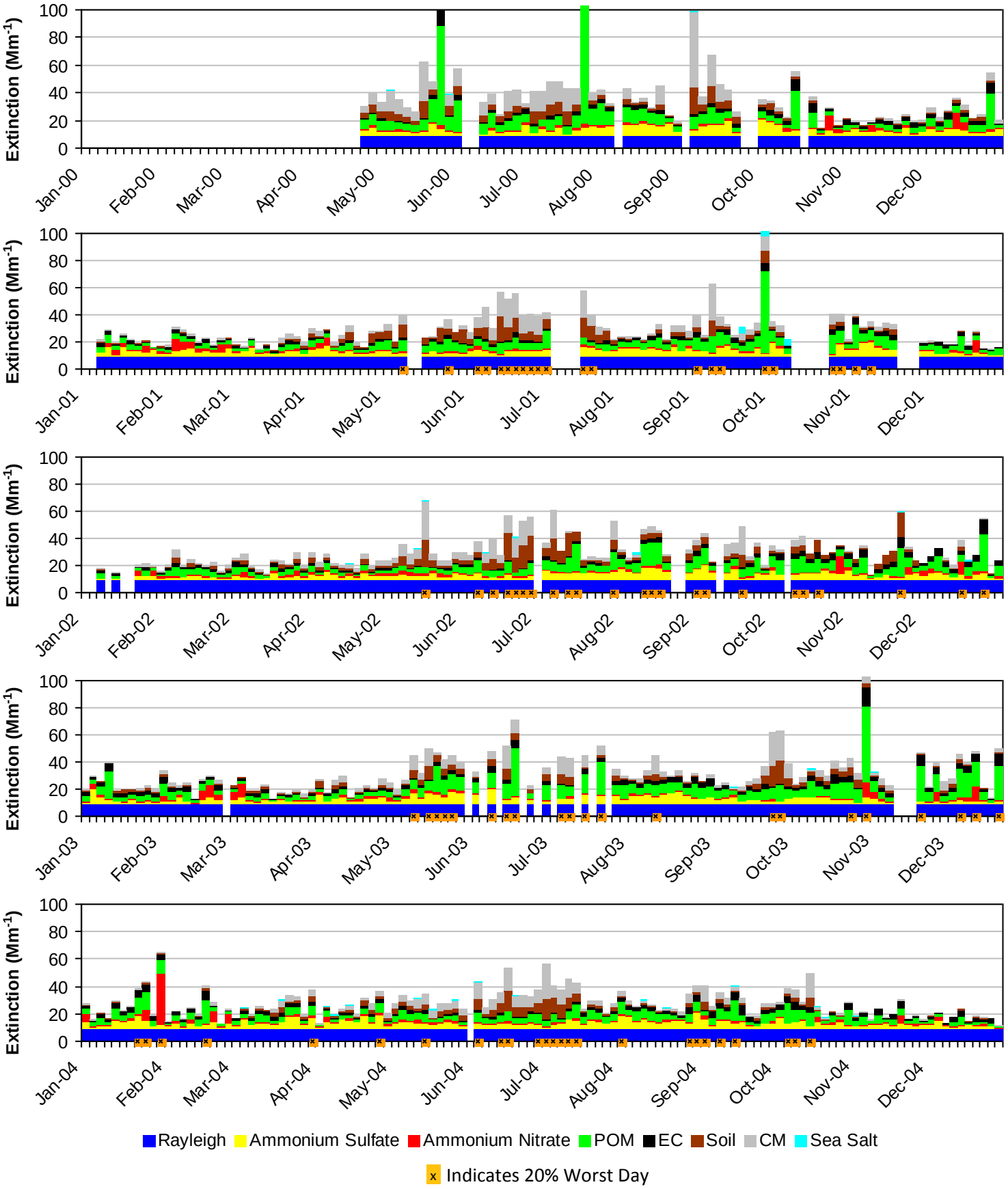
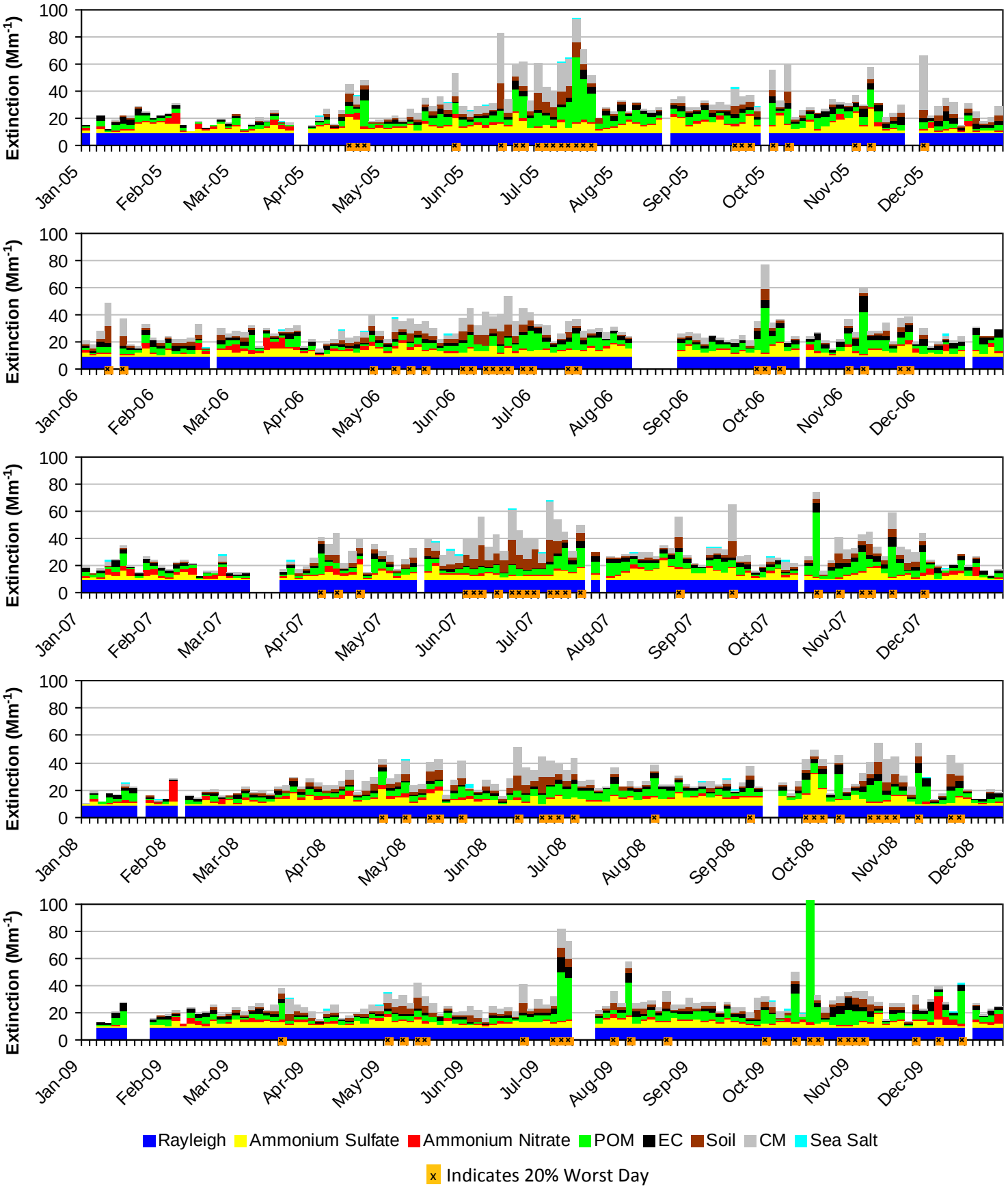


Figure B.9-7
Sycamore Canyon WA, AZ (SYCA1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure B.9-8
Sycamore Canyon WA, AZ (SYCA1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



B.10. SUPERSTITION WA (TONT1)

The following tables and figures are presented in this section for the Superstition Wilderness Area represented by the TONT1 IMPROVE Monitor:

- **Table B.10-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure B.10-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure B.10-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure B.10-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure B.10-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure B.10-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure B.10-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure B.10-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

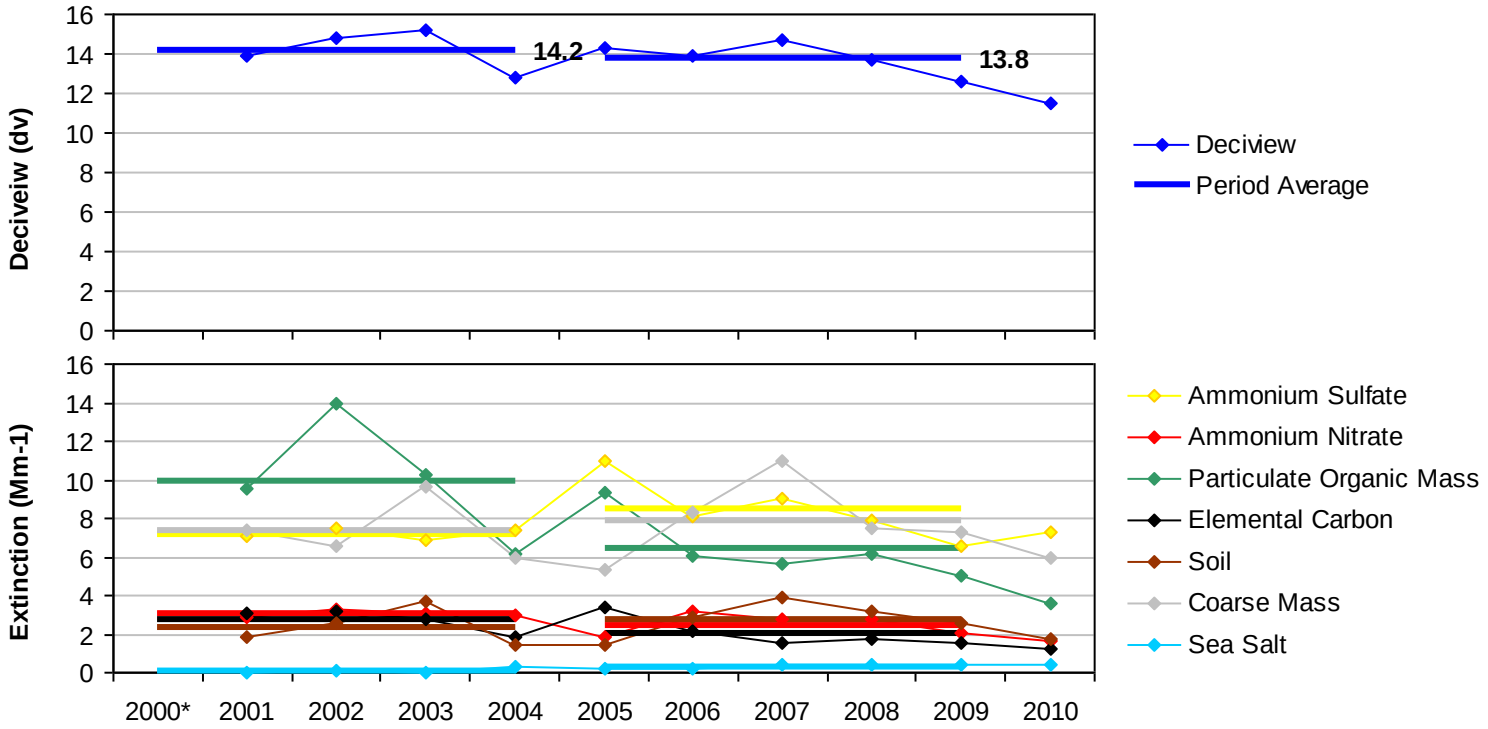
- **Figure B.10-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table B.10-1
Superstition WA, AZ (TONT1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	6.8	6.7	6.5	5.8	5.8	6.1	5.7	5.6	5.3	5.5	-0.2	0.0	6.5	5.7	-0.8	-12%
Worst 20% Days	---	13.9	14.8	15.2	12.8	14.3	13.9	14.7	13.7	12.6	11.5	-0.2	0.1	14.2	13.8	-0.4	-3%
All Days	---	9.9	10.5	10.6	9.3	10.0	10.0	9.9	9.8	9.0	8.6	-0.1	0.1	10.1	9.8	-0.3	-3%
Total Extinction (Mm-1)																	
Best 20% Days	---	19.8	19.7	19.3	18.0	18.1	18.6	17.8	17.6	17.1	17.4	-0.3	0.0	19.2	17.8	-1.4	-7%
Worst 20% Days	---	41.6	47.2	46.4	36.1	42.5	40.9	44.1	39.7	35.4	31.8	-0.9	0.1	42.8	40.5	-2.3	-5%
All Days	---	28.1	30.5	30.3	26.2	28.6	28.4	28.5	27.7	25.3	24.3	-0.4	0.1	28.8	27.7	-1.1	-4%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	3.1	3.1	2.3	2.6	2.8	3.0	2.3	2.5	2.3	2.3	-0.1	0.1	2.8	2.6	-0.2	-7%
Worst 20% Days	---	7.0	7.5	6.9	7.3	11.0	8.1	9.0	7.9	6.5	7.2	0.1	0.4	7.2	8.5	1.3	18%
All Days	---	5.0	5.1	4.7	4.8	6.4	5.5	5.5	5.4	4.5	4.6	0.0	0.5	4.9	5.5	0.6	12%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	1.2	0.9	1.1	0.6	0.7	0.5	0.8	1.0	0.5	0.9	-0.1	0.1	0.9	0.7	-0.2	-22%
Worst 20% Days	---	2.9	3.2	3.1	3.0	1.8	3.2	2.7	2.7	2.1	1.6	-0.1	0.1	3.0	2.5	-0.5	-17%
All Days	---	1.9	1.8	1.8	1.6	1.3	1.6	1.6	1.5	1.2	1.0	-0.1	0.0	1.8	1.4	-0.4	-22%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	2.5	2.2	2.4	2.2	2.1	2.1	1.7	1.8	1.5	1.6	-0.1	0.0	2.3	1.8	-0.5	-22%
Worst 20% Days	---	9.5	13.9	10.3	6.2	9.4	6.1	5.6	6.2	5.0	3.6	-0.8	0.0	10.0	6.4	-3.6	-36%
All Days	---	4.7	5.8	5.3	4.2	4.6	3.8	3.5	4.1	3.3	3.1	-0.2	0.0	5.0	3.9	-1.1	-22%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	1.2	1.2	1.1	0.9	1.0	1.1	0.9	0.8	0.8	0.8	-0.1	0.0	1.1	0.9	-0.2	-18%
Worst 20% Days	---	3.1	3.2	2.8	1.8	3.4	2.1	1.6	1.8	1.6	1.2	-0.2	0.0	2.7	2.1	-0.6	-22%
All Days	---	1.8	1.8	2.2	1.5	2.0	1.7	1.3	1.3	1.3	1.1	-0.1	0.0	1.8	1.5	-0.3	-17%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.5	0.6	0.6	0.5	0.3	0.4	0.5	0.6	0.5	0.4	0.0	0.5	0.5	0.5	0.0	0%
Worst 20% Days	---	1.8	2.6	3.7	1.5	1.4	2.8	3.9	3.2	2.5	1.7	0.1	0.3	2.4	2.8	0.4	17%
All Days	---	1.0	1.6	1.7	0.9	0.8	1.4	1.6	1.6	1.3	1.0	0.0	0.5	1.3	1.3	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	1.4	1.7	1.7	1.2	1.1	1.5	1.4	0.9	1.4	1.3	-0.1	0.1	1.5	1.3	-0.2	-13%
Worst 20% Days	---	7.4	6.6	9.7	6.0	5.3	8.3	11.0	7.5	7.3	6.0	0.1	0.5	7.4	7.9	0.5	7%
All Days	---	3.7	4.4	4.6	3.1	3.3	4.4	4.7	3.6	3.6	3.1	0.0	0.5	3.9	3.9	0.0	0%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.0	0.0	0.0	0.1	0.1	0%
Worst 20% Days	---	0.0	0.1	0.0	0.3	0.2	0.3	0.4	0.4	0.4	0.4	0.1	0.0	0.1	0.3	0.2	>100%
All Days	---	0.0	0.0	0.0	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.0	0.0	0.1	0.2	0.1	100%

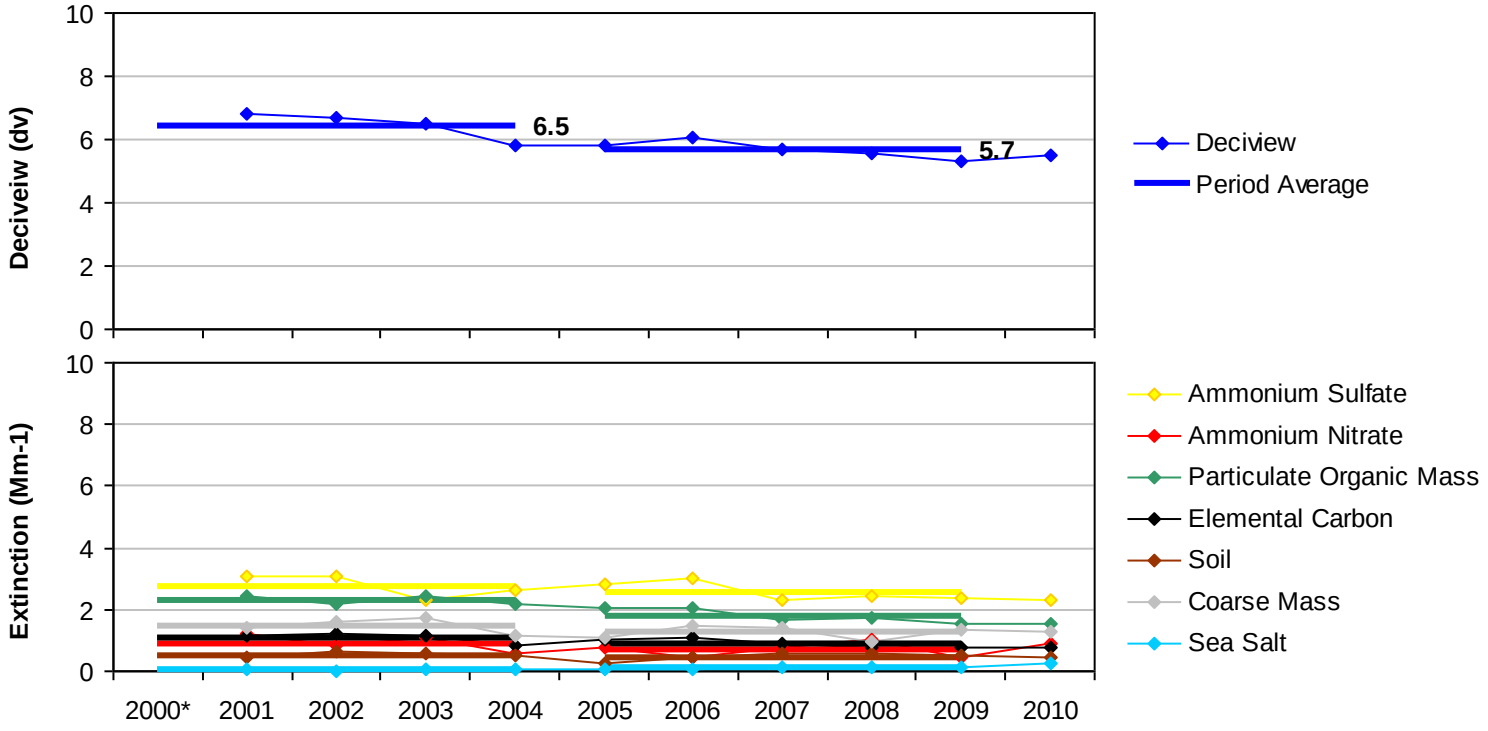
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure B.10-1
Superstition WA, AZ (TONT1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



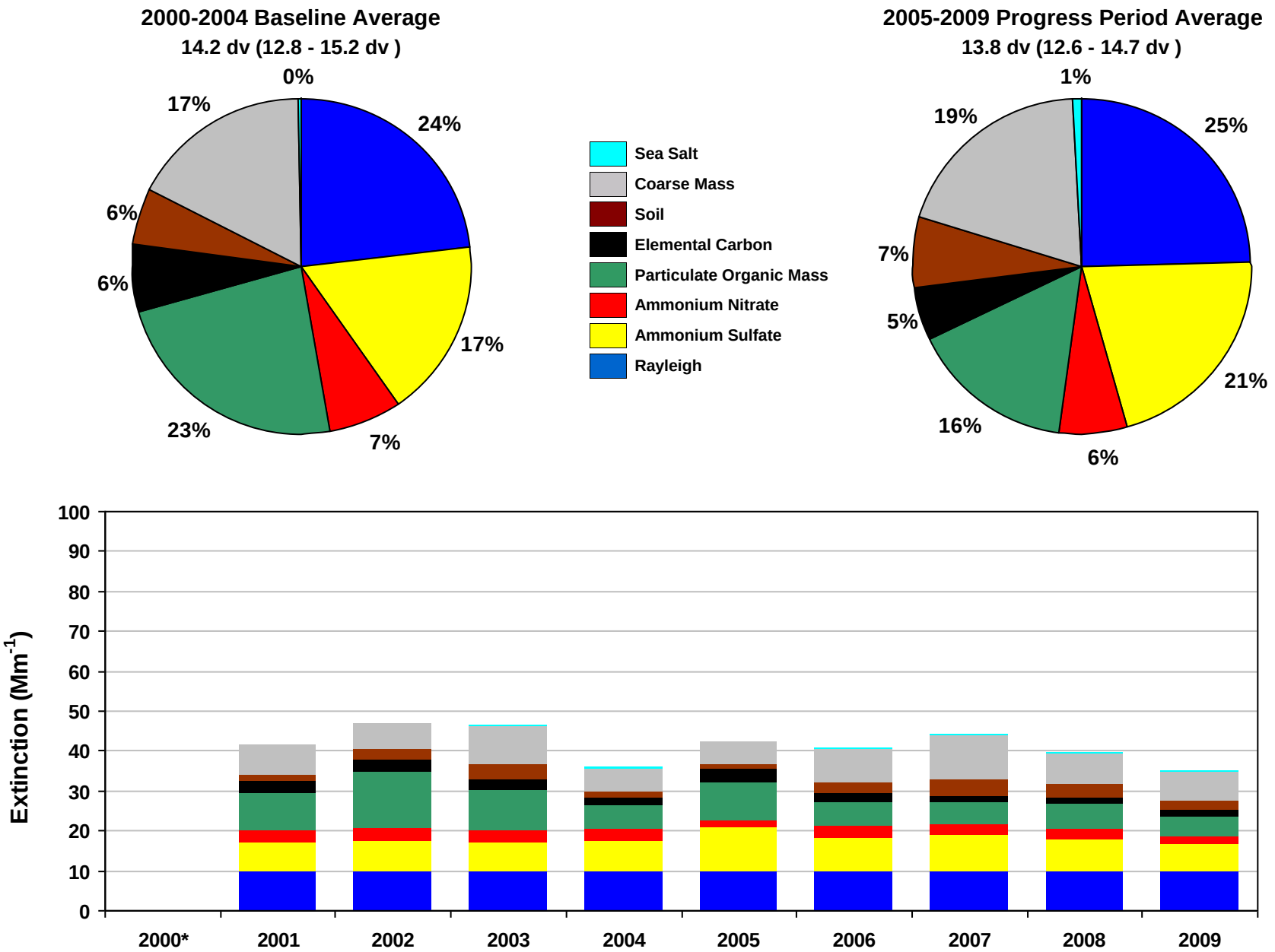
*Missing years did not meet RHR data completeness criteria.

Figure B.10-2
Superstition WA, AZ (TONT1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



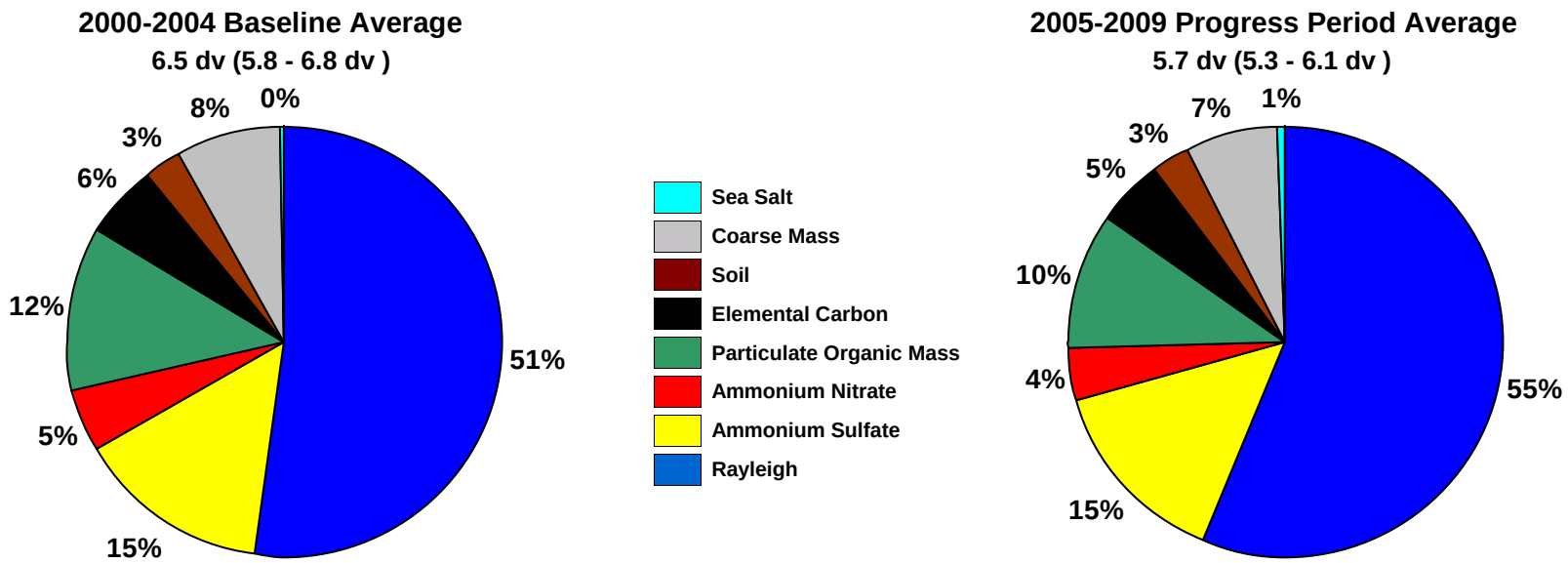
*Missing years did not meet RHR data completeness criteria.

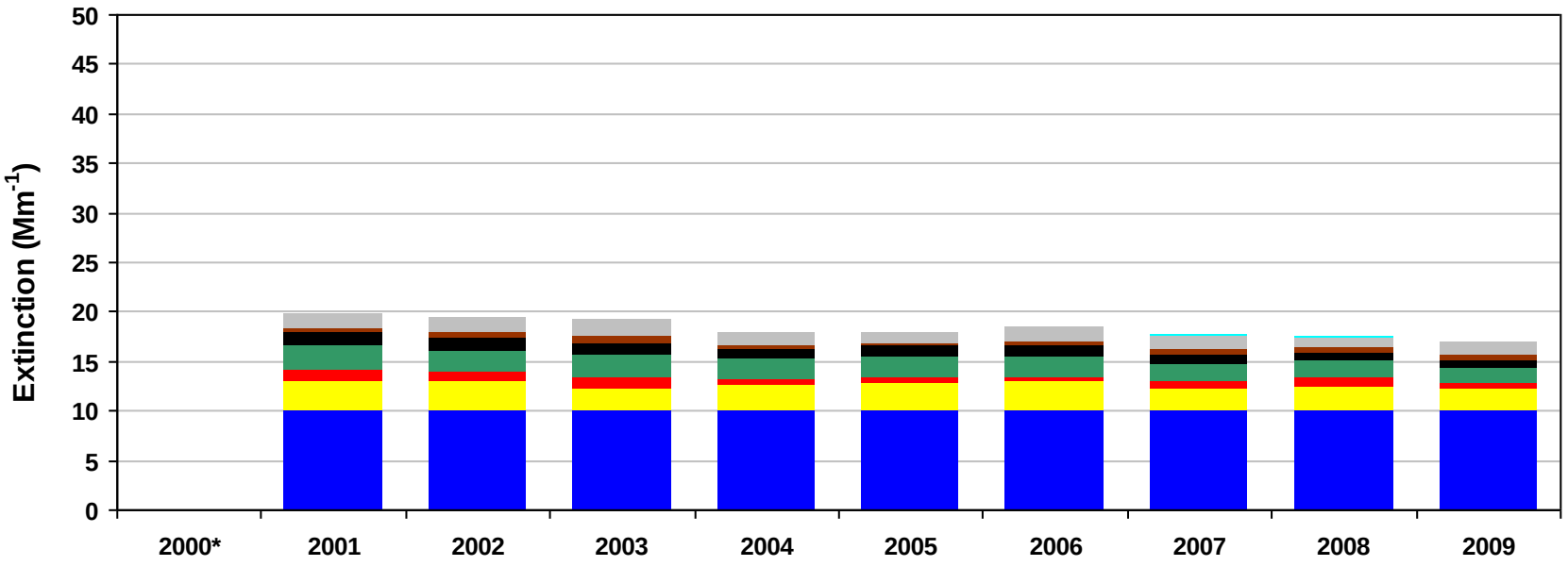
Figure B.10-3
Superstition WA, AZ (TONT1 Site)
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

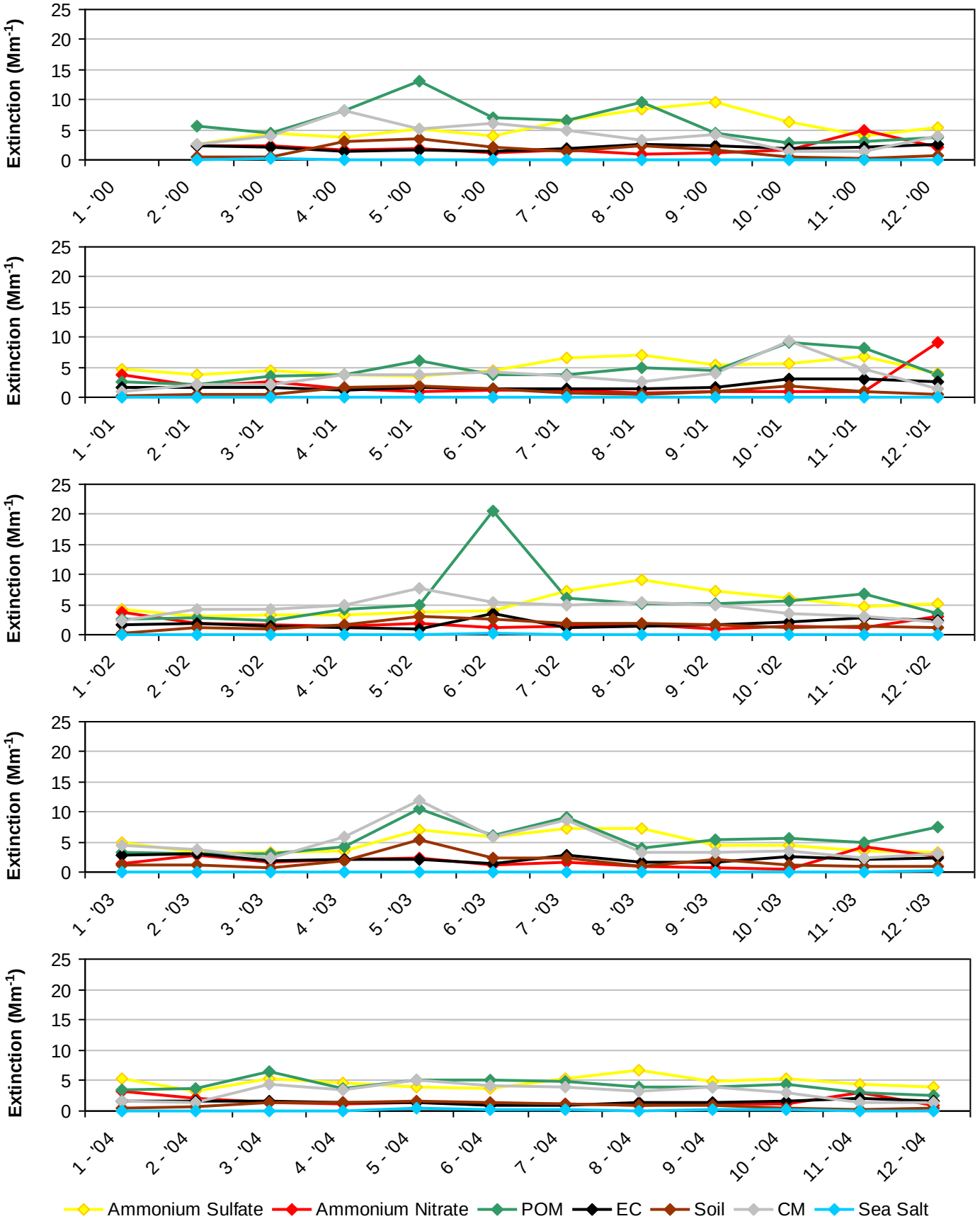
Figure B.10-4
Superstition WA, AZ (TONT1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure B.10-5
Superstition WA, AZ (TONT1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure B.10-6
Superstition WA, AZ (TONT1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

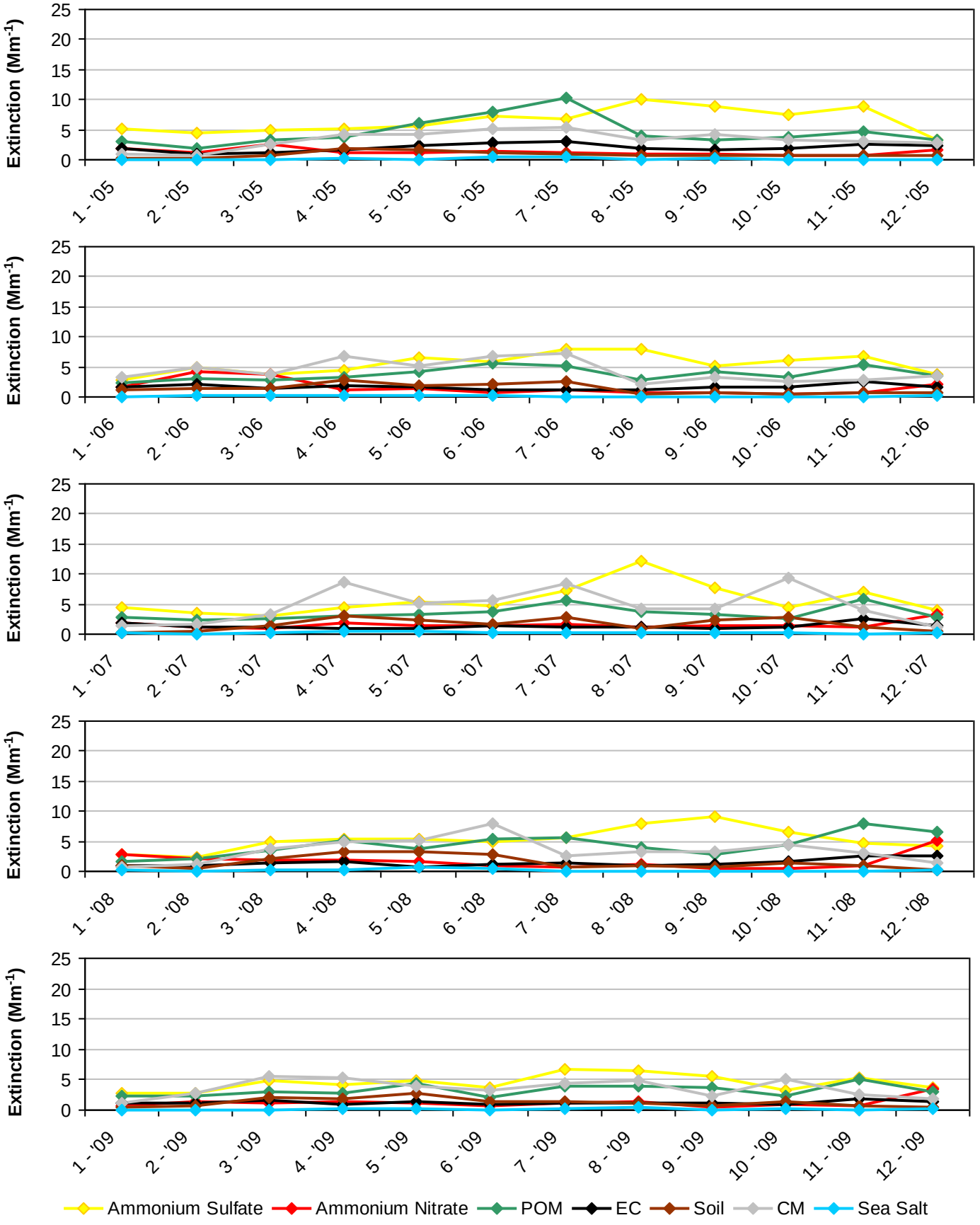
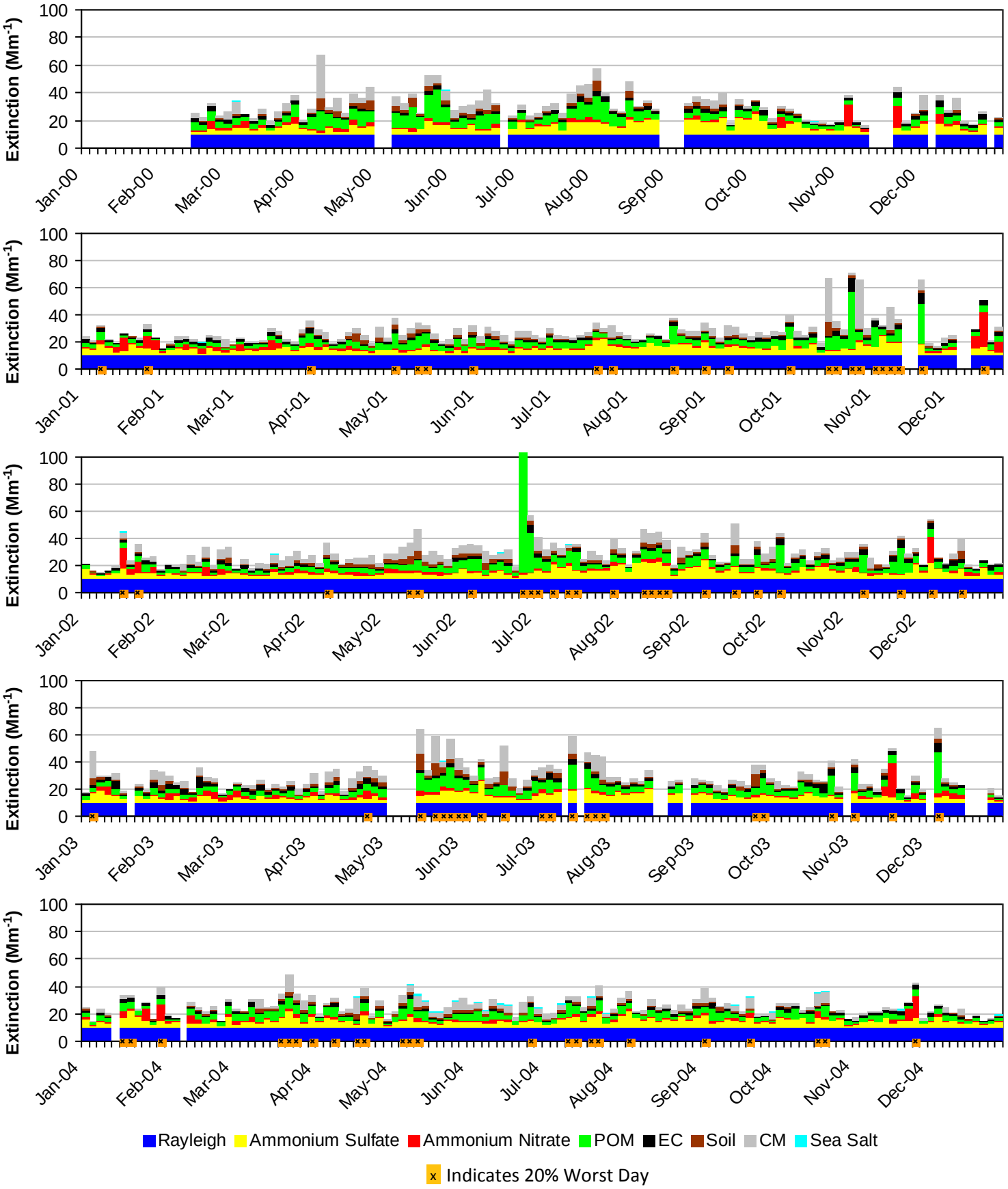
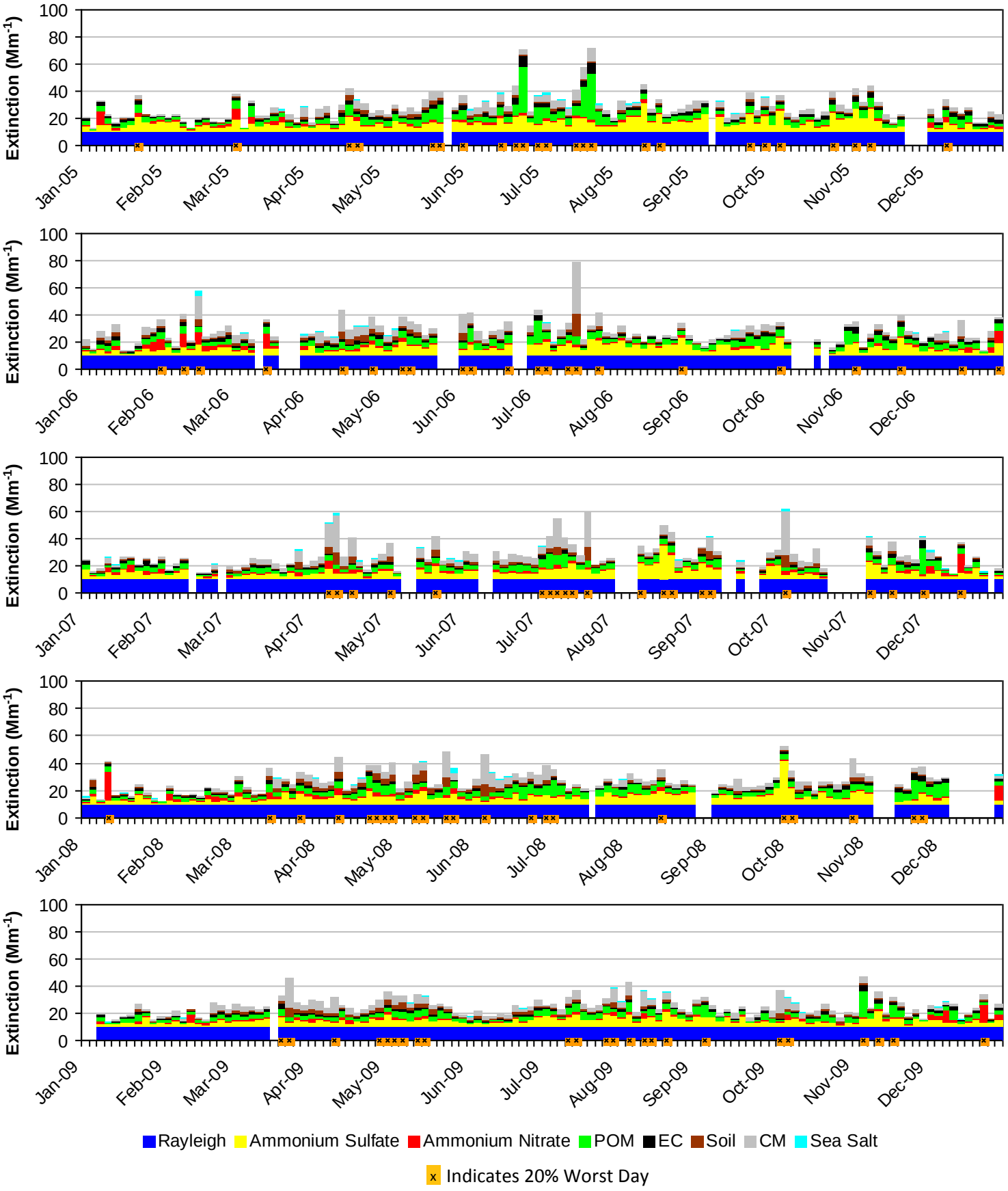


Figure B.10-7
Superstition WA, AZ (TONT1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure B.10-8
Superstition WA, AZ (TONT1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



APPENDIX C:

California Class I Area Monitoring Data Summary Tables and Charts

Includes the following subsections:

Subsection	IMPROVE Monitor	Class I Area(s) Represented
C.1	LABE1	Lava Beds NM and South Warner WA
C.2	LAVO1	Lassen Volcanic NP, Caribou WA, and Thousand Lakes WA
C.3	TRIN1	Marble Mountain WA and Yolla-Bolly-Middle-Eel WA
C.4	BLIS1	Desolation WA and Mokelumne WA
C.5	DOME1	Dome Land WA
C.6	HOOV1	Hoover WA
C.7	KAIS1	Kaiser WA, Ansel Adams WA, and John Muir WA
C.8	SEQU1	Sequoia NP and Kings Canyon NP
C.9	YOSE1	Yosemite NP and Emigrant WA
C.10	AGTI1	Agua Tibia WA
C.11	JOSH1	Joshua Tree NP
C.12	SAGA1	San Gabriel WA and Cucamonga WA
C.13	SAGO1	San Gorgonio WA and San Jacinto WA
C.14	PINN1	Pinnacles NM and Ventana WA
C.15	PORE1	Point Reyes National Seashore
C.16	RAFA1	San Rafael WA
C.17	REDW1	Redwood NP

C.1. LAVA BEDS NM AND SOUTH WARNER WA (LABE1)

The following tables and figures are presented in this section for the Lava Beds NM and South Warner WA represented by the LABE1 IMPROVE Monitor:

- **Table C.1-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure C.1-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.1-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.1-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure C.1-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure C.1-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure C.1-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure C.1-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

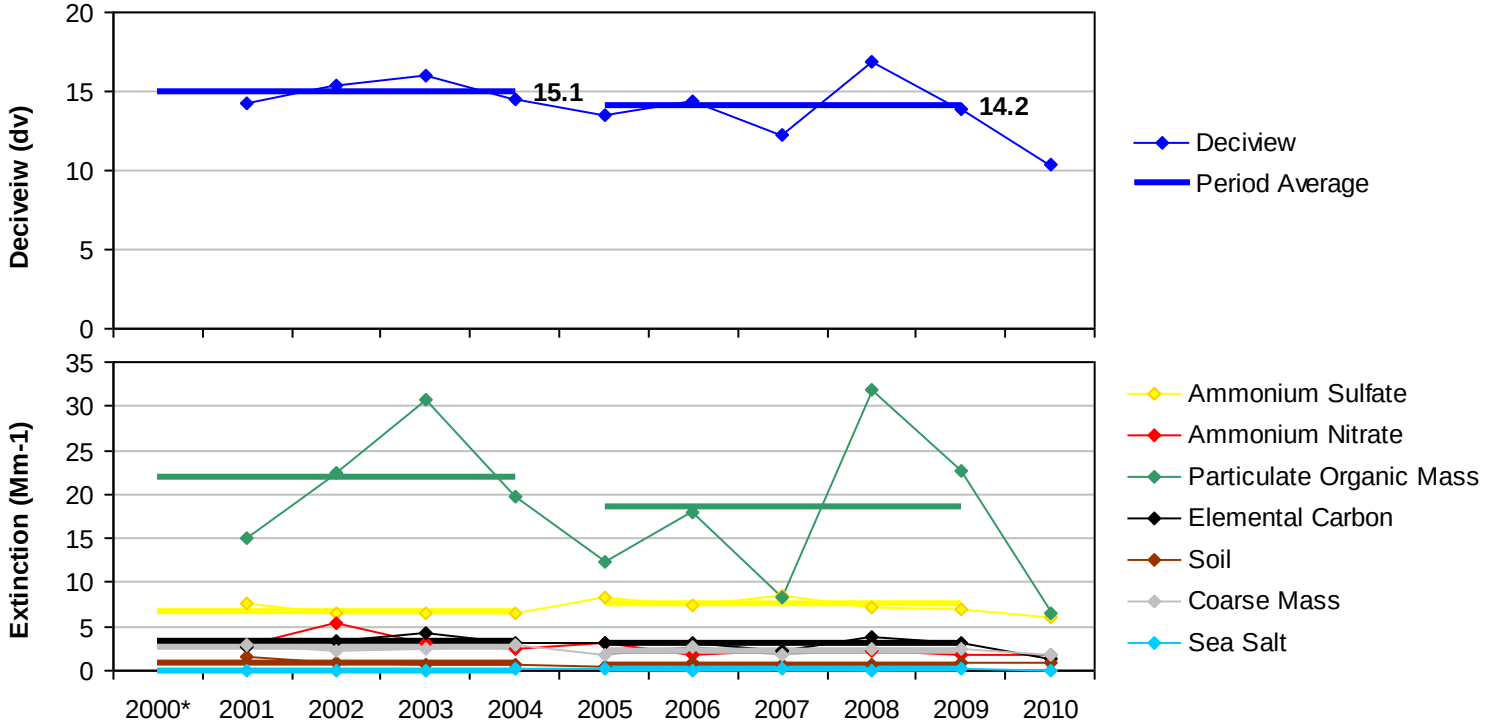
- **Figure C.1-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table C.1-1
Lava Beds NM and South Warner WA, CA (LABE1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	3.6	3.1	3.0	3.1	2.9	2.4	3.6	2.6	2.5	2.5	-0.1	0.0	3.2	2.8	-0.4	-13%
Worst 20% Days	---	14.3	15.4	16.0	14.5	13.5	14.4	12.2	16.9	13.9	10.4	-0.1	0.3	15.1	14.2	-0.9	-6%
All Days	---	8.4	8.6	8.5	8.2	8.1	7.8	7.6	8.6	7.8	6.3	-0.1	0.0	8.4	8.0	-0.4	-5%
Total Extinction (Mm-1)																	
Best 20% Days	---	14.4	13.8	13.5	13.7	13.5	12.8	14.4	13.1	12.9	12.8	-0.2	0.1	13.9	13.3	-0.6	-4%
Worst 20% Days	---	42.8	50.8	57.9	45.6	39.6	43.8	34.2	58.4	47.9	28.5	-0.2	0.5	49.3	44.8	-4.5	-9%
All Days	---	25.1	26.8	27.8	25.3	24.2	24.2	22.4	27.7	25.2	19.6	-0.2	0.3	26.2	24.7	-1.5	-6%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	1.6	1.1	0.8	1.2	1.5	1.2	1.7	1.2	1.1	1.1	0.0	0.5	1.2	1.3	0.1	8%
Worst 20% Days	---	7.6	6.5	6.5	6.6	8.2	7.4	8.5	7.1	6.8	6.0	0.1	0.2	6.8	7.6	0.8	12%
All Days	---	4.6	3.9	3.4	3.7	4.8	4.1	4.3	4.1	4.0	3.3	0.0	0.5	3.9	4.3	0.4	10%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.6	0.7	0.4	0.5	0.4	0.3	0.5	0.4	0.4	0.2	0.0	0.0	0.6	0.4	-0.2	-33%
Worst 20% Days	---	3.0	5.3	3.1	2.4	3.2	1.7	2.3	2.2	1.7	1.8	-0.2	0.0	3.5	2.2	-1.3	-37%
All Days	---	1.6	2.1	1.4	1.3	1.5	1.0	1.2	1.0	1.0	0.9	-0.1	0.0	1.6	1.2	-0.4	-25%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	1.2	1.1	1.4	1.1	0.9	0.5	1.2	0.8	0.7	0.7	-0.1	0.0	1.2	0.8	-0.4	-33%
Worst 20% Days	---	15.0	22.5	30.8	19.8	12.3	17.8	8.4	31.8	22.7	6.5	0.1	0.5	22.0	18.6	-3.4	-16%
All Days	---	5.5	7.3	9.5	7.0	4.9	5.9	4.0	9.4	7.0	3.0	0.0	0.5	7.3	6.2	-1.1	-15%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.3	0.4	0.5	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.0	0.0	0.4	0.3	-0.1	-25%
Worst 20% Days	---	2.8	3.3	4.2	3.1	3.2	3.2	2.2	3.9	3.1	1.4	0.0	0.5	3.3	3.1	-0.2	-6%
All Days	---	1.3	1.4	1.7	1.2	1.4	1.3	1.1	1.4	1.2	0.8	0.0	0.4	1.4	1.3	-0.1	-7%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.5	0.1	0.1	0.0	0%
Worst 20% Days	---	1.6	0.9	0.7	0.8	0.5	0.9	0.8	0.7	1.0	0.8	0.0	0.5	1.0	0.8	-0.2	-20%
All Days	---	0.6	0.5	0.3	0.4	0.3	0.4	0.4	0.4	0.5	0.4	0.0	0.2	0.5	0.4	-0.1	-20%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.4	0.3	0.3	0.2	0.2	0.4	0.3	0.2	0.4	0.0	0.0	0.4	0.2	-0.2	-50%
Worst 20% Days	---	2.9	2.3	2.5	2.9	1.9	2.7	1.9	2.5	2.4	1.9	-0.1	0.2	2.6	2.3	-0.3	-12%
All Days	---	1.4	1.4	1.3	1.5	1.2	1.3	1.2	1.3	1.3	1.1	0.0	0.3	1.4	1.2	-0.2	-14%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.1	0.2	0.1	100%
Worst 20% Days	---	0.0	0.0	0.0	0.1	0.2	0.0	0.2	0.0	0.2	0.1	0.0	0.1	0.1	0.1	0.0	0%
All Days	---	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.0	0.1	0.1	0.2	0.1	100%

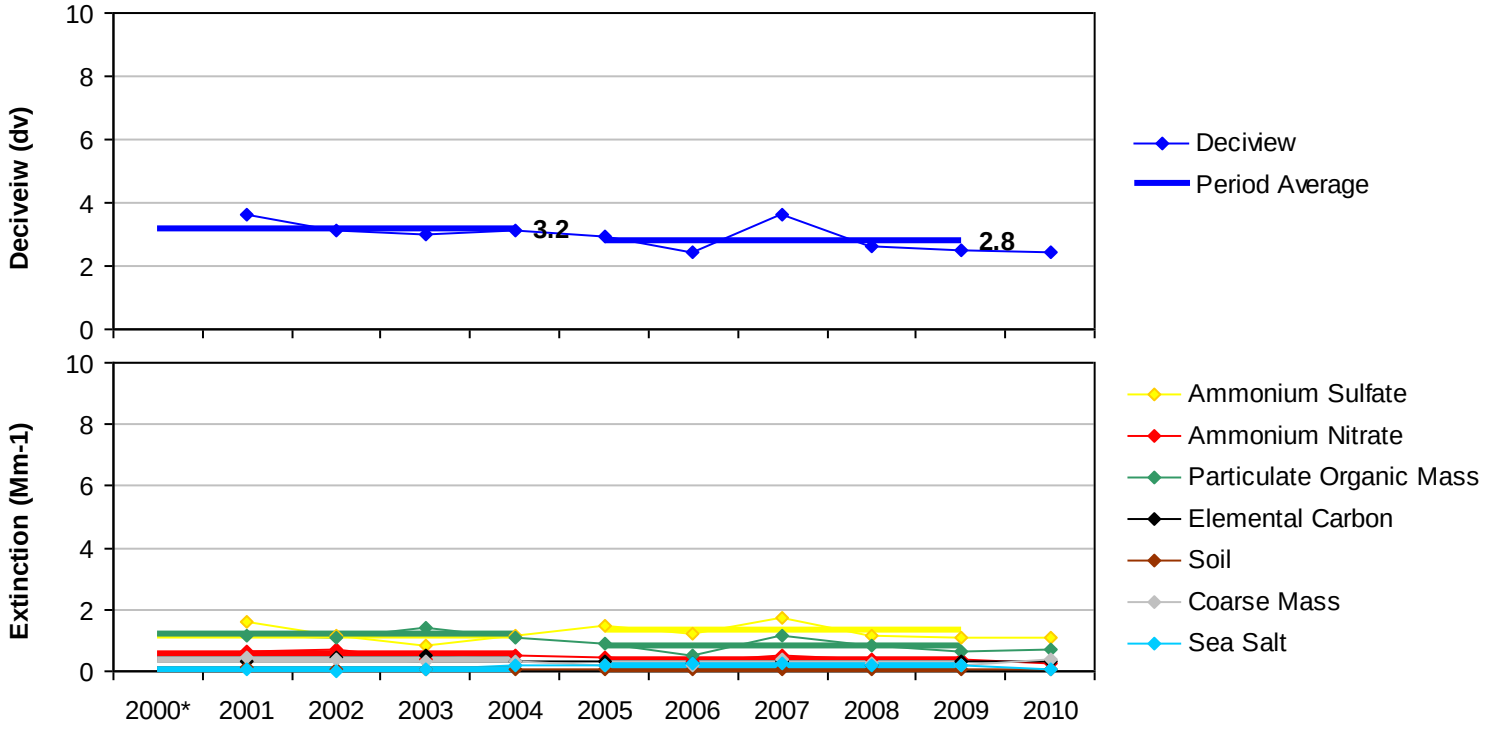
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure C.1-1
Lava Beds NM and South Warner WA, CA (LABE1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure C.1-2
Lava Beds NM and South Warner WA, CA (LABE1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

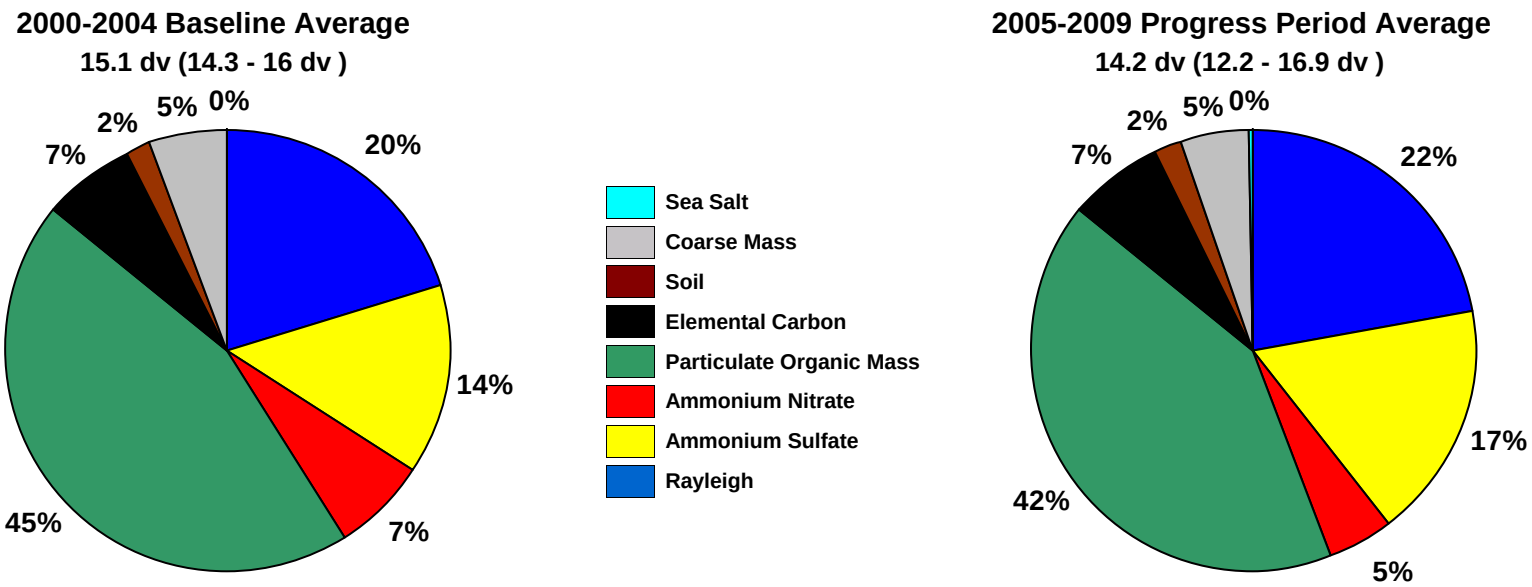


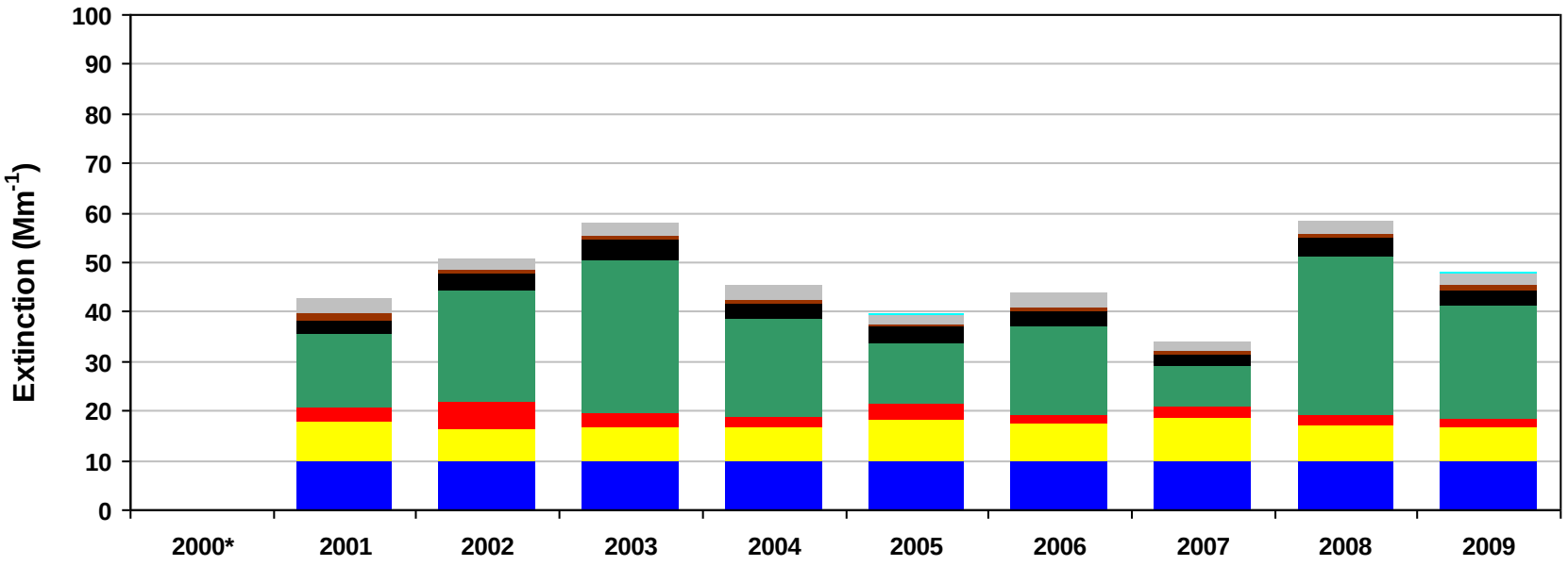
*Missing years did not meet RHR data completeness criteria.

Figure C.1-3

Lava Beds NM and South Warner WA, CA (LABE1 Site)

20% Most Impaired Visibility Days



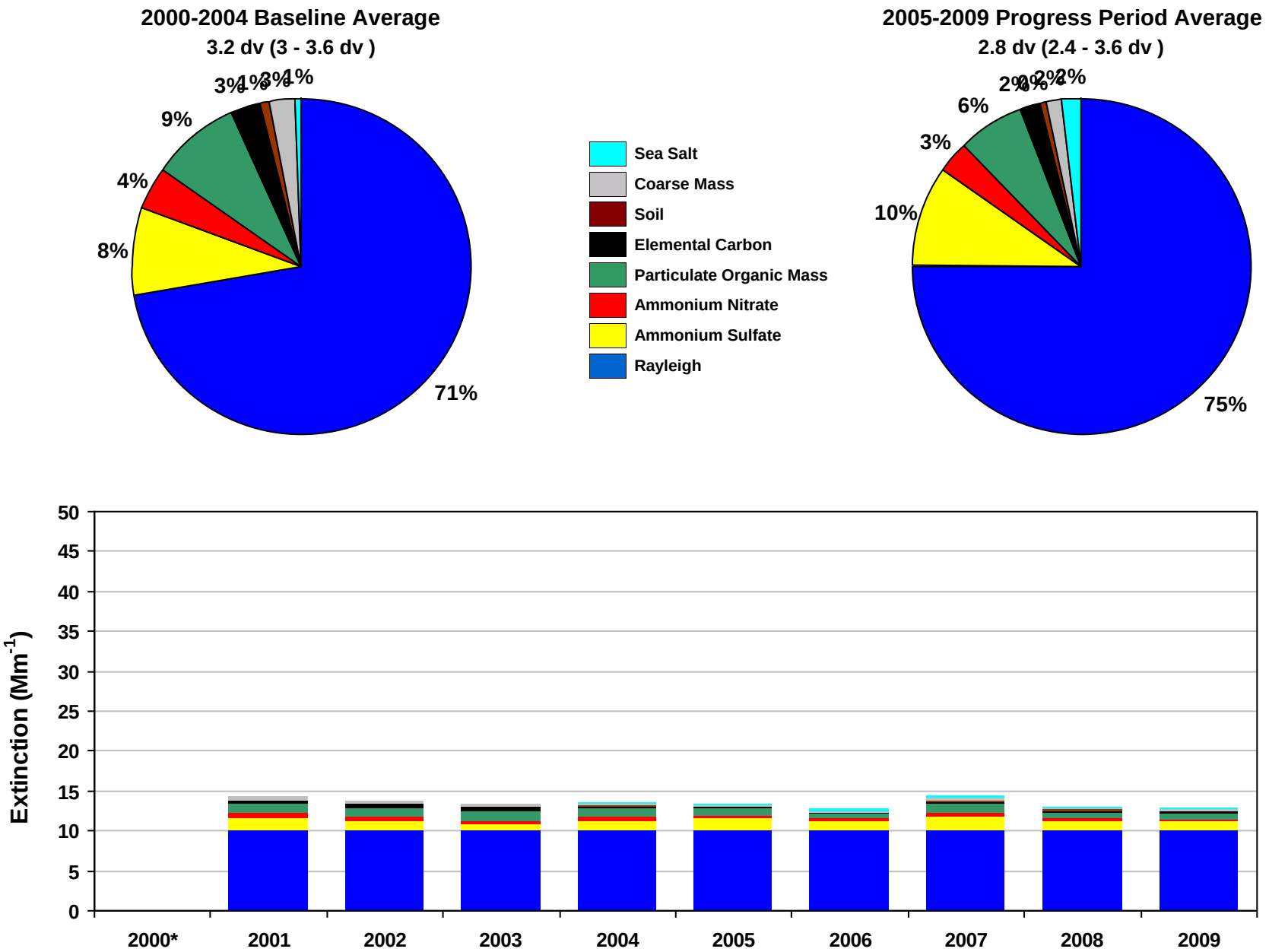


*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure C.1-4

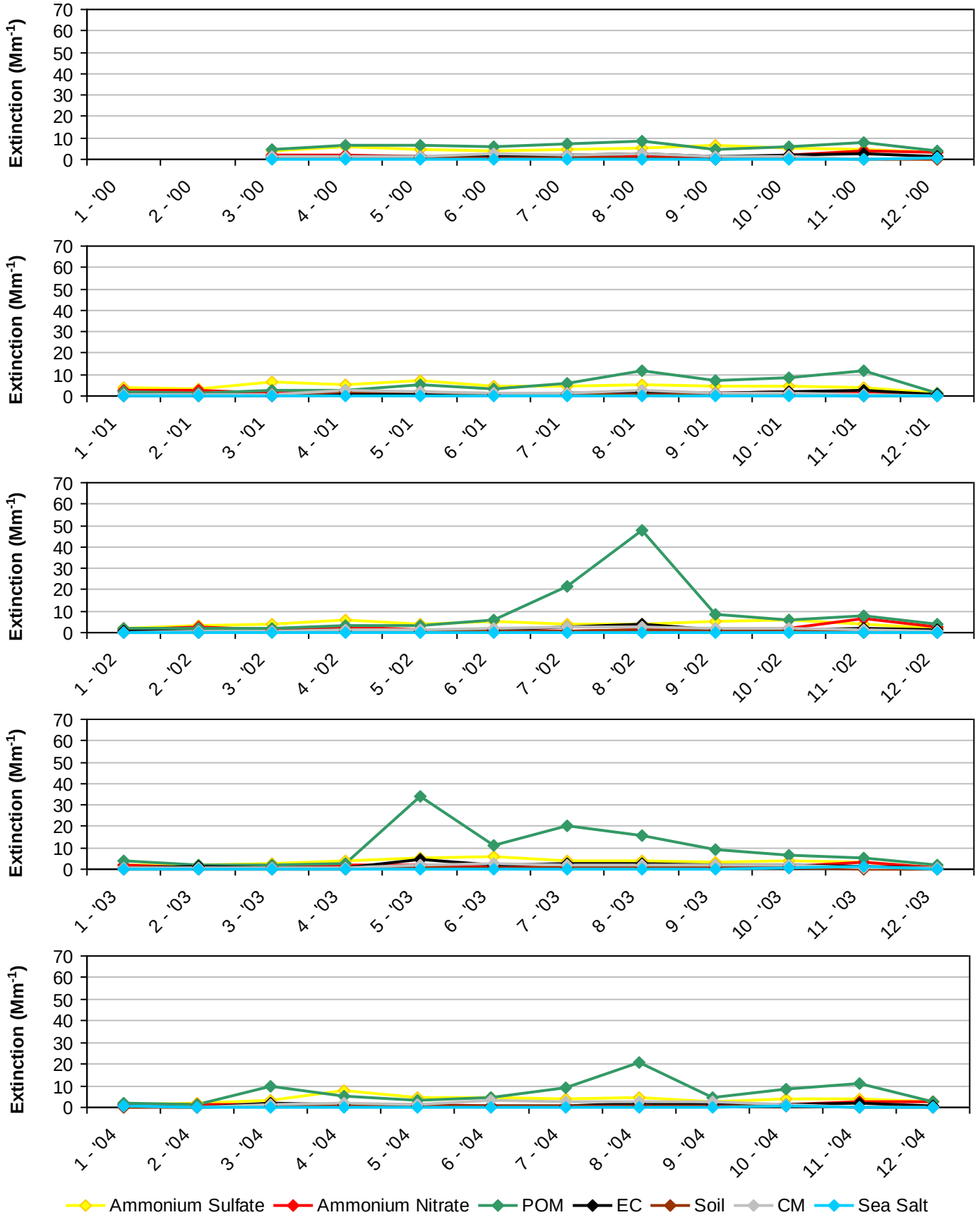
Lava Beds NM and South Warner WA, CA (LABE1 Site)

20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure C.1-5
Lava Beds NM and South Warner WA, CA (LABE1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure C.1-6
Lava Beds NM and South Warner WA, CA (LABE1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

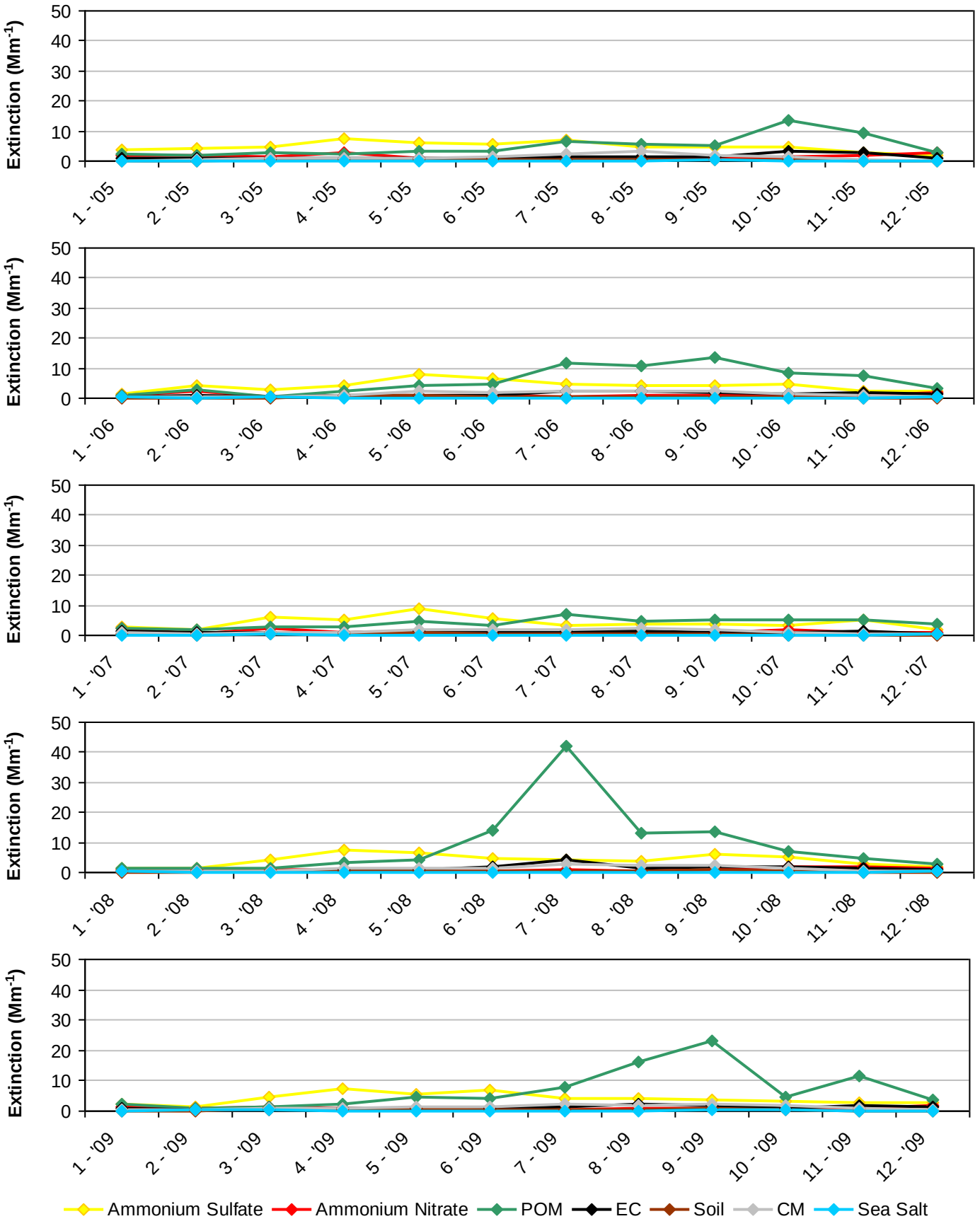
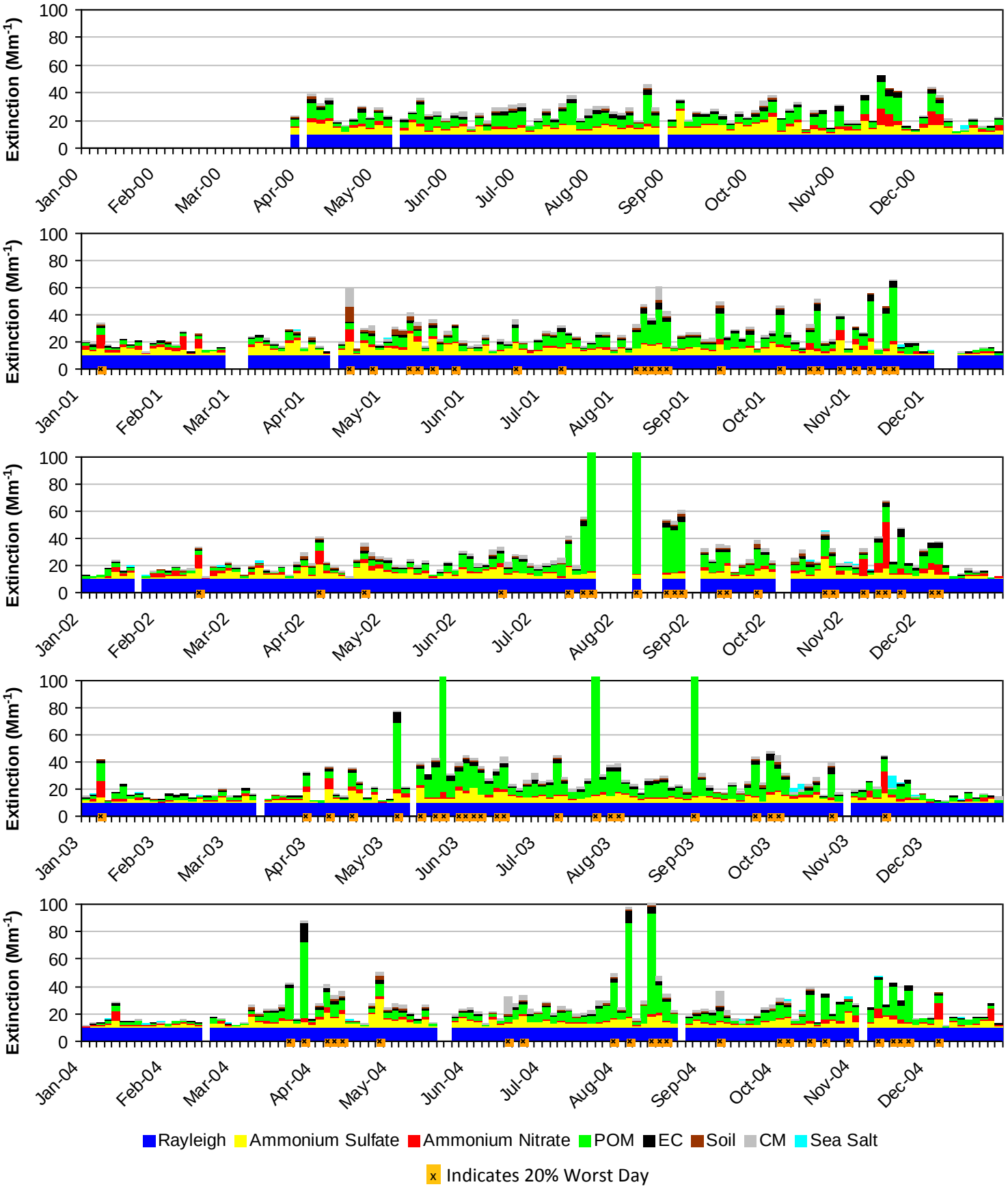
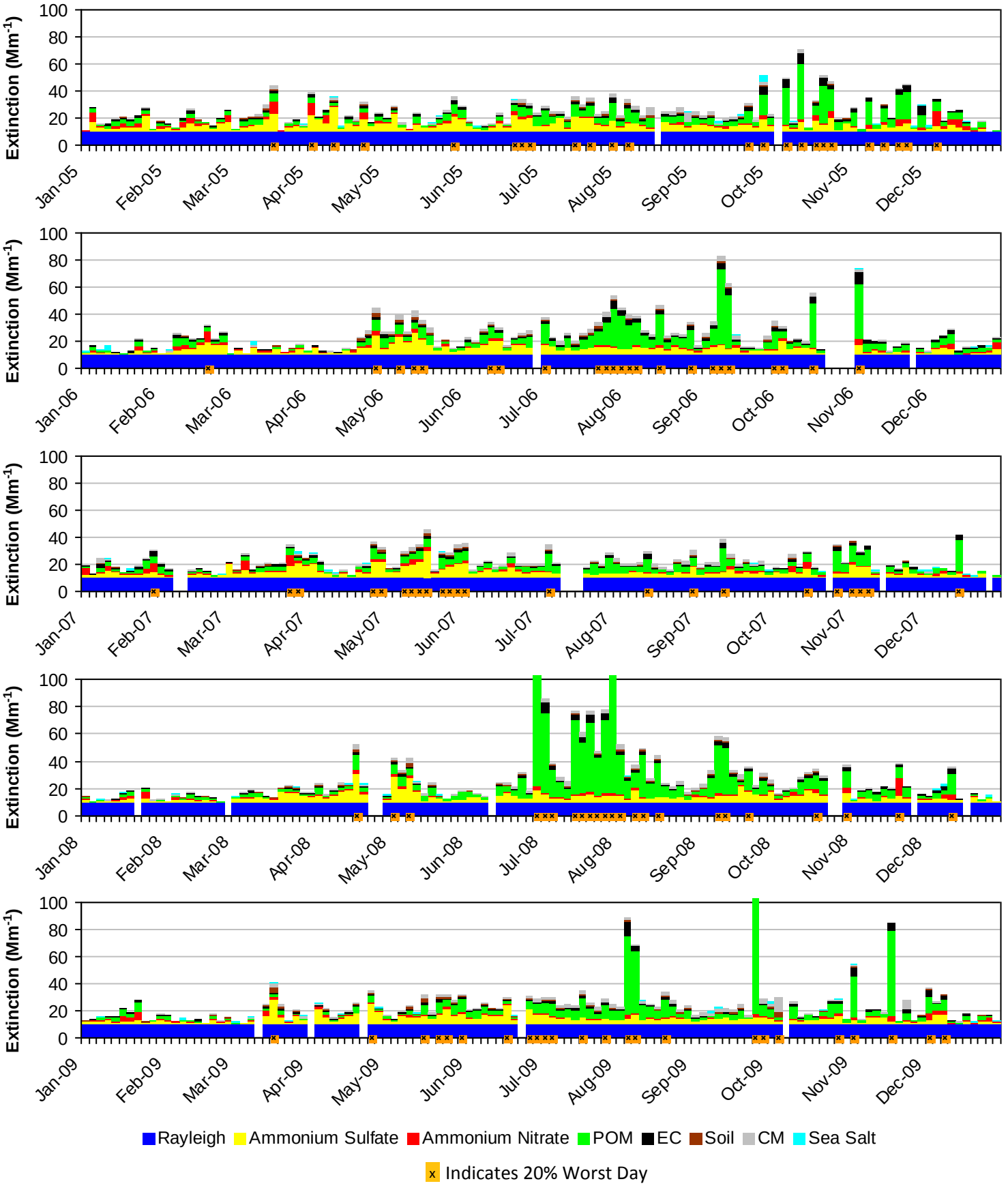


Figure C.1-7
Lava Beds NM and South Warner WA, CA (LABE1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure C.1-8
Lava Beds NM and South Warner WA, CA (LABE1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



C.2. LASSEN VOLCANIC NP, CARIBOU WA, AND THOUSAND LAKES WA (LAVO1)

The following tables and figures are presented in this section for the Lassen Volcanic NP, Caribou WA, and Thousand Lakes WA represented by the LAVO1 IMPROVE Monitor:

- **Table C.2-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure C.2-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.2-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.2-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure C.2-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure C.2-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure C.2-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure C.2-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure C.2-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table C.2-1
Lassen Volcanic NP, Caribou WA and Thousand Lakes WA, CA (LAVO1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	3.4	2.5	2.7	2.1	2.7	2.5	2.2	2.9	2.8	2.4	1.6	0.0	0.4	2.7	2.5	-0.2	-7%
Worst 20% Days	12.5	13.8	16.8	14.0	13.7	12.4	14.1	14.1	22.4	17.1	12.8	0.3	0.1	14.1	16.0	1.9	14%
All Days	7.9	7.7	8.7	7.5	7.8	7.4	7.4	7.6	9.8	8.0	6.4	0.0	0.5	7.9	8.1	0.2	3%
Total Extinction (Mm-1)																	
Best 20% Days	14.1	12.9	13.2	12.3	13.1	13.0	12.5	13.4	13.3	12.7	11.8	-0.1	0.4	13.1	12.9	-0.2	-2%
Worst 20% Days	35.3	41.8	60.8	41.2	39.8	34.8	43.2	45.7	123.4	68.6	40.2	2.0	0.1	43.8	63.1	19.3	44%
All Days	23.4	23.9	28.5	23.2	23.6	22.4	23.5	24.1	41.4	28.6	21.5	0.2	0.1	24.5	28.0	3.5	14%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	1.5	1.1	1.0	0.8	1.3	1.3	1.1	1.4	1.4	1.1	0.9	0.0	0.4	1.2	1.3	0.1	8%
Worst 20% Days	6.3	7.3	6.1	6.6	7.5	8.4	7.1	7.9	6.6	5.9	5.6	0.0	0.4	6.8	7.2	0.4	6%
All Days	3.7	4.1	3.5	3.3	3.9	4.5	4.0	4.0	4.2	3.8	3.1	0.0	0.2	3.7	4.1	0.4	11%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.6	0.4	0.4	0.2	0.3	0.4	0.2	0.4	0.3	0.2	0.2	0.0	0.1	0.4	0.3	-0.1	-25%
Worst 20% Days	3.1	4.5	3.5	3.6	3.6	2.0	2.1	3.4	2.0	0.9	1.8	-0.3	0.0	3.7	2.1	-1.6	-43%
All Days	1.4	1.7	1.7	1.5	1.3	1.2	1.0	1.4	1.2	0.8	0.9	-0.1	0.0	1.5	1.1	-0.4	-27%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.2	0.7	0.9	0.8	0.8	0.6	0.6	0.7	0.8	0.6	0.2	0.0	0.1	0.9	0.7	-0.2	-22%
Worst 20% Days	10.0	13.4	33.3	15.9	13.3	7.9	15.9	17.8	86.9	44.2	14.7	1.6	0.1	17.2	34.5	17.3	>100%
All Days	5.1	4.9	9.6	5.9	5.5	3.5	5.1	5.6	20.2	10.8	4.4	0.2	0.1	6.2	9.0	2.8	45%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.1	0.0	0.0	0.4	0.2	-0.2	-50%
Worst 20% Days	3.2	2.9	3.6	3.2	2.6	2.5	3.5	3.3	12.1	4.5	3.1	0.1	0.2	3.1	5.2	2.1	68%
All Days	1.7	1.4	1.6	1.5	1.2	1.2	1.4	1.3	3.1	1.5	1.1	0.0	0.4	1.5	1.7	0.2	13%
Soil Extinction (Mm-1)																	
Best 20% Days	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.4	0.1	0.1	0.0	0%
Worst 20% Days	0.6	1.4	1.3	0.7	0.9	0.8	1.0	0.9	1.4	0.5	1.1	0.0	0.4	1.0	0.9	-0.1	-10%
All Days	0.4	0.7	0.7	0.4	0.5	0.4	0.5	0.4	0.6	0.4	0.5	0.0	0.4	0.5	0.5	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.3	0.4	0.3	0.2	0.0	0.1	0.2	0.3	0.1	50%
Worst 20% Days	2.0	2.1	2.9	1.3	1.8	3.2	3.6	2.4	4.4	2.3	3.9	0.2	0.1	2.0	3.2	1.2	60%
All Days	1.1	1.1	1.5	0.7	1.0	1.5	1.4	1.3	1.9	1.3	1.4	0.0	0.2	1.1	1.5	0.4	36%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.1	0.0	0.1	0.0	0.1	0.2	0.1	0.2	0.1	0.0	0.1	0.0	0.5	0.1	0.1	0.0	0%
Worst 20% Days	0.0	0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0%
All Days	0.1	0.1	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure C.2-1
Lassen Volcanic NP, Caribou WA and Thousand Lakes WA, CA (LAVO1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

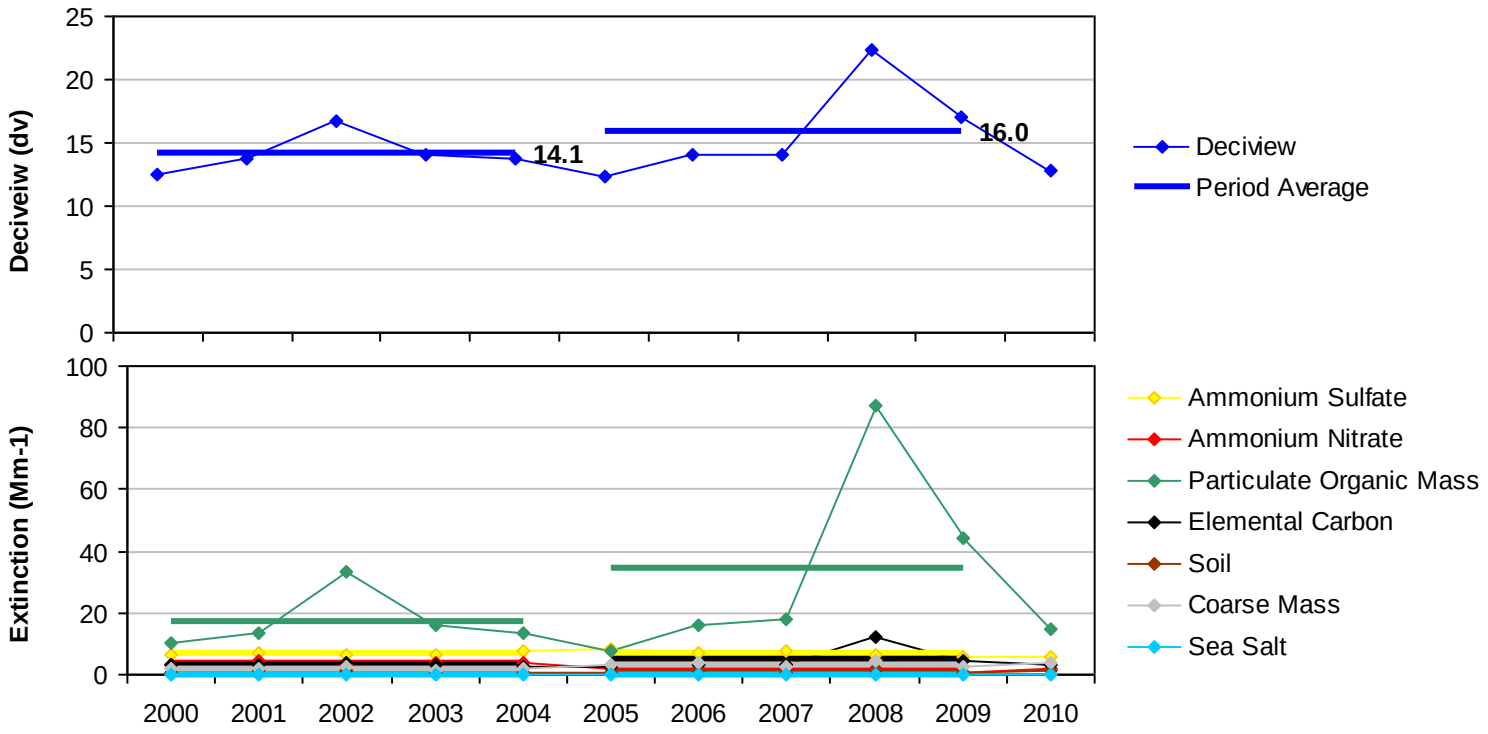


Figure C.2-2
Lassen Volcanic NP, Caribou WA and Thousand Lakes WA, CA (LAVO1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

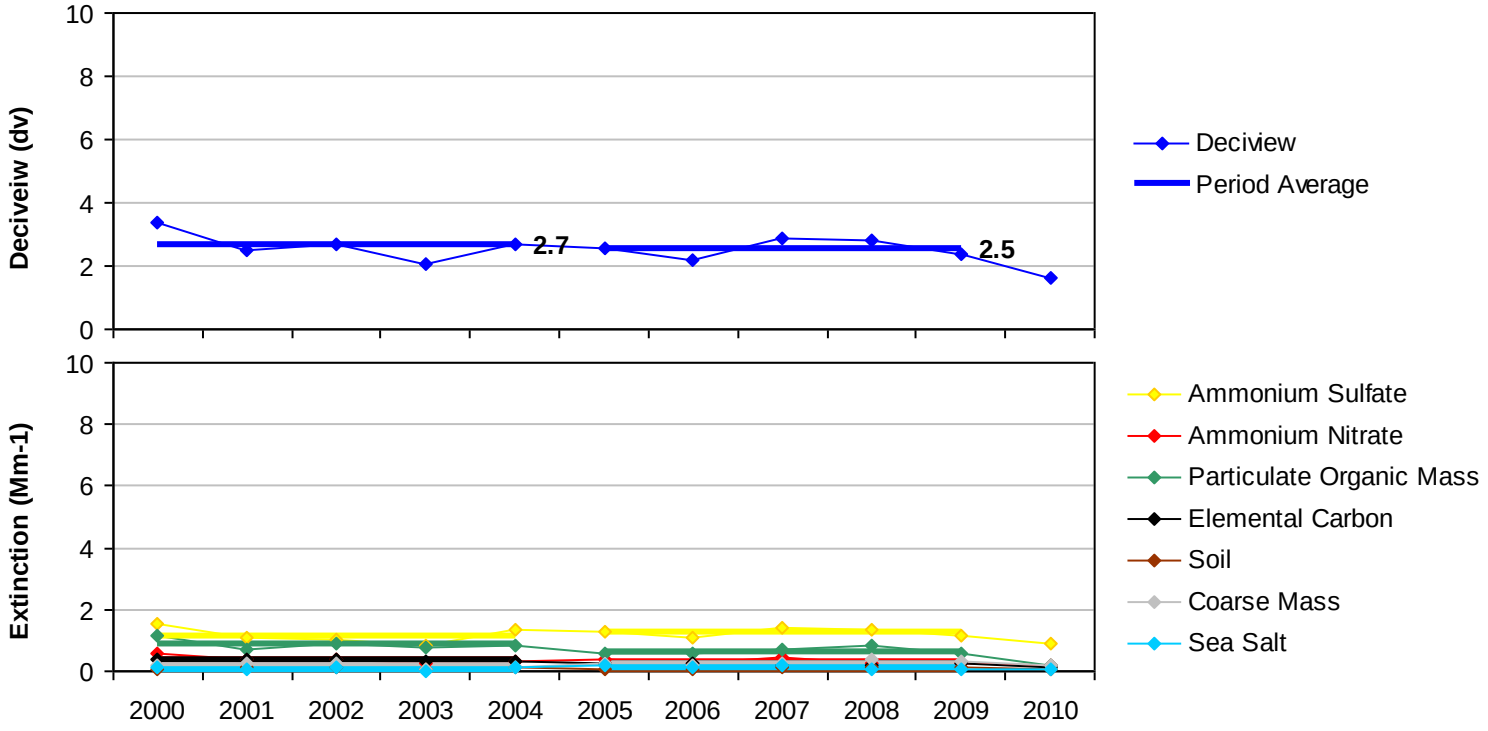


Figure C.2-3

Lassen Volcanic NP, Caribou WA and Thousand Lakes WA, CA (LAVO1 Site)

20% Most Impaired Visibility Days

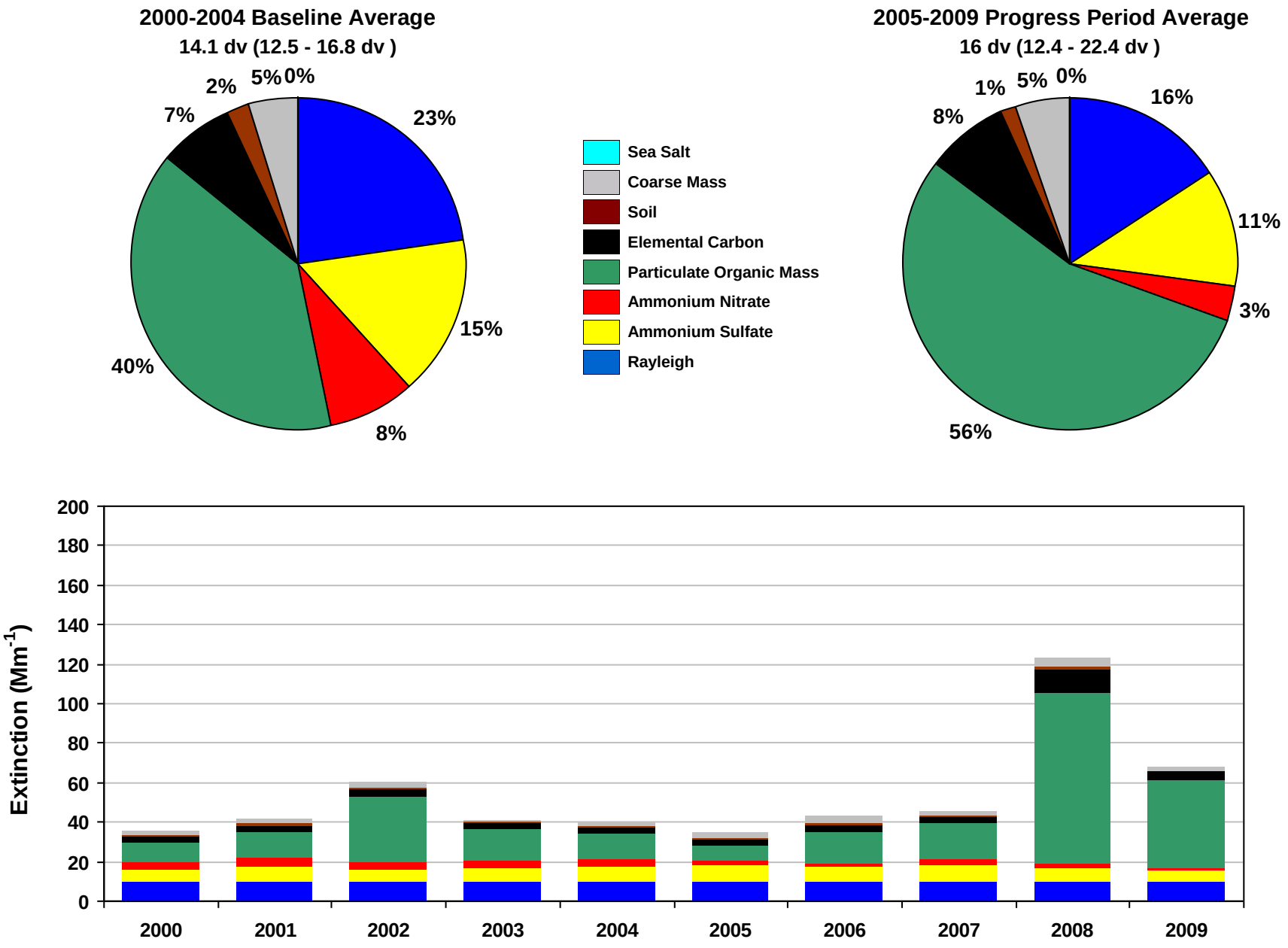


Figure C.2-4

Lassen Volcanic NP, Caribou WA and Thousand Lakes WA, CA (LAVO1 Site)

20% Least Impaired Visibility Days

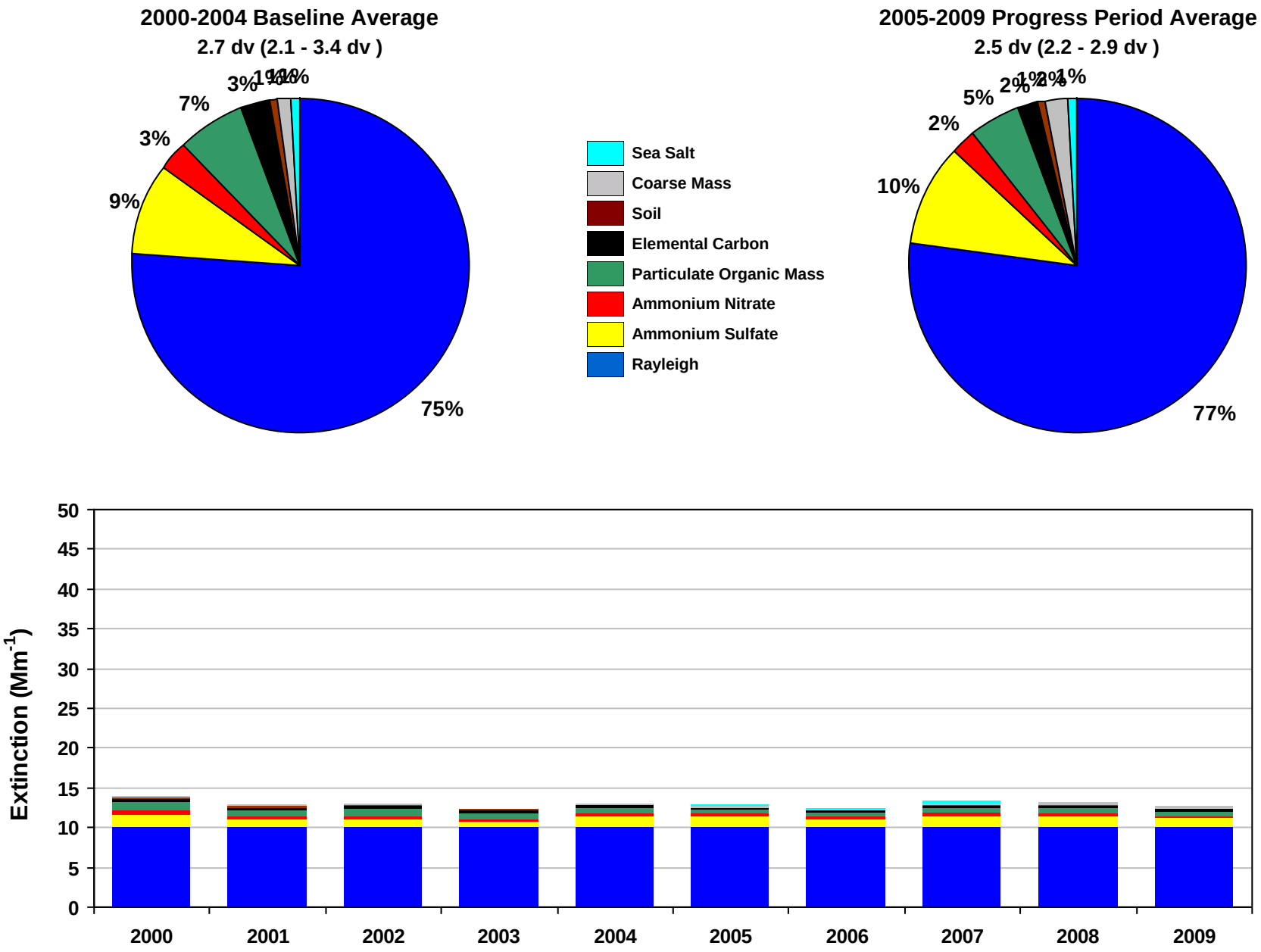


Figure C.2-5
Lassen Volcanic NP, Caribou WA and Thousand Lakes WA, CA (LAVO1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

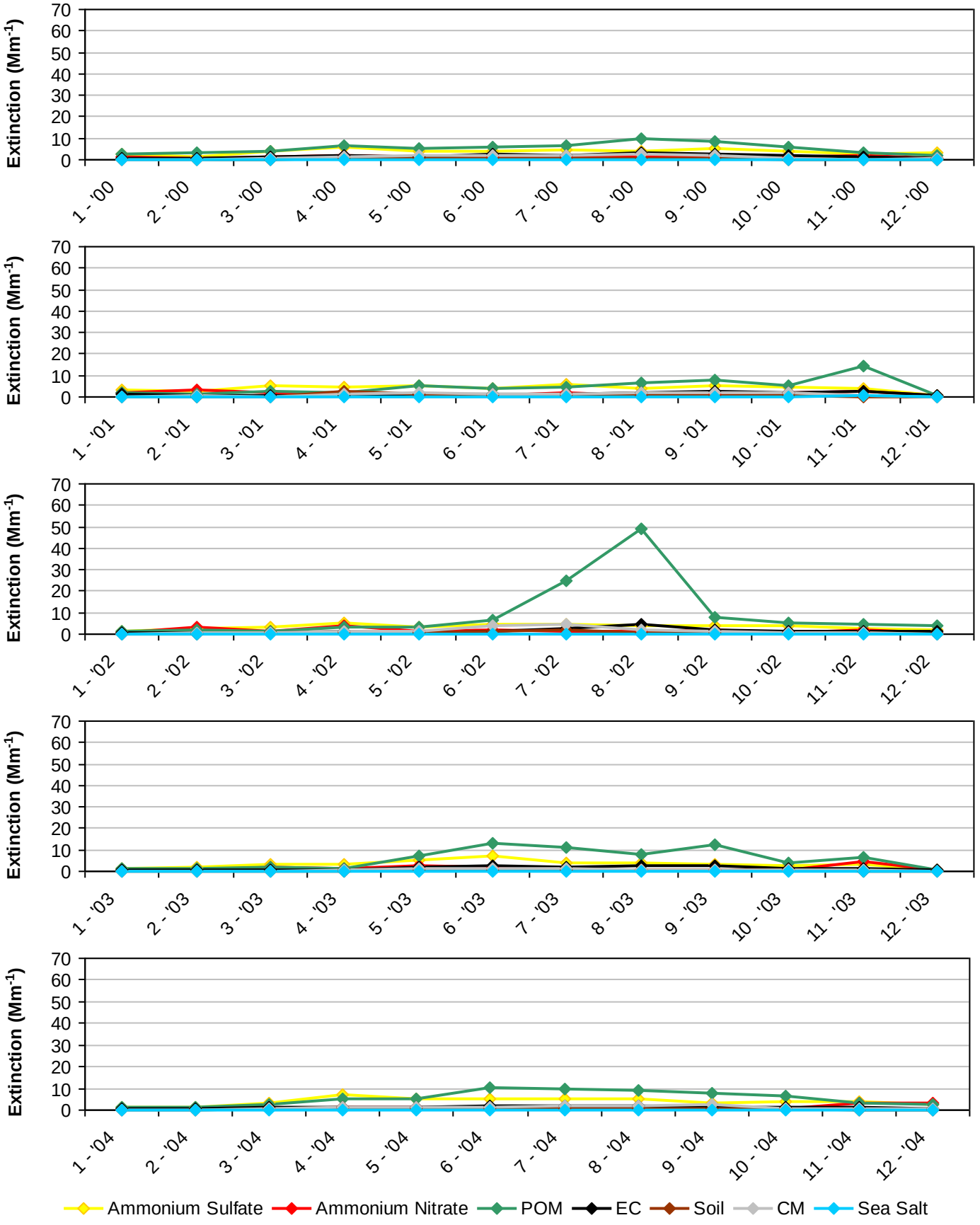


Figure C.2-6
Lassen Volcanic NP, Caribou WA and Thousand Lakes WA, CA (LAVO1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

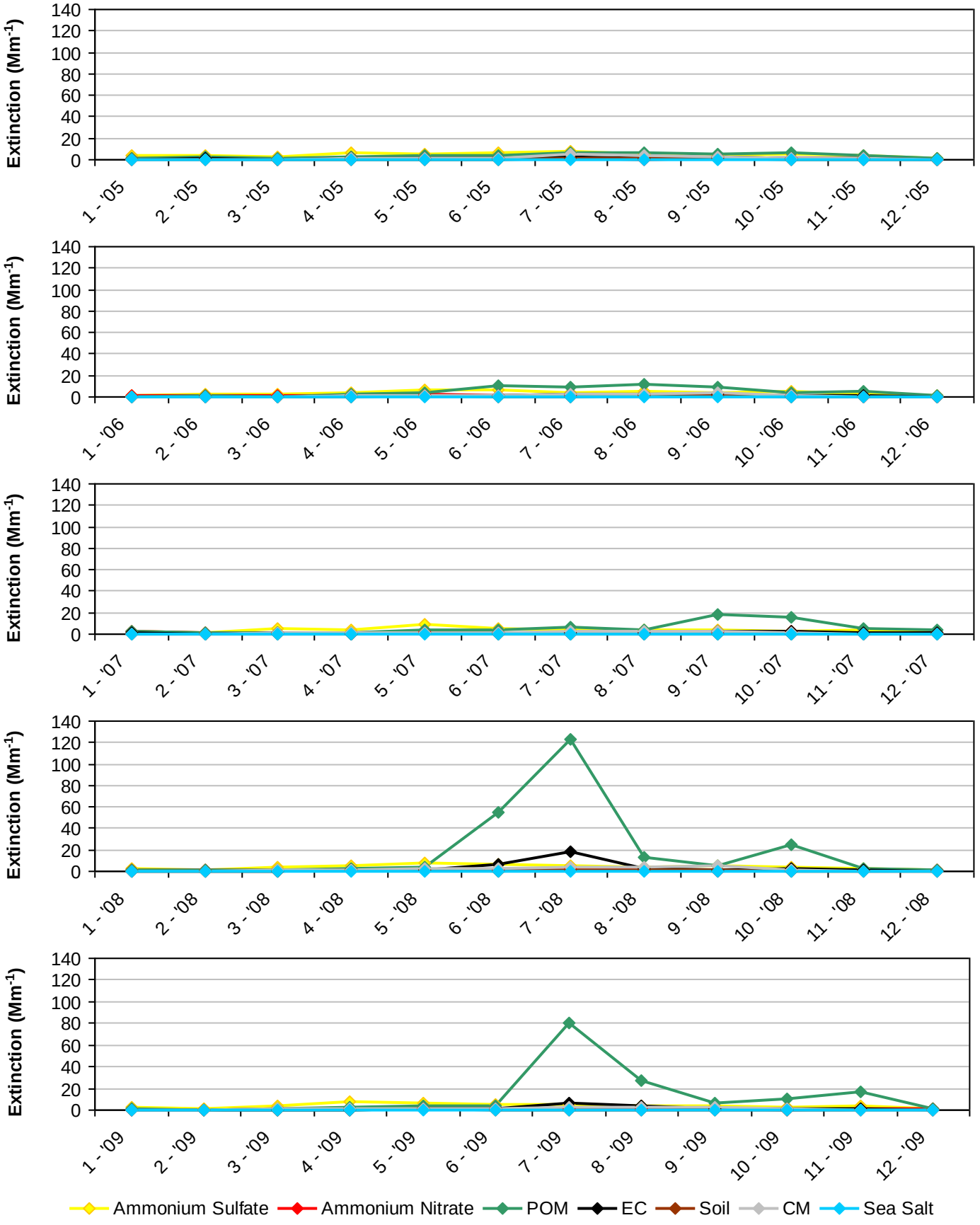


Figure C.2-7
Lassen Volcanic NP, Caribou WA and Thousand Lakes WA, CA (LAVO1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

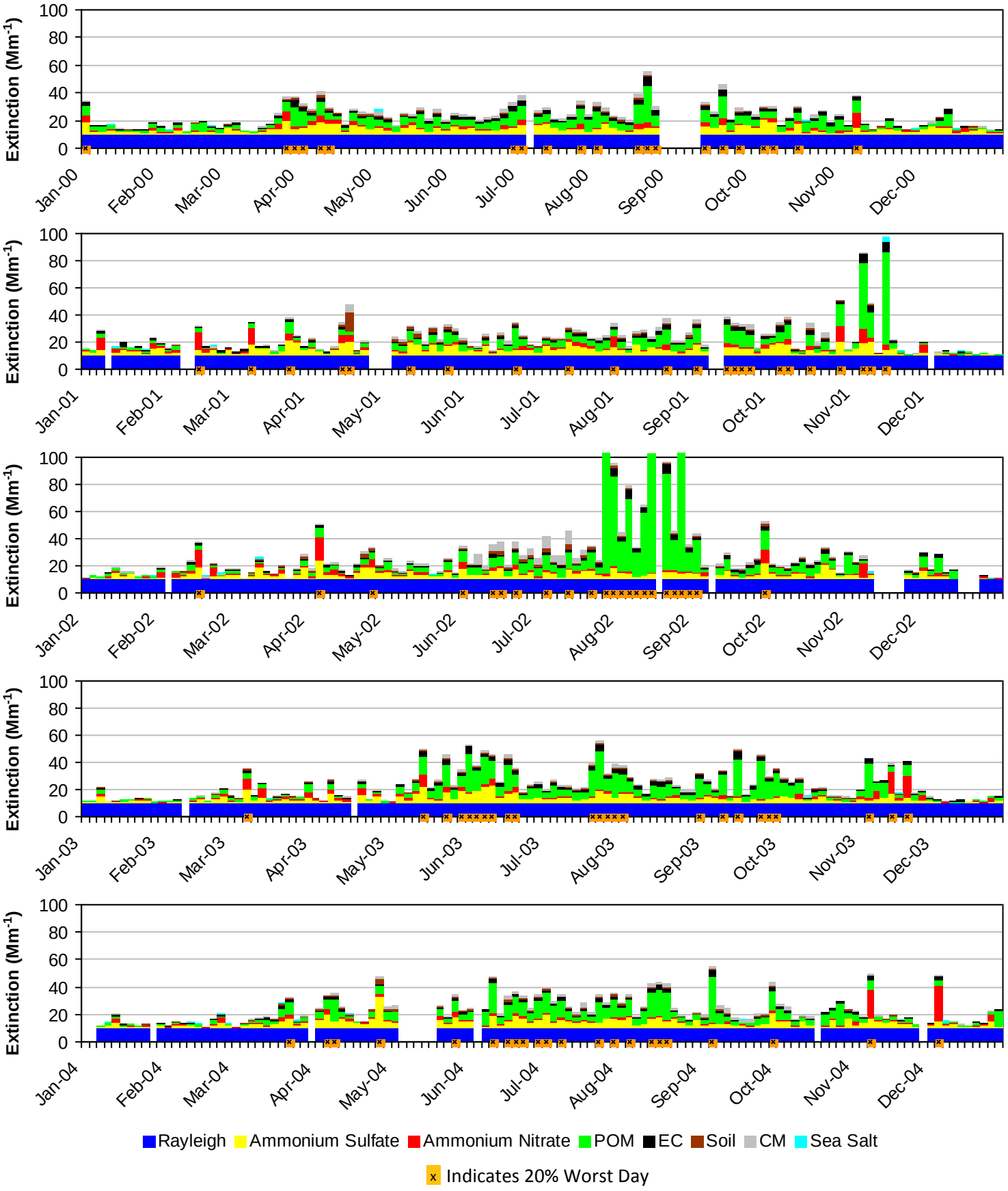
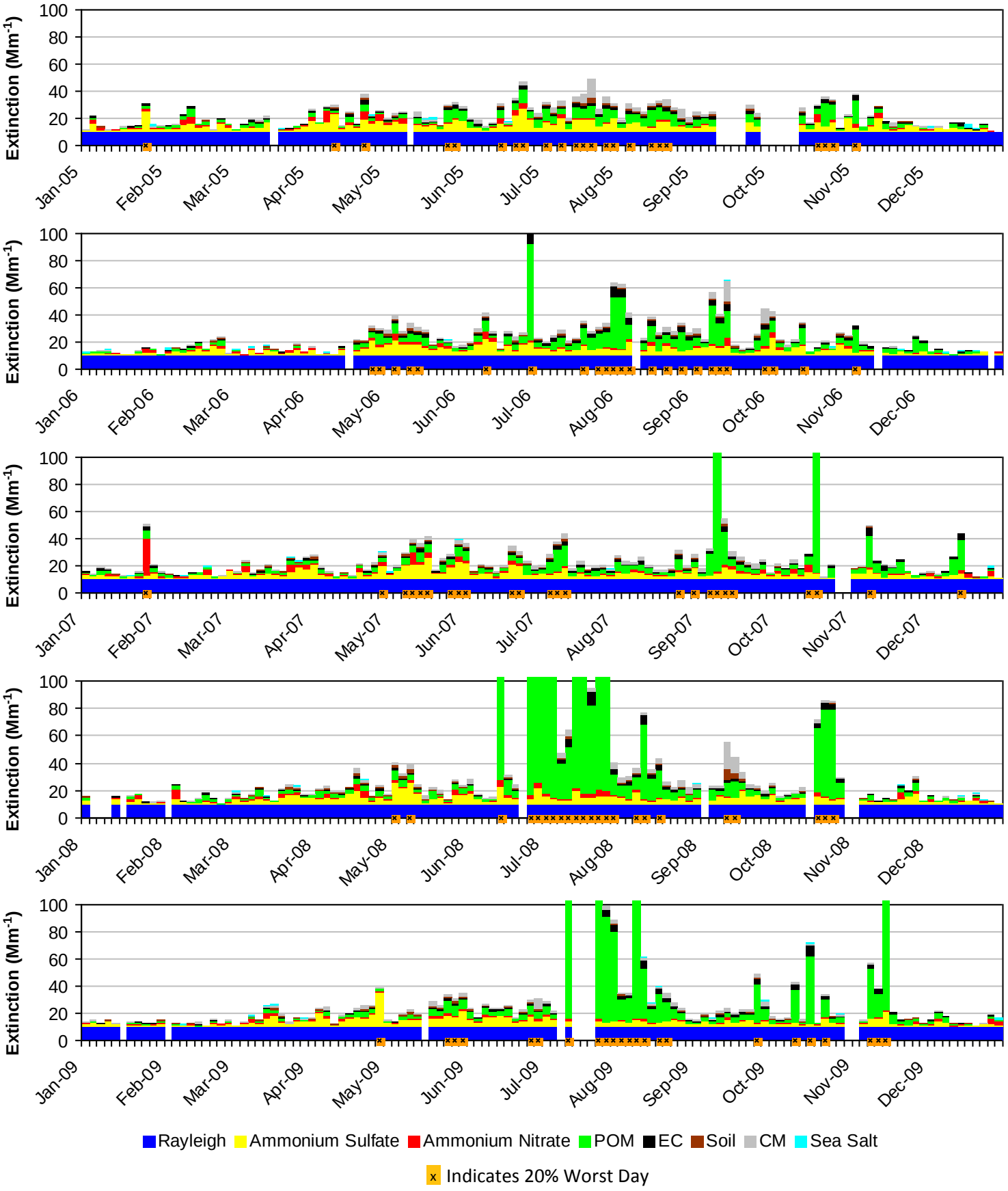


Figure C.2-8
Lassen Volcanic NP, Caribou WA and Thousand Lakes WA, CA (LAVO1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



C.3. MARBLE MOUNTAIN WA AND YOLLA-BOLLY-MIDDLE-EEL WA (TRIN1)

The following tables and figures are presented in this section for the Marble Mountain WA and Yolla-Bolly-Middle-Eel WA represented by the TRIN1 IMPROVE Monitor:

- **Table C.3-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure C.3-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.3-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.3-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure C.3-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure C.3-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure C.3-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure C.3-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

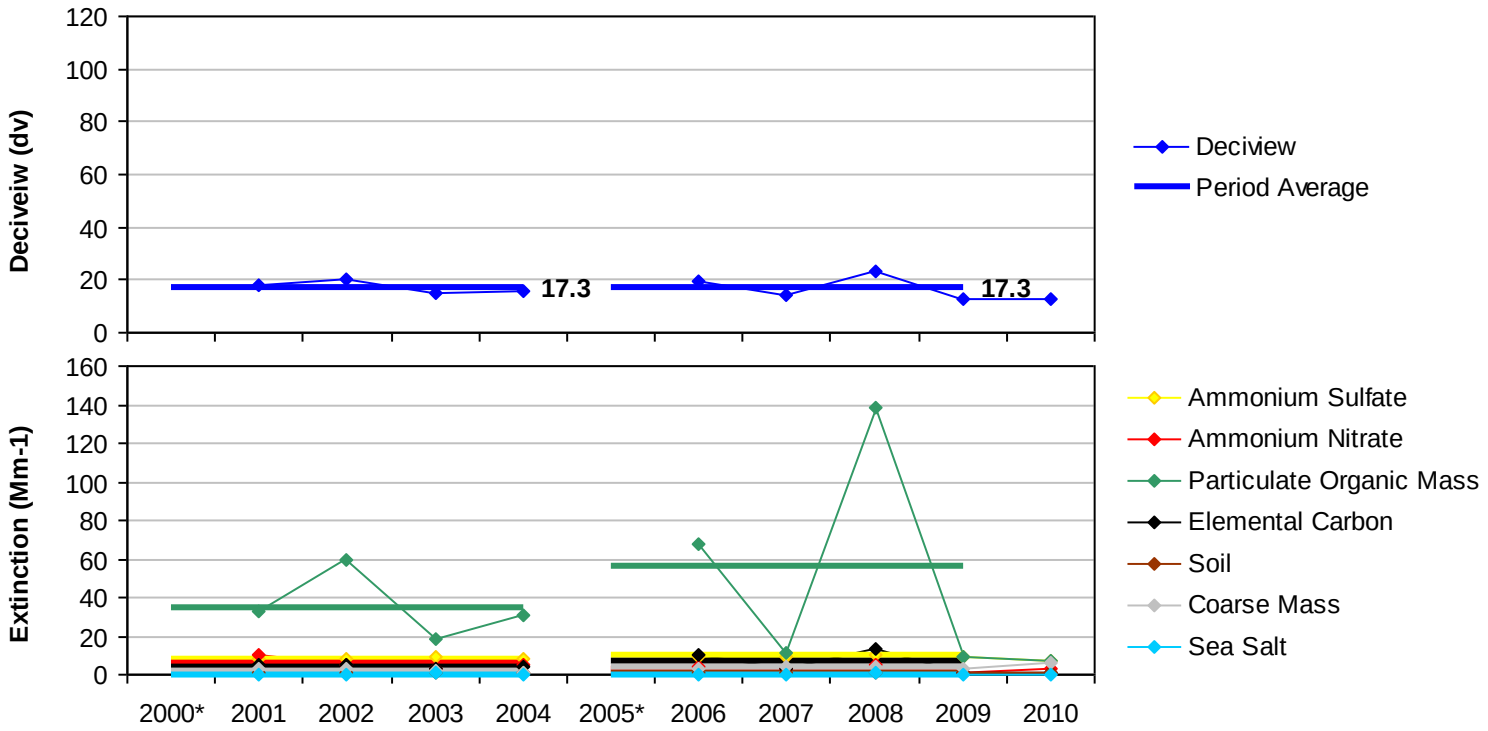
- **Figure C.3-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table C.3-1
Marble Mountain WA and Yolla-Bolly-Middle-Eel WA, CA (TRIN1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	3.4	4.1	2.9	3.4	---	2.1	3.9	4.0	2.6	1.9	0.0	0.5	3.5	3.2	-0.3	-9%
Worst 20% Days	---	18.1	20.5	15.2	15.7	---	19.7	13.9	23.1	12.7	12.4	-0.5	0.3	17.3	17.3	0.0	0%
All Days	---	9.5	10.2	8.5	8.8	---	9.2	8.1	10.5	7.8	6.9	-0.2	0.2	9.2	8.9	-0.3	-3%
Total Extinction (Mm-1)																	
Best 20% Days	---	14.2	15.1	13.5	14.2	---	12.4	14.9	15.0	13.1	12.1	0.0	0.5	14.2	13.9	-0.3	-2%
Worst 20% Days	---	71.3	91.3	47.6	61.7	---	106.2	42.1	183.0	35.8	35.5	-2.6	0.4	68.0	91.8	23.8	35%
All Days	---	31.7	36.3	26.1	29.3	---	37.9	24.5	54.4	23.3	21.6	-0.5	0.4	30.9	35.0	4.1	13%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	1.5	1.5	0.9	1.2	---	0.8	2.1	2.1	1.3	0.8	0.0	0.5	1.3	1.6	0.3	23%
Worst 20% Days	---	8.6	7.8	9.0	8.1	---	9.6	9.7	10.6	9.4	7.1	0.2	0.0	8.4	9.8	1.4	17%
All Days	---	4.9	4.4	4.3	4.4	---	4.9	4.9	5.4	4.9	3.8	0.1	0.0	4.5	5.0	0.5	11%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.6	0.6	0.3	0.4	---	0.3	0.5	0.4	0.3	0.3	0.0	0.0	0.5	0.4	-0.1	-20%
Worst 20% Days	---	10.3	5.0	3.5	5.4	---	4.3	3.0	5.0	1.4	3.1	-0.7	0.1	6.1	3.4	-2.7	-44%
All Days	---	3.0	2.4	1.5	1.9	---	1.5	1.3	1.5	0.9	1.3	-0.2	0.0	2.2	1.3	-0.9	-41%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	1.1	1.7	1.3	1.5	---	0.6	1.0	1.4	0.9	0.6	0.0	0.2	1.4	0.9	-0.5	-36%
Worst 20% Days	---	32.8	59.0	18.0	31.2	---	67.8	11.8	139.0	8.8	6.8	-1.5	0.4	35.3	56.8	21.5	61%
All Days	---	9.7	15.3	6.9	9.7	---	16.6	4.7	31.6	4.2	3.0	-0.4	0.5	10.4	14.3	3.9	38%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.5	0.5	0.4	---	0.2	0.3	0.3	0.2	0.2	0.0	0.0	0.5	0.3	-0.2	-40%
Worst 20% Days	---	5.3	5.5	3.2	4.5	---	9.9	2.7	13.3	1.5	1.4	-0.3	0.4	4.6	6.9	2.3	50%
All Days	---	1.9	1.9	1.5	1.6	---	2.8	1.2	3.4	0.8	0.7	-0.1	0.4	1.7	2.1	0.4	24%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.1	0.0	0.1	---	0.0	0.1	0.1	0.1	0.0	0.0	0.6	0.1	0.1	0.0	0%
Worst 20% Days	---	1.1	0.7	0.6	1.0	---	1.0	0.8	1.0	0.7	0.8	0.0	0.4	0.8	0.9	0.1	13%
All Days	---	0.6	0.5	0.3	0.4	---	0.4	0.4	0.4	0.4	0.3	0.0	0.1	0.4	0.4	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.3	0.4	0.2	0.2	---	0.1	0.4	0.3	0.2	0.2	0.0	0.4	0.3	0.3	0.0	0%
Worst 20% Days	---	3.3	3.1	2.5	1.3	---	3.4	3.8	3.7	3.5	6.3	0.1	0.1	2.5	3.6	1.1	44%
All Days	---	1.5	1.5	1.2	0.8	---	1.3	1.6	1.6	1.6	2.1	0.0	0.1	1.2	1.5	0.3	25%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.3	0.2	0.4	---	0.4	0.5	0.6	0.1	0.1	0.0	0.1	0.2	0.4	0.2	100%
Worst 20% Days	---	0.0	0.3	0.7	0.2	---	0.1	0.2	0.5	0.4	0.1	0.0	0.2	0.3	0.3	0.0	0%
All Days	---	0.1	0.3	0.3	0.4	---	0.4	0.4	0.4	0.5	0.3	0.0	0.0	0.3	0.4	0.1	33%

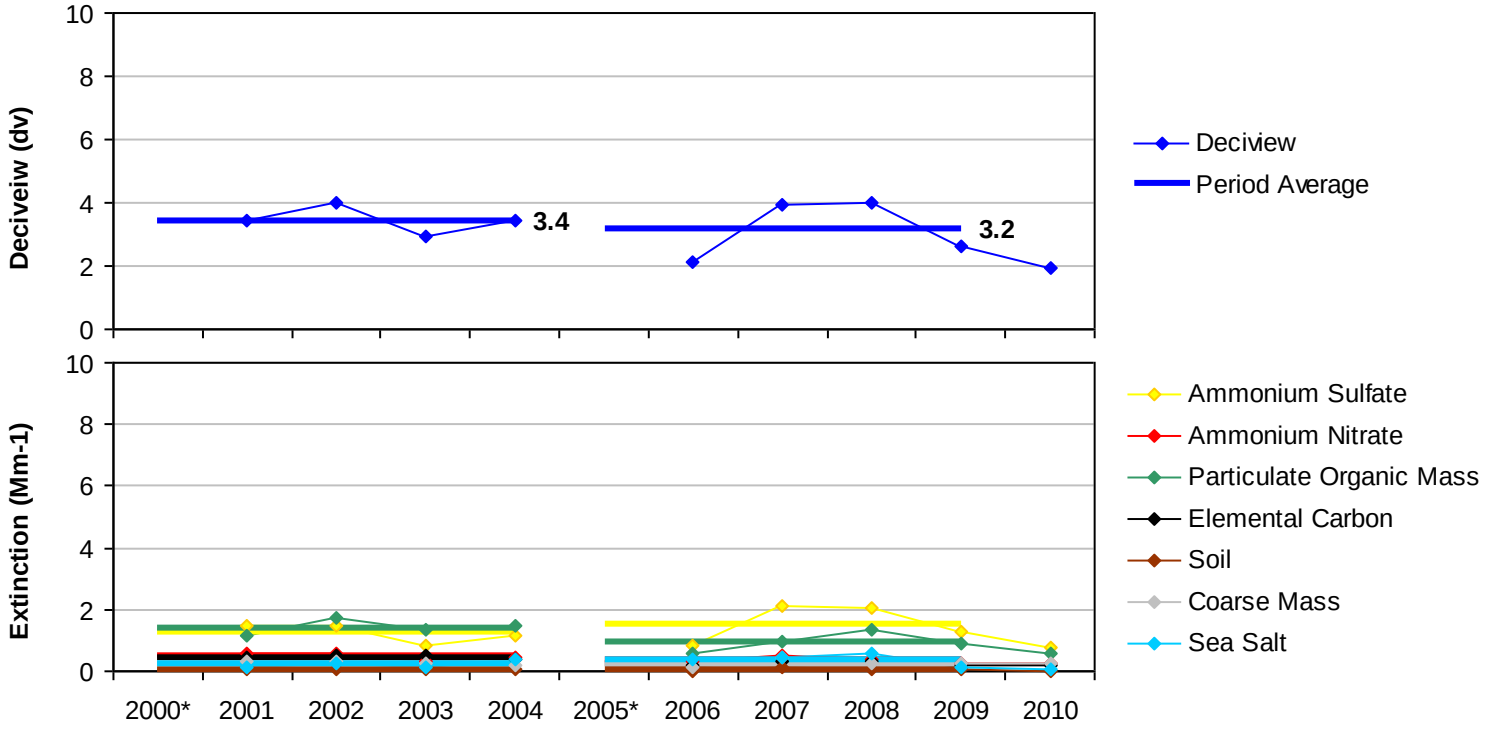
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure C.3-1
Marble Mountain WA and Yolla-Bolly-Middle-Eel WA, CA (TRIN1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure C.3-2
Marble Mountain WA and Yolla-Bolly-Middle-Eel WA, CA (TRIN1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

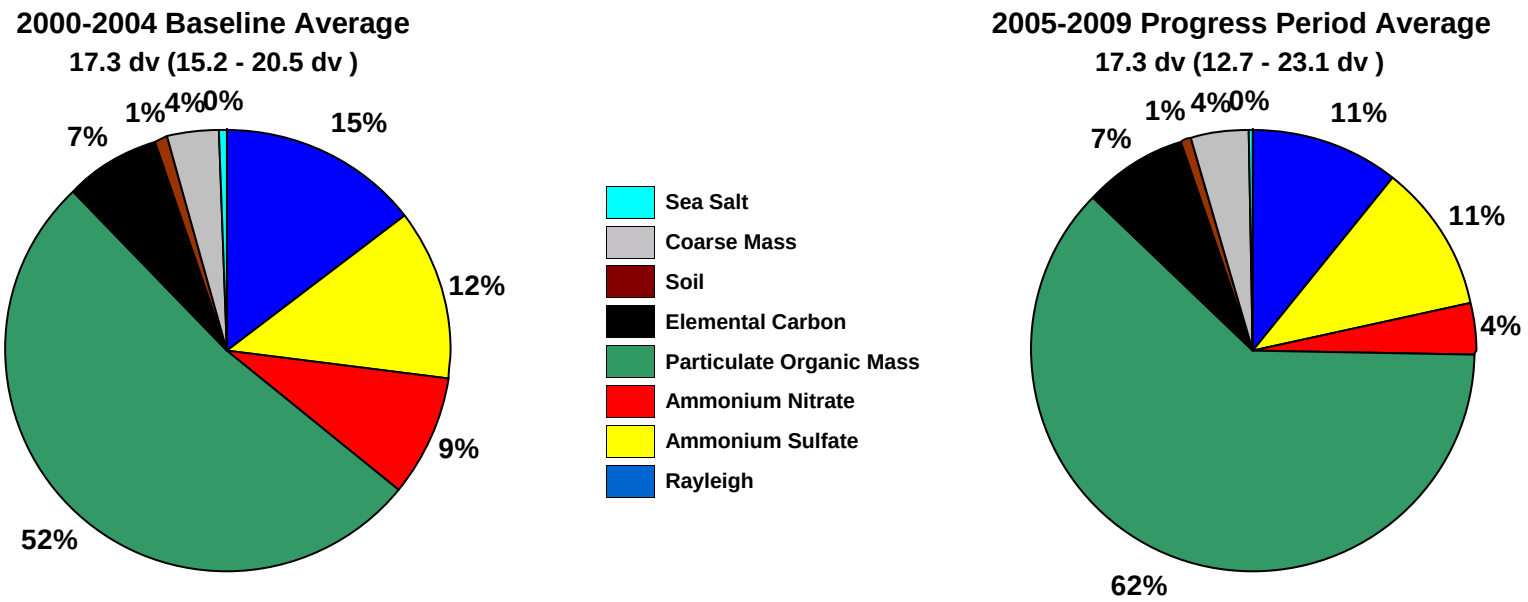


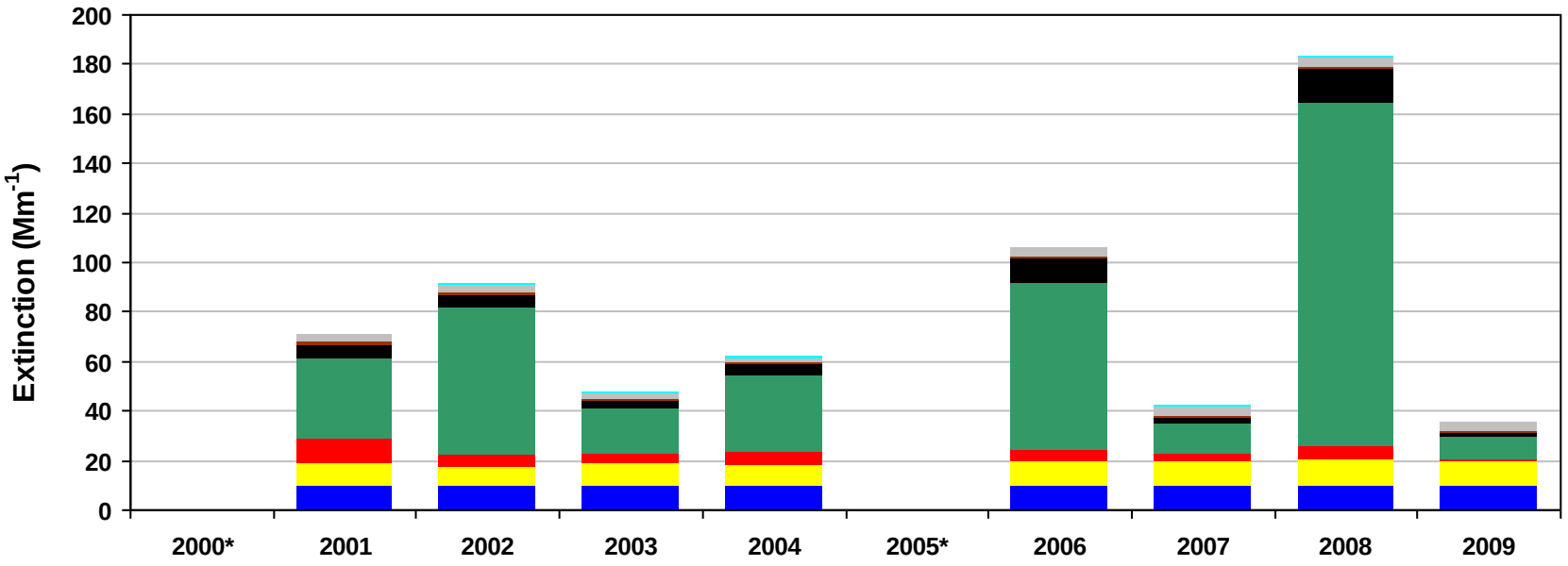
*Missing years did not meet RHR data completeness criteria.

Figure C.3-3

Marble Mountain WA and Yolla-Bolly-Middle-Eel WA, CA (TRIN1 Site)

20% Most Impaired Visibility Days



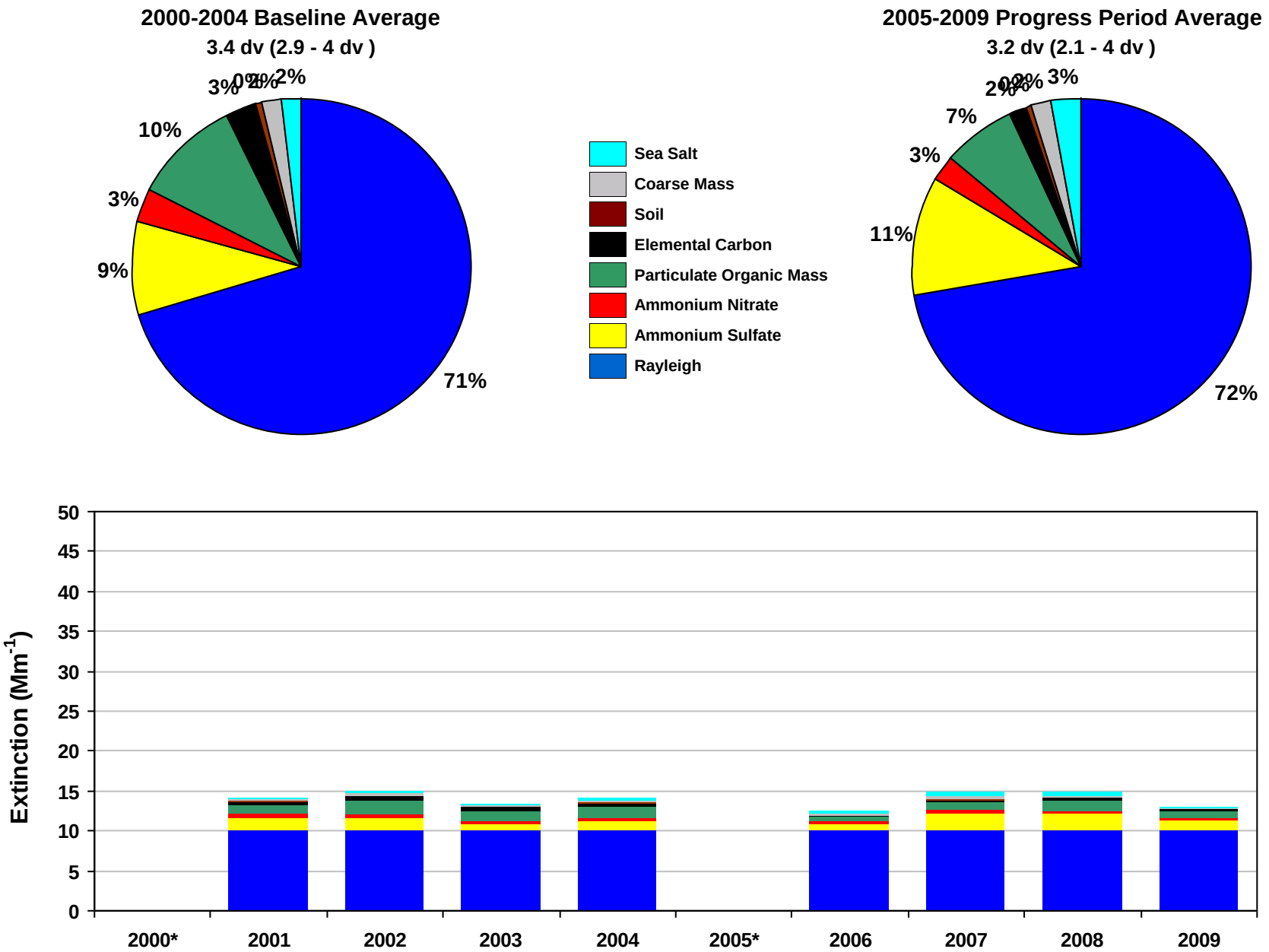


*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure C.3-4

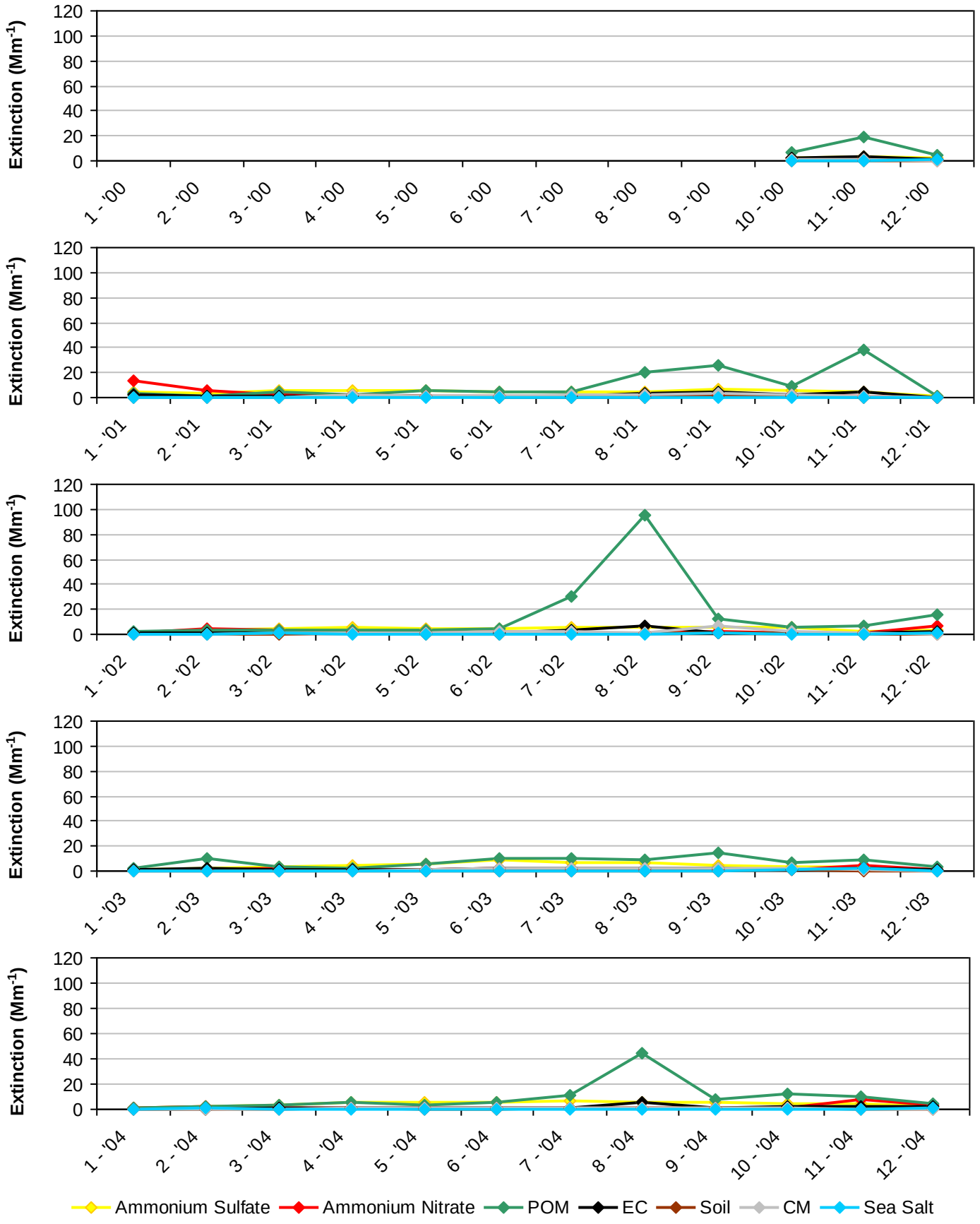
Marble Mountain WA and Yolla-Bolly-Middle-Eel WA, CA (TRIN1 Site)

20% Least Impaired Visibility Days



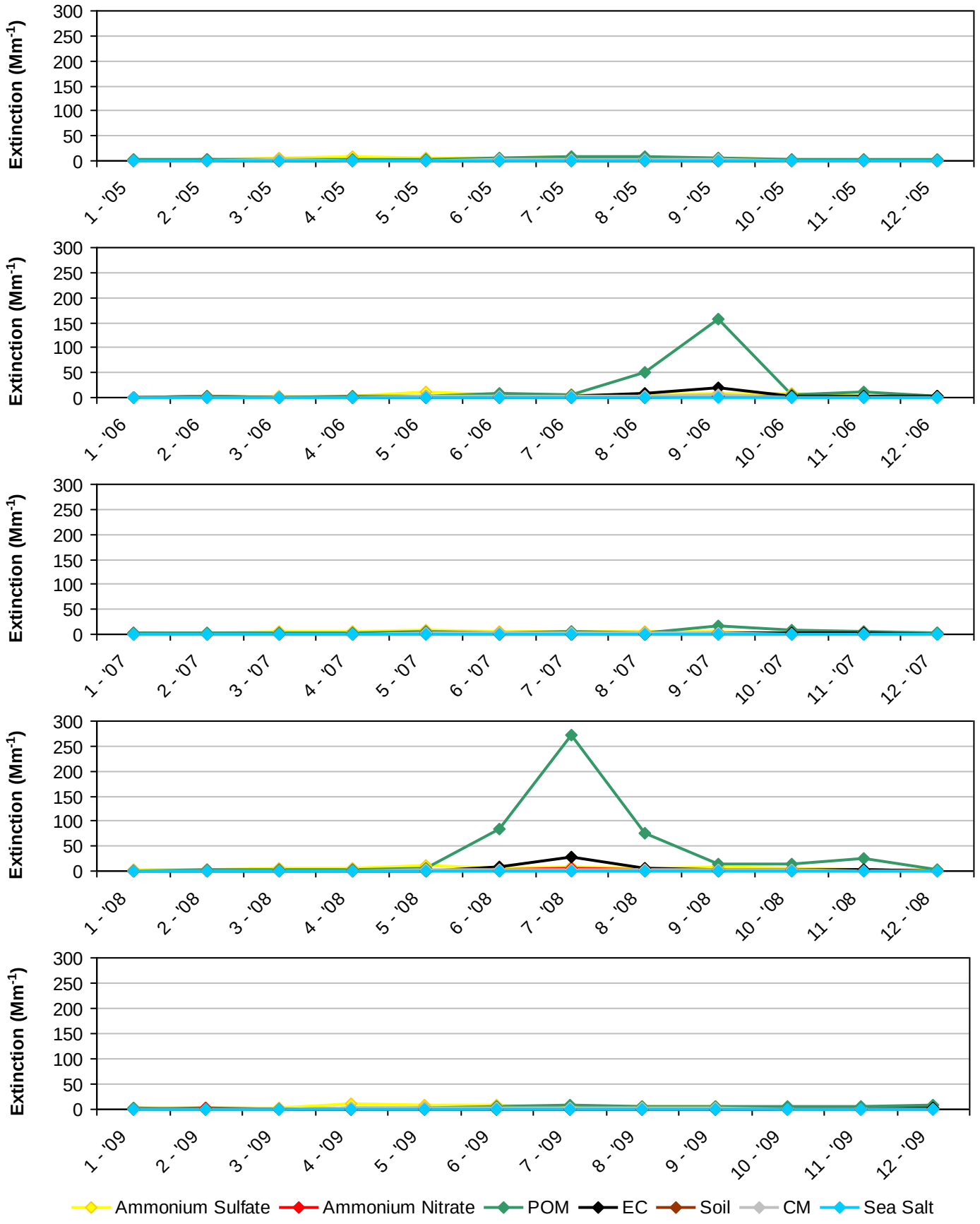
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure C.3-5
Marble Mountain WA and Yolla-Bolly-Middle-Eel WA, CA (TRIN1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



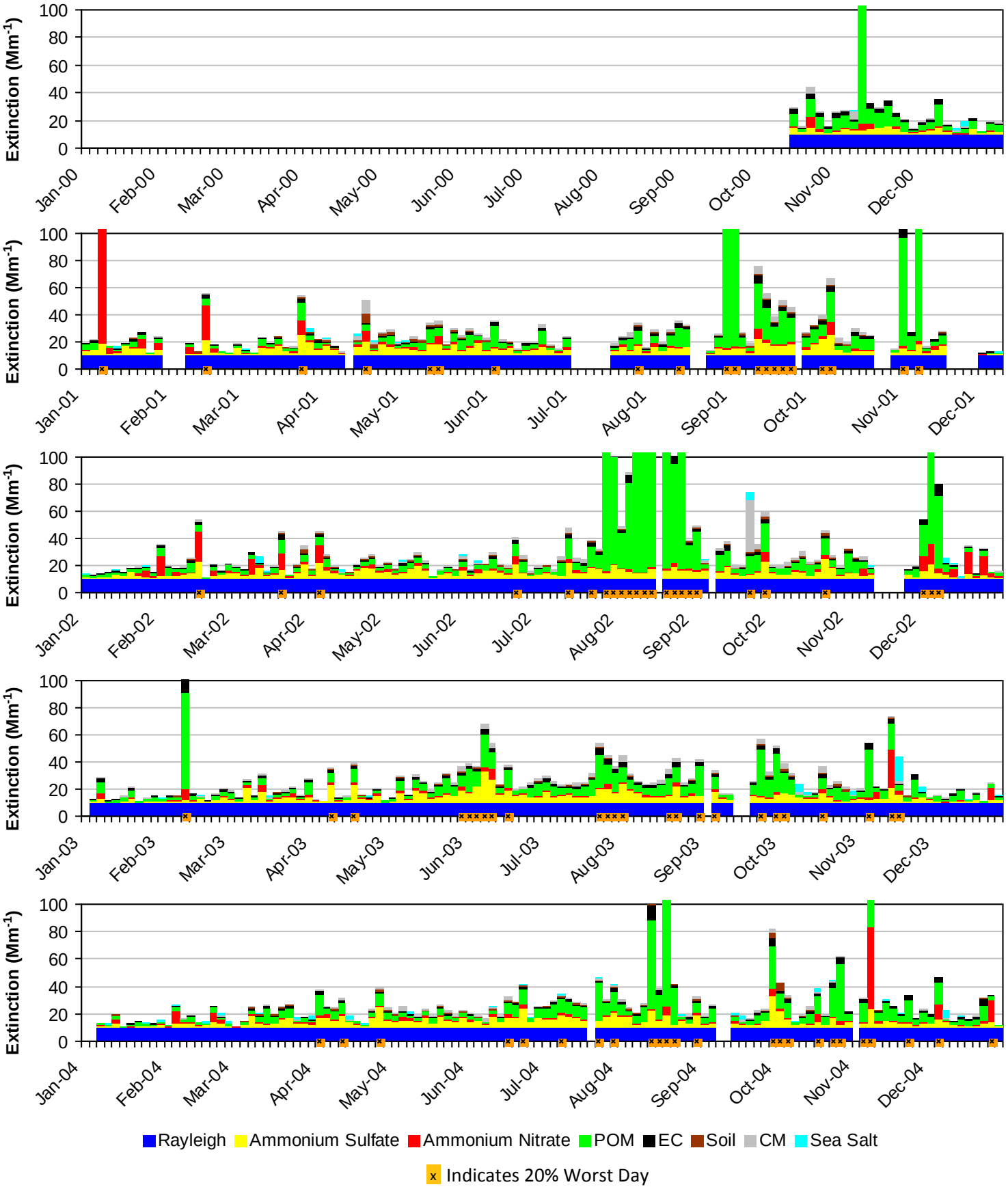
*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure C.3-6
Marble Mountain WA and Yolla-Bolly-Middle-Eel WA, CA (TRIN1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days



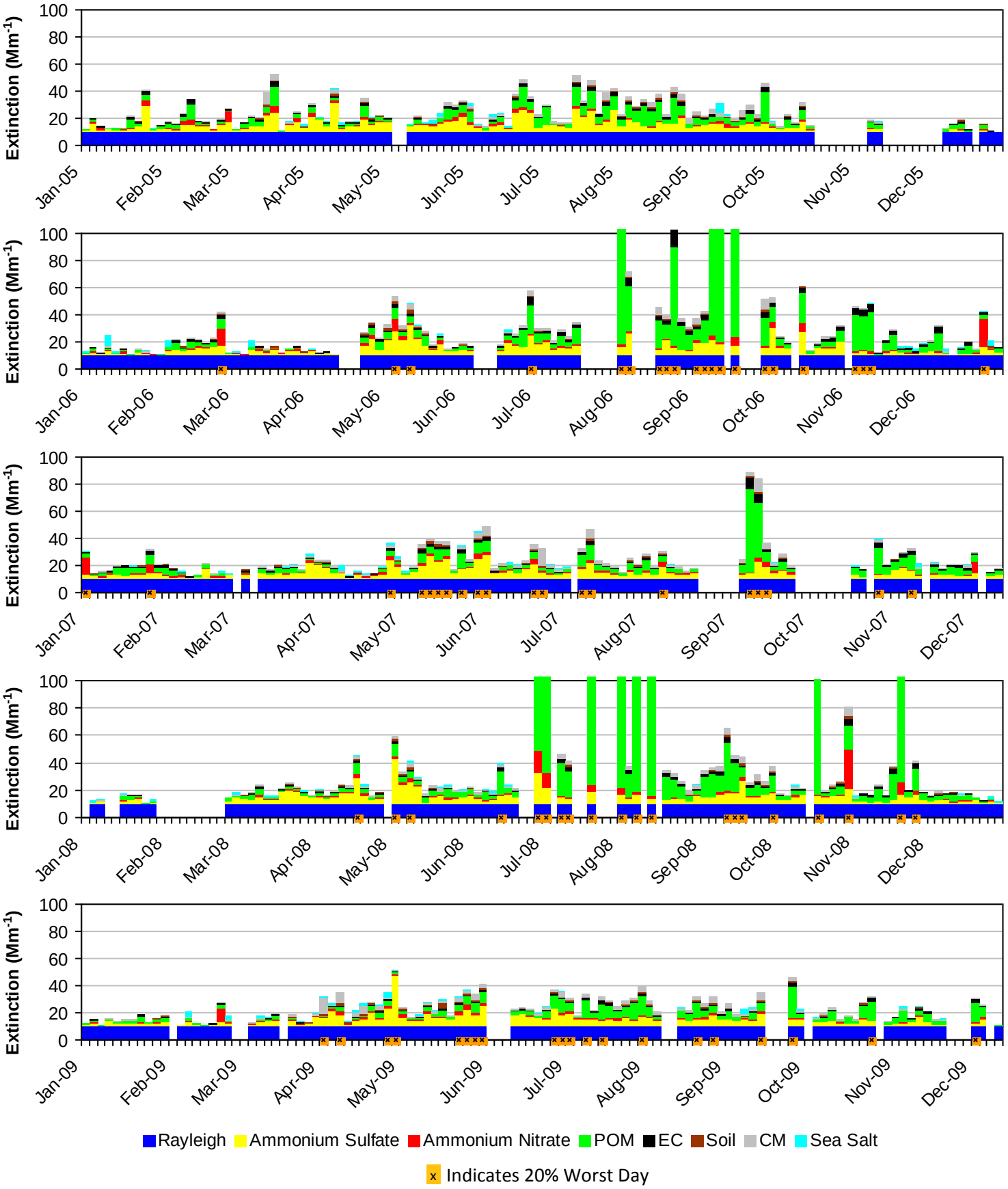
*Note that monthly averages for the year 2005 are shown here, but this year did not meet RHR data completeness criteria.

Figure C.3-7
Marble Mountain WA and Yolla-Bolly-Middle-Eel WA, CA (TRIN1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure C.3-8
Marble Mountain WA and Yolla-Bolly-Middle-Eel WA, CA (TRIN1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2005 are shown here, but this year did not meet RHR data completeness criteria.

C.4. DESOLATION WA AND MOKELUMNE WA (BLIS1)

The following tables and figures are presented in this section for the Desolation WA and Mokelumne WA represented by the BLIS1 IMPROVE Monitor:

- **Table C.4-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure C.4-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.4-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.4-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure C.4-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure C.4-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure C.4-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure C.4-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

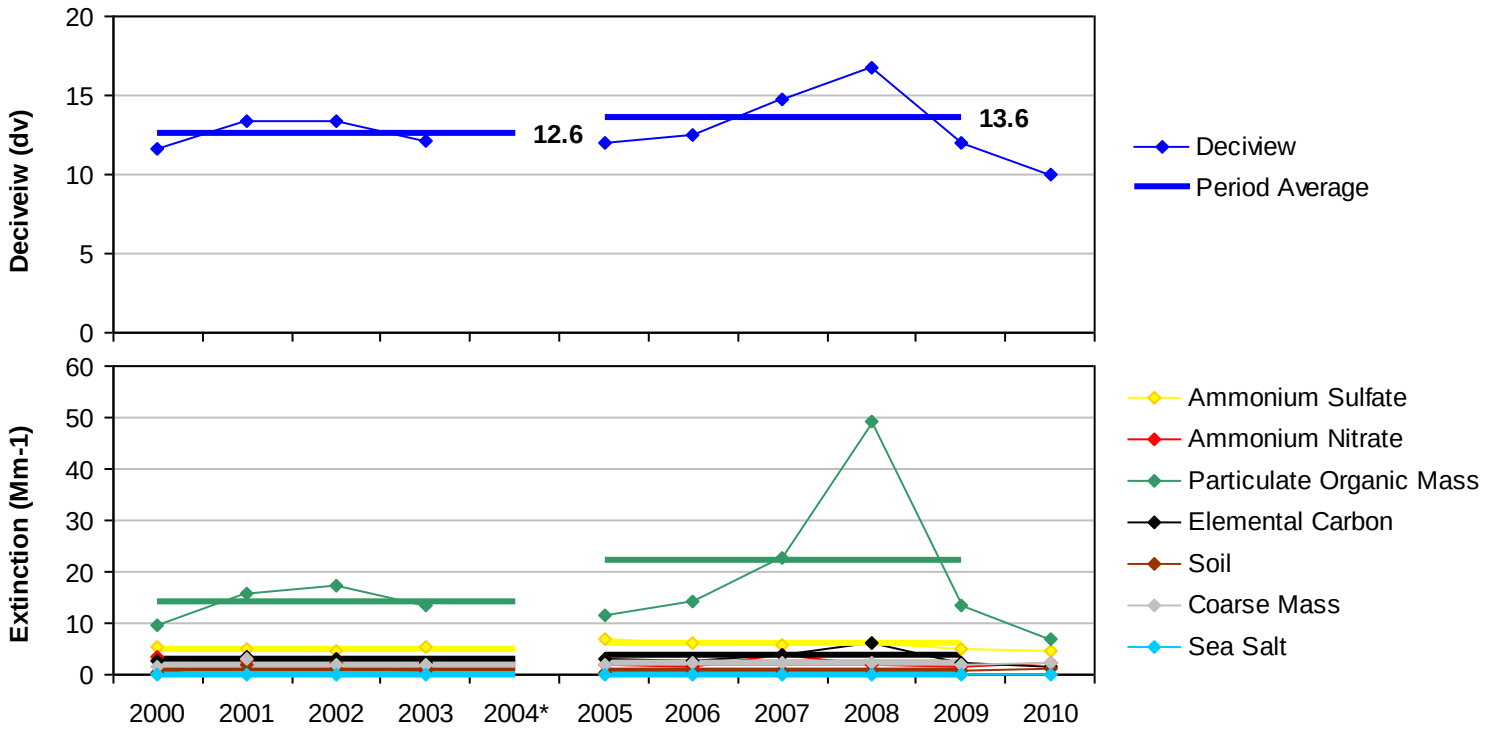
- **Figure C.4-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table C.4-1
Desolation WA and Mokelumne WA, CA (BLIS1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	3.5	2.3	2.2	2.1	---	2.1	2.0	2.7	2.2	1.9	1.6	-0.1	0.0	2.5	2.2	-0.3	-12%
Worst 20% Days	11.6	13.4	13.4	12.2	---	12.0	12.5	14.8	16.8	12.0	10.0	0.1	0.2	12.6	13.6	1.0	8%
All Days	7.9	7.3	7.6	6.7	---	7.0	7.2	7.7	8.4	6.9	5.5	0.0	0.5	7.4	7.4	0.0	0%
Total Extinction (Mm-1)																	
Best 20% Days	14.3	12.7	12.5	12.4	---	12.4	12.3	13.1	12.5	12.1	11.7	-0.1	0.0	13.0	12.5	-0.5	-4%
Worst 20% Days	32.1	41.0	39.3	34.1	---	34.5	37.3	48.1	76.2	34.2	27.7	0.8	0.2	36.6	46.1	9.5	26%
All Days	22.9	22.9	23.2	21.0	---	21.5	22.5	24.7	30.9	21.3	18.3	0.1	0.4	22.5	24.2	1.7	8%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	1.6	1.2	1.2	1.1	---	1.4	1.4	1.5	1.2	1.1	0.9	0.0	0.2	1.3	1.3	0.0	0%
Worst 20% Days	5.3	4.9	4.6	5.5	---	6.9	6.3	5.8	6.3	4.9	4.5	0.1	0.3	5.1	6.0	0.9	18%
All Days	3.5	3.3	3.0	2.9	---	3.9	3.7	3.5	3.7	3.3	2.7	0.0	0.3	3.2	3.6	0.4	13%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.7	0.6	0.4	0.4	---	0.4	0.3	0.5	0.3	0.3	0.3	0.0	0.0	0.5	0.4	-0.1	-20%
Worst 20% Days	3.6	2.7	2.2	1.1	---	1.8	1.4	3.7	2.1	1.7	2.3	-0.1	0.2	2.4	2.1	-0.3	-13%
All Days	1.8	1.5	1.4	1.0	---	1.2	1.0	1.5	1.2	1.0	0.9	-0.1	0.0	1.4	1.2	-0.2	-14%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.7	0.8	0.9	1.1	---	0.9	0.7	1.1	1.0	0.8	0.7	0.0	0.2	1.1	0.9	-0.2	-18%
Worst 20% Days	9.5	15.8	17.4	13.6	---	11.3	14.4	22.7	49.2	13.5	7.0	0.9	0.2	14.1	22.3	8.2	58%
All Days	5.4	5.4	6.4	5.5	---	4.4	5.6	7.0	12.9	5.1	3.1	0.1	0.2	5.7	7.0	1.3	23%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.6	0.5	0.4	0.4	---	0.3	0.3	0.3	0.2	0.3	0.2	0.0	0.0	0.5	0.3	-0.2	-40%
Worst 20% Days	2.8	3.5	3.3	2.4	---	3.1	2.8	3.9	6.3	2.4	1.6	0.0	0.5	3.0	3.7	0.7	23%
All Days	1.8	1.6	1.6	1.3	---	1.5	1.4	1.6	2.0	1.1	0.8	0.0	0.2	1.5	1.5	0.0	0%
Soil Extinction (Mm-1)																	
Best 20% Days	0.1	0.1	0.1	0.1	---	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.3	0.1	0.1	0.0	0%
Worst 20% Days	0.5	1.9	1.0	0.6	---	0.5	0.9	0.8	0.9	0.7	1.1	0.0	0.5	1.0	0.8	-0.2	-20%
All Days	0.4	0.7	0.5	0.3	---	0.3	0.5	0.5	0.5	0.5	0.5	0.0	0.4	0.5	0.4	-0.1	-20%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	0.4	0.3	0.4	0.3	---	0.3	0.4	0.5	0.5	0.4	0.5	0.0	0.1	0.4	0.4	0.0	0%
Worst 20% Days	1.5	3.2	1.9	1.8	---	1.9	2.4	2.2	2.3	2.0	2.1	0.0	0.2	2.1	2.1	0.0	0%
All Days	1.0	1.3	1.3	1.0	---	1.1	1.3	1.5	1.5	1.3	1.3	0.0	0.1	1.1	1.3	0.2	18%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.2	0.2	0.1	0.0	---	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.5	0.1	0.1	0.0	0%
Worst 20% Days	0.0	0.0	0.0	0.1	---	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0%
All Days	0.1	0.1	0.1	0.0	---	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.4	0.1	0.1	0.0	0%

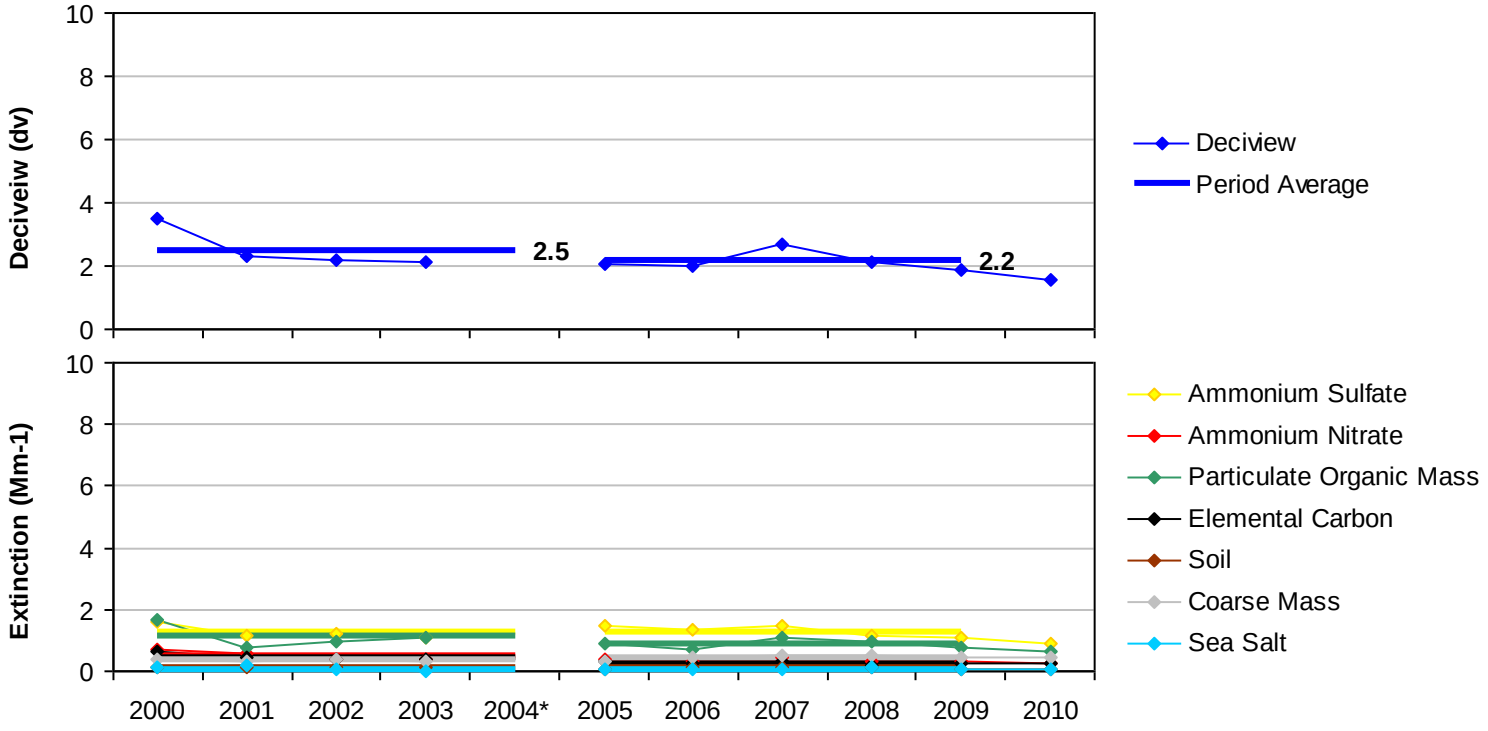
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure C.4-1
Desolation WA and Mokelumne WA, CA (BLIS1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure C.4-2
Desolation WA and Mokelumne WA, CA (BLIS1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

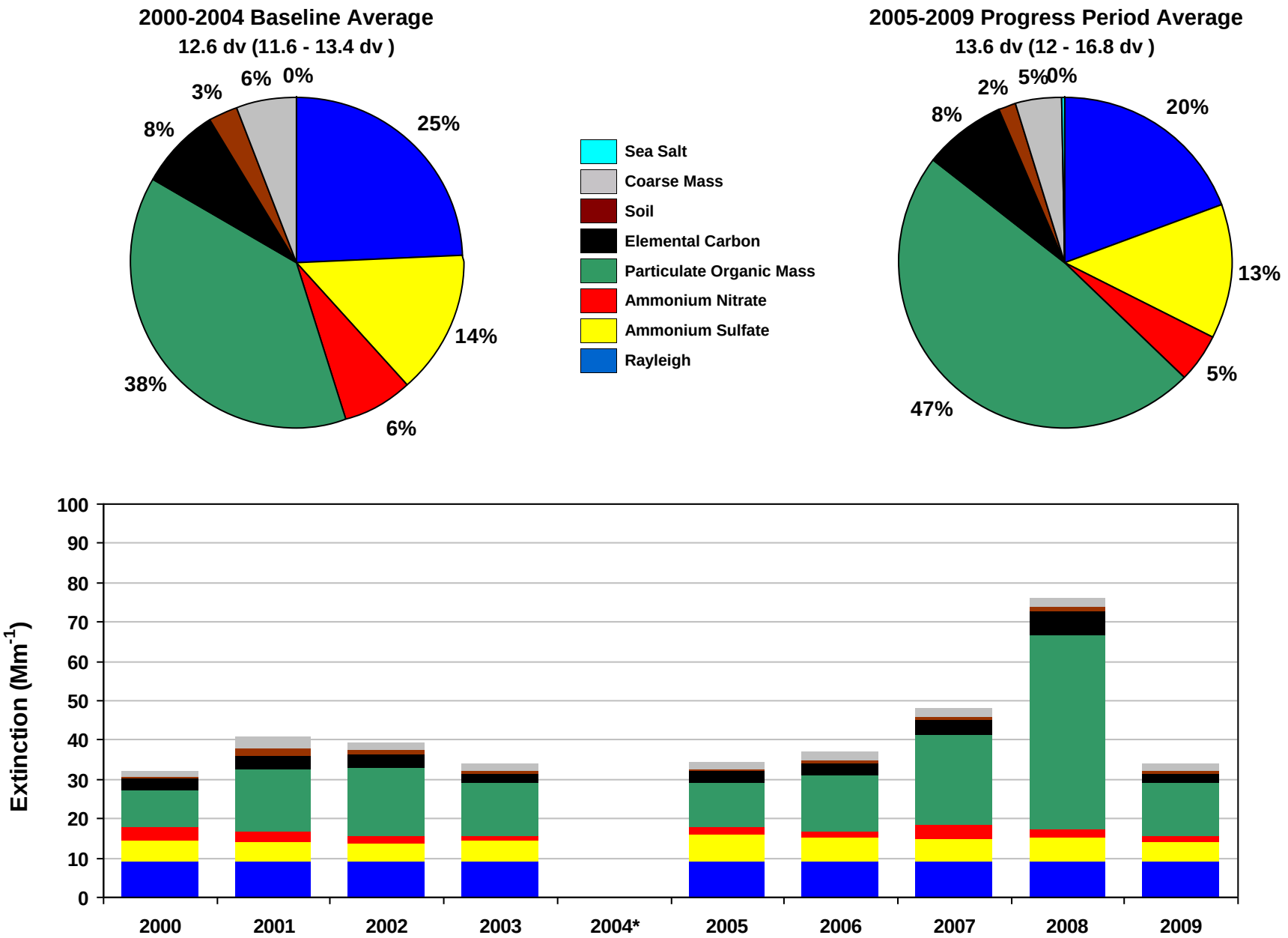


*Missing years did not meet RHR data completeness criteria.

Figure C.4-3

Desolation WA and Mokelumne WA, CA (BLIS1 Site)

20% Most Impaired Visibility Days

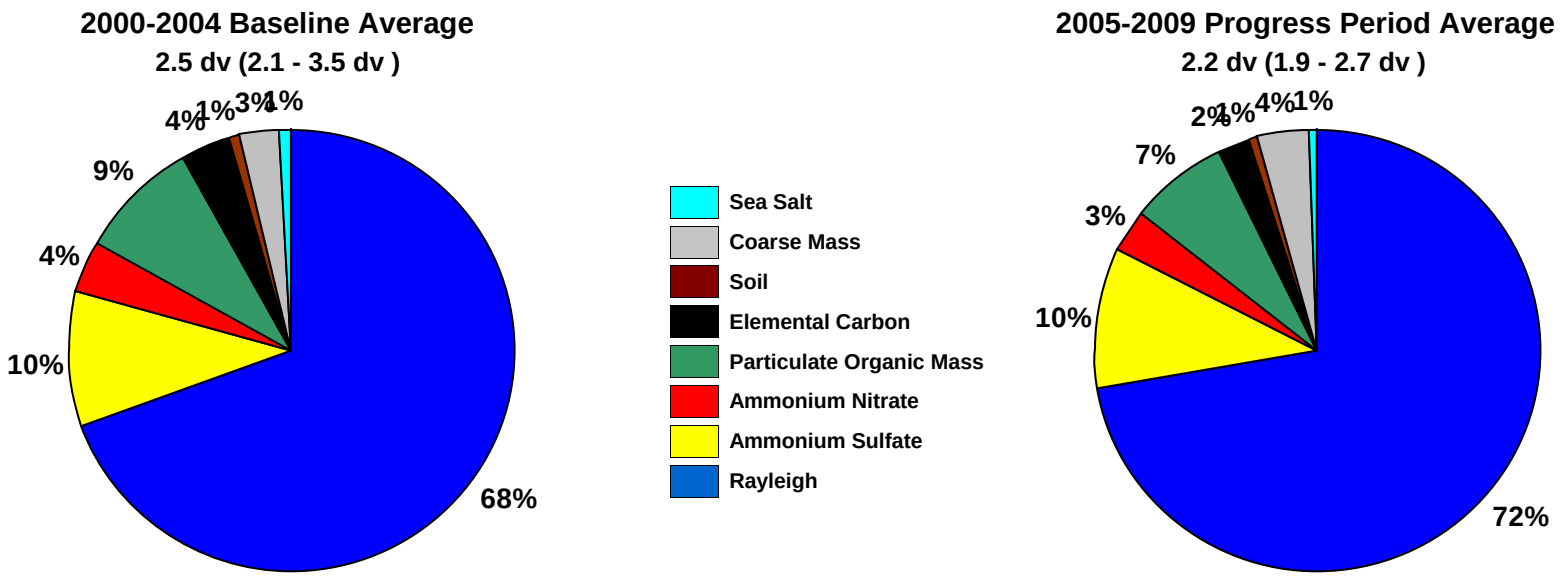


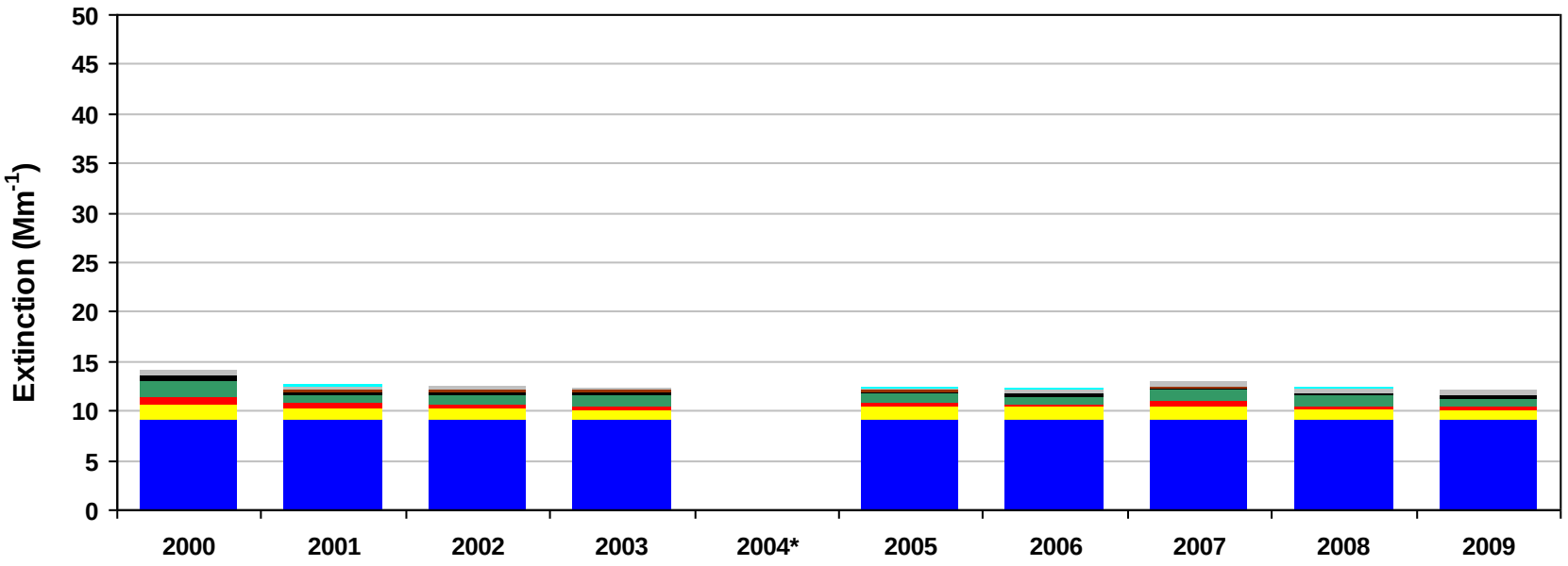
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure C.4-4

Desolation WA and Mokelumne WA, CA (BLIS1 Site)

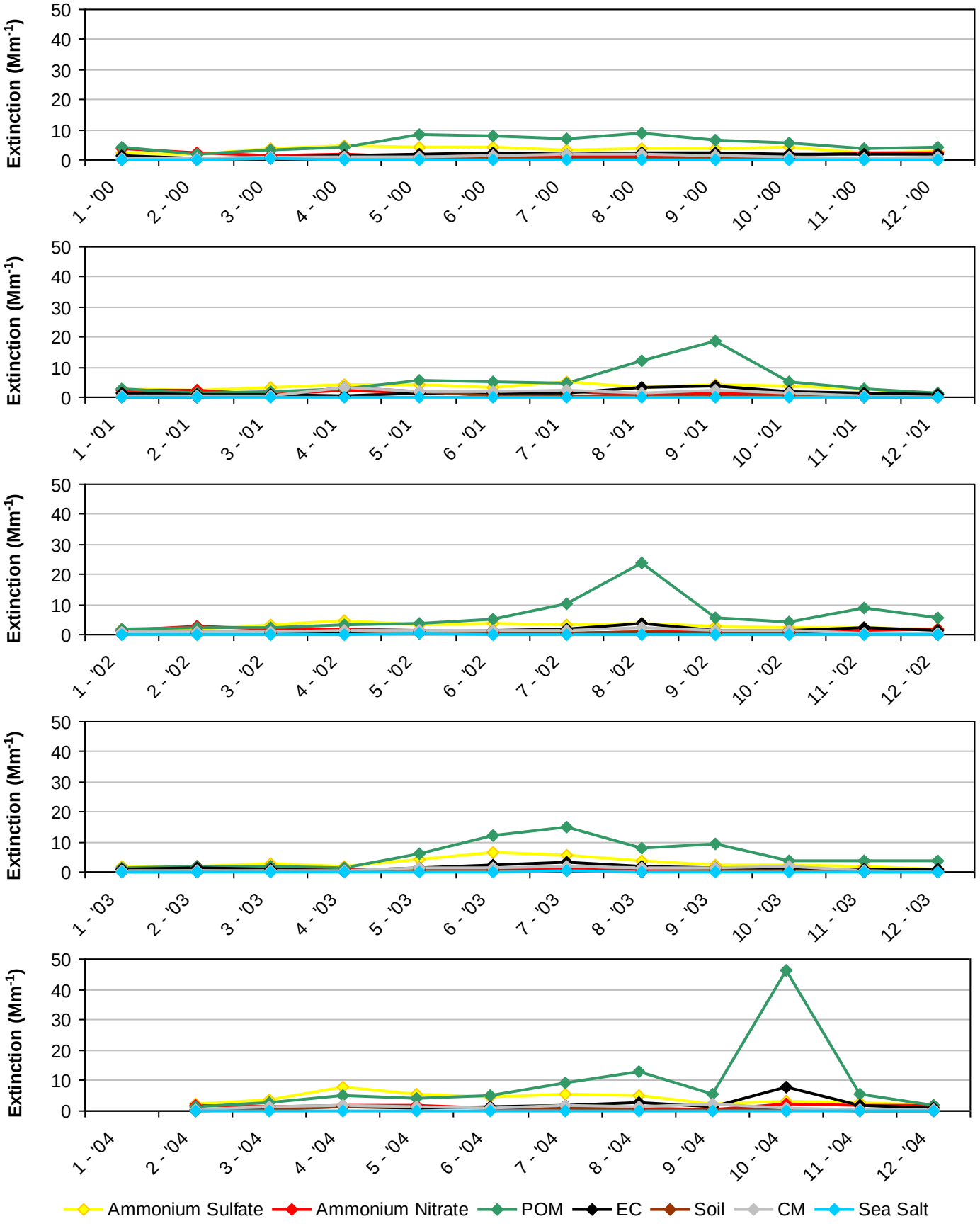
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure C.4-5
Desolation WA and Mokelumne WA, CA (BLIS1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2004 are shown here, but this year did not meet RHR data completeness criteria.

Figure C.4-6
Desolation WA and Mokelumne WA, CA (BLIS1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

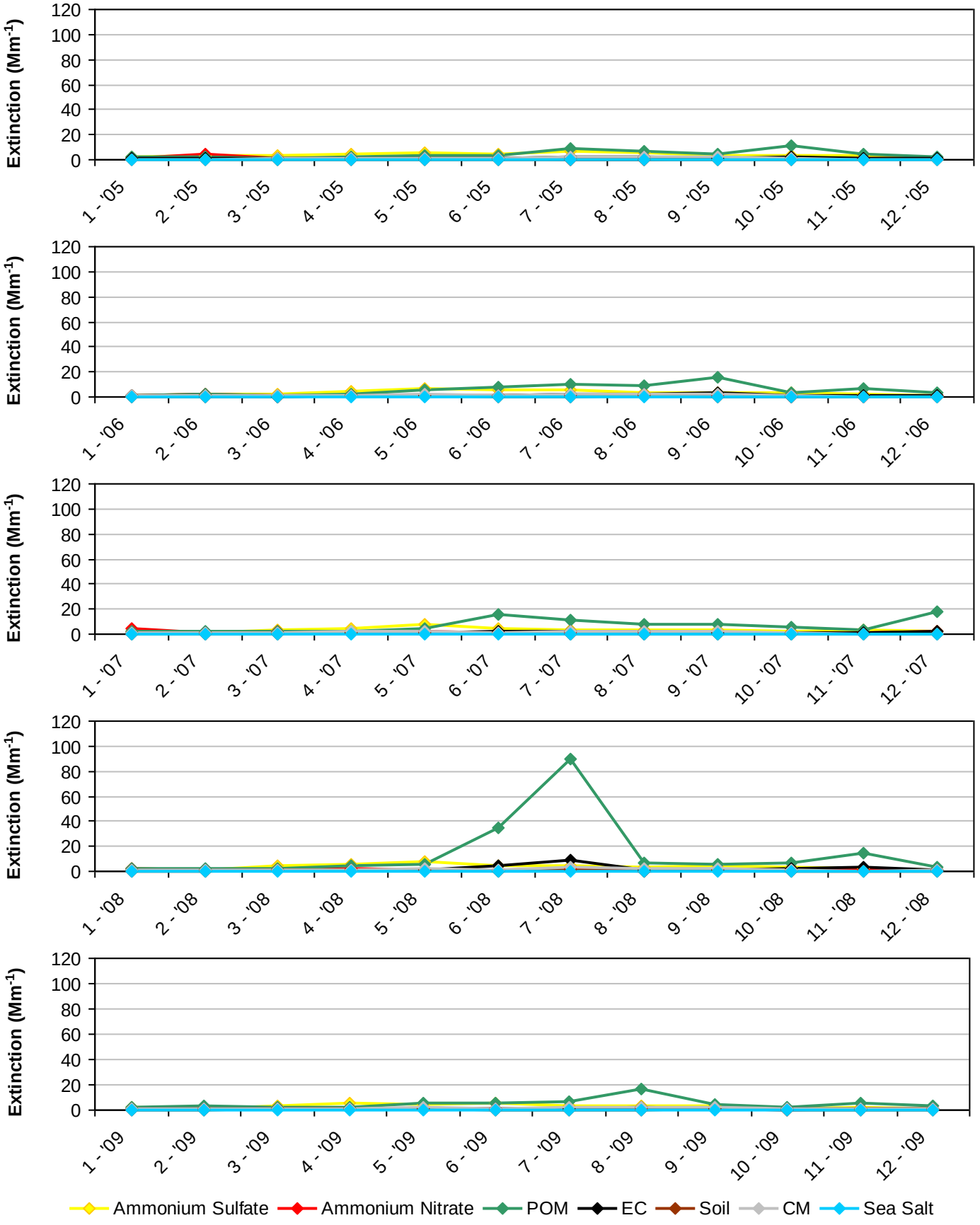
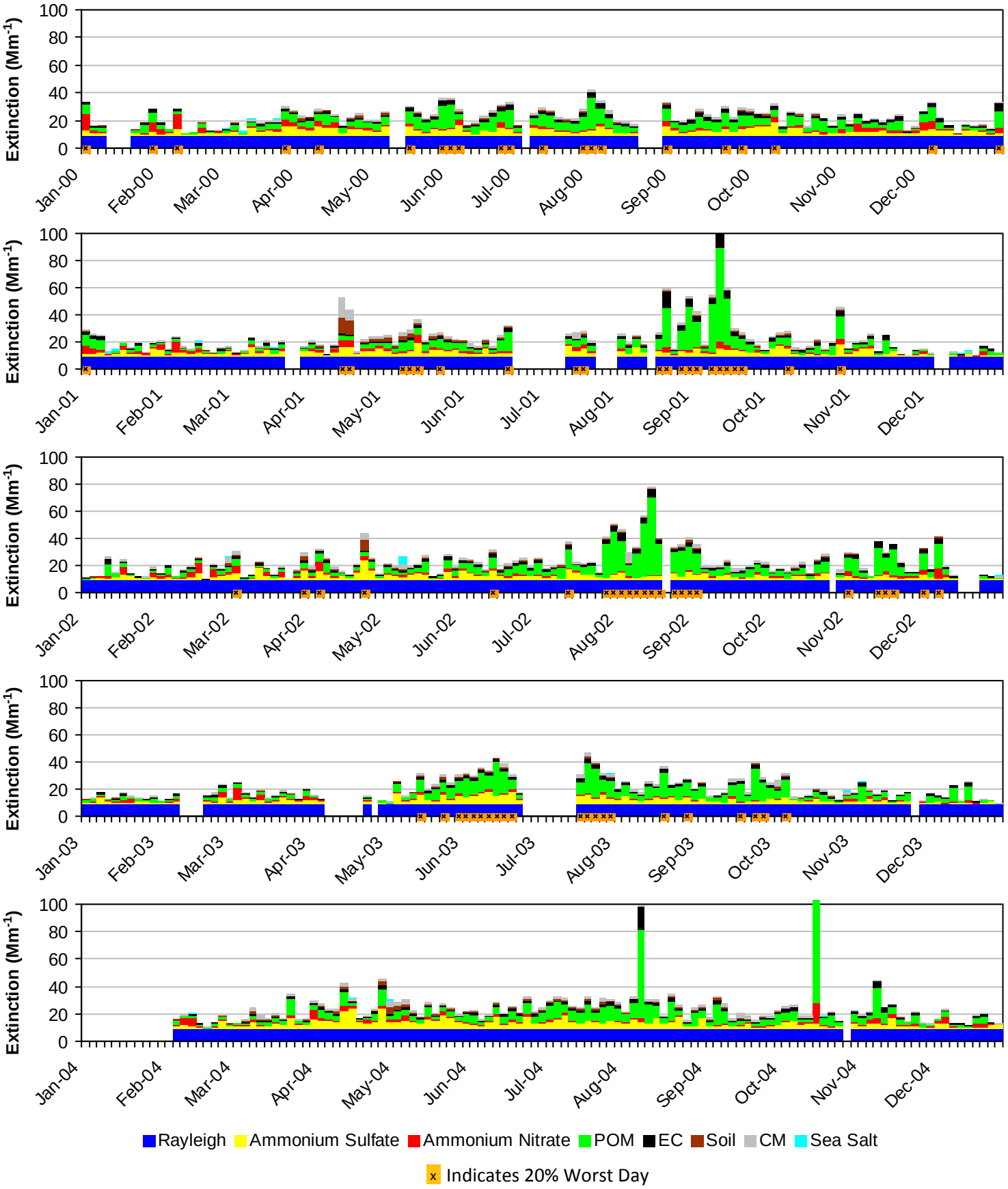
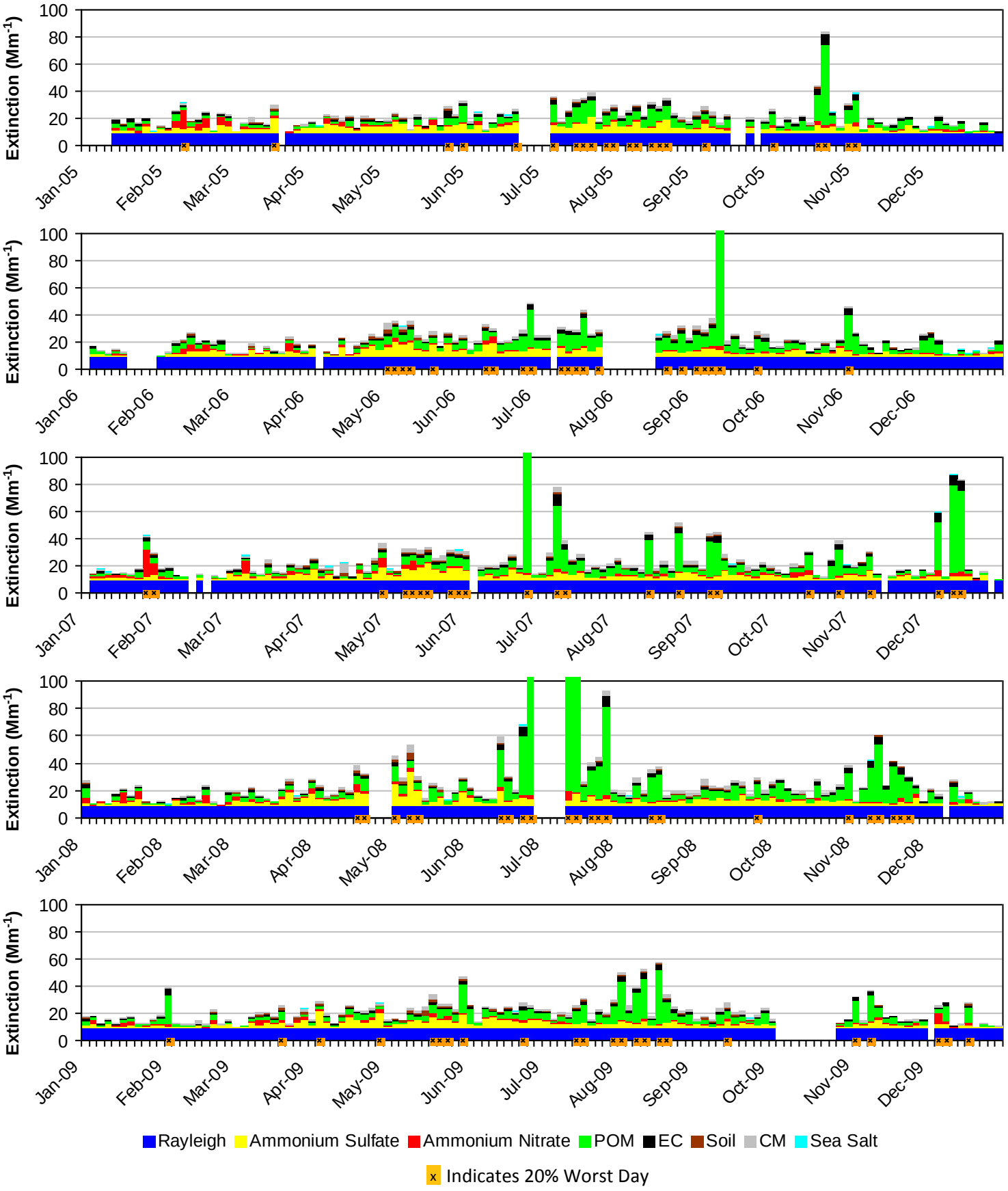


Figure C.4-7
Desolation WA and Mokelumne WA, CA (BLIS1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2004 are shown here, but this year did not meet RHR data completeness criteria.

Figure C.4-8
Desolation WA and Mokelumne WA, CA (BLIS1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



C.5. DOME LAND WA (DOME1)

The following tables and figures are presented in this section for the Dome Land WA represented by the DOME1 IMPROVE Monitor:

- **Table C.5-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure C.5-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.5-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.5-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure C.5-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure C.5-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure C.5-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure C.5-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

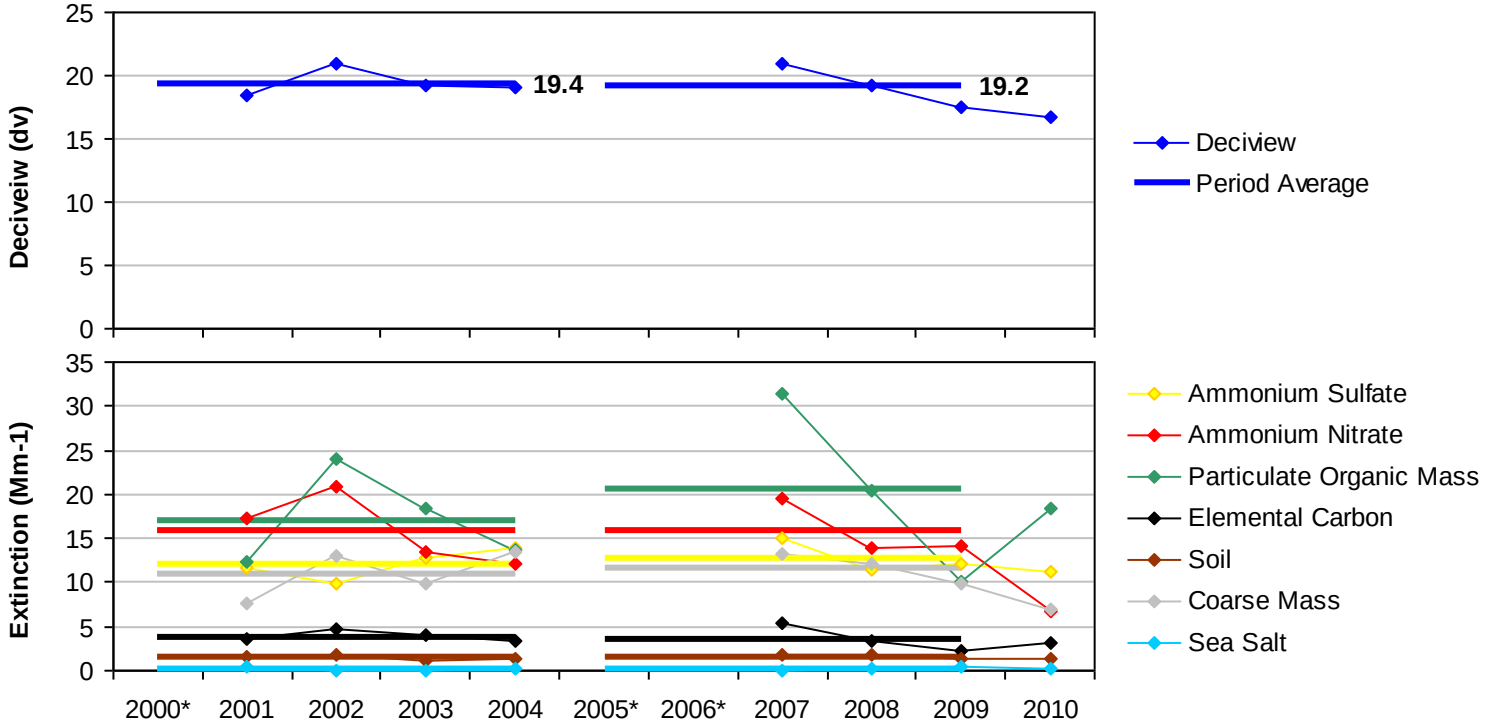
- **Figure C.5-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table C.5-1
Dome Land WA, CA (DOME1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	5.6	4.5	5.7	4.4	---	---	5.7	4.9	4.8	3.9	0.0	0.4	5.1	5.1	0.0	0%
Worst 20% Days	---	18.4	21.0	19.3	19.1	---	---	20.9	19.3	17.6	16.7	-0.1	0.3	19.4	19.2	-0.2	-1%
All Days	---	12.0	12.8	12.8	12.4	---	---	13.2	12.2	11.4	10.2	-0.1	0.3	12.5	12.3	-0.2	-2%
Total Extinction (Mm-1)																	
Best 20% Days	---	17.6	15.8	17.9	15.7	---	---	17.8	16.4	16.2	14.8	-0.1	0.4	16.7	16.8	0.1	1%
Worst 20% Days	---	64.2	84.4	69.9	68.1	---	---	96.7	73.1	60.2	58.3	-0.5	0.5	71.7	76.7	5.0	7%
All Days	---	37.0	43.2	40.2	39.7	---	---	46.2	39.4	35.2	31.9	-0.2	0.3	40.0	40.2	0.2	1%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	2.1	1.6	1.9	1.5	---	---	2.0	1.5	1.5	1.2	-0.1	0.0	1.8	1.6	-0.2	-11%
Worst 20% Days	---	11.7	9.8	12.8	13.8	---	---	15.0	11.4	12.0	11.3	0.3	0.3	12.0	12.8	0.8	7%
All Days	---	7.1	6.3	6.8	7.3	---	---	7.5	6.6	6.2	5.6	-0.1	0.4	6.9	6.8	-0.1	-1%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	1.2	0.7	1.3	0.6	---	---	1.2	1.0	0.7	0.4	0.0	0.3	0.9	0.9	0.0	0%
Worst 20% Days	---	17.2	20.9	13.5	12.1	---	---	19.6	13.9	14.1	6.8	-0.4	0.4	15.9	15.8	-0.1	-1%
All Days	---	6.5	8.1	6.4	5.6	---	---	8.1	5.5	4.6	3.2	-0.2	0.0	6.7	6.1	-0.6	-9%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	2.4	1.5	2.3	1.8	---	---	1.8	2.0	1.7	1.7	-0.1	0.3	2.0	1.8	-0.2	-10%
Worst 20% Days	---	12.3	24.0	18.5	13.7	---	---	31.4	20.5	10.2	18.5	-0.3	0.5	17.1	20.7	3.6	21%
All Days	---	6.7	9.4	8.9	7.2	---	---	10.8	8.2	5.8	6.9	-0.1	0.4	8.0	8.3	0.3	4%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	1.0	0.9	0.9	0.6	---	---	0.7	0.7	0.8	0.6	0.0	0.1	0.8	0.7	-0.1	-13%
Worst 20% Days	---	3.5	4.7	4.1	3.4	---	---	5.4	3.3	2.4	3.2	-0.1	0.1	3.9	3.7	-0.2	-5%
All Days	---	2.2	2.4	2.4	2.0	---	---	2.4	1.8	1.5	1.5	-0.1	0.1	2.2	1.9	-0.3	-14%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.2	0.2	0.1	---	---	0.3	0.1	0.2	0.1	0.0	0.2	0.1	0.2	0.1	100%
Worst 20% Days	---	1.7	1.9	1.1	1.3	---	---	1.9	1.7	1.4	1.4	0.0	0.5	1.5	1.7	0.2	13%
All Days	---	0.9	1.0	0.6	0.8	---	---	1.0	1.1	1.0	0.8	0.0	0.1	0.8	1.0	0.2	25%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.7	0.8	1.3	0.9	---	---	1.6	0.8	1.3	0.6	0.1	0.1	0.9	1.2	0.3	33%
Worst 20% Days	---	7.5	13.1	9.8	13.6	---	---	13.3	12.0	9.8	6.8	0.1	0.5	11.0	11.7	0.7	6%
All Days	---	3.5	5.9	5.0	6.6	---	---	6.3	6.0	5.8	3.8	0.1	0.3	5.3	6.0	0.7	13%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.1	0.0	0.1	---	---	0.2	0.3	0.1	0.1	0.0	0.1	0.1	0.2	0.1	100%
Worst 20% Days	---	0.4	0.0	0.1	0.2	---	---	0.1	0.2	0.4	0.2	0.0	0.1	0.2	0.2	0.0	0%
All Days	---	0.2	0.1	0.1	0.1	---	---	0.2	0.2	0.2	0.2	0.0	0.0	0.1	0.2	0.1	100%

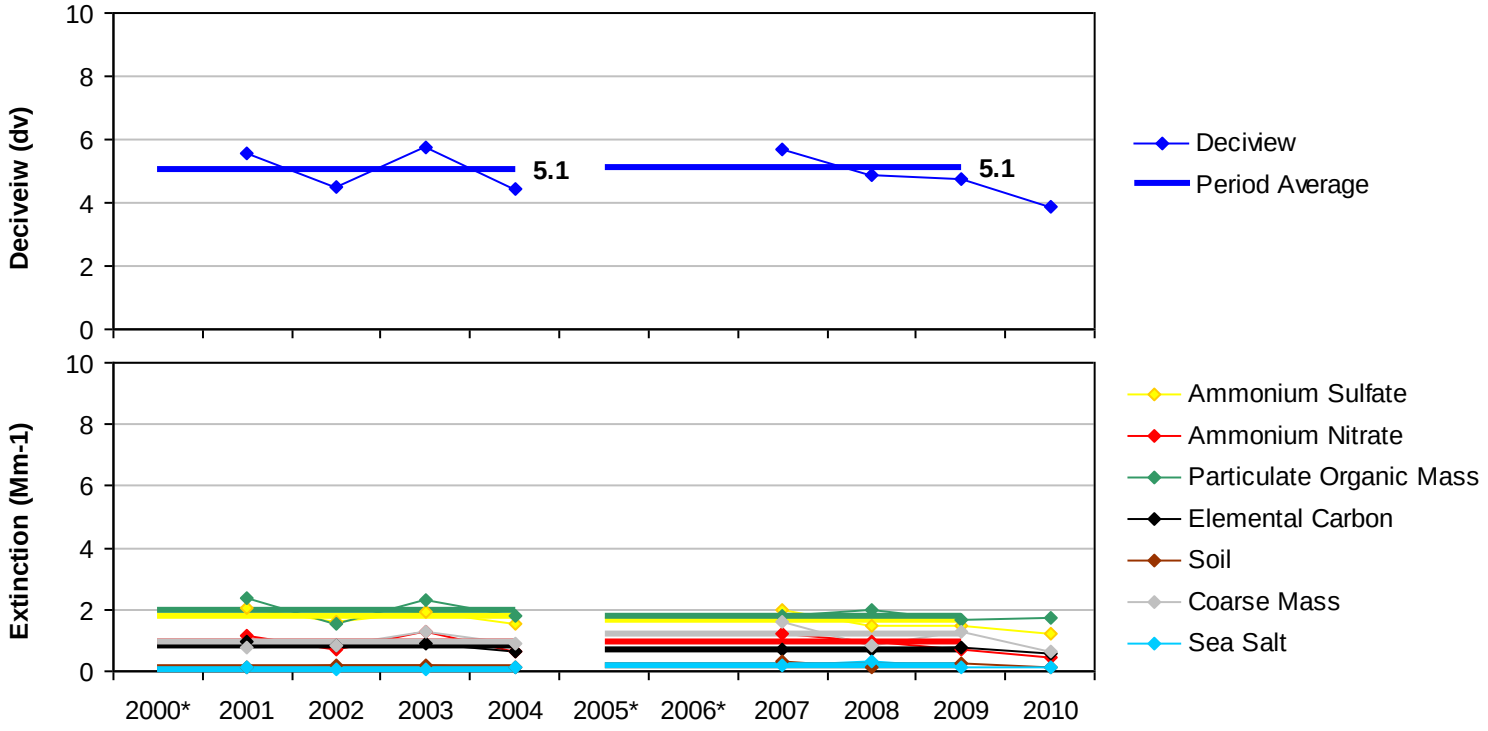
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure C.5-1
Dome Land WA, CA (DOME1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



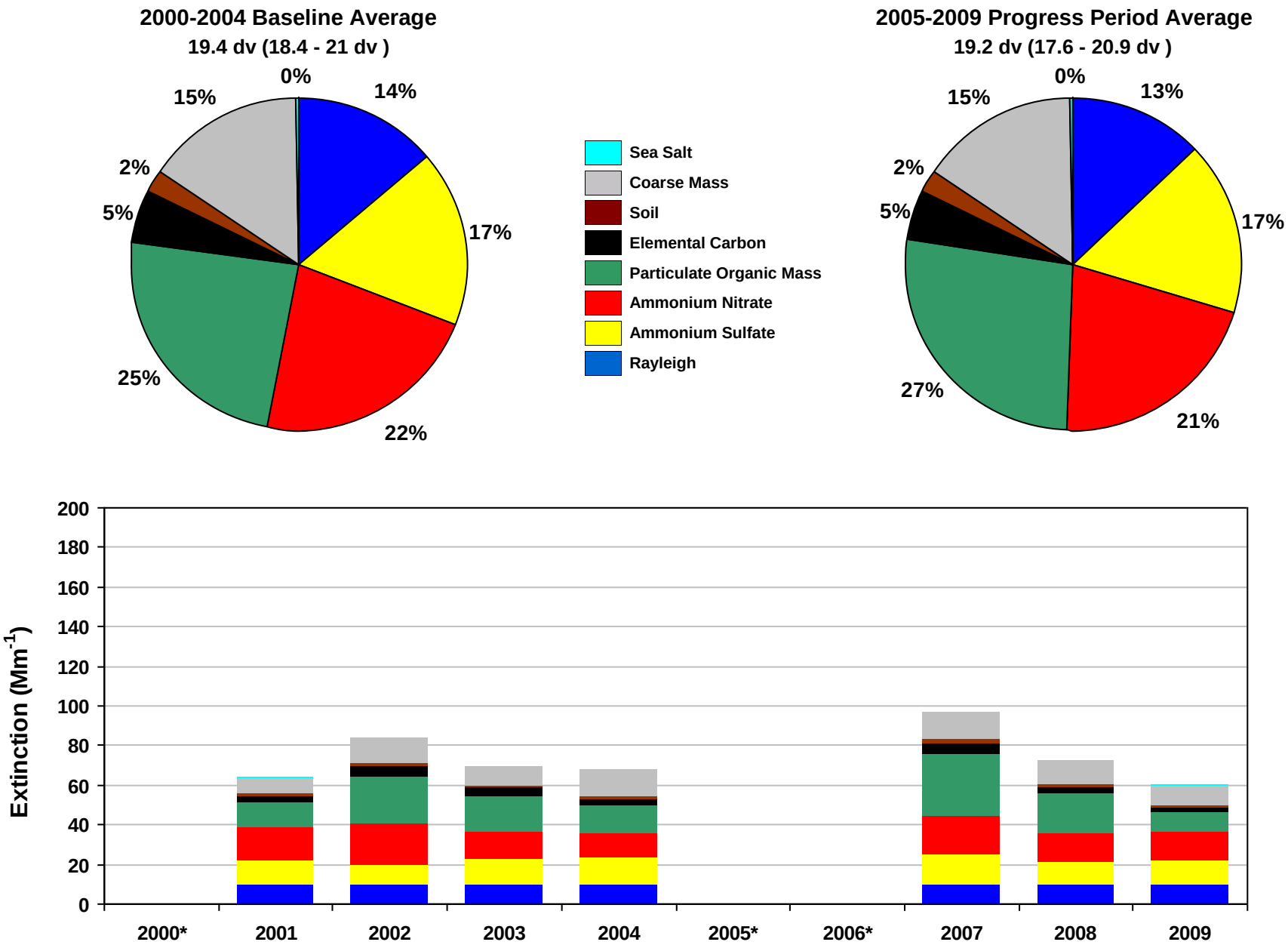
*Missing years did not meet RHR data completeness criteria.

Figure C.5-2
Dome Land WA, CA (DOME1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



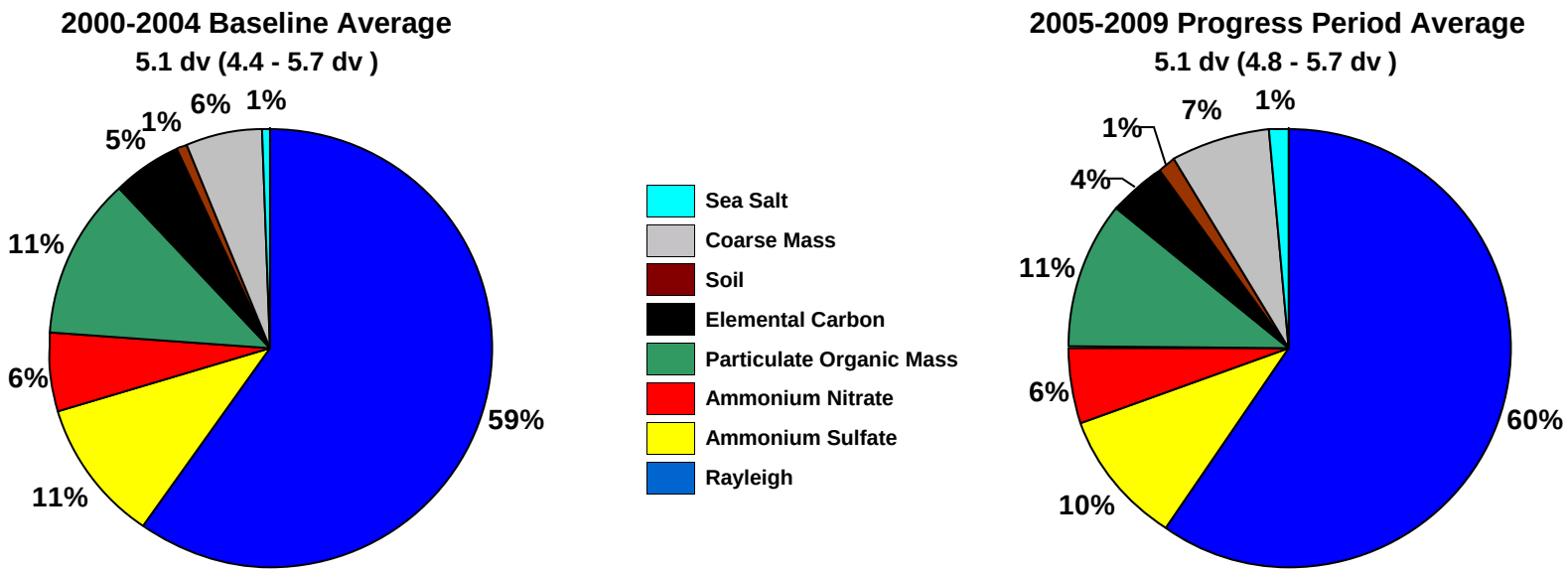
*Missing years did not meet RHR data completeness criteria.

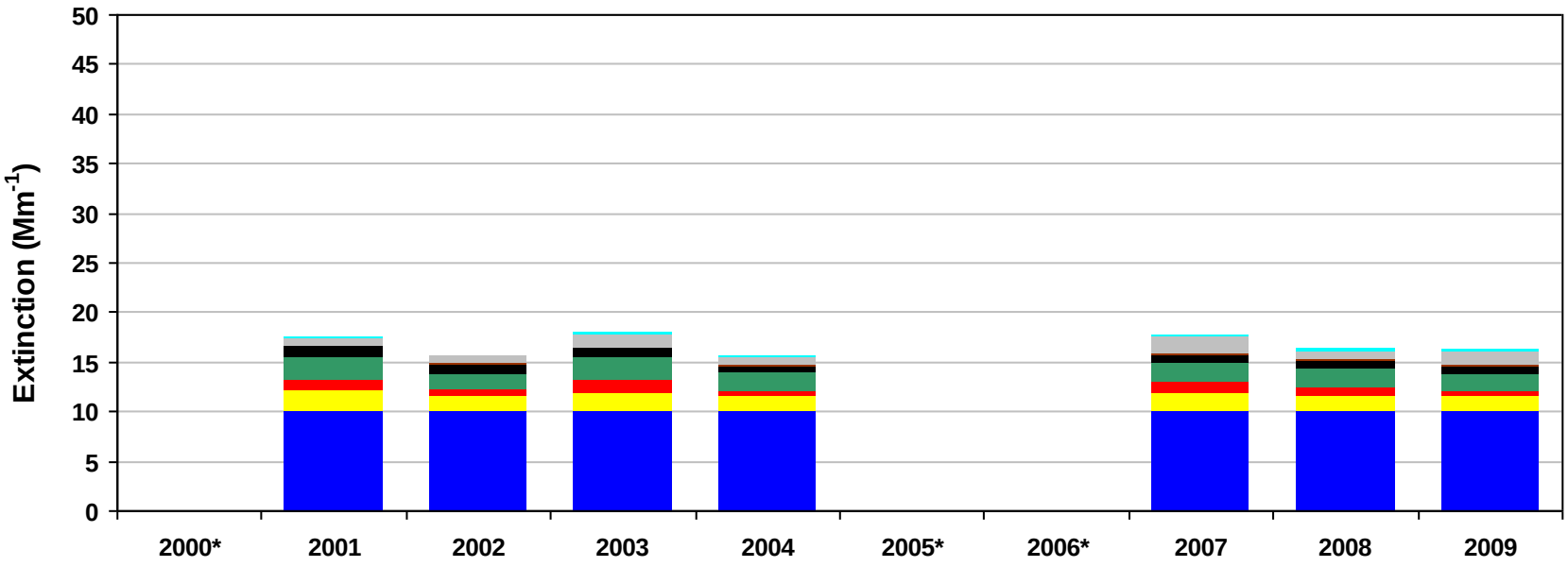
Figure C.5-3
Dome Land WA, CA (DOME1 Site)
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

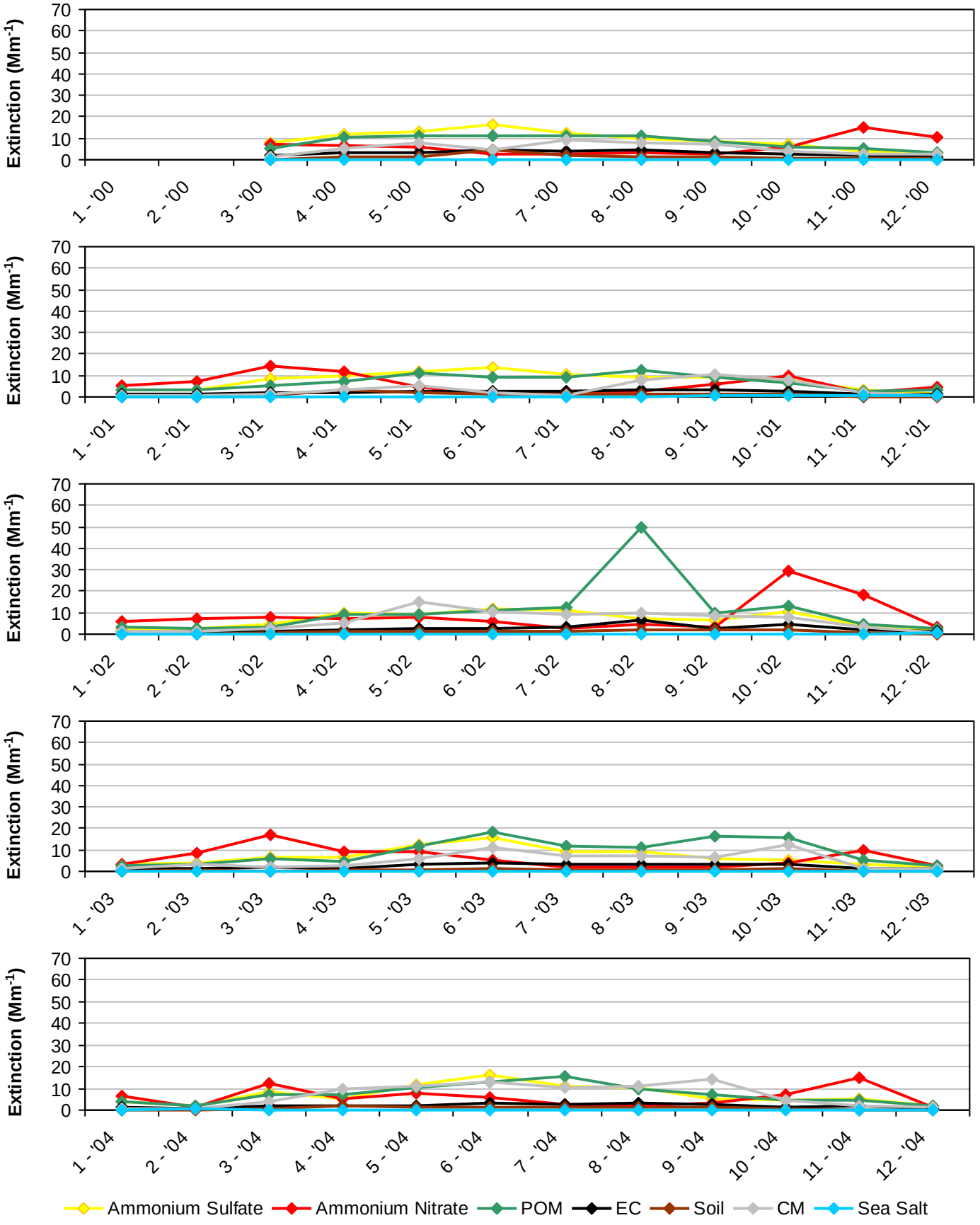
Figure C.5-4
Dome Land WA, CA (DOME1 Site)
20% Least Impaired Visibility Days





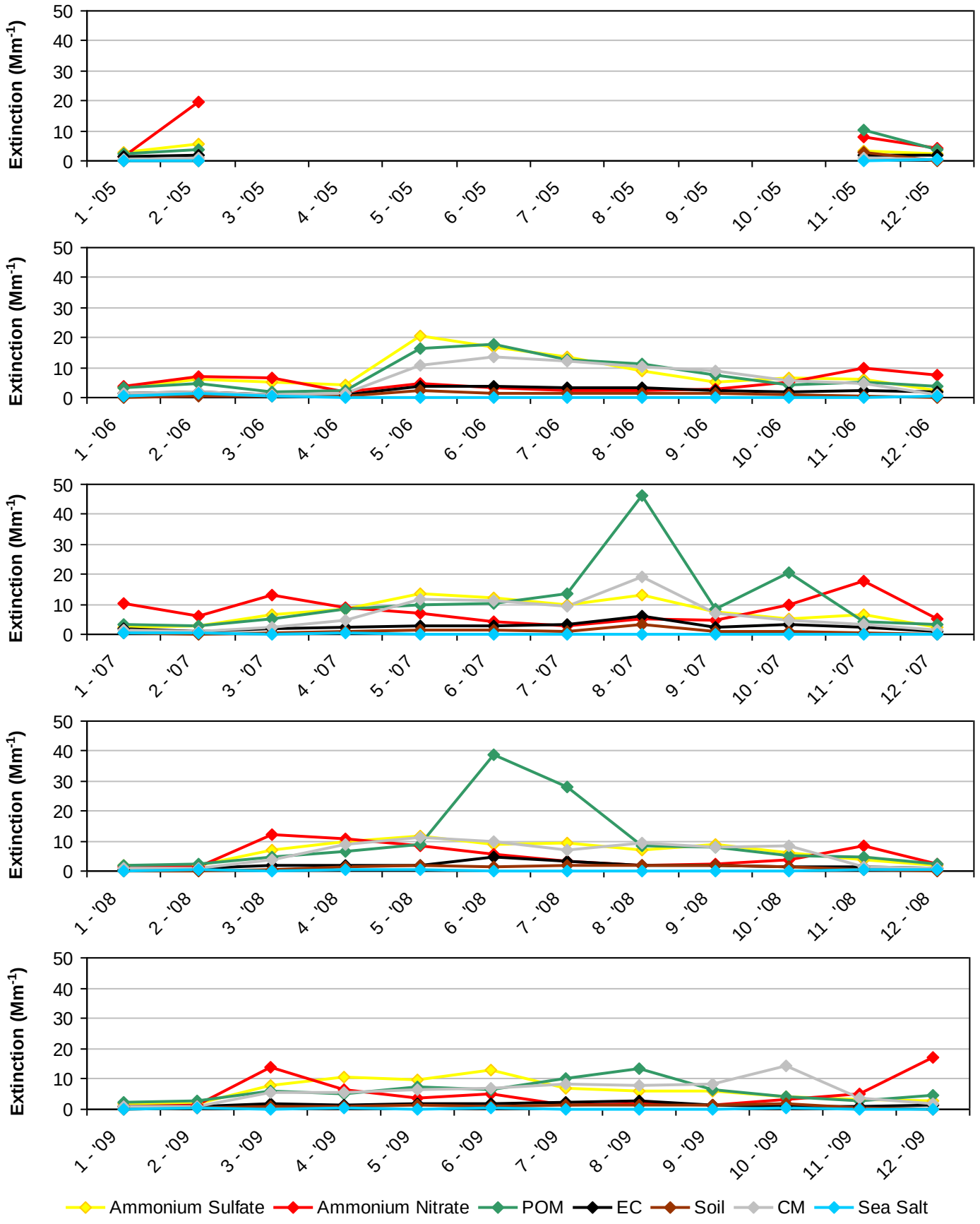
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure C.5-5
Dome Land WA, CA (DOME1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



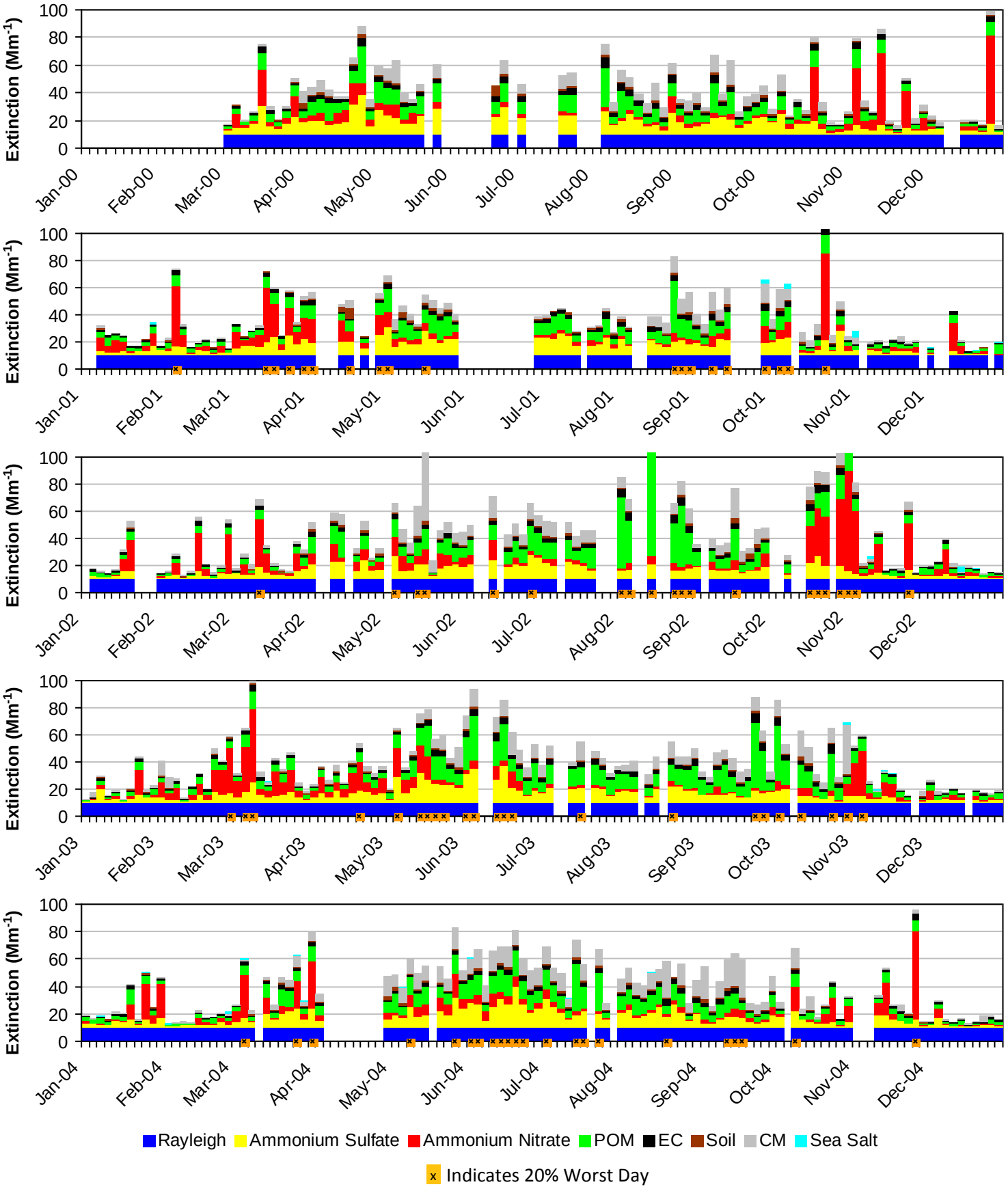
*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure C.5-6
Dome Land WA, CA (DOME1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days



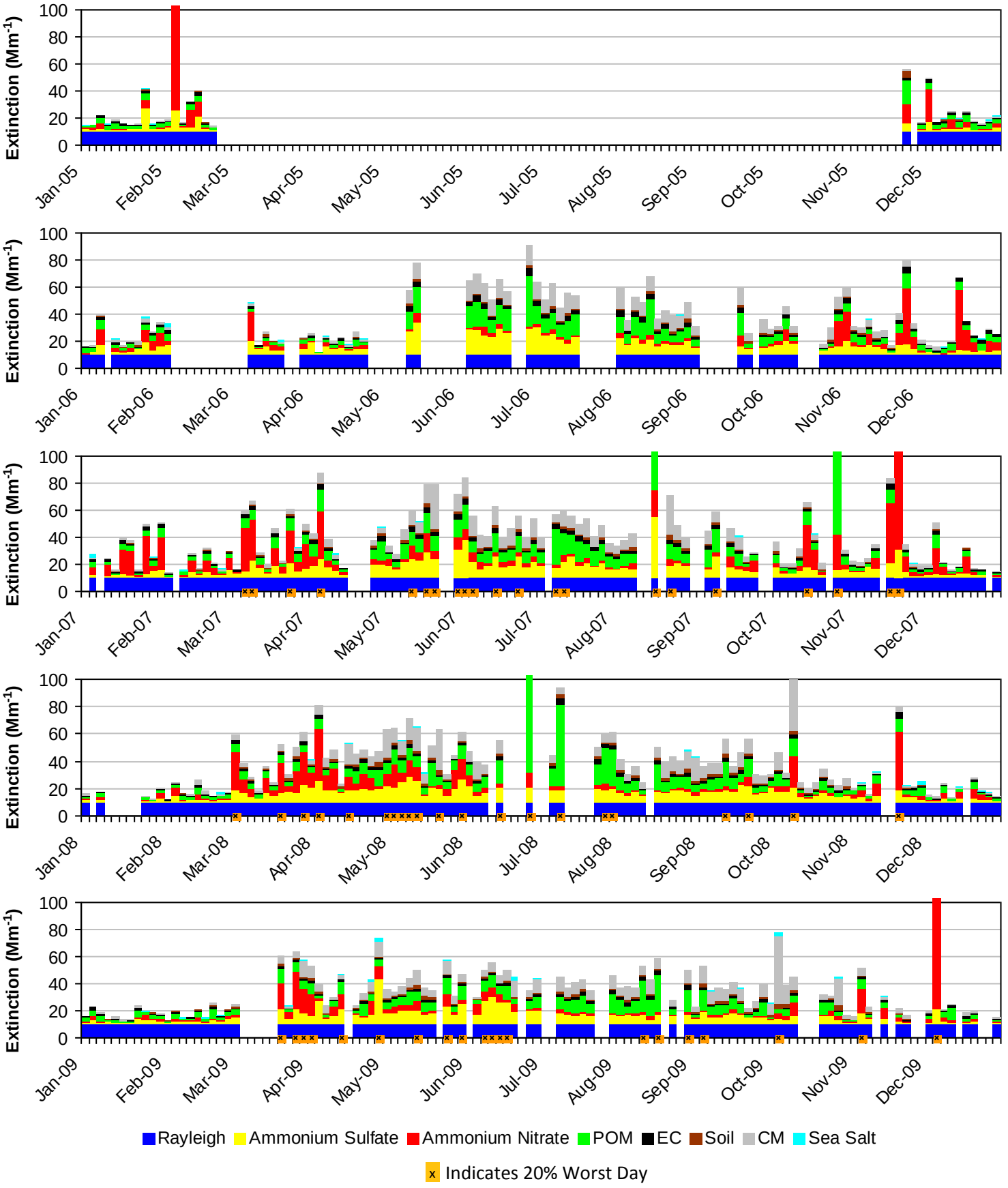
*Note that monthly averages for the years 2005 and 2006 are shown here, but these years did not meet RHR data completeness criteria.

Figure C.5-7
Dome Land WA, CA (DOME1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure C.5-8
Dome Land WA, CA (DOME1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2005 and 2006 are shown here, but these years did not meet RHR data completeness criteria.

C.6. HOOVER WA (HOOV1)

The following tables and figures are presented in this section for the Hoover Wilderness Area represented by the HOOV1 IMPROVE Monitor:

- **Table C.6-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure C.6-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.6-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.6-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure C.6-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure C.6-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure C.6-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure C.6-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

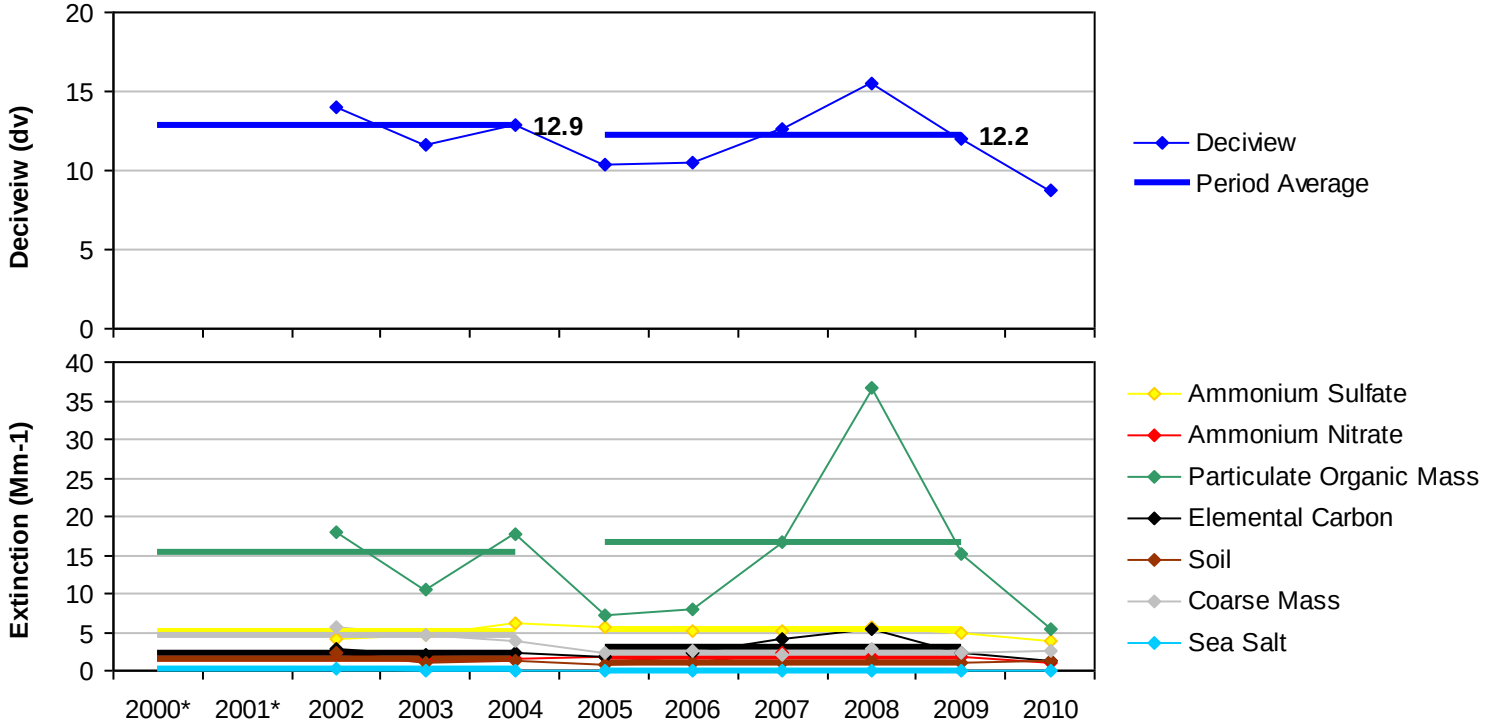
- **Figure C.6-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table C.6-1
Hoover WA, CA (HOOV1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	---	1.8	1.1	1.4	1.1	1.3	1.7	1.2	1.1	0.9	0.0	0.1	1.4	1.3	-0.1	-7%
Worst 20% Days	---	---	14.1	11.7	12.9	10.4	10.5	12.6	15.5	12.0	8.8	0.0	0.6	12.9	12.2	-0.7	-5%
All Days	---	---	6.8	5.7	6.5	5.7	5.8	6.3	7.1	5.6	4.6	0.0	0.4	6.3	6.1	-0.2	-3%
Total Extinction (Mm-1)																	
Best 20% Days	---	---	12.0	11.2	11.5	11.2	11.5	11.9	11.3	11.2	11.0	0.0	0.2	11.6	11.4	-0.2	-2%
Worst 20% Days	---	---	44.4	32.9	42.3	28.4	29.2	40.6	62.6	36.4	24.2	0.0	0.6	39.9	39.4	-0.5	-1%
All Days	---	---	22.4	19.1	22.0	18.6	18.9	21.5	26.3	19.6	16.5	0.0	0.6	21.2	21.0	-0.2	-1%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	---	1.1	0.8	0.9	0.9	1.2	1.1	1.0	1.0	0.8	0.0	0.3	0.9	1.1	0.2	22%
Worst 20% Days	---	---	4.2	4.5	6.3	5.7	5.1	5.2	5.8	4.9	3.9	0.1	0.3	5.0	5.4	0.4	8%
All Days	---	---	2.6	2.4	3.2	3.3	3.1	3.2	3.4	2.8	2.3	0.0	0.2	2.8	3.2	0.4	14%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	---	0.3	0.2	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.1	0.3	0.2	-0.1	-33%
Worst 20% Days	---	---	2.2	1.2	1.5	1.7	1.1	2.3	1.7	1.7	0.9	0.0	0.4	1.6	1.7	0.1	6%
All Days	---	---	1.1	0.8	1.2	0.9	0.8	1.1	0.8	0.8	0.6	0.0	0.2	1.1	0.9	-0.2	-18%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	---	0.4	0.5	0.5	0.5	0.3	0.8	0.5	0.3	0.3	0.0	0.5	0.5	0.5	0.0	0%
Worst 20% Days	---	---	17.9	10.4	17.8	7.1	7.9	16.6	36.6	15.2	5.3	0.4	0.6	15.4	16.7	1.3	8%
All Days	---	---	5.3	3.7	5.1	2.9	3.1	5.1	9.4	4.3	2.2	0.1	0.5	4.7	5.0	0.3	6%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	---	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.2	0.2	0.0	0%
Worst 20% Days	---	---	2.7	2.2	2.4	1.8	2.3	4.2	5.4	2.3	1.2	0.1	0.4	2.4	3.2	0.8	33%
All Days	---	---	1.1	0.9	0.9	0.9	1.0	1.3	1.5	0.8	0.5	0.0	0.6	1.0	1.1	0.1	10%
Soil Extinction (Mm-1)																	
Best 20% Days	---	---	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0%
Worst 20% Days	---	---	2.4	1.0	1.3	0.8	1.0	1.1	1.4	1.0	1.2	0.0	0.3	1.6	1.0	-0.6	-38%
All Days	---	---	0.9	0.5	0.7	0.4	0.5	0.6	0.8	0.6	0.6	0.0	0.6	0.7	0.6	-0.1	-14%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	---	0.7	0.3	0.4	0.3	0.4	0.4	0.2	0.4	0.4	0.0	0.3	0.5	0.3	-0.2	-40%
Worst 20% Days	---	---	5.6	4.7	4.0	2.3	2.7	2.1	2.8	2.2	2.5	-0.5	0.0	4.7	2.4	-2.3	-49%
All Days	---	---	2.2	1.7	1.9	1.2	1.4	1.2	1.3	1.3	1.3	-0.1	0.1	2.0	1.3	-0.7	-35%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0%
Worst 20% Days	---	---	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.4	0.1	0.0	-0.1	-100%
All Days	---	---	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0%

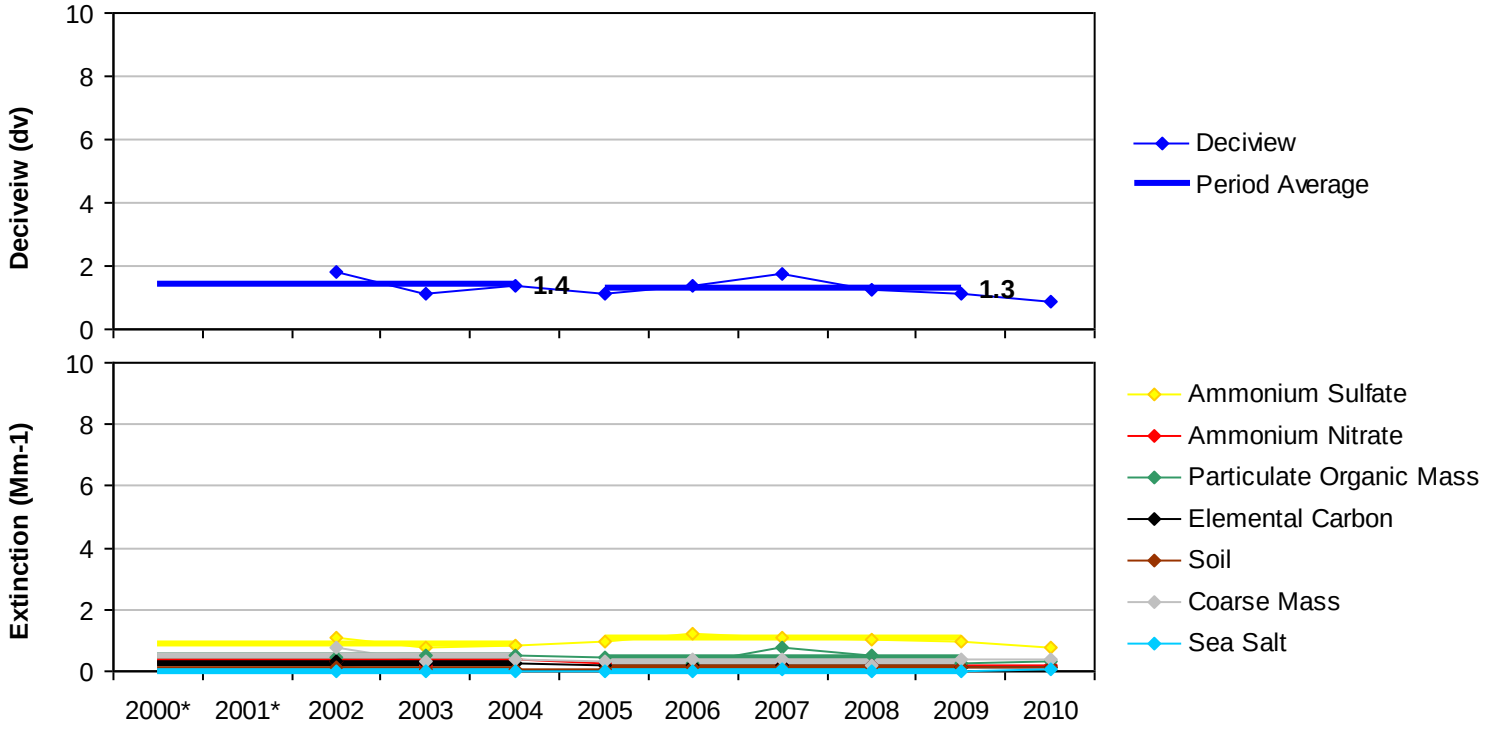
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure C.6-1
Hoover WA, CA (HOOV1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



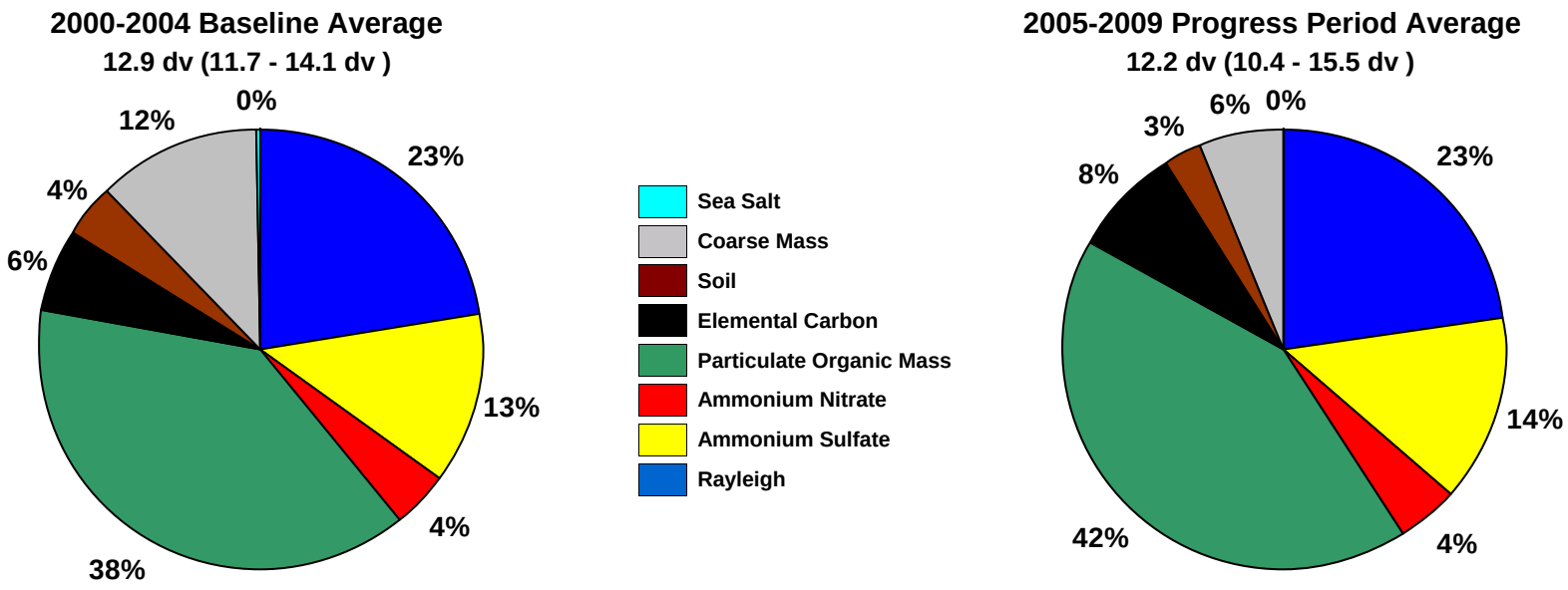
*Missing years did not meet RHR data completeness criteria.

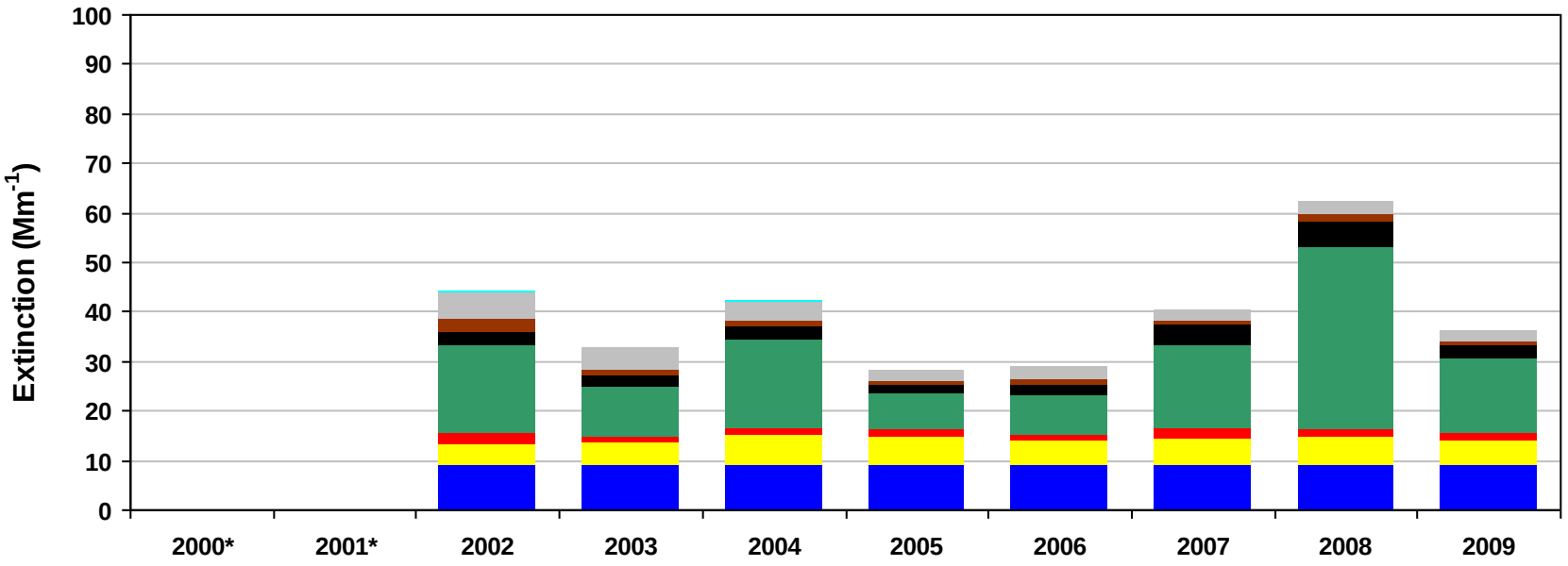
Figure C.6-2
Hoover WA, CA (HOOV1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

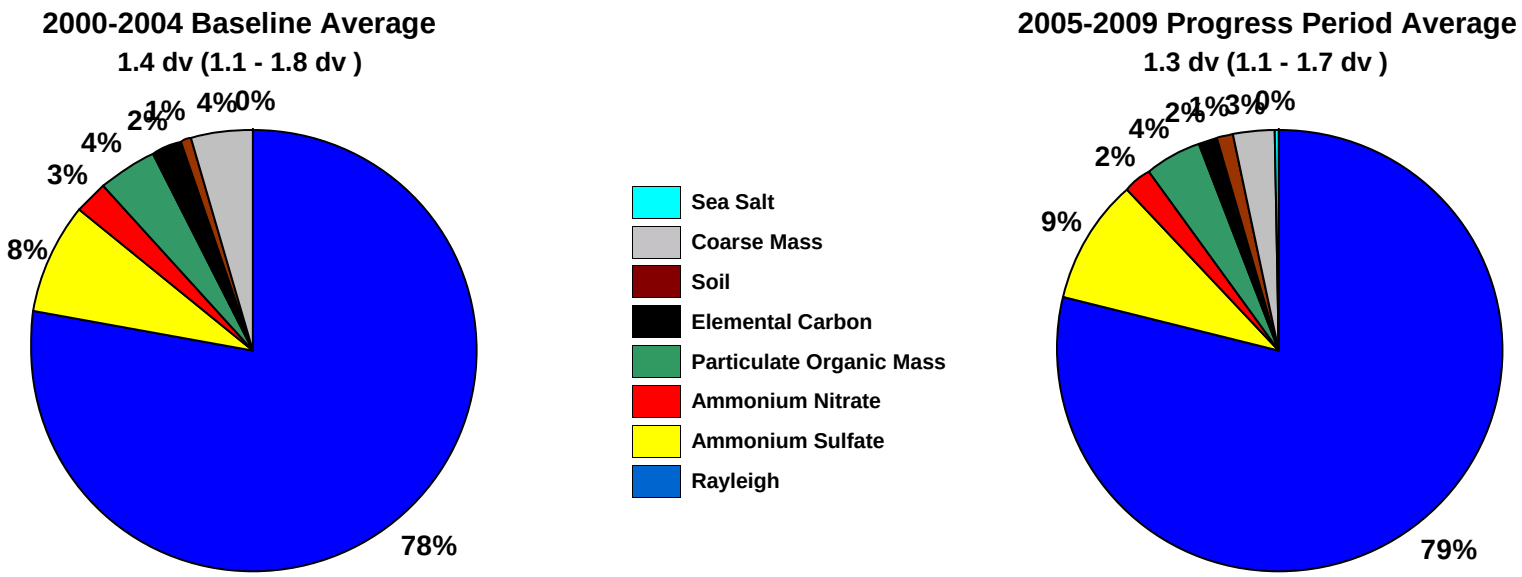
Figure C.6-3
Hoover WA, CA (HOOV1 Site)
20% Most Impaired Visibility Days

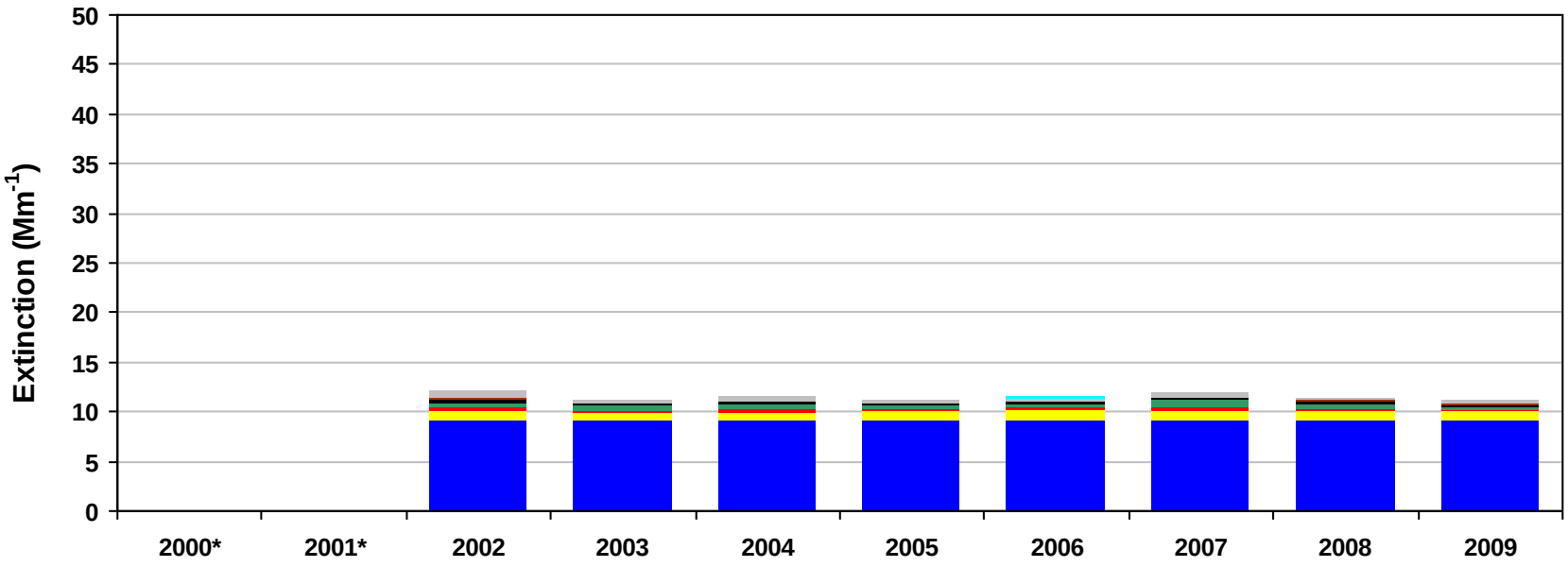




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

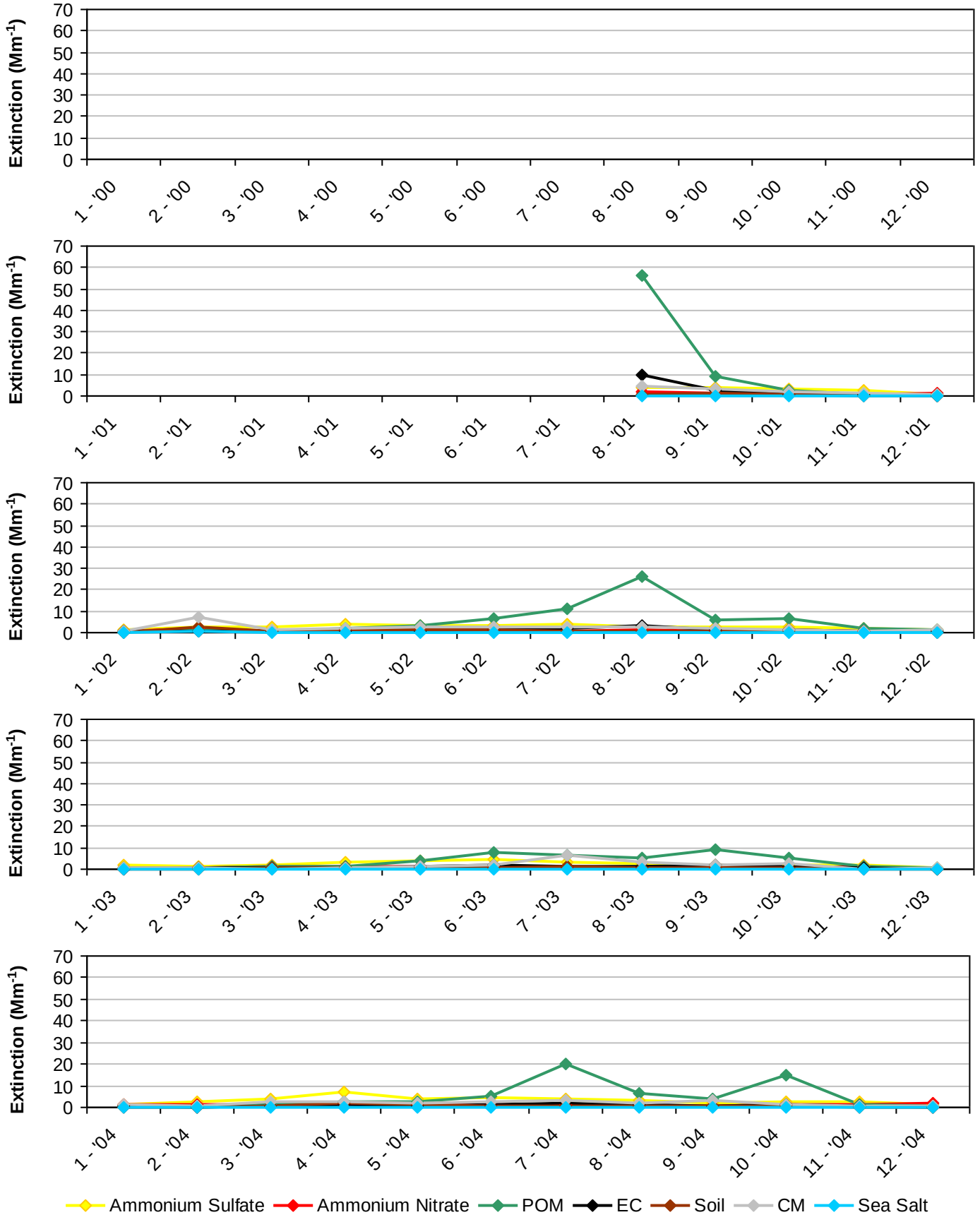
Figure C.6-4
Hoover WA, CA (HOOV1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure C.6-5
Hoover WA, CA (HOOV1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure C.6-6
Hoover WA, CA (HOOV1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

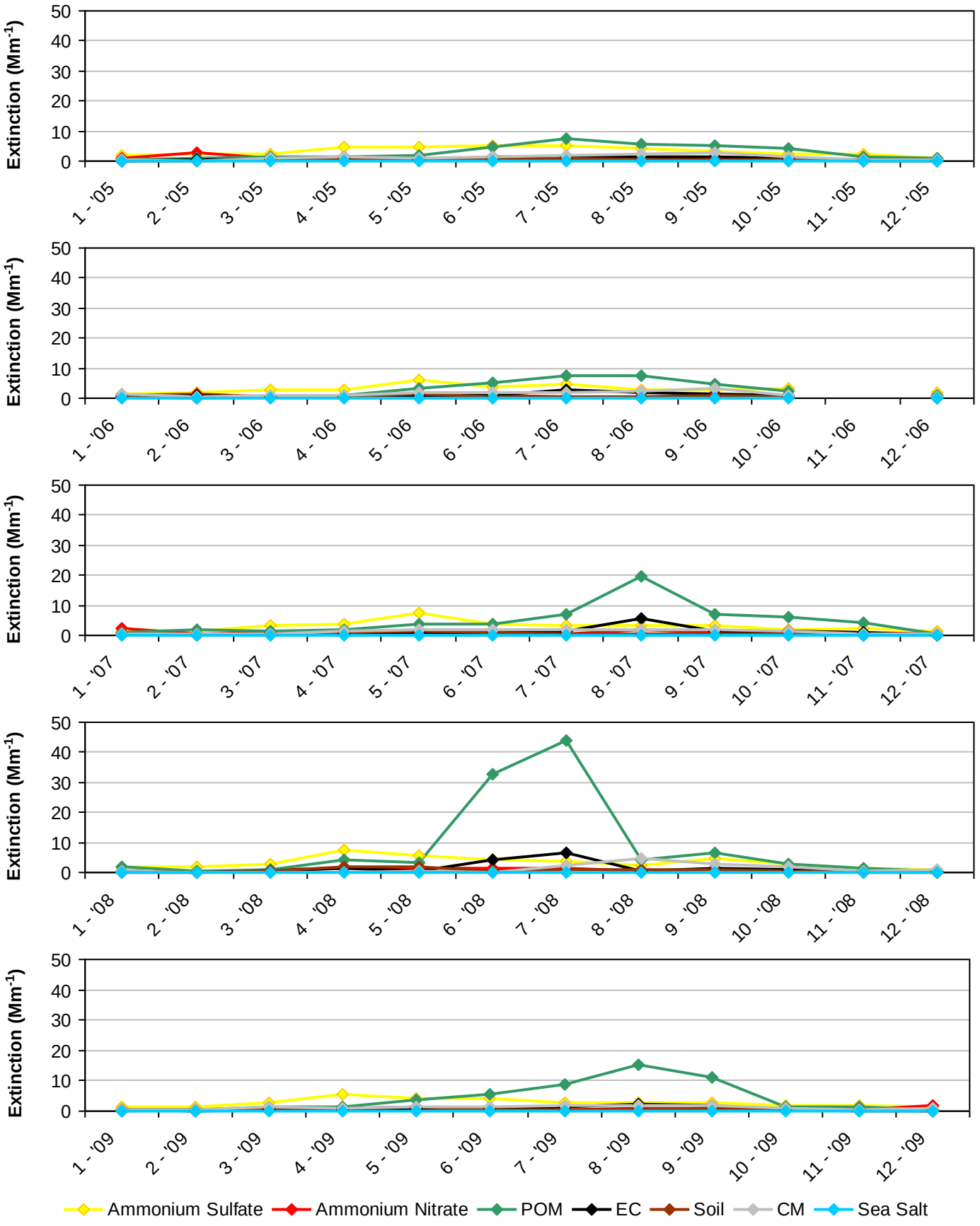
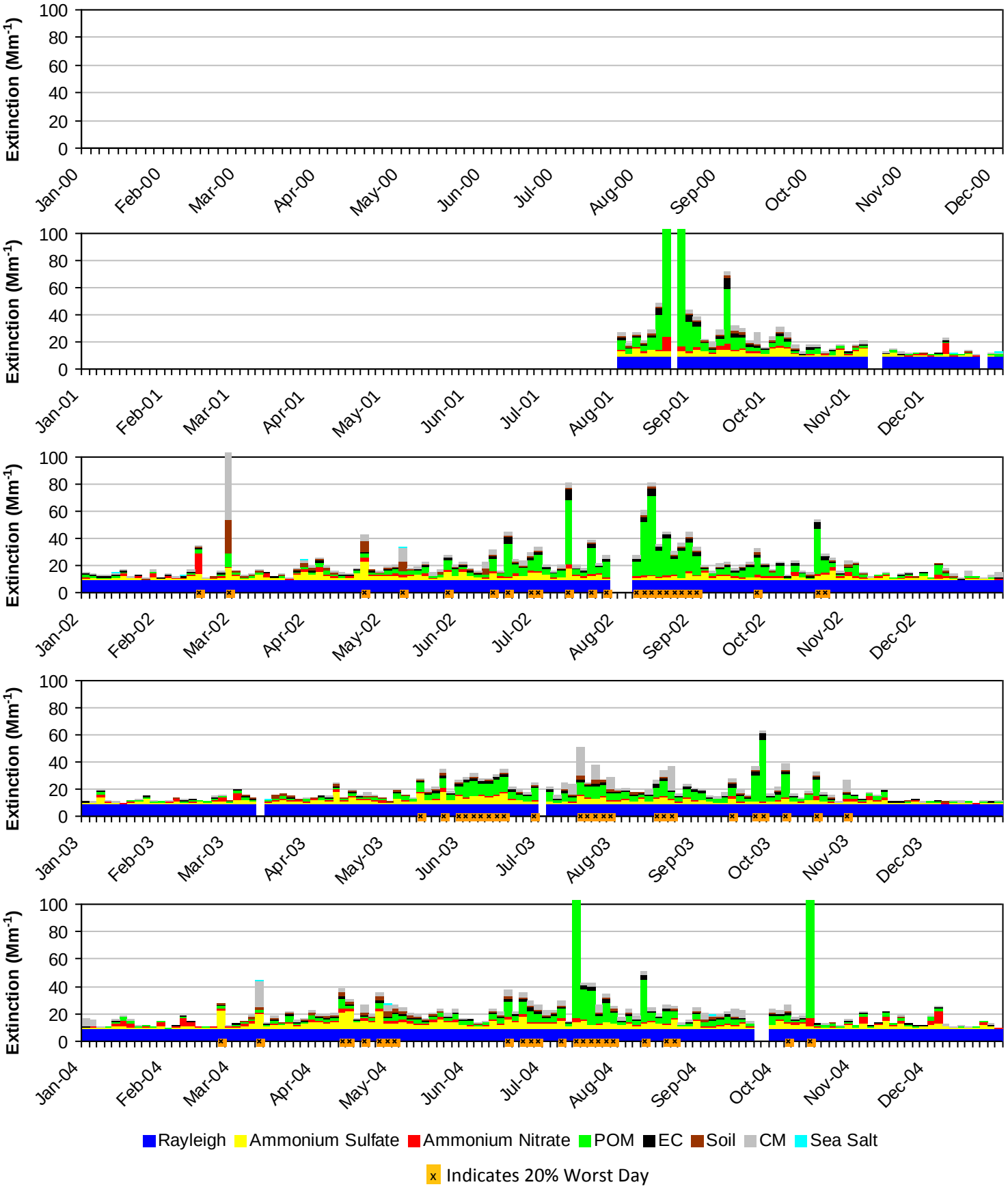
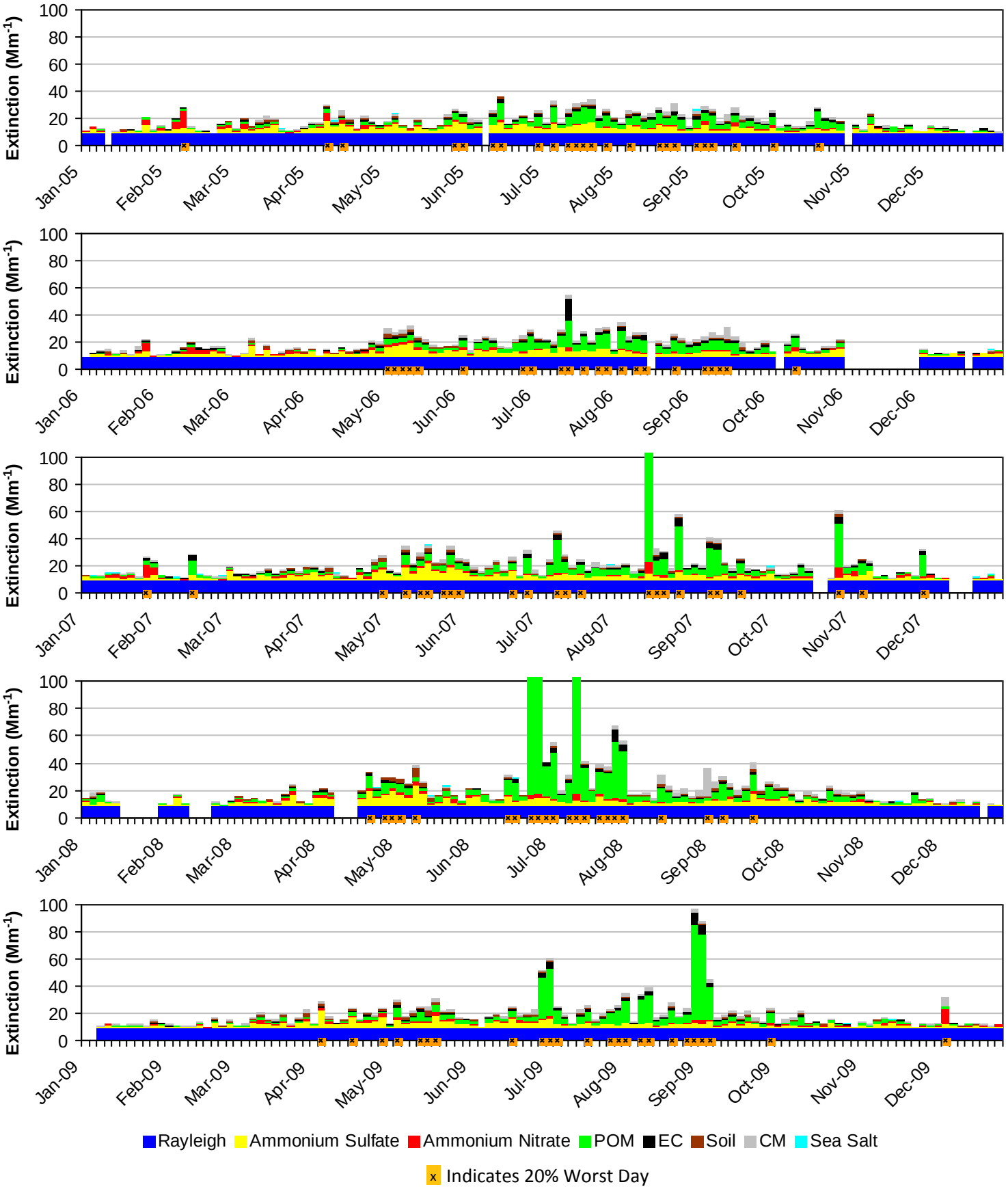


Figure C.6-7
Hoover WA, CA (HOOV1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure C.6-8
Hoover WA, CA (HOOV1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



C.7. KAISER WA, ANSEL ADAMS WA, AND JOHN MUIR WA (KAIS1)

The following tables and figures are presented in this section for the Kaiser WA, Ansel Adams WA, and John Muir WA represented by the KAIS1 IMPROVE Monitor:

- **Table C.7-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure C.7-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.7-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.7-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure C.7-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure C.7-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure C.7-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure C.7-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

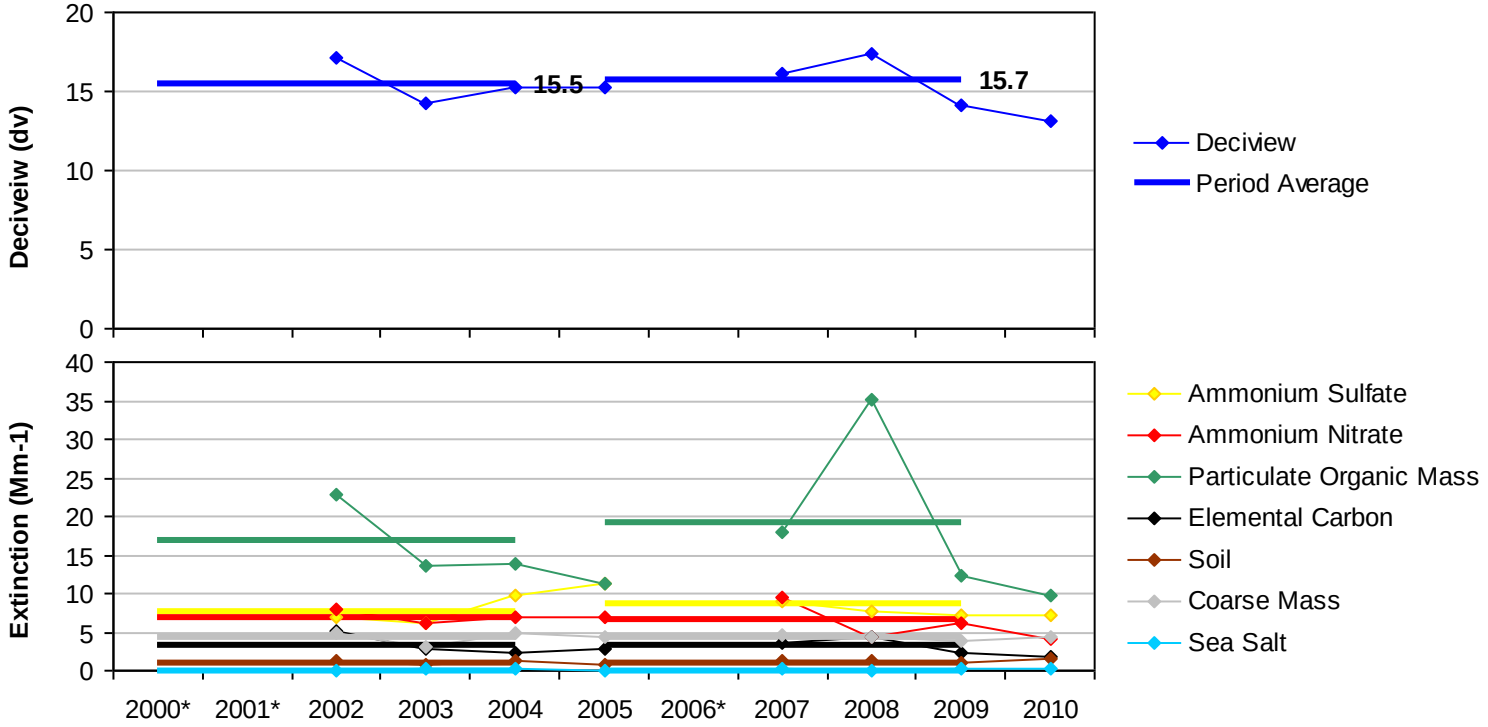
- **Figure C.7-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table C.7-1
Kaiser WA, Ansel Adams WA and John Muir WA, CA (KAIS1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	---	2.6	2.1	2.3	1.2	---	1.8	1.4	1.8	1.1	-0.1	0.1	2.3	1.6	-0.7	-30%
Worst 20% Days	---	---	17.1	14.2	15.3	15.3	---	16.2	17.4	14.1	13.1	0.0	0.5	15.5	15.7	0.2	1%
All Days	---	---	9.3	7.9	8.7	8.4	---	8.3	8.9	7.8	6.7	-0.1	0.2	8.6	8.3	-0.3	-4%
Total Extinction (Mm-1)																	
Best 20% Days	---	---	13.0	12.3	12.6	11.3	---	12.0	11.5	12.0	11.2	-0.2	0.1	12.6	11.7	-0.9	-7%
Worst 20% Days	---	---	58.1	41.7	48.3	46.6	---	54.7	66.3	41.9	37.9	0.0	0.5	49.3	52.4	3.1	6%
All Days	---	---	29.6	24.4	26.9	26.3	---	27.1	30.3	24.0	21.5	-0.1	0.5	27.0	26.9	-0.1	0%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	---	1.1	1.0	1.0	0.8	---	1.0	1.0	1.1	0.9	0.0	0.5	1.0	1.0	0.0	0%
Worst 20% Days	---	---	7.0	6.1	9.8	11.3	---	8.9	7.8	7.1	7.1	0.0	0.5	7.6	8.8	1.2	16%
All Days	---	---	3.9	3.5	4.8	5.4	---	4.4	4.4	4.0	3.6	0.0	0.5	4.1	4.5	0.4	10%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	---	0.3	0.2	0.4	0.2	---	0.3	0.2	0.2	0.1	0.0	0.2	0.3	0.2	-0.1	-33%
Worst 20% Days	---	---	7.9	6.1	6.9	6.8	---	9.4	4.3	6.2	4.2	-0.2	0.3	7.0	6.7	-0.3	-4%
All Days	---	---	3.5	2.6	2.9	2.6	---	3.2	2.2	2.4	1.6	-0.1	0.1	3.0	2.6	-0.4	-13%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	---	1.1	1.1	0.8	0.5	---	0.7	0.5	0.5	0.6	-0.1	0.0	1.0	0.5	-0.5	-50%
Worst 20% Days	---	---	22.8	13.7	14.0	11.4	---	17.9	35.1	12.2	9.7	-0.2	0.5	16.8	19.2	2.4	14%
All Days	---	---	7.9	5.7	5.6	5.0	---	6.0	10.1	4.7	3.9	-0.2	0.3	6.4	6.5	0.1	2%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	---	0.7	0.6	0.8	0.4	---	0.4	0.2	0.5	0.3	-0.1	0.1	0.7	0.4	-0.3	-43%
Worst 20% Days	---	---	5.2	2.9	2.3	2.9	---	3.5	4.3	2.2	1.8	-0.1	0.4	3.4	3.2	-0.2	-6%
All Days	---	---	2.0	1.5	1.5	1.5	---	1.4	1.6	1.1	0.9	-0.1	0.1	1.7	1.4	-0.3	-18%
Soil Extinction (Mm-1)																	
Best 20% Days	---	---	0.1	0.1	0.1	0.1	---	0.1	0.1	0.1	0.1	0.0	0.4	0.1	0.1	0.0	0%
Worst 20% Days	---	---	1.4	0.7	1.3	0.8	---	1.3	1.3	1.1	1.6	0.0	0.5	1.1	1.1	0.0	0%
All Days	---	---	0.7	0.4	0.7	0.5	---	0.6	0.7	0.6	0.7	0.0	0.5	0.6	0.6	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	---	0.6	0.3	0.3	0.2	---	0.4	0.4	0.7	0.3	0.0	0.3	0.4	0.4	0.0	0%
Worst 20% Days	---	---	4.9	3.1	4.9	4.4	---	4.5	4.4	3.9	4.4	-0.1	0.3	4.3	4.3	0.0	0%
All Days	---	---	2.5	1.6	2.4	2.2	---	2.4	2.3	2.2	1.8	0.0	0.3	2.2	2.2	0.0	0%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	---	0.1	0.0	0.1	0.1	---	0.0	0.1	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0%
Worst 20% Days	---	---	0.0	0.2	0.2	0.1	---	0.1	0.1	0.2	0.2	0.0	0.4	0.1	0.1	0.0	0%
All Days	---	---	0.1	0.1	0.2	0.1	---	0.1	0.1	0.1	0.1	0.0	0.5	0.1	0.1	0.0	0%

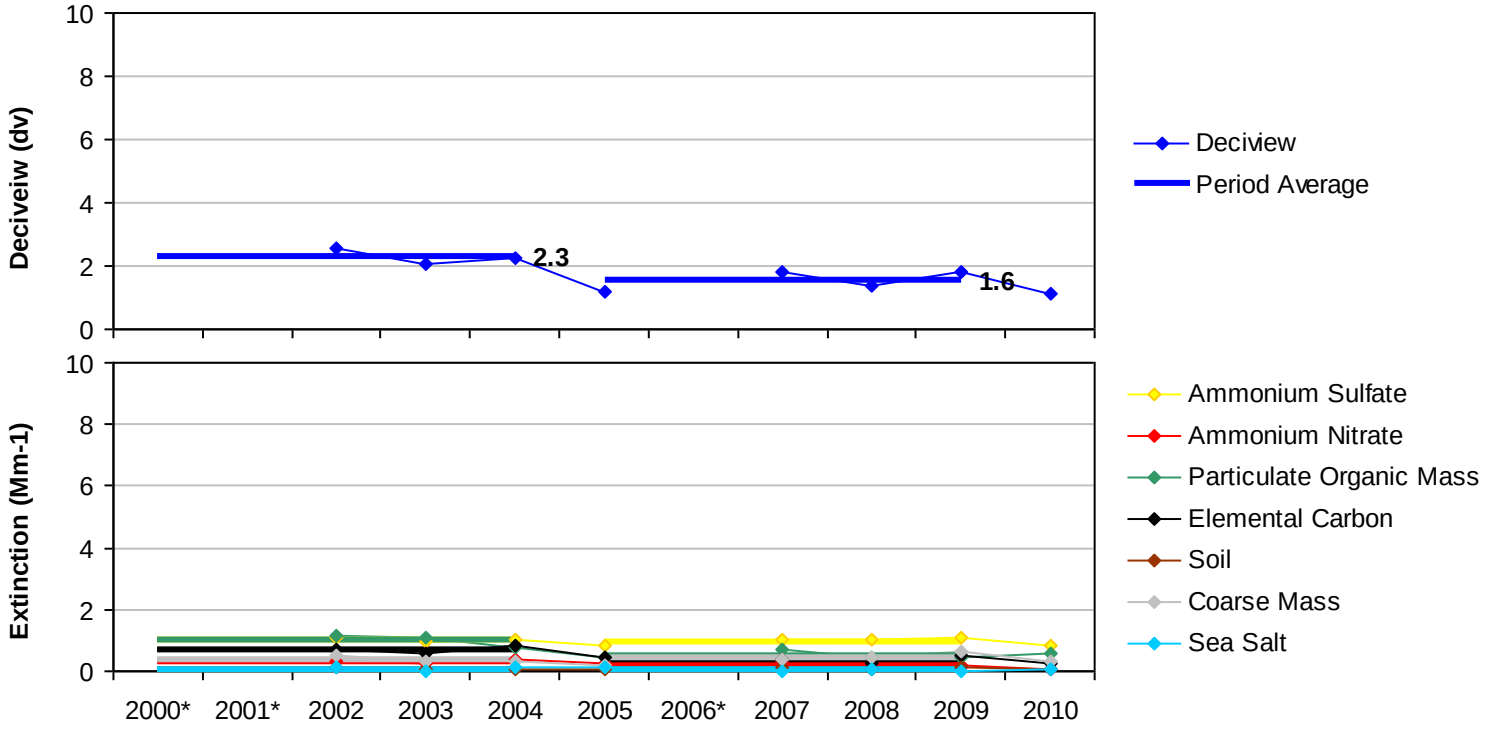
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure C.7-1
Kaiser WA, Ansel Adams WA and John Muir WA, CA (KAIS1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure C.7-2
Kaiser WA, Ansel Adams WA and John Muir WA, CA (KAIS1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

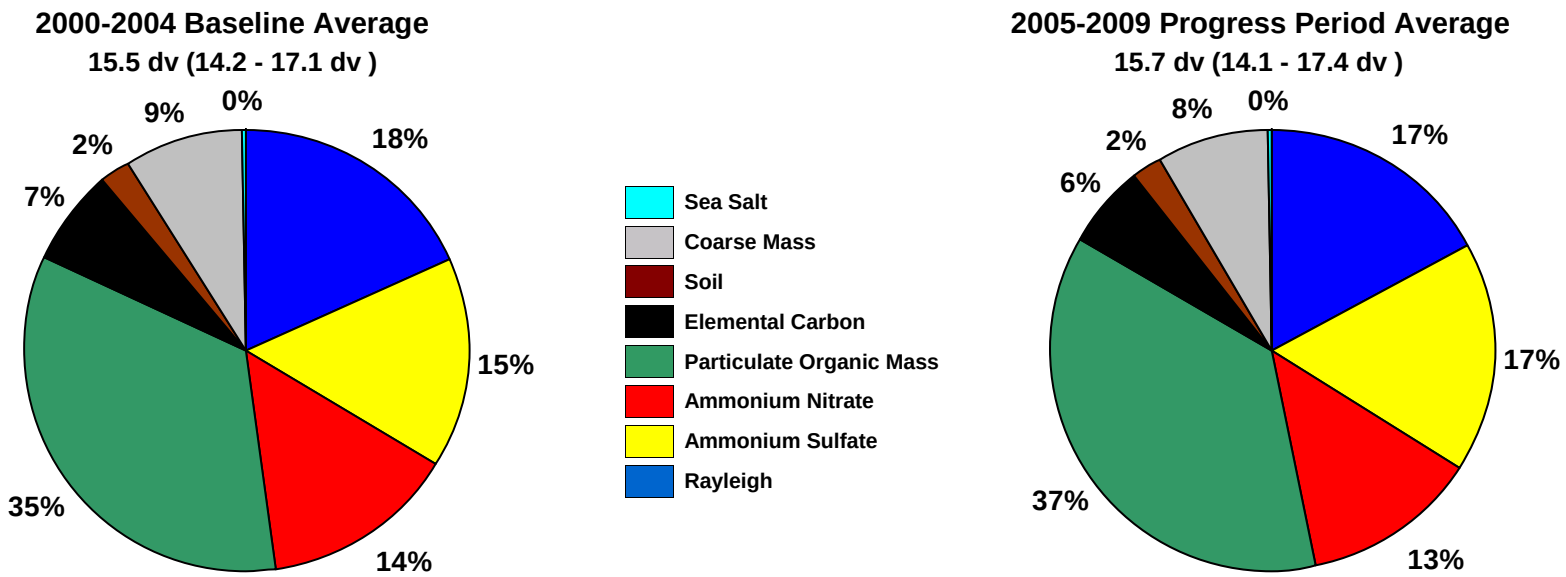


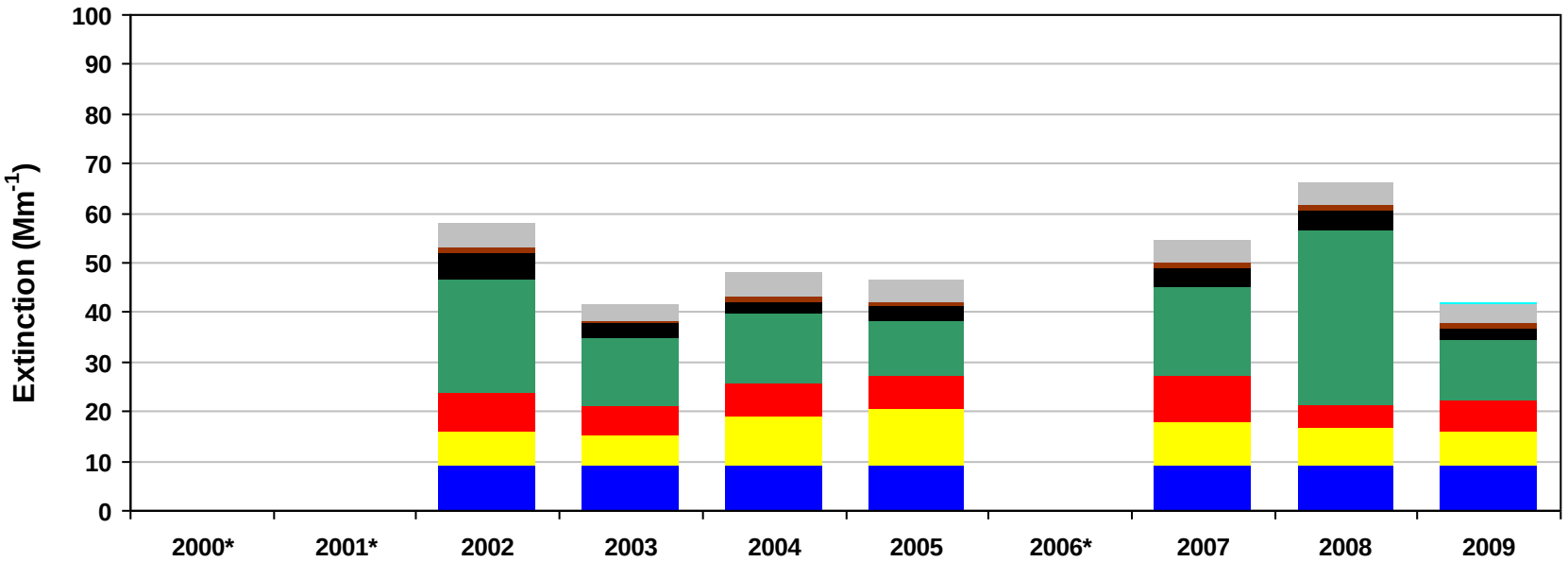
*Missing years did not meet RHR data completeness criteria.

Figure C.7-3

Kaiser WA, Ansel Adams WA and John Muir WA, CA (KAIS1 Site)

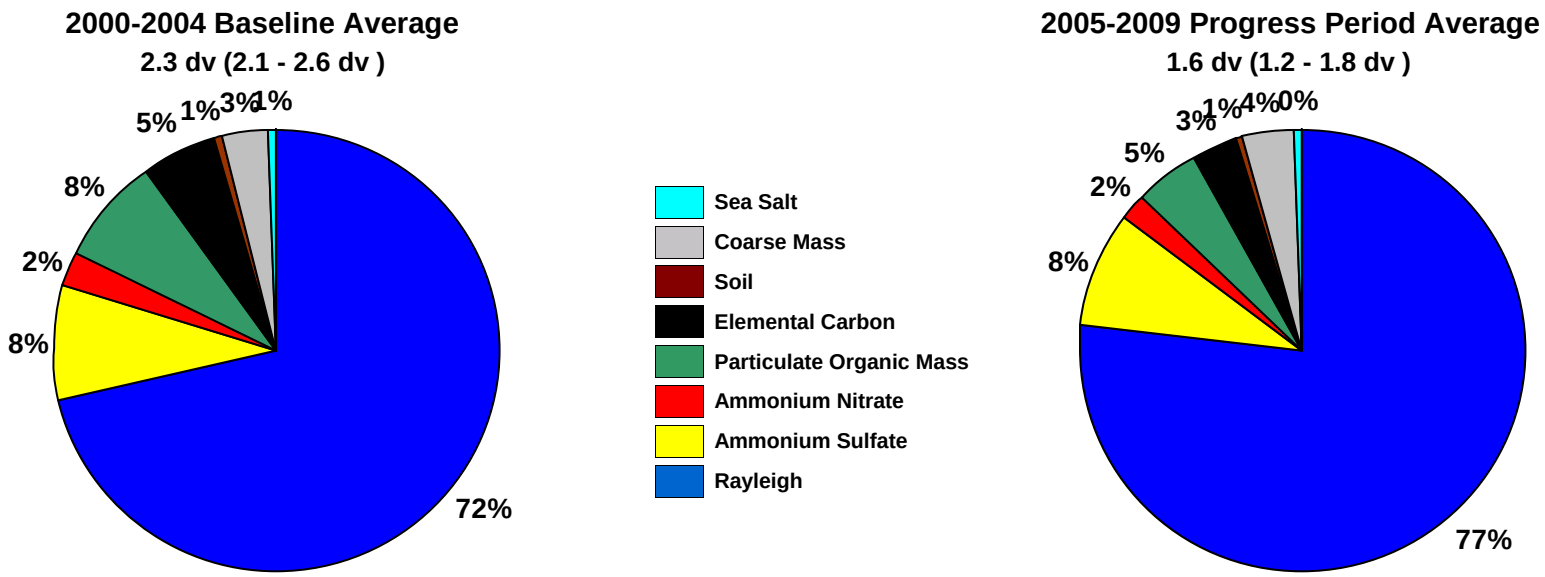
20% Most Impaired Visibility Days

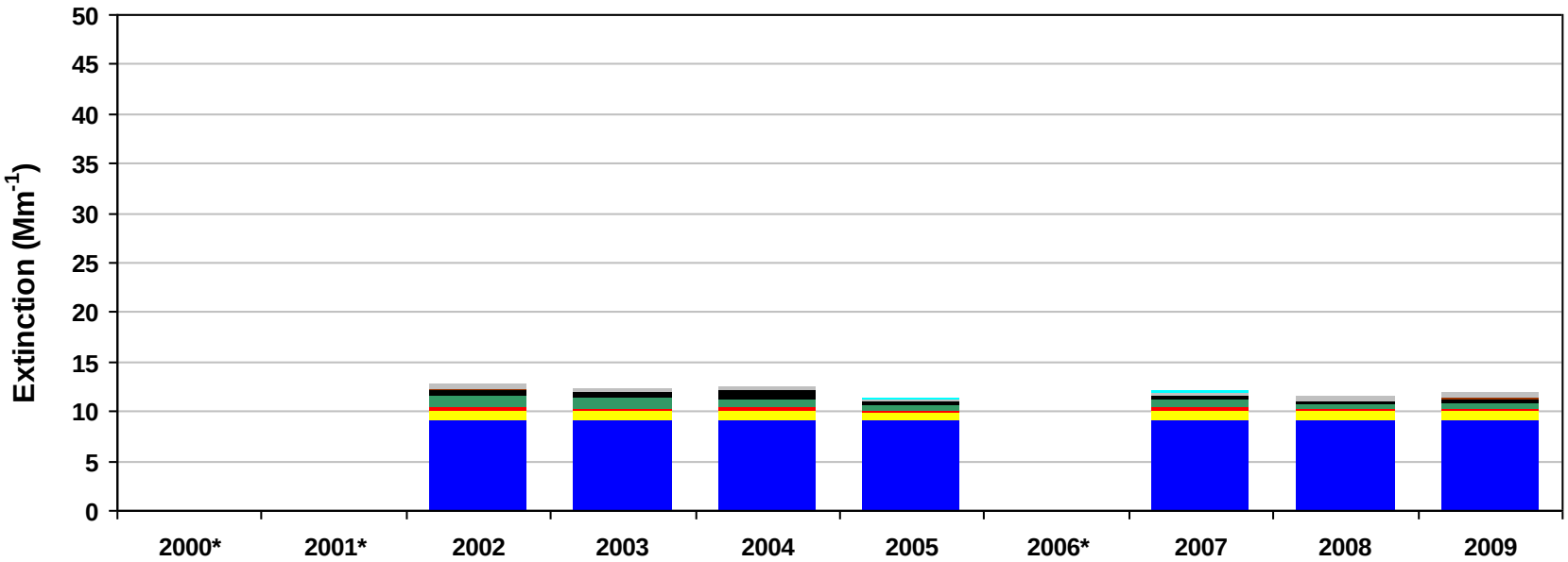




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

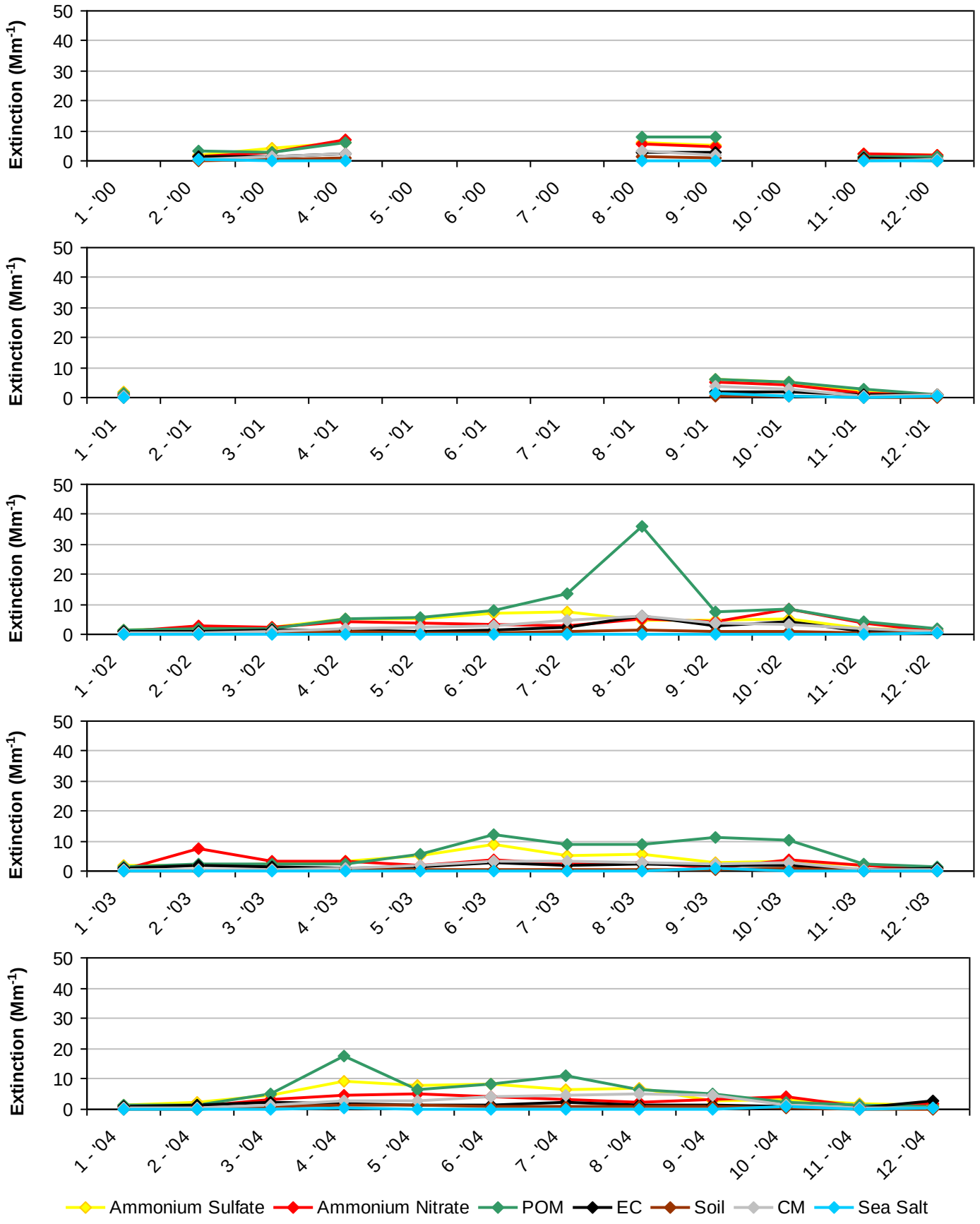
Figure C.7-4
Kaiser WA, Ansel Adams WA and John Muir WA, CA (KAIS1 Site)
20% Least Impaired Visibility Days





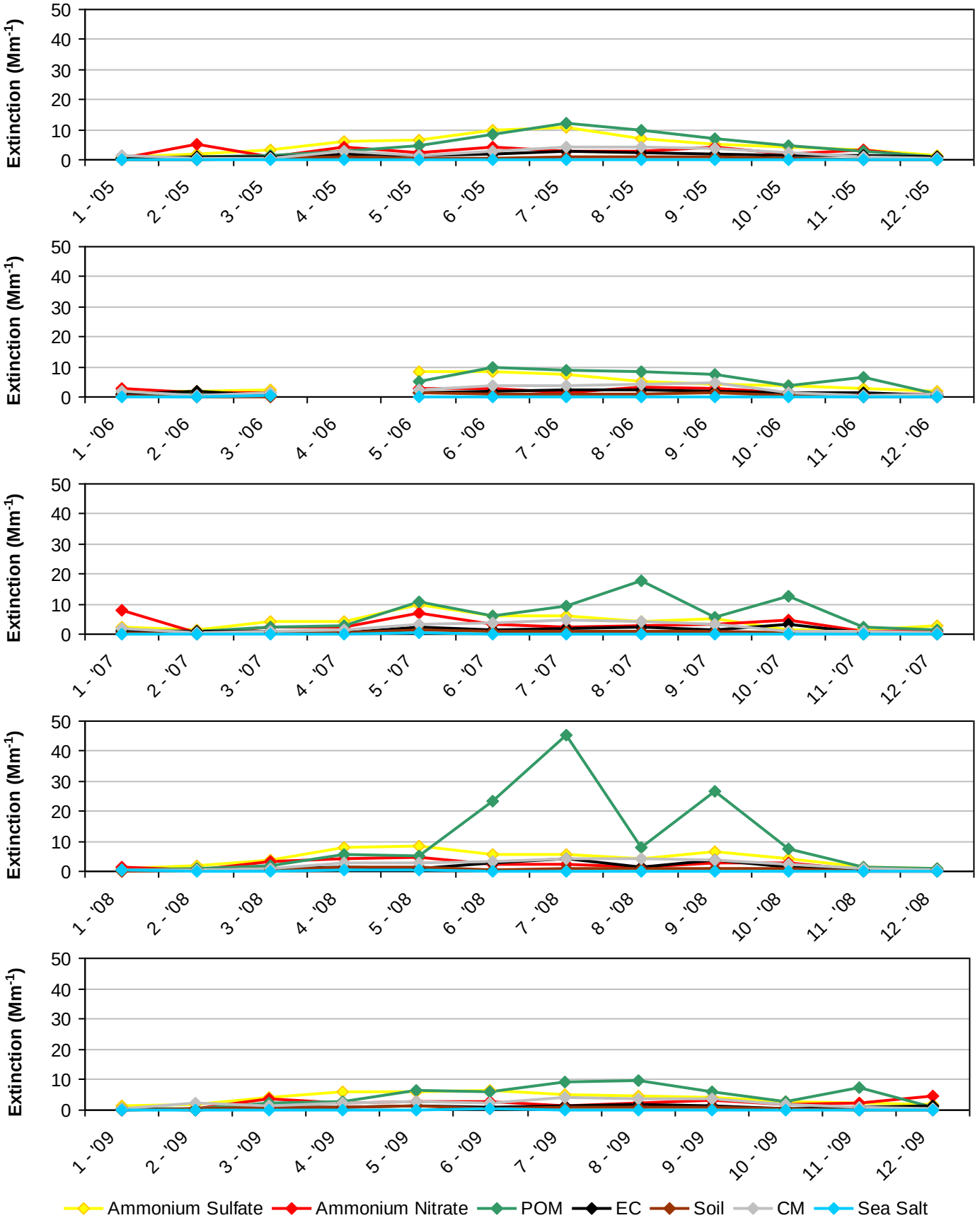
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure C.7-5
Kaiser WA, Ansel Adams WA and John Muir WA, CA (KAIS1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



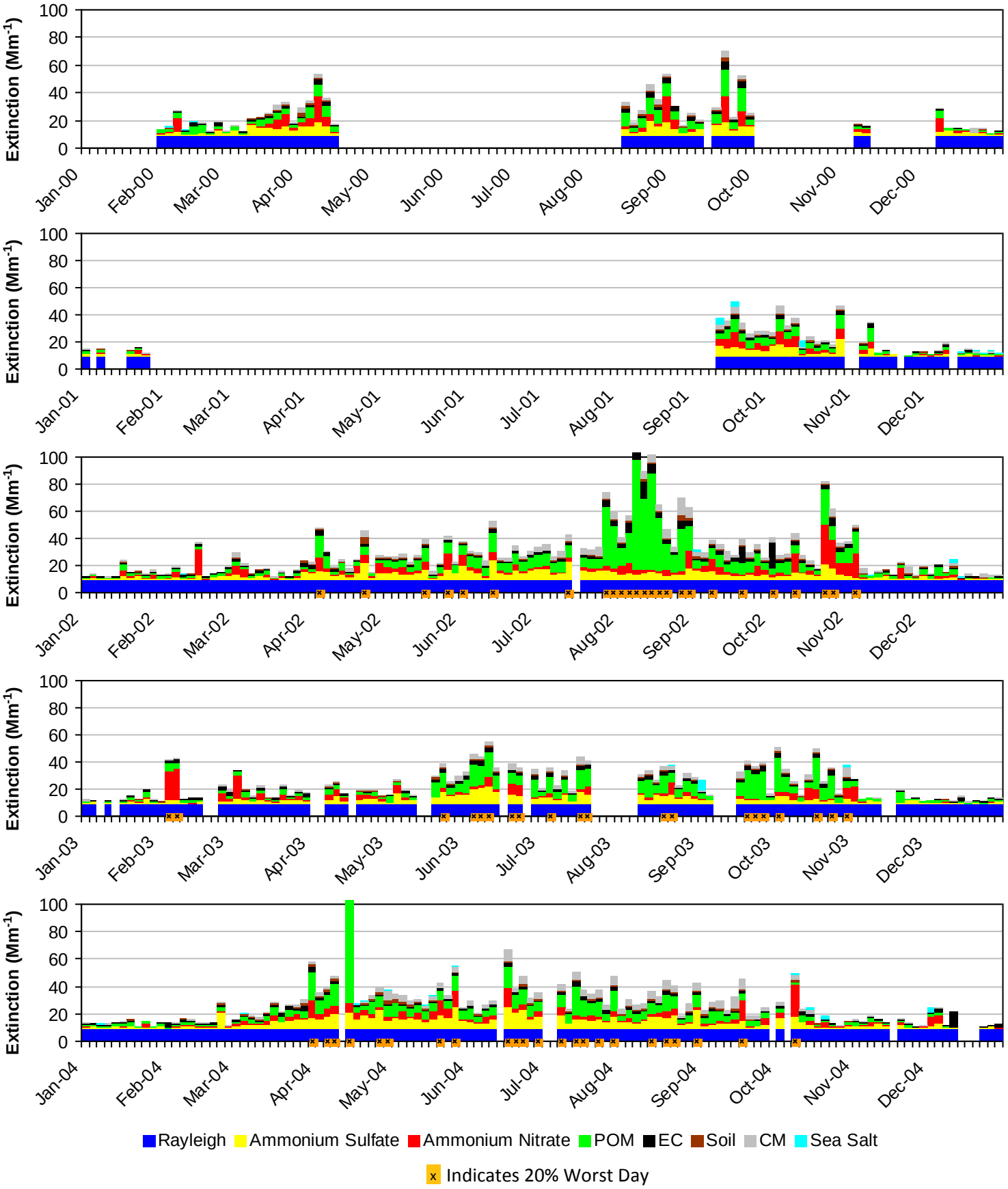
*Note that monthly averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure C.7-6
Kaiser WA, Ansel Adams WA and John Muir WA, CA (KAIS1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days



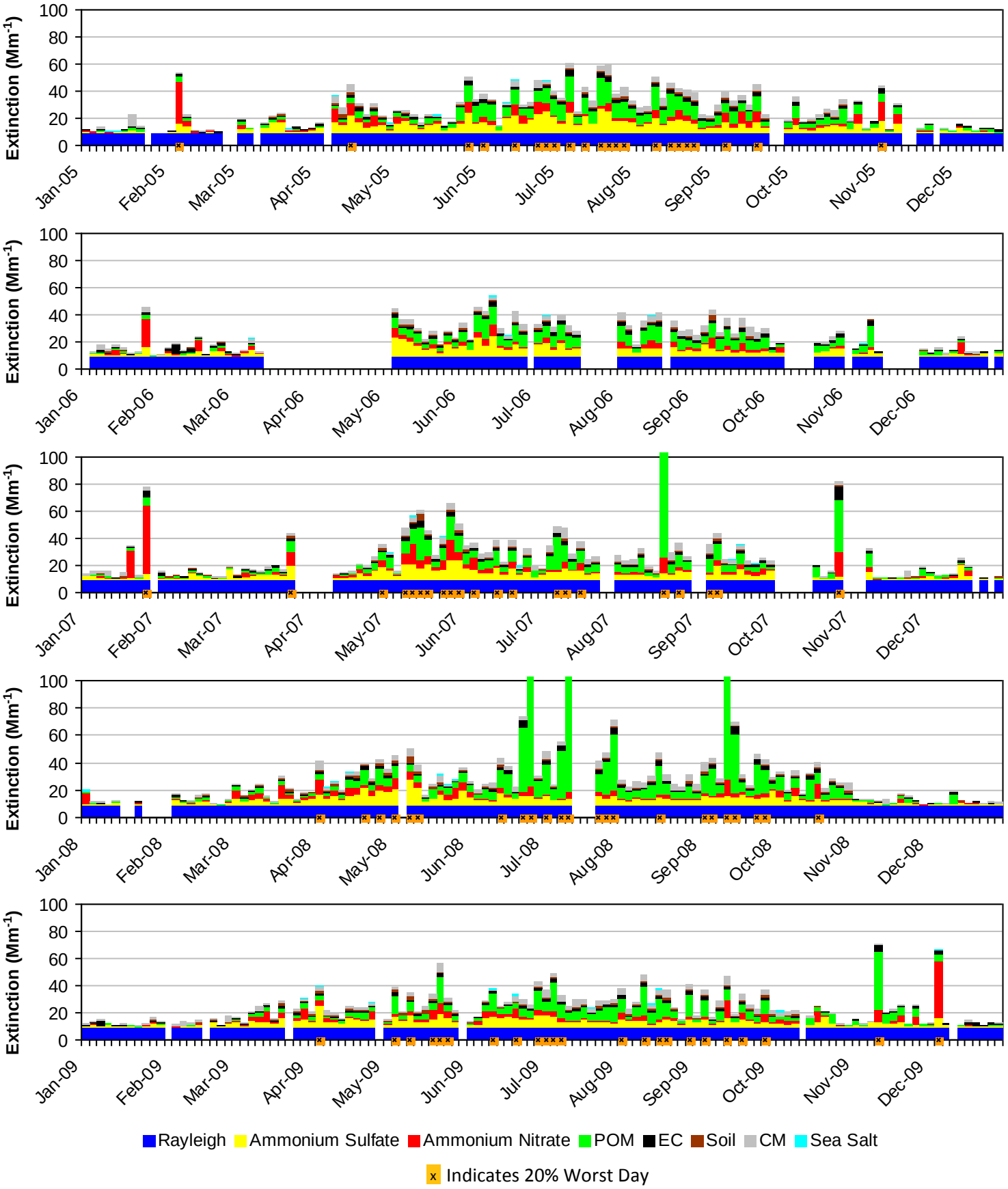
*Note that monthly averages for the year 2006 are shown here, but this year did not meet RHR data completeness criteria.

Figure C.7-7
Kaiser WA, Ansel Adams WA and John Muir WA, CA (KAIS1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure C.7-8
Kaiser WA, Ansel Adams WA and John Muir WA, CA (KAIS1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2006 are shown here, but this year did not meet RHR data completeness criteria.

C.8. SEQUOIA NP AND KINGS CANYON NP (SEQU1)

The following tables and figures are presented in this section for the Sequoia NP and Kings Canyon NP represented by the SEQU1 IMPROVE Monitor:

- **Table C.8-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure C.8-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.8-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.8-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure C.8-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure C.8-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure C.8-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure C.8-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure C.8-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table C.8-1
Sequoia NP and Kings Canyon NP, CA (SEQU1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	9.7	7.8	9.0	8.7	8.9	7.2	7.7	9.2	9.3	6.2	5.7	-0.2	0.2	8.8	7.9	-0.9	-10%
Worst 20% Days	25.7	24.5	27.0	26.0	23.7	23.1	23.4	24.7	24.7	21.0	20.1	-0.4	0.1	25.4	23.4	-2.0	-8%
All Days	18.0	16.6	17.9	17.5	16.8	16.0	16.4	16.9	16.9	14.4	13.4	-0.2	0.1	17.3	16.1	-1.2	-7%
Total Extinction (Mm-1)																	
Best 20% Days	27.2	22.3	25.3	24.6	24.8	21.0	22.1	25.5	26.4	18.8	17.9	-0.3	0.2	24.9	22.7	-2.2	-9%
Worst 20% Days	148.2	123.5	154.2	141.2	116.0	104.3	111.7	126.8	129.1	92.6	76.9	-3.9	0.1	136.6	112.9	-23.7	-17%
All Days	73.3	62.7	73.3	69.5	62.2	57.4	60.4	63.4	64.3	49.5	43.5	-1.5	0.1	68.2	59.0	-9.2	-14%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	3.3	2.8	3.2	2.8	2.8	3.1	3.6	3.4	3.5	2.2	2.1	0.0	0.4	3.0	3.2	0.2	7%
Worst 20% Days	20.1	14.5	14.2	15.7	18.2	20.0	22.3	14.8	14.2	13.7	14.2	-0.2	0.2	16.5	17.0	0.5	3%
All Days	12.5	9.9	10.3	10.3	11.0	11.0	11.9	9.9	9.7	8.5	8.1	-0.2	0.2	10.8	10.2	-0.6	-6%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	3.7	2.5	4.0	3.6	3.7	1.6	2.5	3.9	4.3	1.2	1.1	0.0	0.4	3.5	2.7	-0.8	-23%
Worst 20% Days	76.1	63.5	66.7	43.3	54.0	40.5	44.9	66.5	34.2	42.0	18.3	-3.7	0.0	60.7	45.6	-15.1	-25%
All Days	23.2	18.6	21.6	16.2	16.8	14.0	15.8	20.9	14.0	12.9	6.8	-0.8	0.0	19.3	15.5	-3.8	-20%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	5.0	2.9	3.8	4.0	3.7	2.4	2.6	3.5	4.1	2.0	1.8	-0.1	0.1	3.9	2.9	-1.0	-26%
Worst 20% Days	26.8	20.6	43.9	51.6	19.2	20.6	21.3	21.2	54.3	14.7	20.2	-0.5	0.4	32.4	26.4	-6.0	-19%
All Days	15.8	12.5	19.6	21.0	12.5	12.4	12.4	11.5	19.9	8.9	9.5	-0.4	0.1	16.3	13.0	-3.3	-20%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	2.0	1.1	1.4	1.5	1.4	1.1	0.9	1.3	1.1	0.7	0.6	-0.1	0.0	1.5	1.0	-0.5	-33%
Worst 20% Days	7.9	5.8	7.7	8.9	4.7	5.9	5.6	6.0	7.5	3.7	4.4	-0.3	0.2	7.0	5.7	-1.3	-19%
All Days	5.0	3.5	4.1	4.6	3.2	3.7	3.5	3.5	3.5	2.3	2.2	-0.2	0.0	4.1	3.3	-0.8	-20%
Soil Extinction (Mm-1)																	
Best 20% Days	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.3	0.3	0.2	0.1	0.0	0.2	0.2	0.2	0.0	0%
Worst 20% Days	0.8	0.8	1.1	1.4	1.2	0.6	1.1	0.9	1.3	1.1	1.2	0.0	0.2	1.1	1.0	-0.1	-9%
All Days	0.7	0.8	0.9	0.8	1.1	0.5	0.9	0.8	1.0	0.9	0.8	0.0	0.2	0.9	0.8	-0.1	-11%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	1.9	1.5	1.6	1.5	1.7	1.3	1.1	1.9	1.7	1.3	1.2	0.0	0.2	1.6	1.4	-0.2	-13%
Worst 20% Days	5.6	7.0	9.4	9.2	7.1	5.5	5.1	6.1	6.4	5.8	7.4	-0.2	0.2	7.7	5.8	-1.9	-25%
All Days	5.0	6.1	5.8	5.6	6.2	4.5	4.7	5.6	4.9	4.7	4.8	-0.1	0.2	5.7	4.9	-0.8	-14%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.2	0.3	0.1	0.0	0.2	0.2	0.3	0.3	0.4	0.1	0.2	0.0	0.1	0.1	0.3	0.2	>100%
Worst 20% Days	0.1	0.2	0.3	0.1	0.5	0.2	0.4	0.3	0.2	0.5	0.2	0.0	0.2	0.2	0.3	0.1	50%
All Days	0.1	0.3	0.1	0.1	0.4	0.2	0.3	0.2	0.3	0.3	0.2	0.0	0.1	0.2	0.3	0.1	50%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure C.8-1
Sequoia NP and Kings Canyon NP, CA (SEQU1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

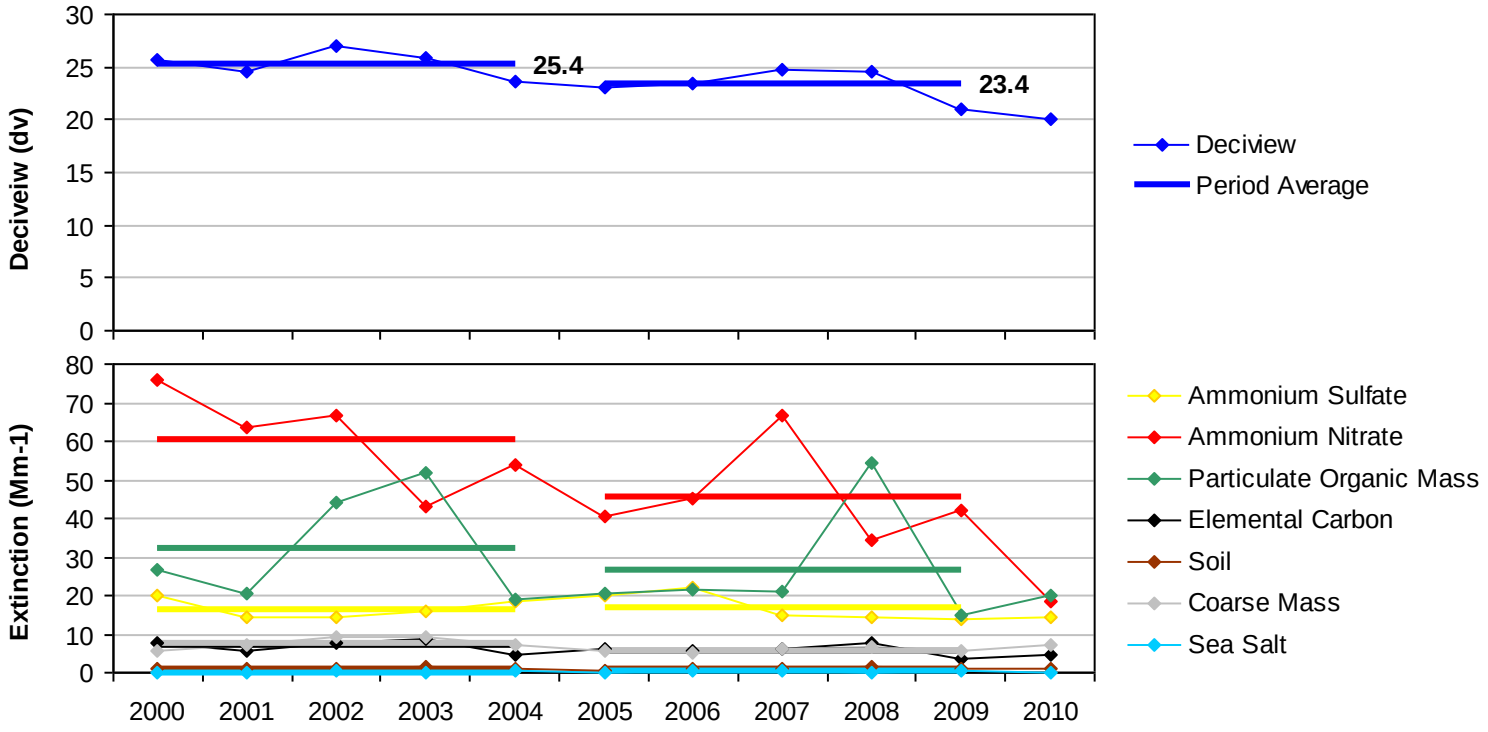


Figure C.8-2
Sequoia NP and Kings Canyon NP, CA (SEQU1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

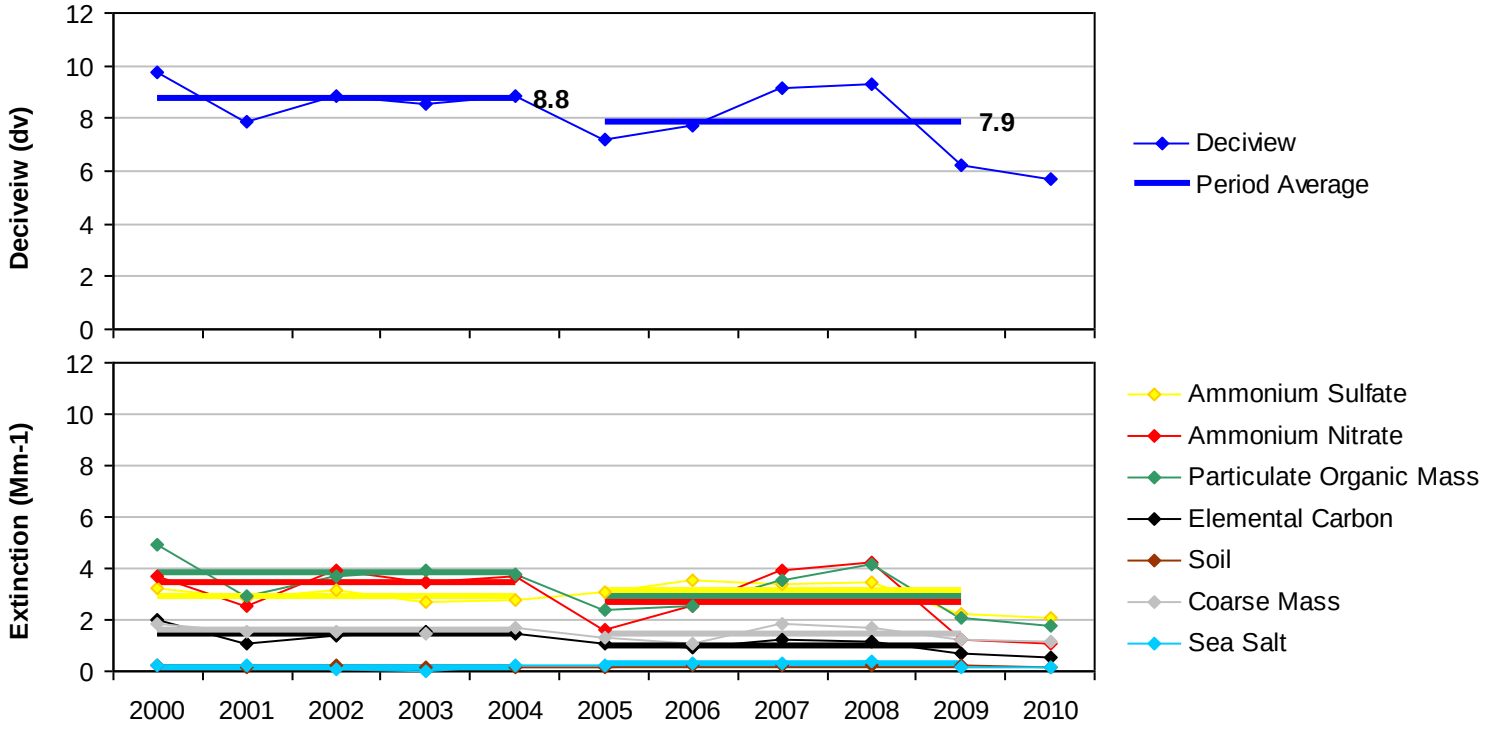
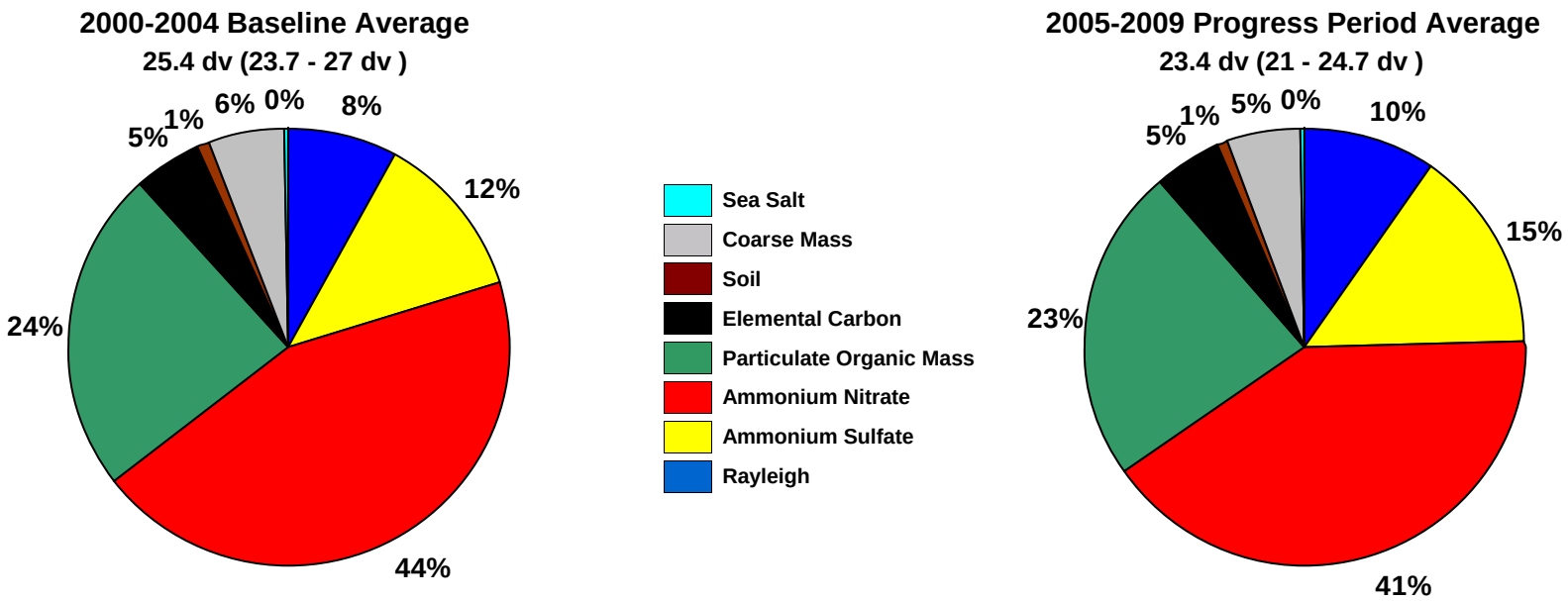


Figure C.8-3

Sequoia NP and Kings Canyon NP, CA (SEQU1 Site)

20% Most Impaired Visibility Days



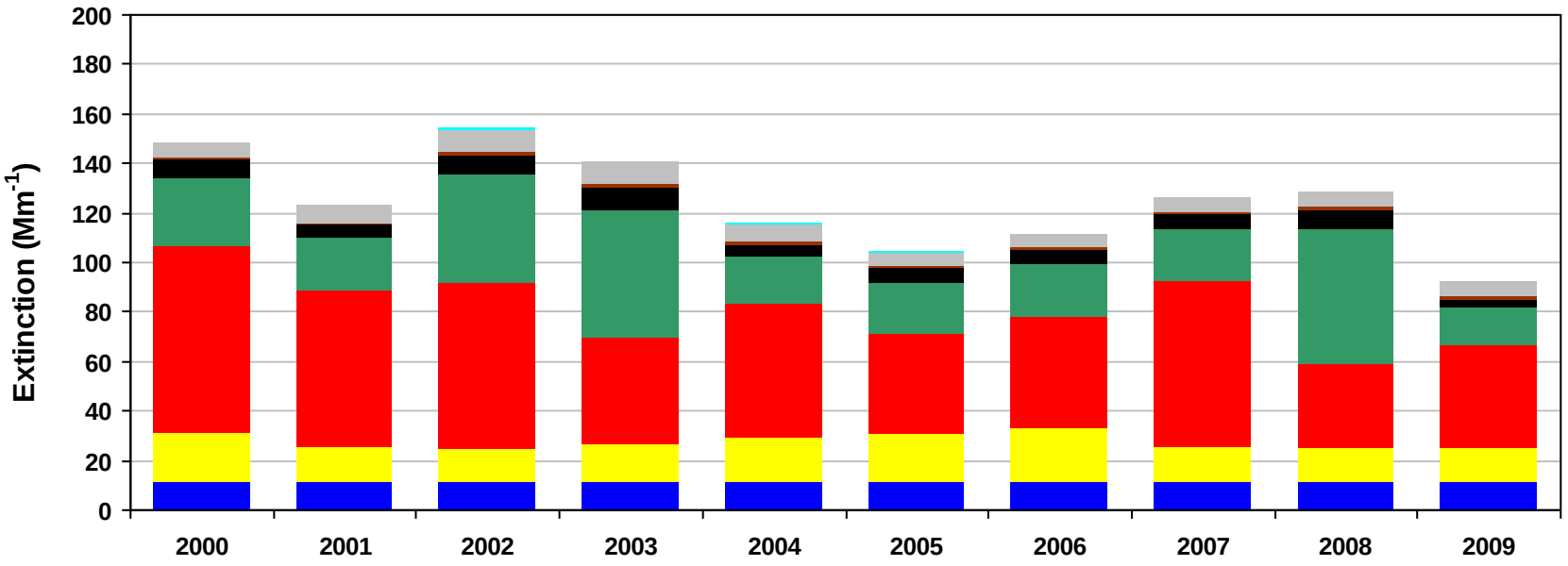
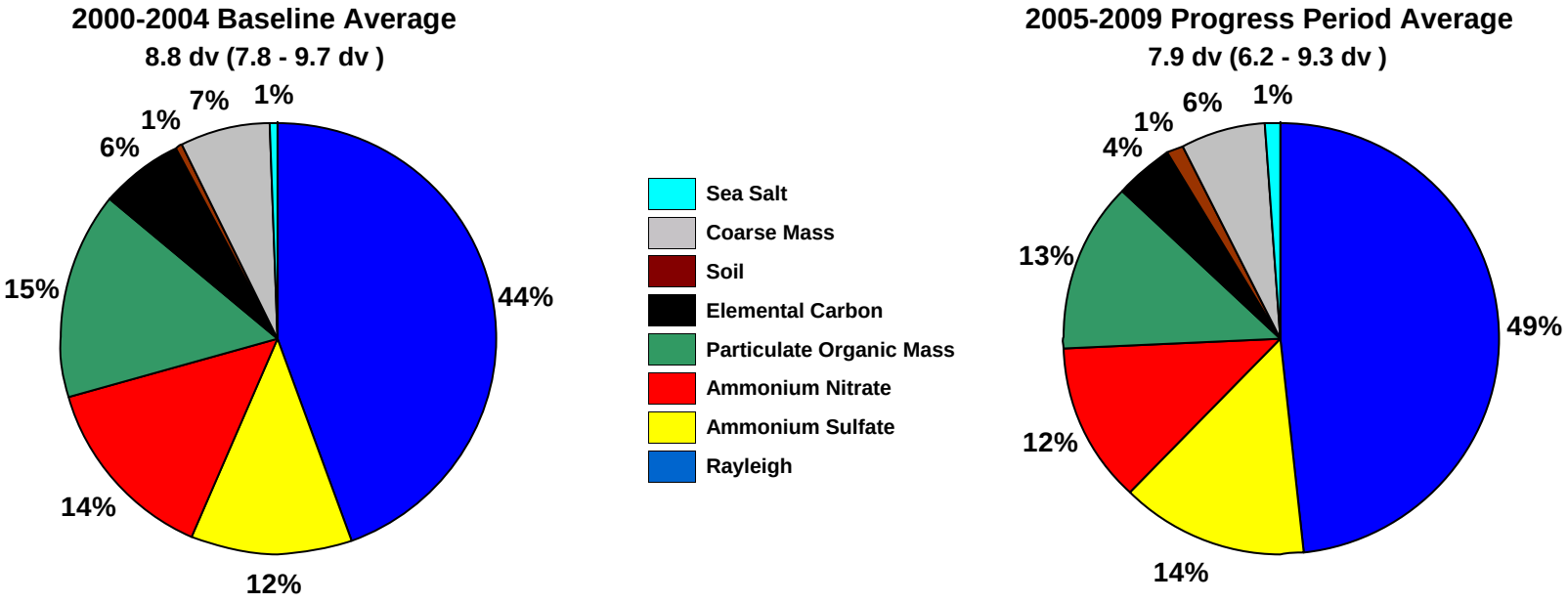


Figure C.8-4

Sequoia NP and Kings Canyon NP, CA (SEQU1 Site)

20% Least Impaired Visibility Days



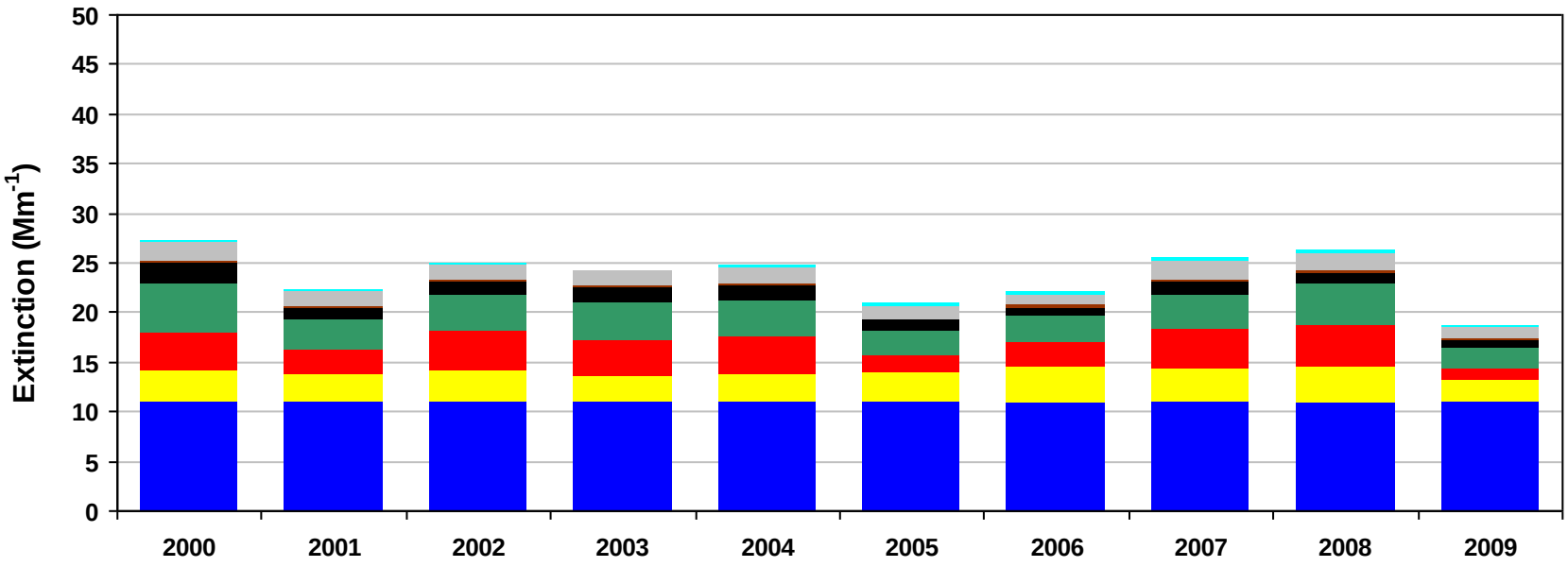


Figure C.8-5
Sequoia NP and Kings Canyon NP, CA (SEQU1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

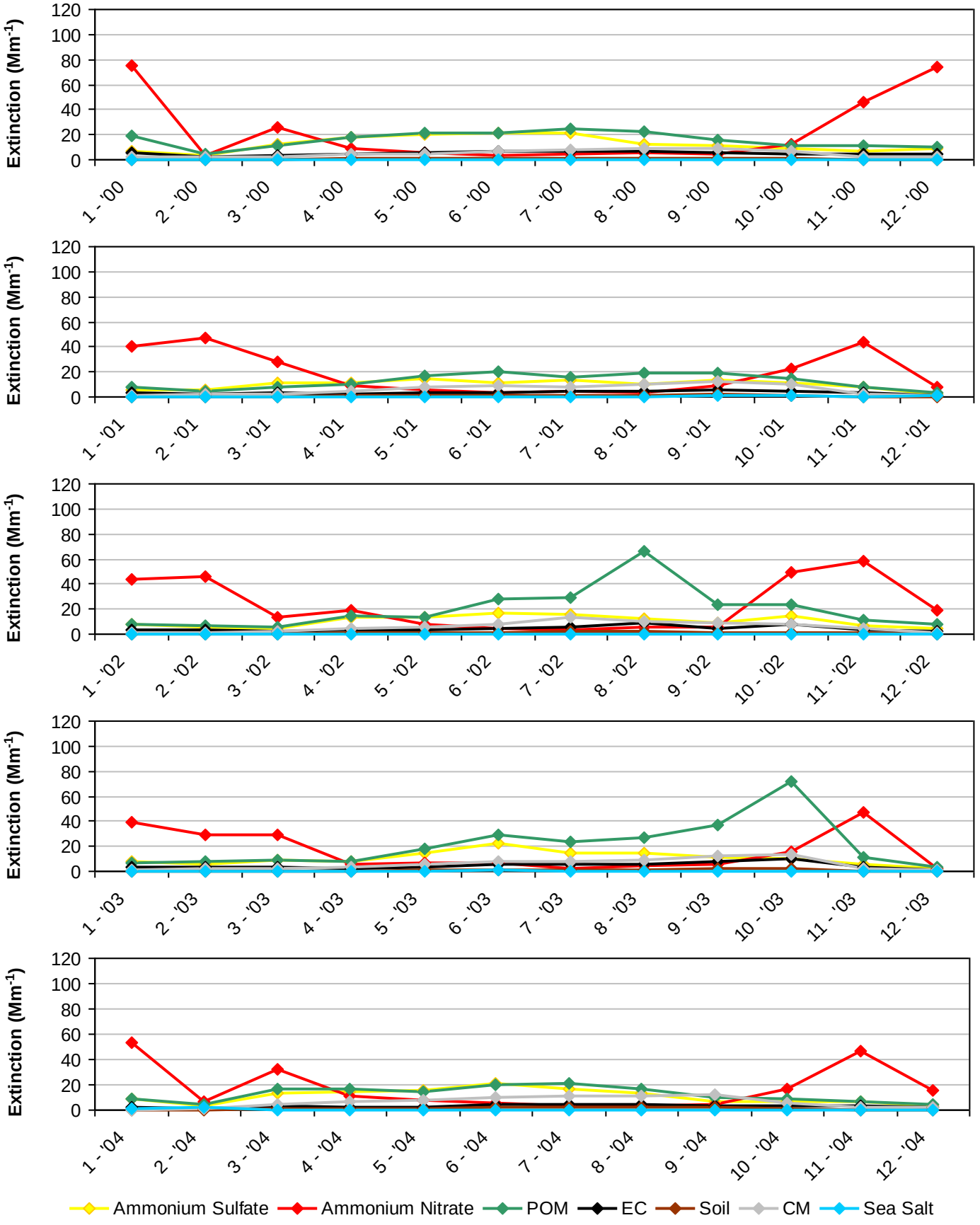


Figure C.8-6
Sequoia NP and Kings Canyon NP, CA (SEQU1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

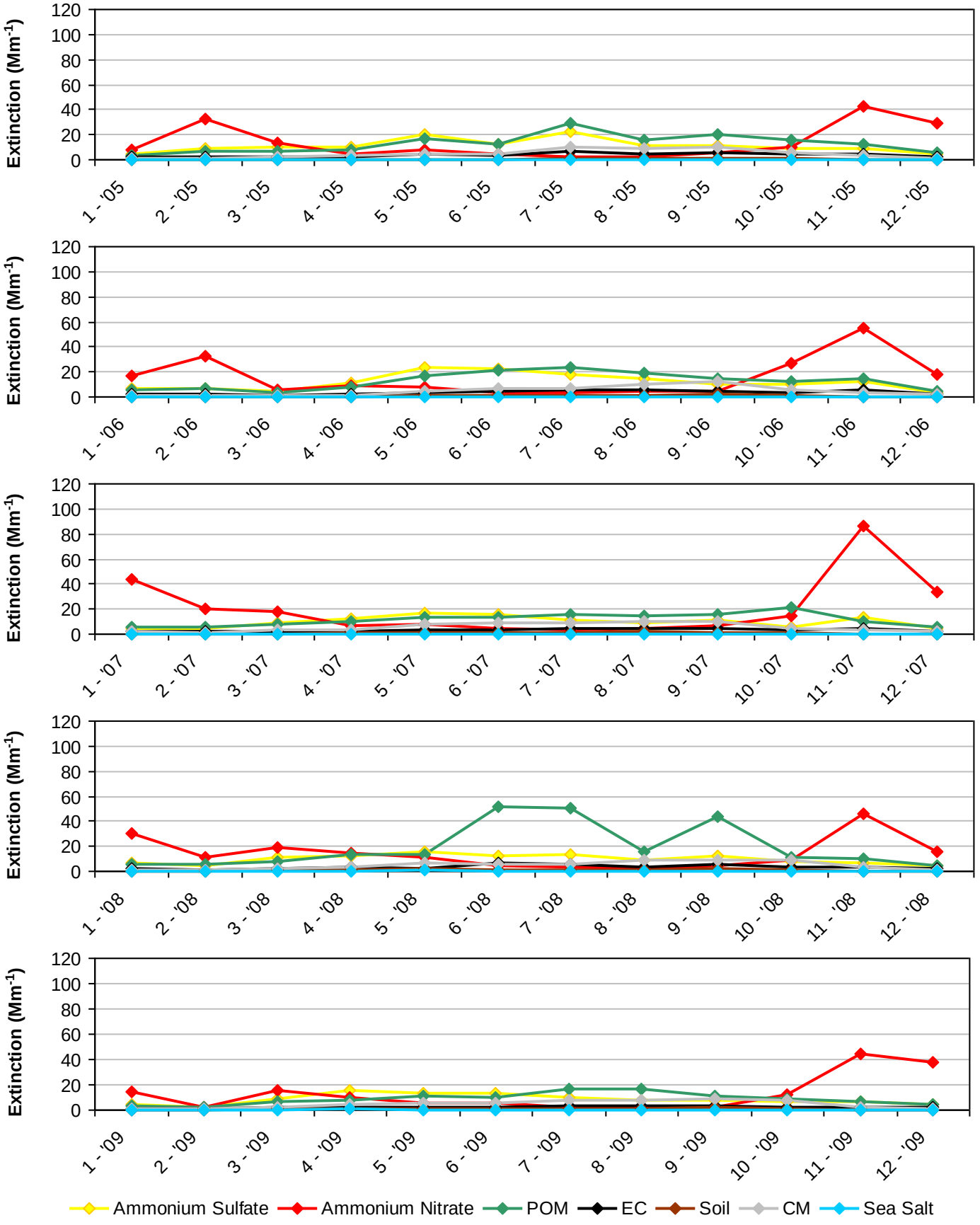


Figure C.8-7
Sequoia NP and Kings Canyon NP, CA (SEQU1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

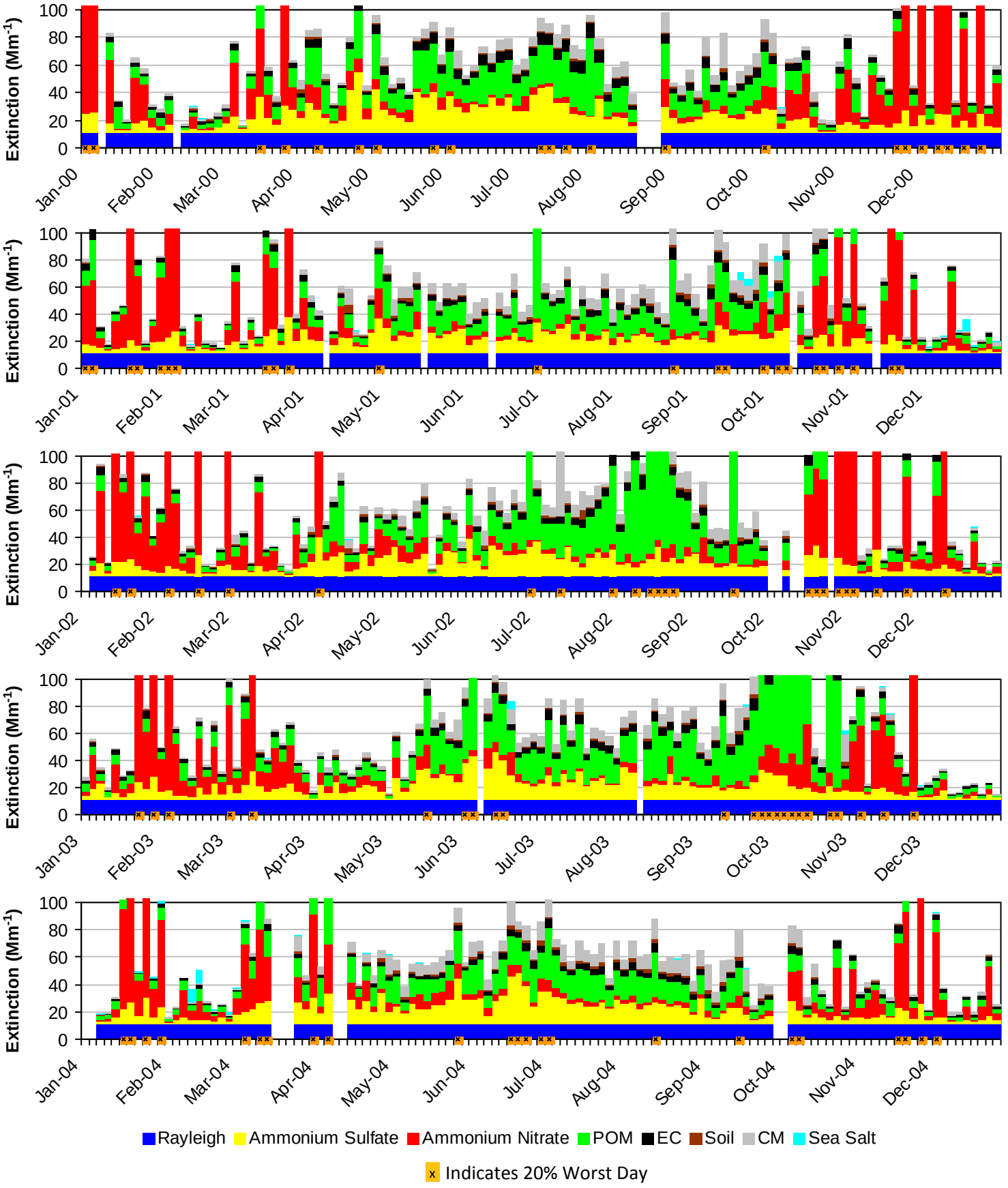
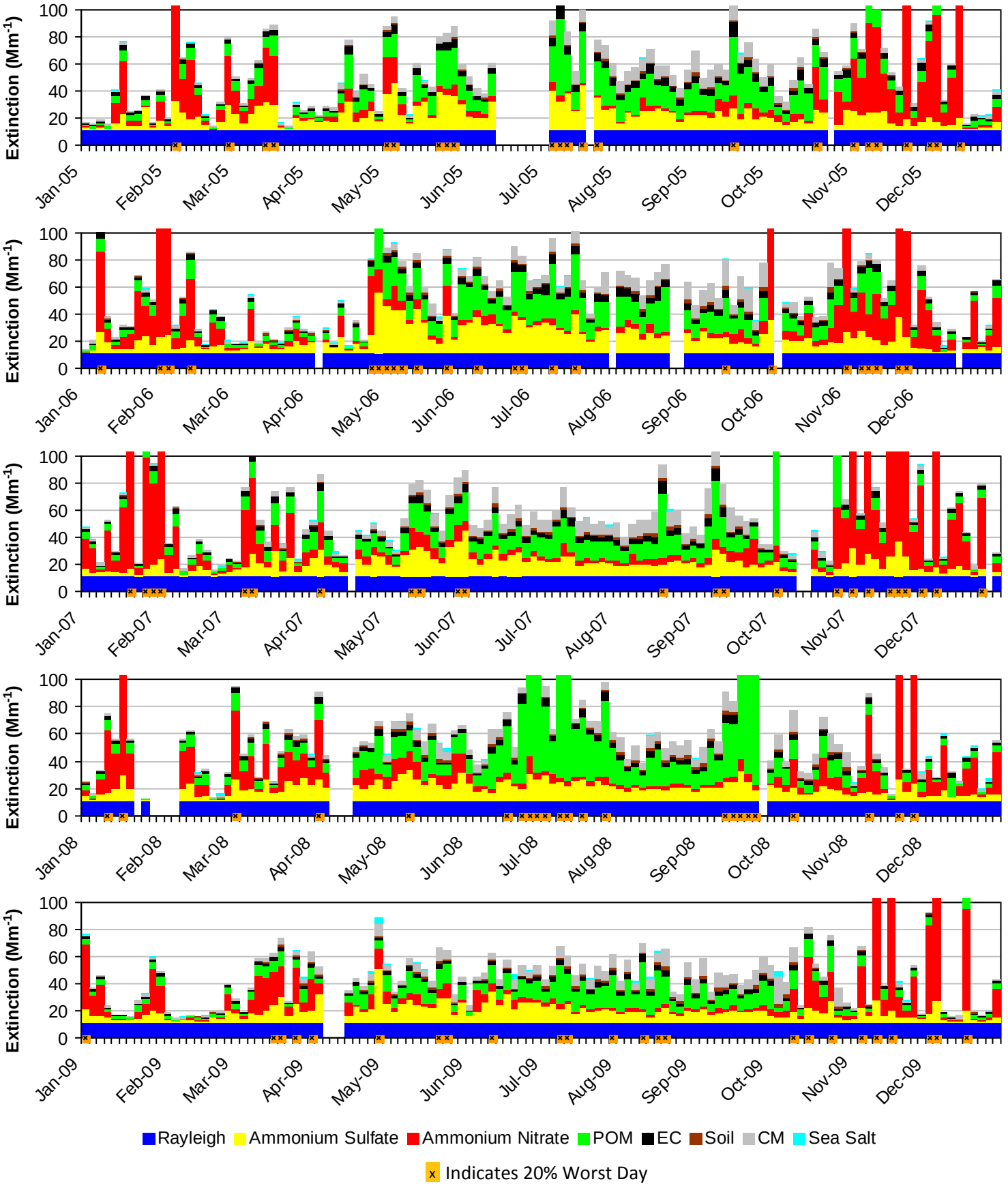


Figure C.8-8
Sequoia NP and Kings Canyon NP, CA (SEQU1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



C.9. YOSEMITE NP AND EMIGRANT WA (YOSE1)

The following tables and figures are presented in this section for the Yosemite NP and Emigrant WA represented by the YOSE1 IMPROVE Monitor:

- **Table C.9-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure C.9-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.9-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.9-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure C.9-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure C.9-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure C.9-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure C.9-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure C.9-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table C.9-1
Yosemite NP and Emigrant WA, CA (YOSE1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	4.2	2.8	3.7	3.2	3.1	3.2	3.4	3.9	2.0	2.3	1.8	-0.1	0.2	3.4	2.9	-0.5	-15%
Worst 20% Days	16.6	16.3	20.2	18.0	17.1	15.7	15.9	17.7	18.6	16.5	12.8	0.0	0.5	17.6	16.9	-0.7	-4%
All Days	10.4	9.7	11.3	10.4	9.9	9.6	9.7	10.1	9.4	8.8	7.3	-0.2	0.0	10.4	9.5	-0.9	-9%
Total Extinction (Mm-1)																	
Best 20% Days	15.3	13.4	14.6	13.8	13.8	13.9	14.1	14.9	12.2	12.7	12.0	-0.2	0.2	14.2	13.5	-0.7	-5%
Worst 20% Days	61.1	52.9	78.5	67.1	63.9	49.2	49.5	67.1	84.5	59.7	36.4	0.3	0.4	64.7	62.0	-2.7	-4%
All Days	32.7	29.8	37.4	33.8	31.9	29.0	29.1	32.5	34.5	28.8	22.5	-0.2	0.2	33.1	30.8	-2.3	-7%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	1.8	1.2	1.4	1.2	1.2	1.3	1.7	1.8	1.0	1.2	0.8	0.0	0.3	1.4	1.4	0.0	0%
Worst 20% Days	9.5	7.7	7.4	6.4	8.5	10.2	10.9	8.2	8.7	8.0	6.7	0.1	0.4	7.9	9.2	1.3	17%
All Days	5.4	4.8	4.9	4.6	5.0	6.0	5.8	4.7	4.7	4.3	3.5	-0.1	0.2	4.9	5.1	0.2	4%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.5	0.6	0.7	0.5	0.5	0.8	0.4	0.6	0.2	0.2	0.2	0.0	0.2	0.6	0.5	-0.1	-17%
Worst 20% Days	15.6	7.4	8.3	5.7	3.5	4.6	5.5	13.4	3.2	5.8	2.2	-0.5	0.1	8.1	6.5	-1.6	-20%
All Days	4.9	3.2	3.6	2.7	1.9	2.2	2.1	4.2	1.7	2.1	1.2	-0.2	0.0	3.3	2.4	-0.9	-27%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.6	0.6	1.2	1.3	1.1	0.9	0.9	1.1	0.4	0.4	0.3	-0.1	0.0	1.2	0.8	-0.4	-33%
Worst 20% Days	16.1	19.0	42.4	35.5	31.8	16.4	14.5	25.5	50.2	26.6	8.3	0.9	0.4	29.0	26.7	-2.3	-8%
All Days	7.3	7.2	13.5	11.8	9.9	6.7	6.8	8.8	13.1	8.0	3.6	-0.1	0.5	9.9	8.7	-1.2	-12%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.5	0.2	0.4	0.3	0.4	0.4	0.4	0.4	0.1	0.2	0.2	0.0	0.1	0.4	0.3	-0.1	-25%
Worst 20% Days	4.6	4.0	5.5	5.2	4.6	3.8	3.6	5.0	6.7	4.2	1.9	0.0	0.4	4.8	4.6	-0.2	-4%
All Days	2.2	1.8	2.3	2.2	1.9	1.9	1.9	2.0	2.1	1.6	0.9	0.0	0.1	2.1	1.9	-0.2	-10%
Soil Extinction (Mm-1)																	
Best 20% Days	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.5	0.1	0.1	0.0	0%
Worst 20% Days	0.8	1.2	0.8	0.6	1.1	0.5	1.3	0.8	1.1	0.9	1.2	0.0	0.4	0.9	0.9	0.0	0%
All Days	0.4	0.6	0.5	0.3	0.6	0.3	0.7	0.5	0.6	0.5	0.5	0.0	0.4	0.5	0.5	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	0.5	0.5	0.5	0.4	0.4	0.2	0.3	0.7	0.3	0.5	0.4	0.0	0.2	0.5	0.4	-0.1	-20%
Worst 20% Days	4.5	3.6	4.0	3.4	4.4	3.5	3.6	4.2	4.5	4.0	5.8	0.0	0.4	4.0	4.0	0.0	0%
All Days	2.2	2.0	2.5	2.0	2.5	1.9	1.9	2.3	2.3	2.2	2.7	0.0	0.5	2.2	2.1	-0.1	-5%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0%
Worst 20% Days	0.0	0.0	0.1	0.3	0.1	0.1	0.2	0.1	0.1	0.3	0.2	0.0	0.0	0.1	0.1	0.0	0%
All Days	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.4	0.1	0.1	0.0	0%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure C.9-1
Yosemite NP and Emigrant WA, CA (YOSE1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

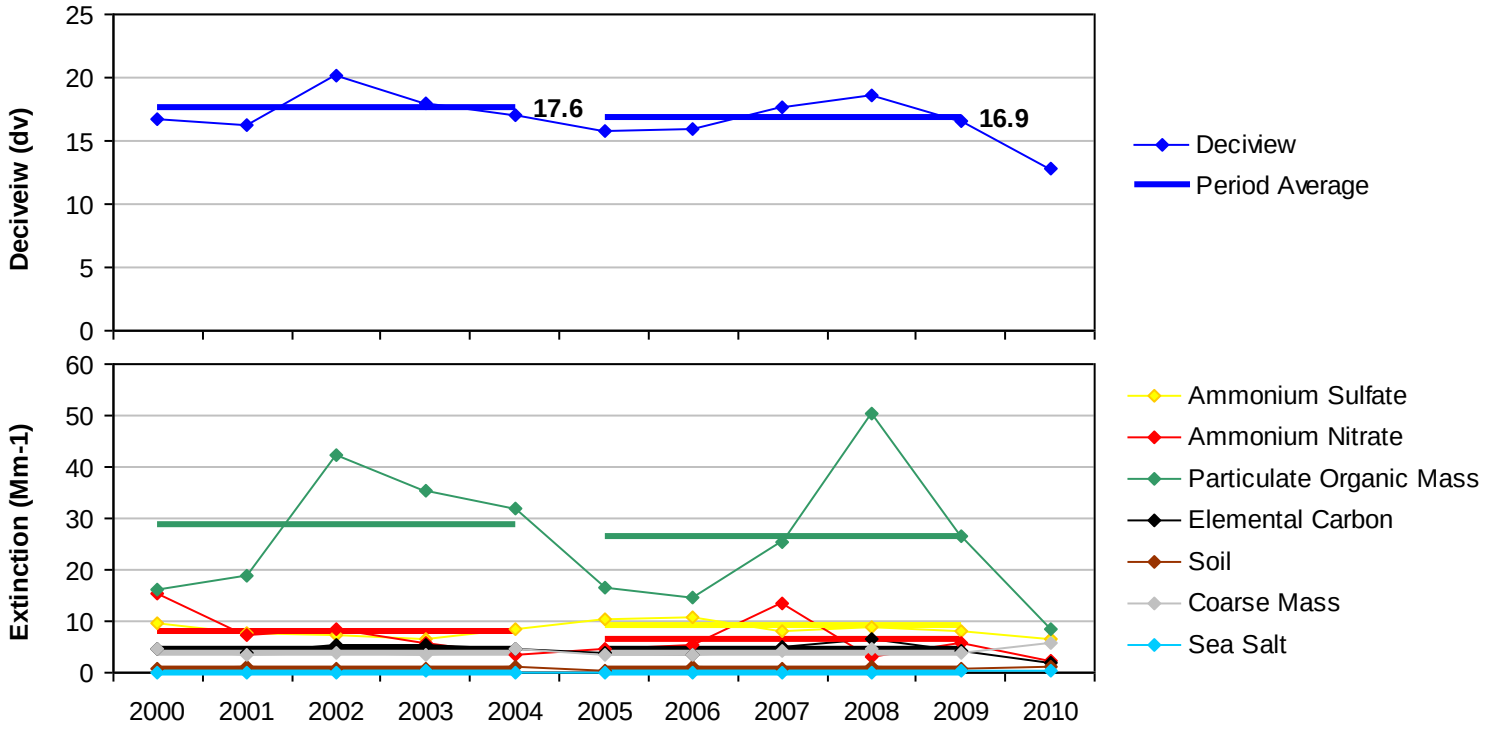


Figure C.9-2
Yosemite NP and Emigrant WA, CA (YOSE1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

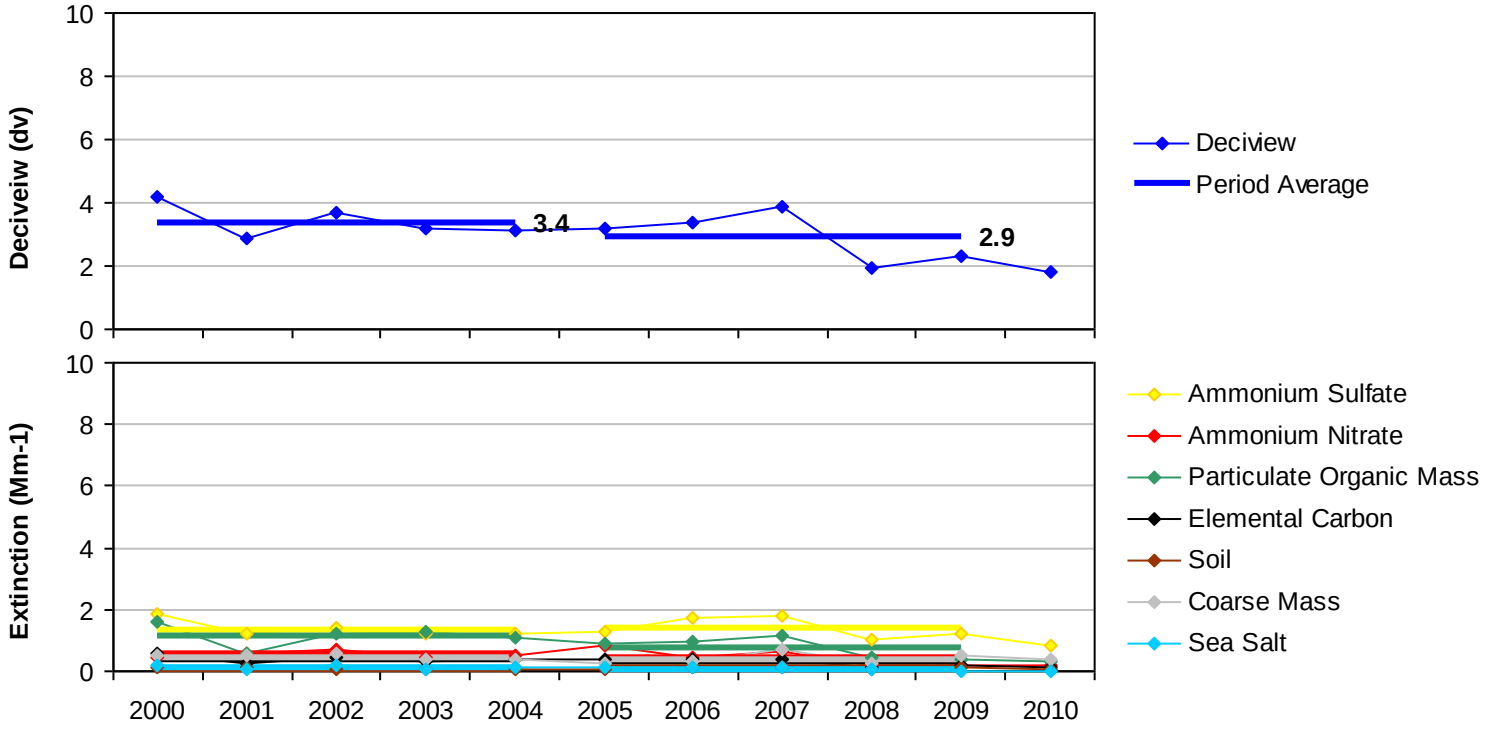
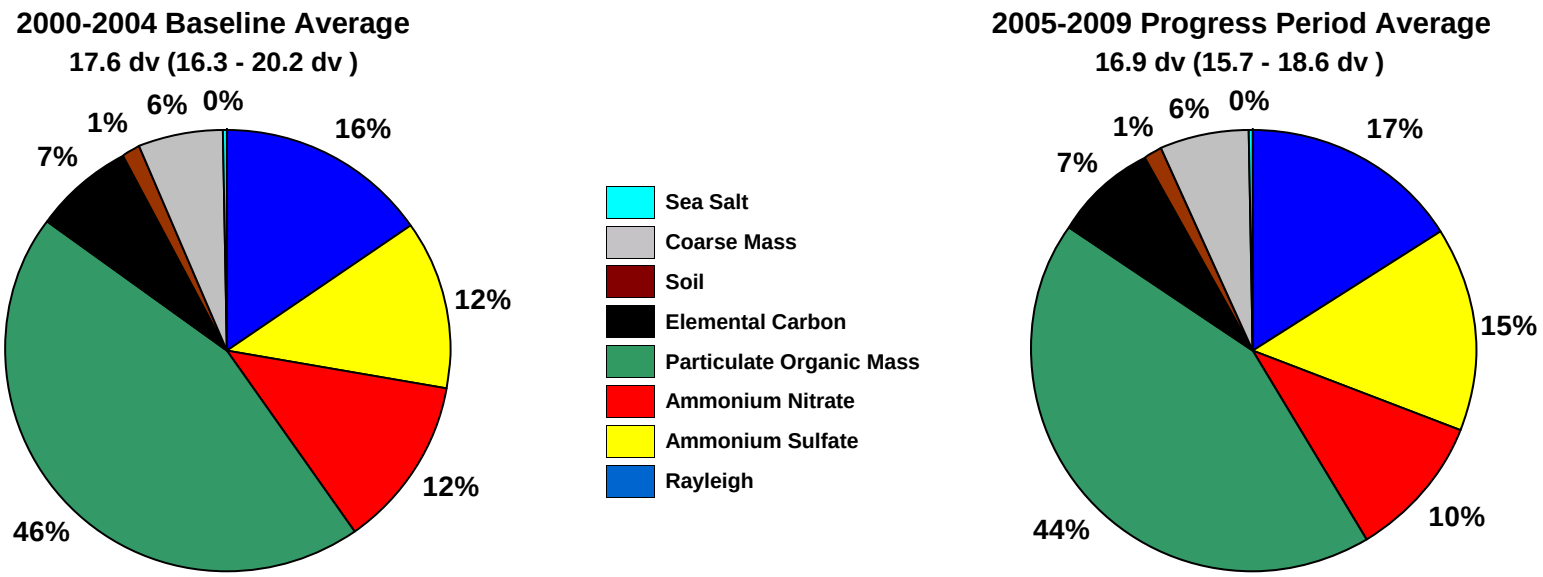


Figure C.9-3
Yosemite NP and Emigrant WA, CA (YOSE1 Site)
20% Most Impaired Visibility Days



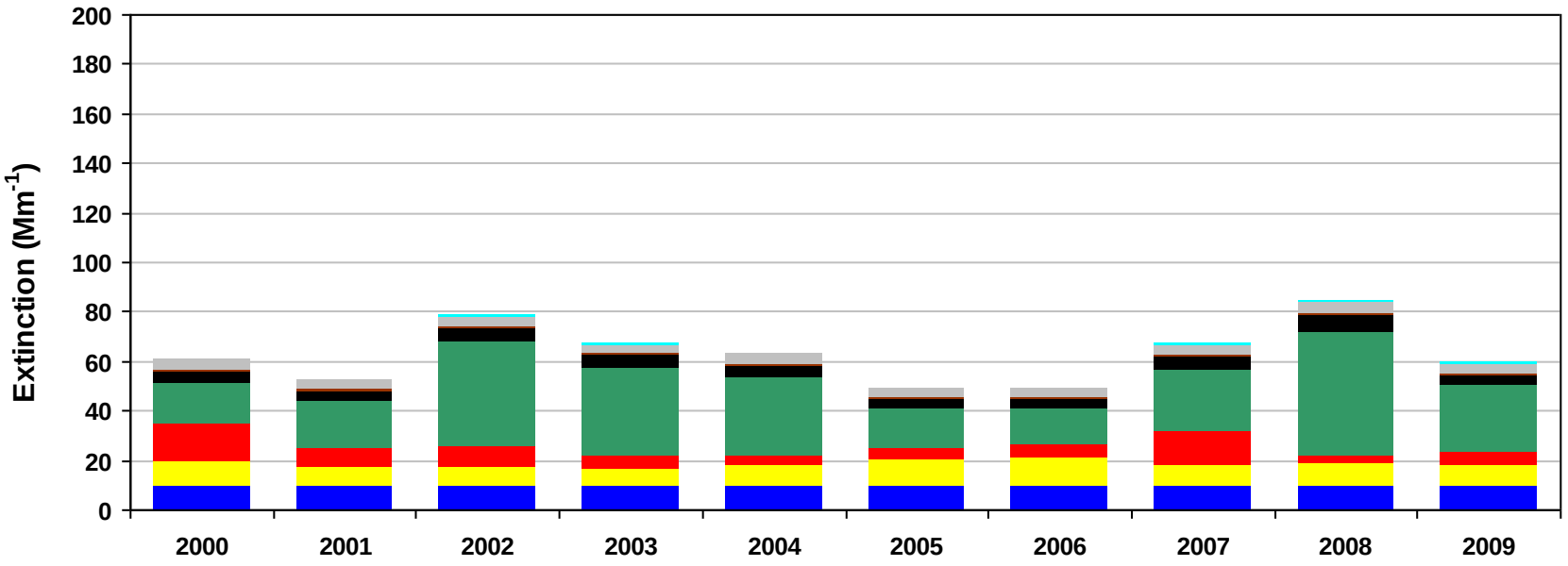
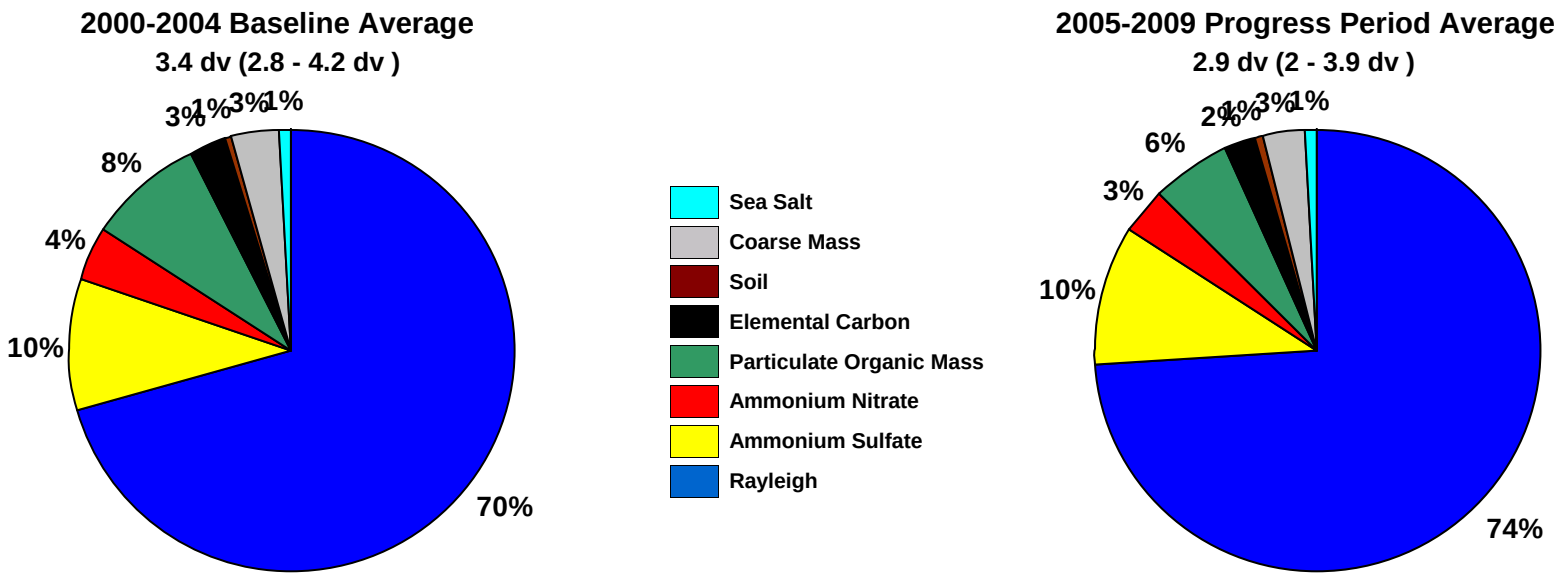


Figure C.9-4
Yosemite NP and Emigrant WA, CA (YOSE1 Site)
20% Least Impaired Visibility Days



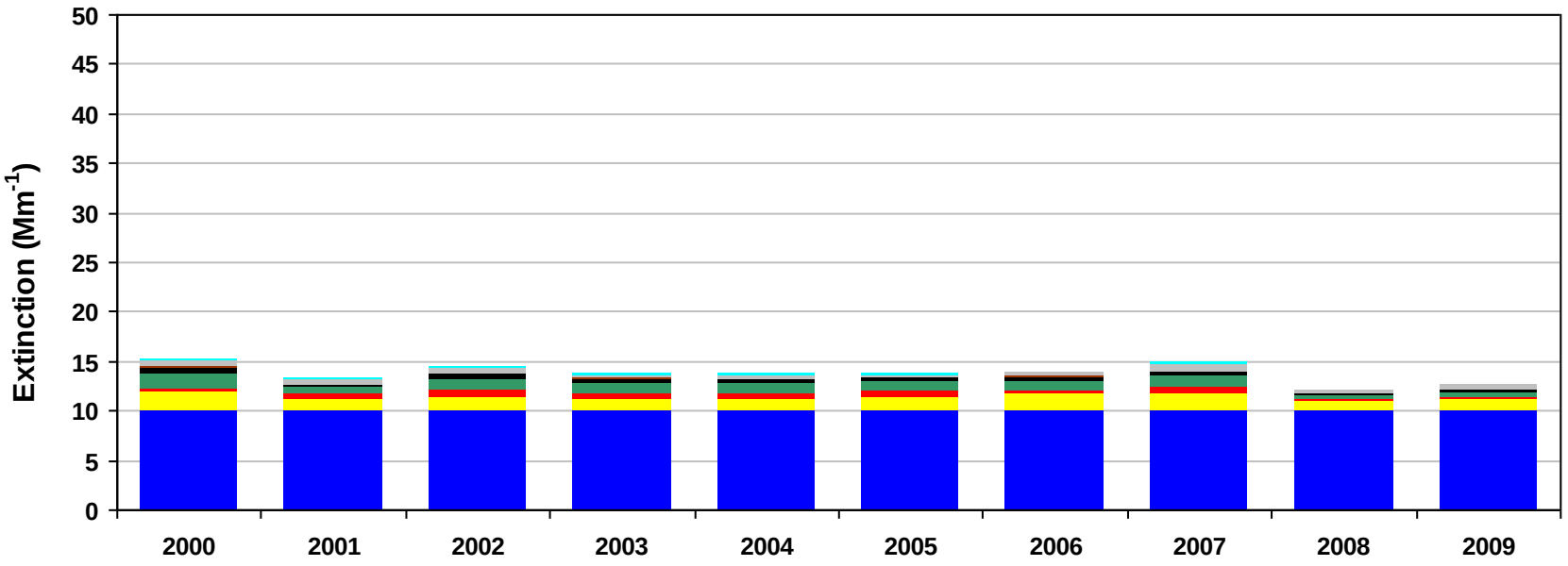


Figure C.9-5
Yosemite NP and Emigrant WA, CA (YOSE1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

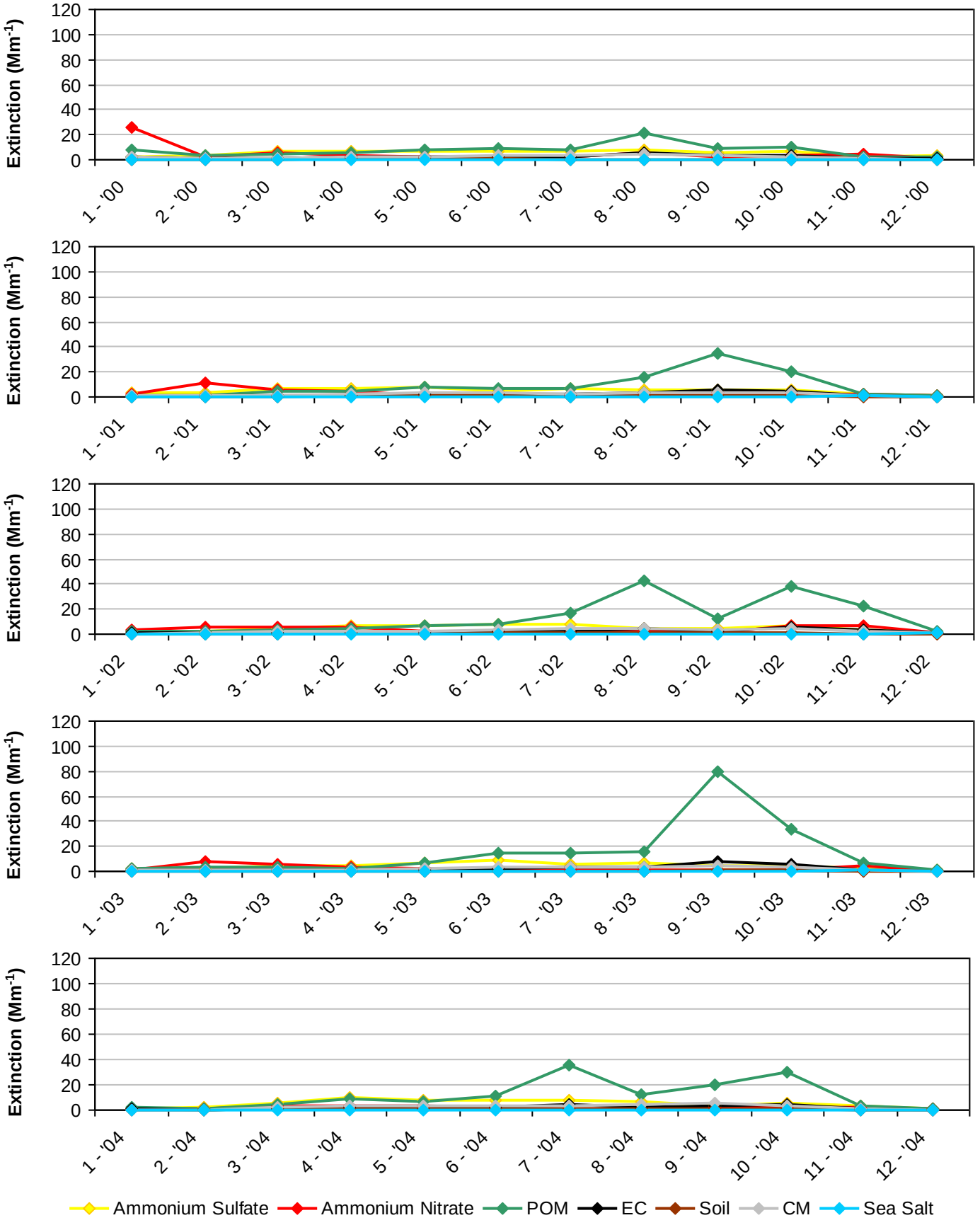


Figure C.9-6
Yosemite NP and Emigrant WA, CA (YOSE1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

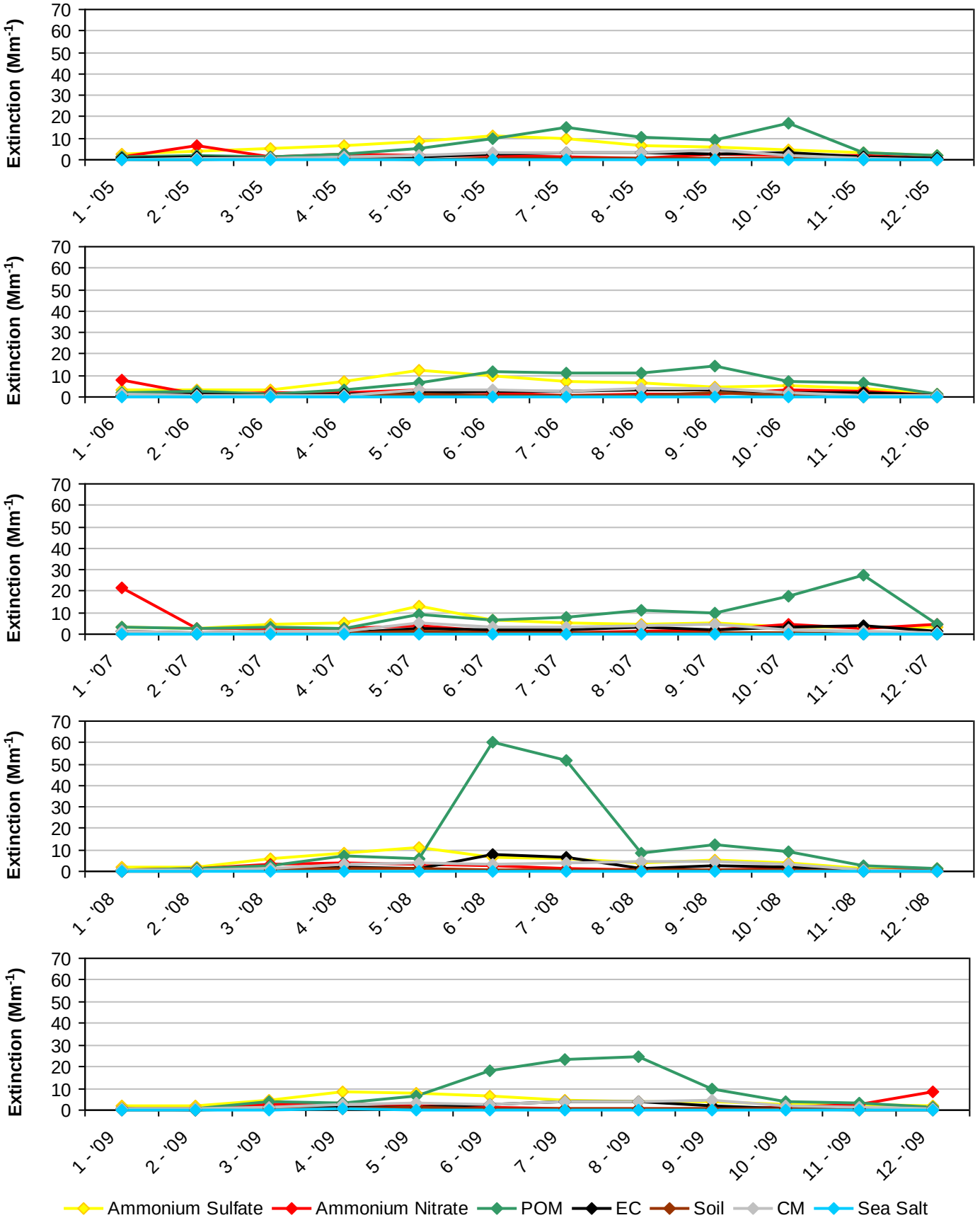


Figure C.9-7
Yosemite NP and Emigrant WA, CA (YOSE1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

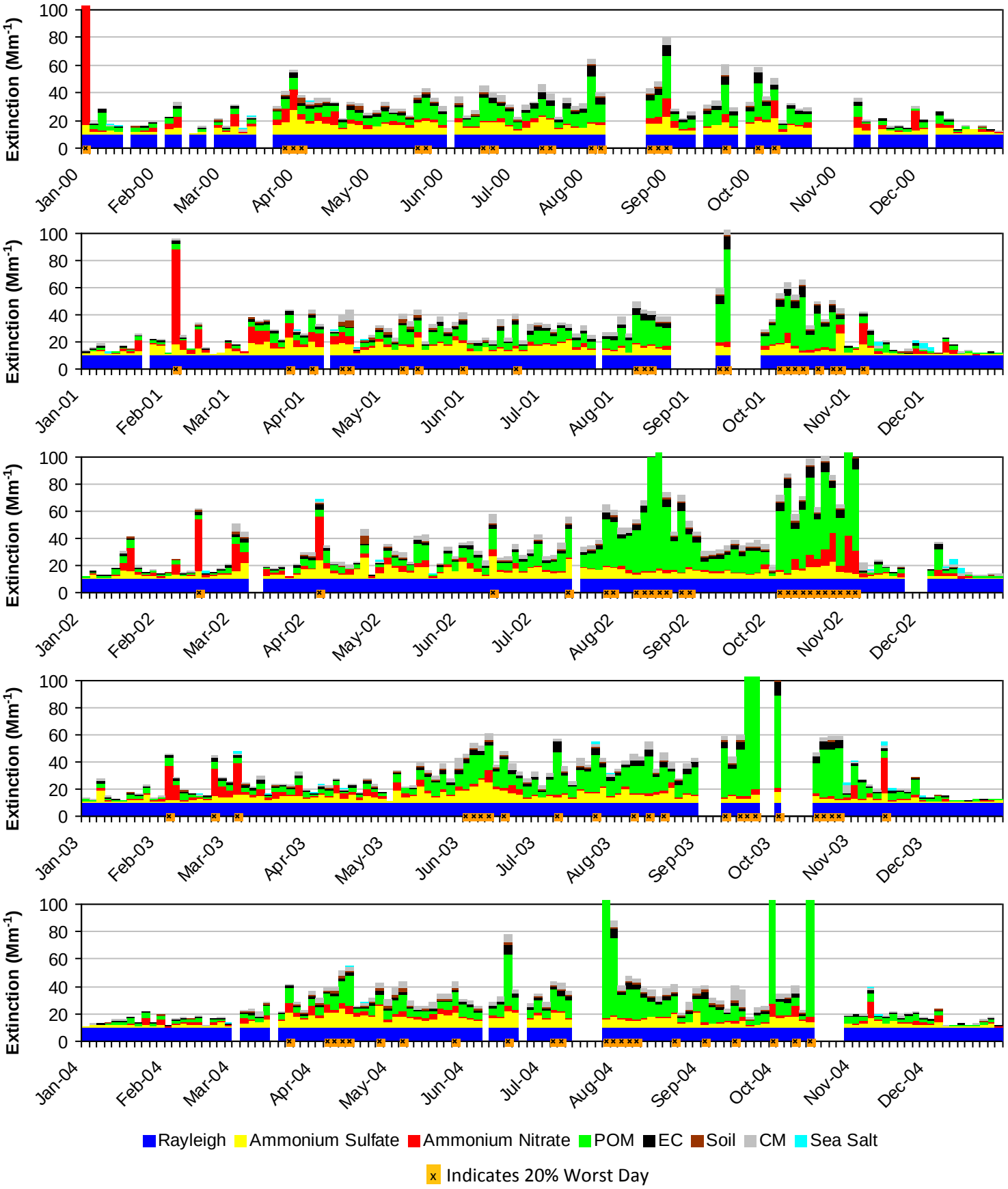
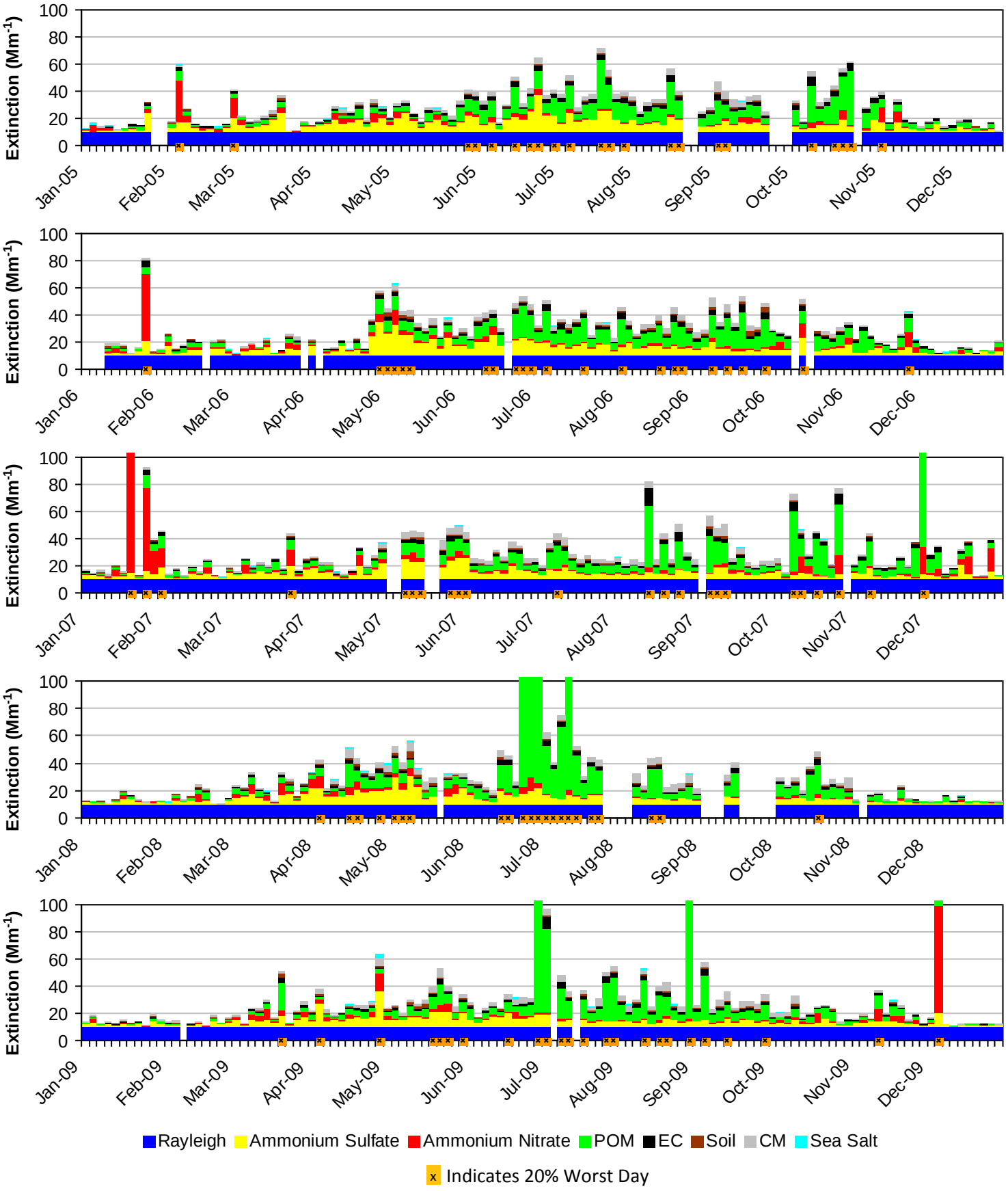


Figure C.9-8
Yosemite NP and Emigrant WA, CA (YOSE1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



C.10. AGUA TIBIA WA (AGTI1)

The following tables and figures are presented in this section for the Agua Tibia WA represented by the AGTI1 IMPROVE Monitor:

- **Table C.10-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure C.10-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.10-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.10-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure C.10-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure C.10-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure C.10-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure C.10-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

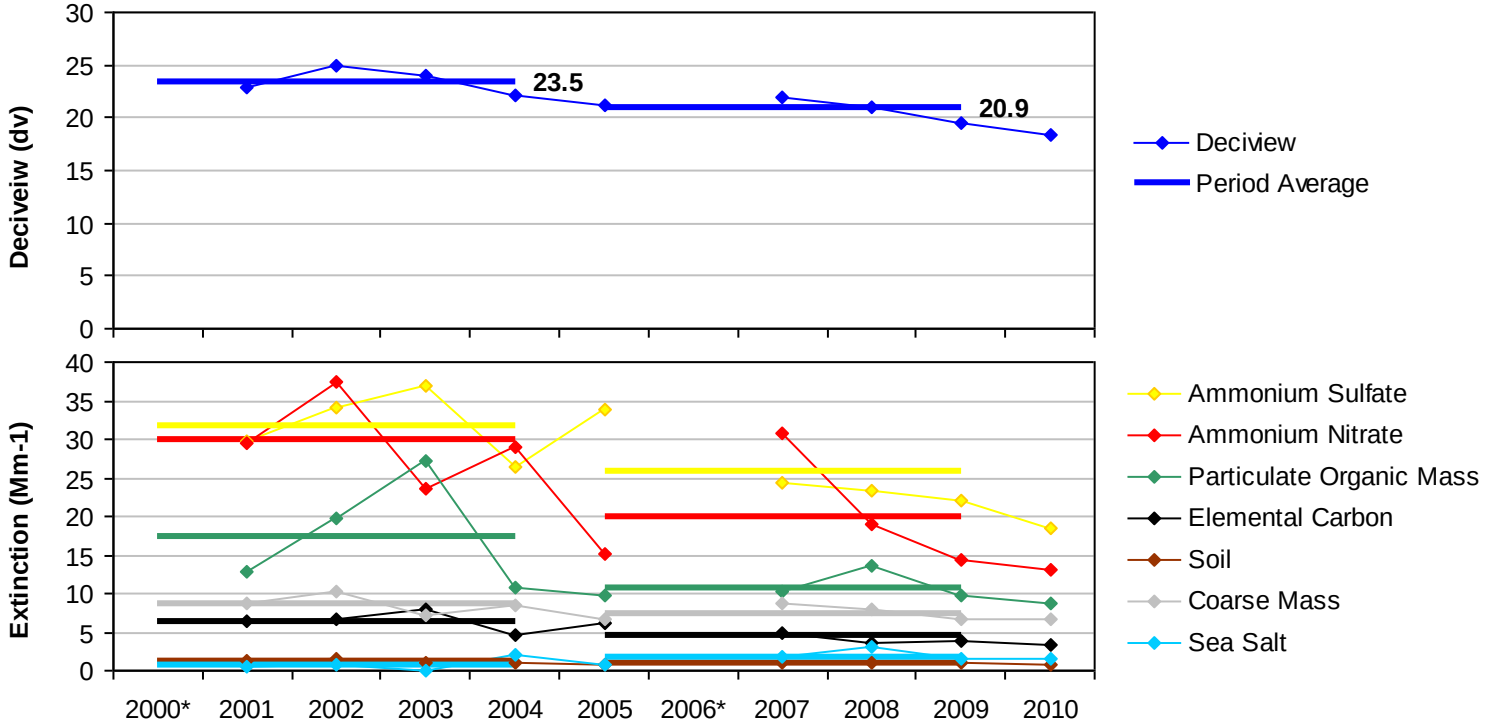
- **Figure C.10-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table C.10-1
Agua Tibia WA, CA (AGTI1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	10.2	10.4	9.4	8.4	6.9	---	9.0	7.5	6.3	6.8	-0.5	0.0	9.6	7.4	-2.2	-23%
Worst 20% Days	---	22.9	24.9	24.0	22.2	21.2	---	22.0	21.0	19.4	18.4	-0.6	0.0	23.5	20.9	-2.6	-11%
All Days	---	17.2	17.9	17.2	16.2	15.0	---	16.4	14.9	13.4	13.0	-0.5	0.0	17.1	14.9	-2.2	-13%
Total Extinction (Mm-1)																	
Best 20% Days	---	28.3	28.8	26.2	23.5	20.2	---	25.1	21.4	19.1	19.8	-1.2	0.0	26.7	21.4	-5.3	-20%
Worst 20% Days	---	99.8	121.7	114.7	93.2	84.3	---	92.7	82.5	70.2	63.4	-5.7	0.0	107.4	82.4	-25.0	-23%
All Days	---	61.6	67.9	63.9	56.5	50.5	---	57.1	49.3	42.2	40.0	-2.8	0.0	62.5	49.8	-12.7	-20%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	3.9	4.8	3.3	3.6	2.6	---	3.1	2.1	2.2	2.0	-0.3	0.0	3.9	2.5	-1.4	-36%
Worst 20% Days	---	29.7	34.2	36.9	26.5	33.8	---	24.3	23.3	22.0	18.4	-1.1	0.0	31.8	25.8	-6.0	-19%
All Days	---	17.3	17.4	17.0	15.3	15.4	---	14.4	12.5	11.0	9.2	-0.7	0.0	16.8	13.3	-3.5	-21%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	4.5	3.8	3.1	1.7	1.2	---	2.2	1.6	1.3	1.3	-0.4	0.0	3.3	1.6	-1.7	-52%
Worst 20% Days	---	29.5	37.6	23.5	29.1	15.2	---	30.8	19.1	14.3	13.0	-2.2	0.1	29.9	19.9	-10.0	-33%
All Days	---	14.0	16.7	12.6	12.4	8.6	---	13.7	8.7	6.7	6.4	-0.9	0.0	13.9	9.4	-4.5	-32%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	3.3	3.0	3.2	2.5	1.7	---	2.4	1.9	1.2	1.7	-0.3	0.0	3.0	1.8	-1.2	-40%
Worst 20% Days	---	12.8	19.6	27.1	10.7	9.9	---	10.1	13.5	9.8	8.7	-0.6	0.1	17.5	10.8	-6.7	-38%
All Days	---	8.0	9.9	11.8	6.8	6.2	---	6.4	6.8	4.9	4.9	-0.4	0.0	9.1	6.1	-3.0	-33%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	2.0	2.1	2.1	1.3	1.3	---	1.6	1.3	0.8	0.9	-0.1	0.0	1.9	1.2	-0.7	-37%
Worst 20% Days	---	6.5	6.6	7.9	4.5	6.2	---	4.9	3.5	3.8	3.4	-0.4	0.0	6.4	4.6	-1.8	-28%
All Days	---	4.4	4.3	4.9	3.2	4.0	---	3.2	2.5	2.1	2.2	-0.3	0.0	4.2	2.9	-1.3	-31%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.3	0.6	0.5	0.4	0.2	---	0.6	0.4	0.3	0.3	0.0	0.2	0.5	0.4	-0.1	-20%
Worst 20% Days	---	1.3	1.7	1.0	1.0	0.8	---	0.9	0.9	1.0	0.8	0.0	0.2	1.3	0.9	-0.4	-31%
All Days	---	0.8	1.1	0.8	0.9	0.5	---	0.8	0.8	0.7	0.6	0.0	0.1	0.9	0.7	-0.2	-22%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	2.4	2.8	2.1	2.3	1.8	---	3.7	2.3	1.9	1.9	-0.1	0.2	2.4	2.4	0.0	0%
Worst 20% Days	---	8.6	10.4	7.2	8.3	6.7	---	8.7	8.0	6.8	6.7	-0.2	0.1	8.6	7.5	-1.1	-13%
All Days	---	5.7	6.8	5.3	5.7	4.0	---	6.5	5.5	4.6	4.5	-0.1	0.2	5.9	5.1	-0.8	-14%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.8	0.7	0.9	0.7	0.4	---	0.5	0.9	0.4	0.7	0.0	0.2	0.8	0.6	-0.2	-25%
Worst 20% Days	---	0.4	0.8	0.0	2.0	0.8	---	1.9	3.1	1.4	1.5	0.2	0.1	0.8	1.8	1.0	>100%
All Days	---	0.5	0.6	0.4	1.3	0.9	---	1.2	1.6	1.1	1.1	0.1	0.1	0.7	1.2	0.5	71%

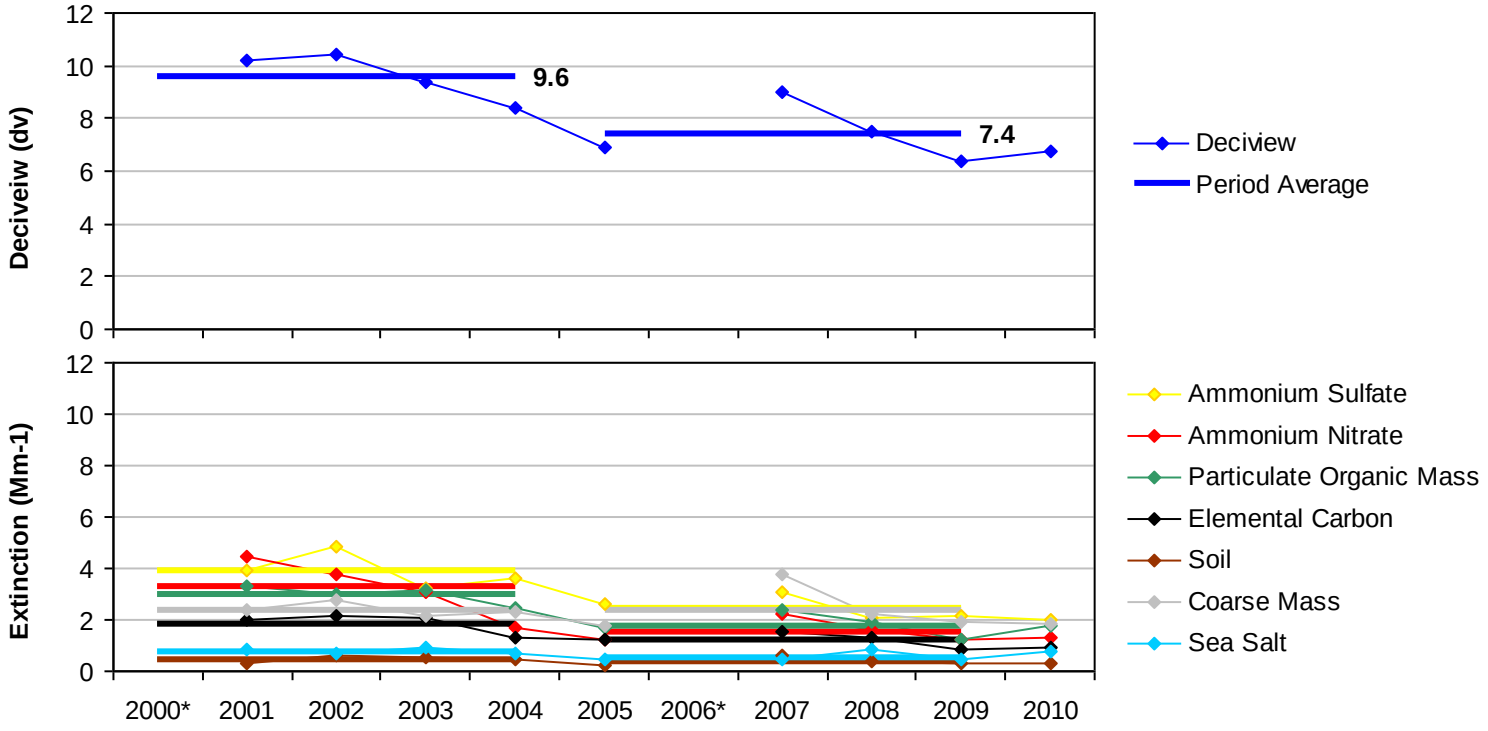
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure C.10-1
Agua Tibia WA, CA (AGTI1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



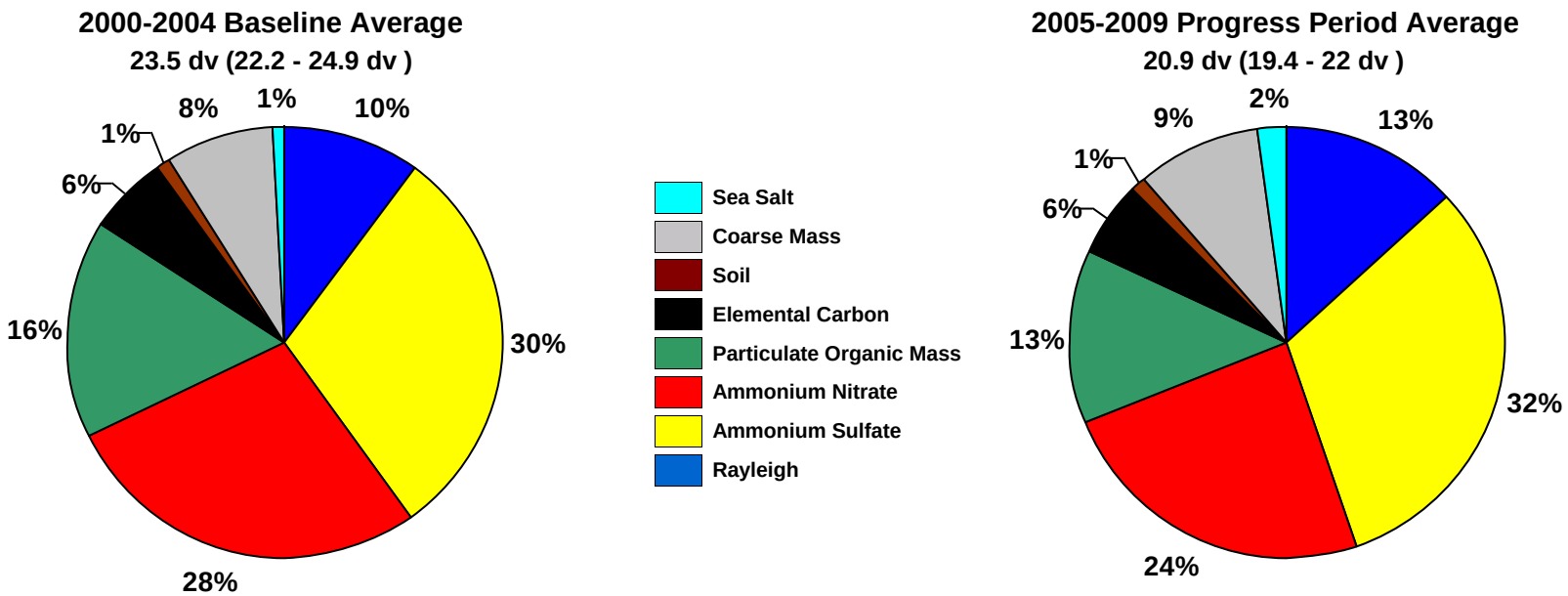
*Missing years did not meet RHR data completeness criteria.

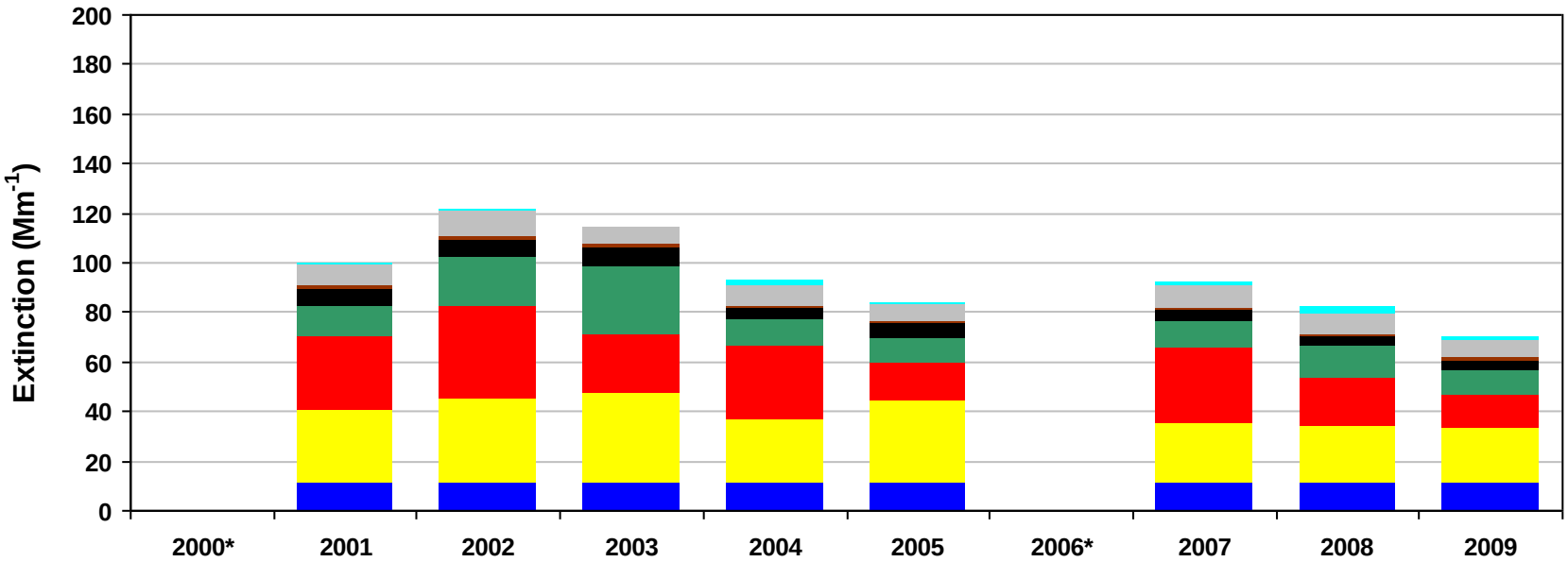
Figure C.10-2
Agua Tibia WA, CA (AGTI1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

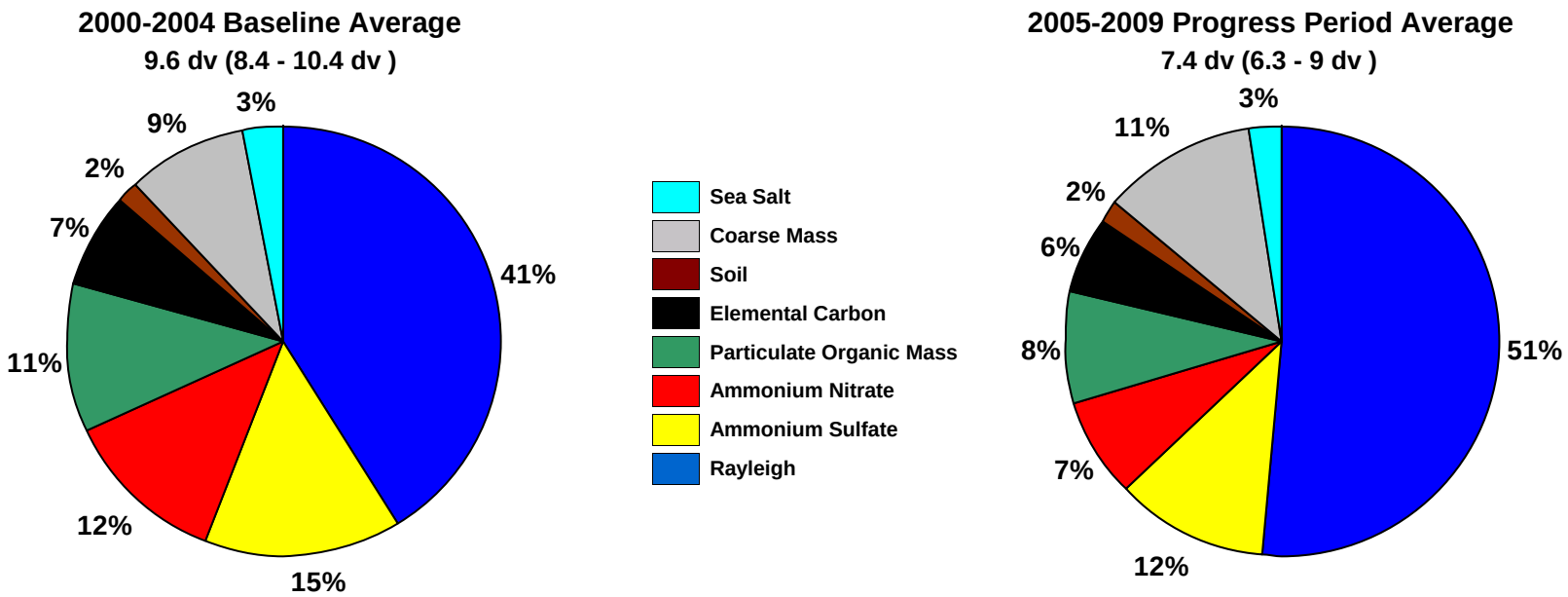
Figure C.10-3
Agua Tibia WA, CA (AGTI1 Site)
20% Most Impaired Visibility Days

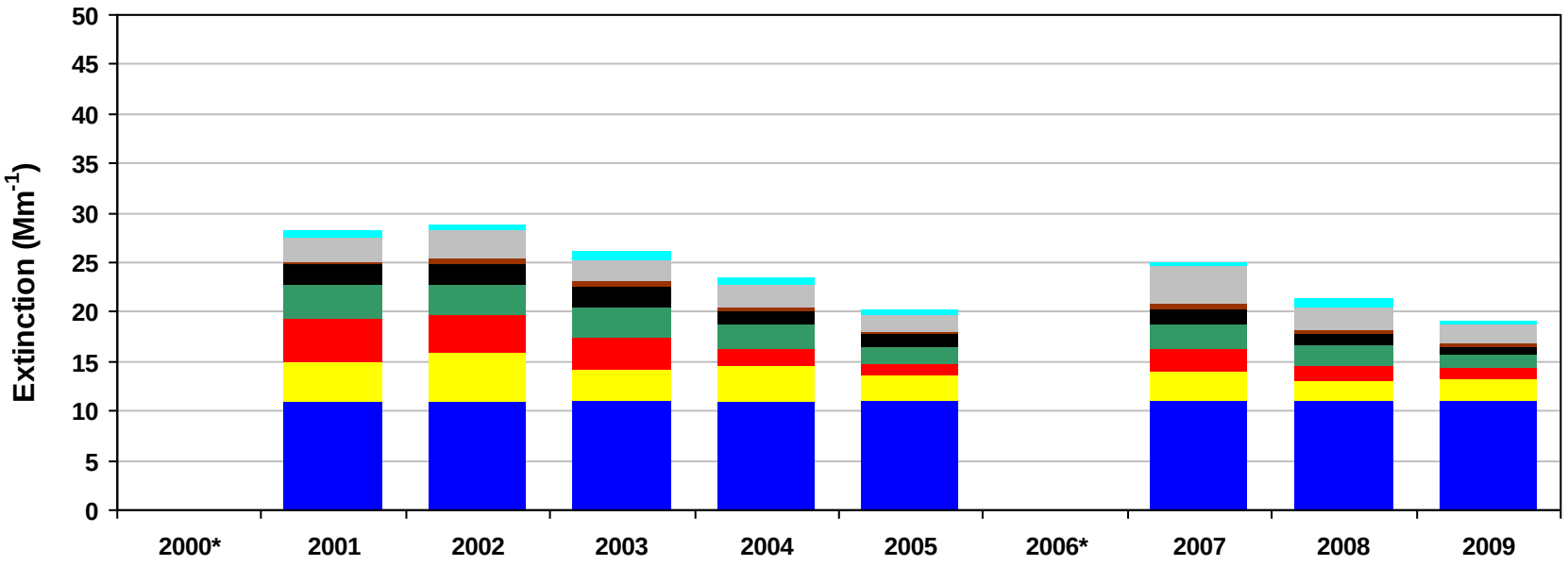




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

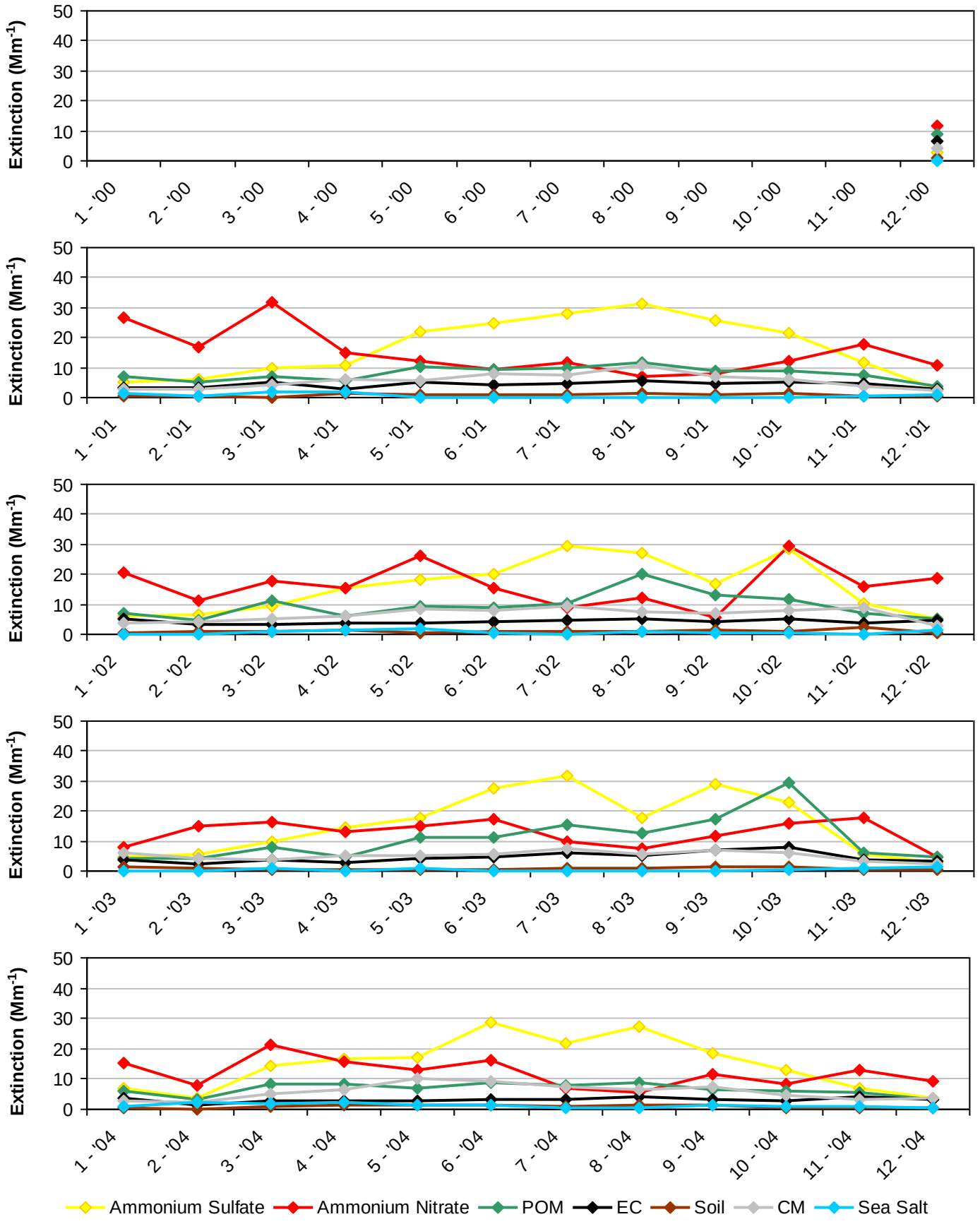
Figure C.10-4
Agua Tibia WA, CA (AGTI1 Site)
20% Least Impaired Visibility Days





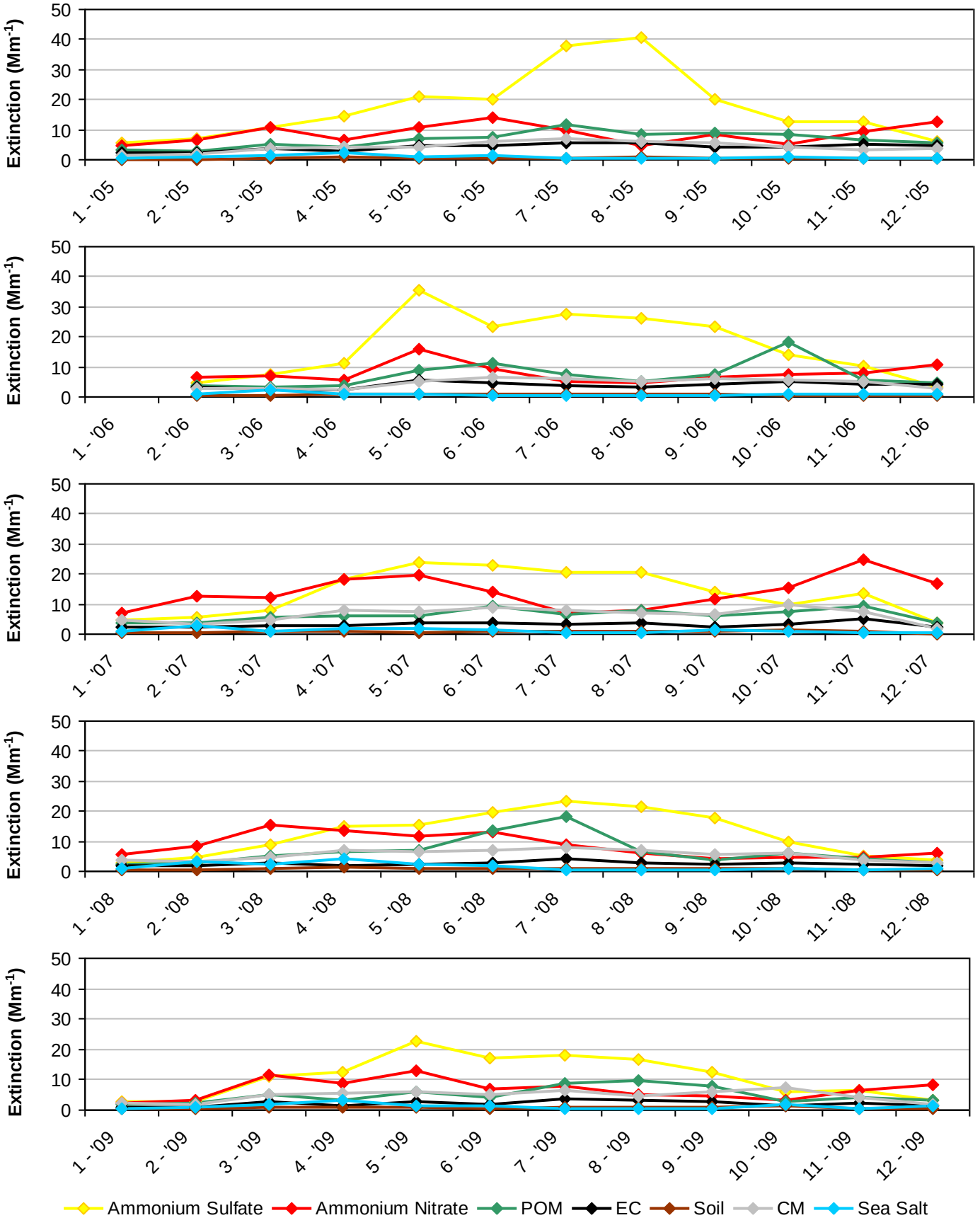
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure C.10-5
Agua Tibia WA, CA (AGTI1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



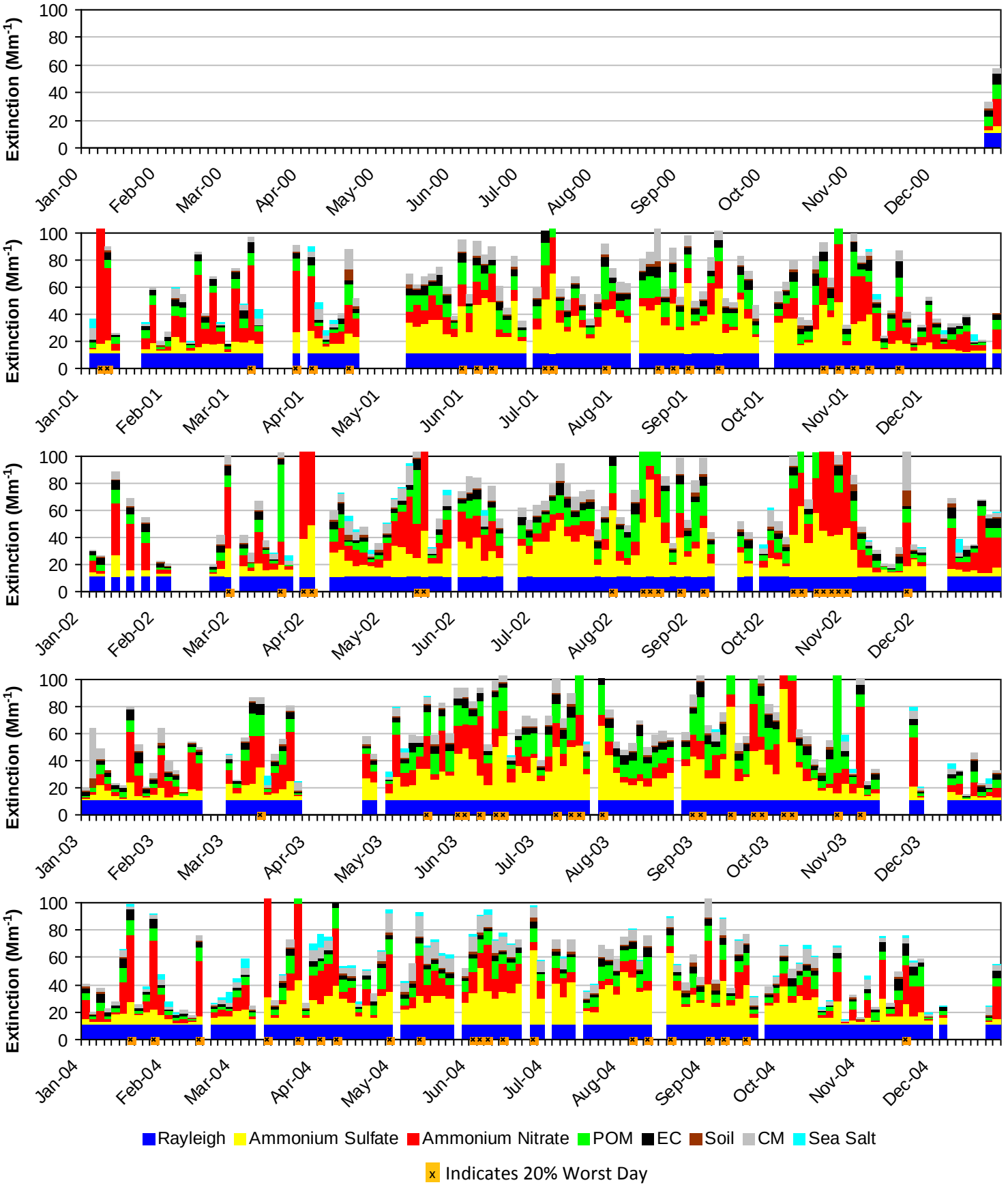
*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure C.10-6
Agua Tibia WA, CA (AGTI1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days



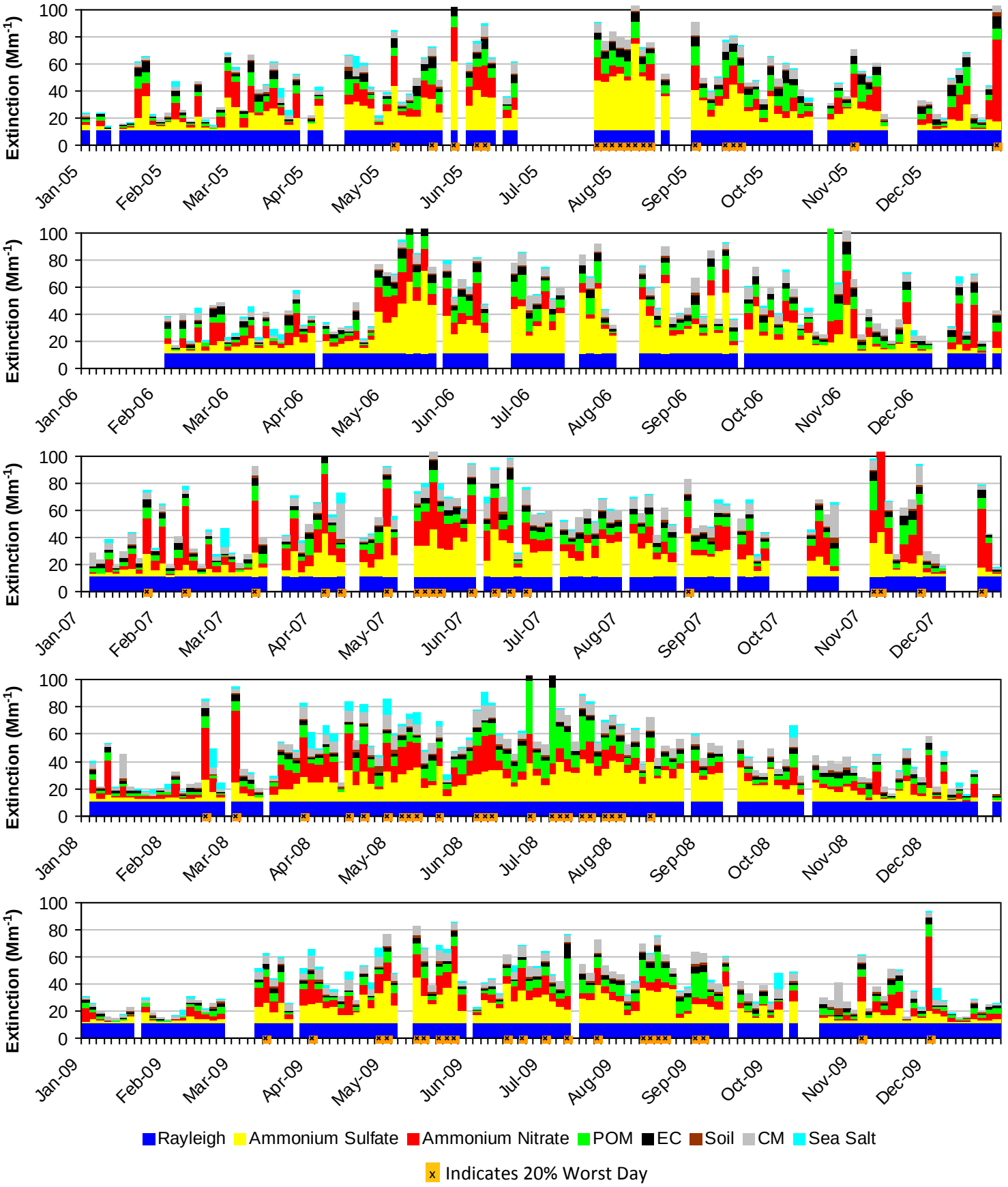
*Note that monthly averages for the year 2006 are shown here, but this year did not meet RHR data completeness criteria.

Figure C.10-7
Agua Tibia WA, CA (AGTI1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure C.10-8
Agua Tibia WA, CA (AGTI1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2006 are shown here, but this year did not meet RHR data completeness criteria.

C.11. JOSHUA TREE NP (JOSH1)

The following tables and figures are presented in this section for Joshua Tree NP represented by the JOSH1 IMPROVE Monitor:

- **Table C.11-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure C.11-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.11-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.11-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure C.11-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure C.11-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure C.11-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure C.11-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

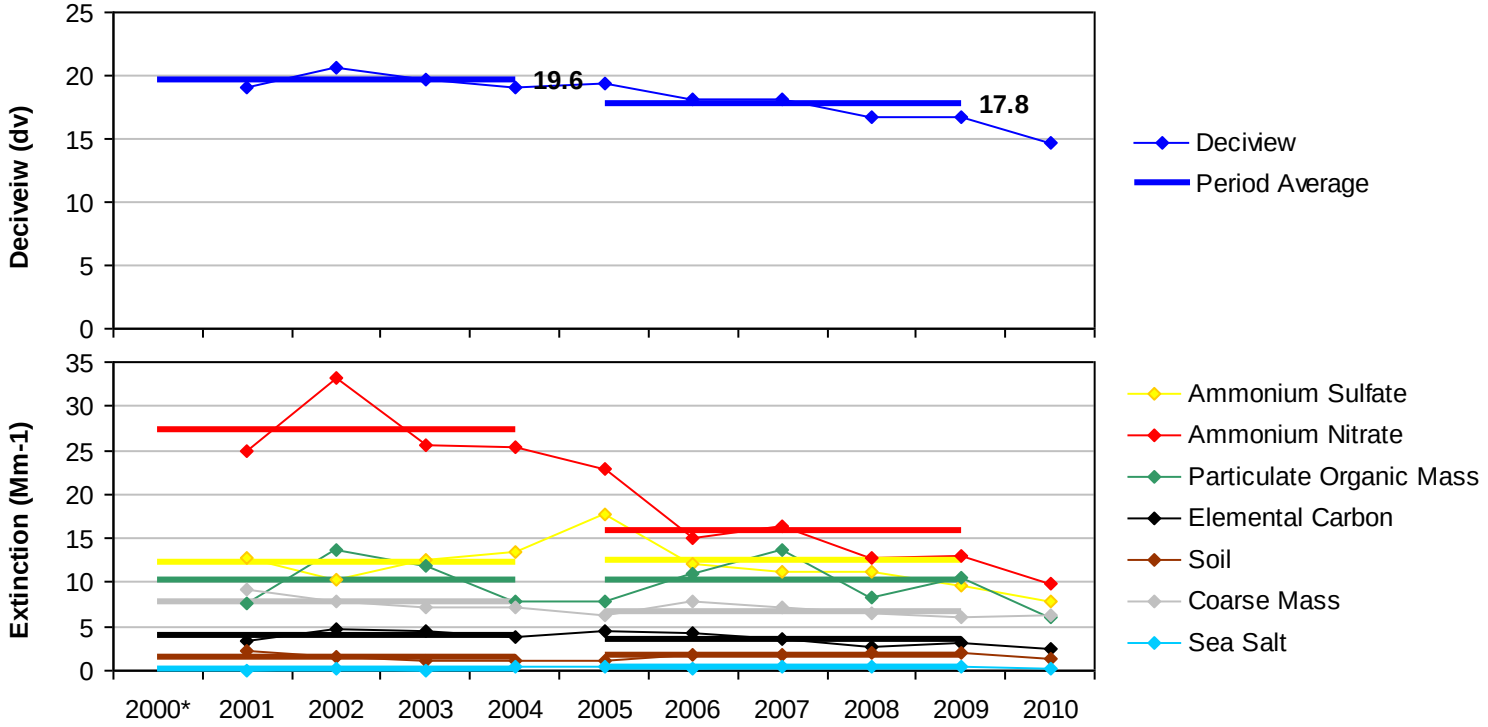
- **Figure C.11-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table C.11-1
Joshua Tree NP, CA (JOSH1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	5.9	6.6	6.2	5.6	5.5	5.7	5.7	5.1	4.4	4.5	-0.2	0.0	6.1	5.3	-0.8	-13%
Worst 20% Days	---	19.1	20.5	19.8	19.1	19.4	18.1	18.1	16.7	16.8	14.7	-0.5	0.0	19.6	17.8	-1.8	-9%
All Days	---	12.3	13.4	13.0	12.5	12.4	11.6	11.8	11.0	10.9	9.9	-0.3	0.0	12.8	11.5	-1.3	-10%
Total Extinction (Mm-1)																	
Best 20% Days	---	18.2	19.5	18.8	17.8	17.4	17.7	17.8	16.8	15.6	15.8	-0.4	0.0	18.6	17.1	-1.5	-8%
Worst 20% Days	---	70.3	81.3	73.2	69.2	70.6	62.5	64.6	54.0	54.8	43.9	-3.2	0.0	73.5	61.3	-12.2	-17%
All Days	---	38.6	43.5	41.2	39.4	39.3	35.5	36.2	32.8	32.9	28.6	-1.4	0.0	40.7	35.3	-5.4	-13%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	2.4	3.1	2.1	2.0	2.4	2.3	2.4	1.8	1.6	1.5	-0.1	0.1	2.4	2.1	-0.3	-13%
Worst 20% Days	---	12.9	10.4	12.6	13.3	17.8	12.2	11.3	11.3	9.8	7.8	-0.3	0.1	12.3	12.5	0.2	2%
All Days	---	7.2	6.5	7.2	7.6	9.3	6.7	6.4	6.6	6.5	4.9	-0.1	0.2	7.1	7.1	0.0	0%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	1.4	1.6	1.9	1.1	1.1	0.8	0.8	1.3	0.6	1.1	-0.1	0.0	1.5	0.9	-0.6	-40%
Worst 20% Days	---	24.8	33.1	25.6	25.5	22.8	15.0	16.5	12.8	13.1	10.0	-2.5	0.0	27.3	16.0	-11.3	-41%
All Days	---	9.5	12.3	10.4	9.4	8.1	6.3	6.9	5.5	5.0	4.7	-0.9	0.0	10.4	6.4	-4.0	-39%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	1.4	1.6	1.8	1.8	1.3	1.5	1.4	1.2	1.0	1.3	-0.1	0.0	1.6	1.3	-0.3	-19%
Worst 20% Days	---	7.6	13.6	12.0	7.8	7.7	11.1	13.8	8.4	10.5	6.1	0.0	0.4	10.3	10.3	0.0	0%
All Days	---	4.3	6.3	6.1	4.7	4.5	4.7	5.3	4.4	4.6	3.3	0.0	0.3	5.4	4.7	-0.7	-13%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.9	0.8	1.0	0.9	0.8	0.8	0.7	0.6	0.6	0.6	0.0	0.0	0.9	0.7	-0.2	-22%
Worst 20% Days	---	3.5	4.6	4.6	3.8	4.4	4.3	3.6	2.7	3.1	2.4	-0.1	0.0	4.1	3.6	-0.5	-12%
All Days	---	2.1	2.5	2.5	2.1	2.5	2.2	1.9	1.6	1.7	1.4	-0.1	0.1	2.3	2.0	-0.3	-13%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.5	0.3	0.4	0.3	0.4	0.5	0.3	0.4	0.2	0.0	0.4	0.4	0.4	0.0	0%
Worst 20% Days	---	2.4	1.5	1.2	1.2	1.2	1.9	1.8	2.1	1.9	1.3	0.1	0.2	1.6	1.8	0.2	13%
All Days	---	1.1	1.0	0.7	0.9	0.7	0.9	1.1	1.1	1.1	0.7	0.0	0.5	0.9	1.0	0.1	11%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	1.6	1.9	1.5	1.4	1.4	1.7	1.9	1.4	1.3	1.0	0.0	0.1	1.6	1.5	-0.1	-6%
Worst 20% Days	---	9.2	7.9	7.1	7.1	6.2	7.9	7.2	6.4	6.1	6.2	-0.3	0.0	7.8	6.8	-1.0	-13%
All Days	---	4.4	4.8	4.2	4.4	3.9	4.4	4.2	3.4	3.7	3.4	-0.1	0.0	4.4	3.9	-0.5	-11%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.0	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0%
Worst 20% Days	---	0.0	0.2	0.1	0.5	0.4	0.2	0.5	0.4	0.4	0.1	0.0	0.1	0.2	0.4	0.2	100%
All Days	---	0.0	0.1	0.1	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.0	0.1	0.1	0.3	0.2	>100%

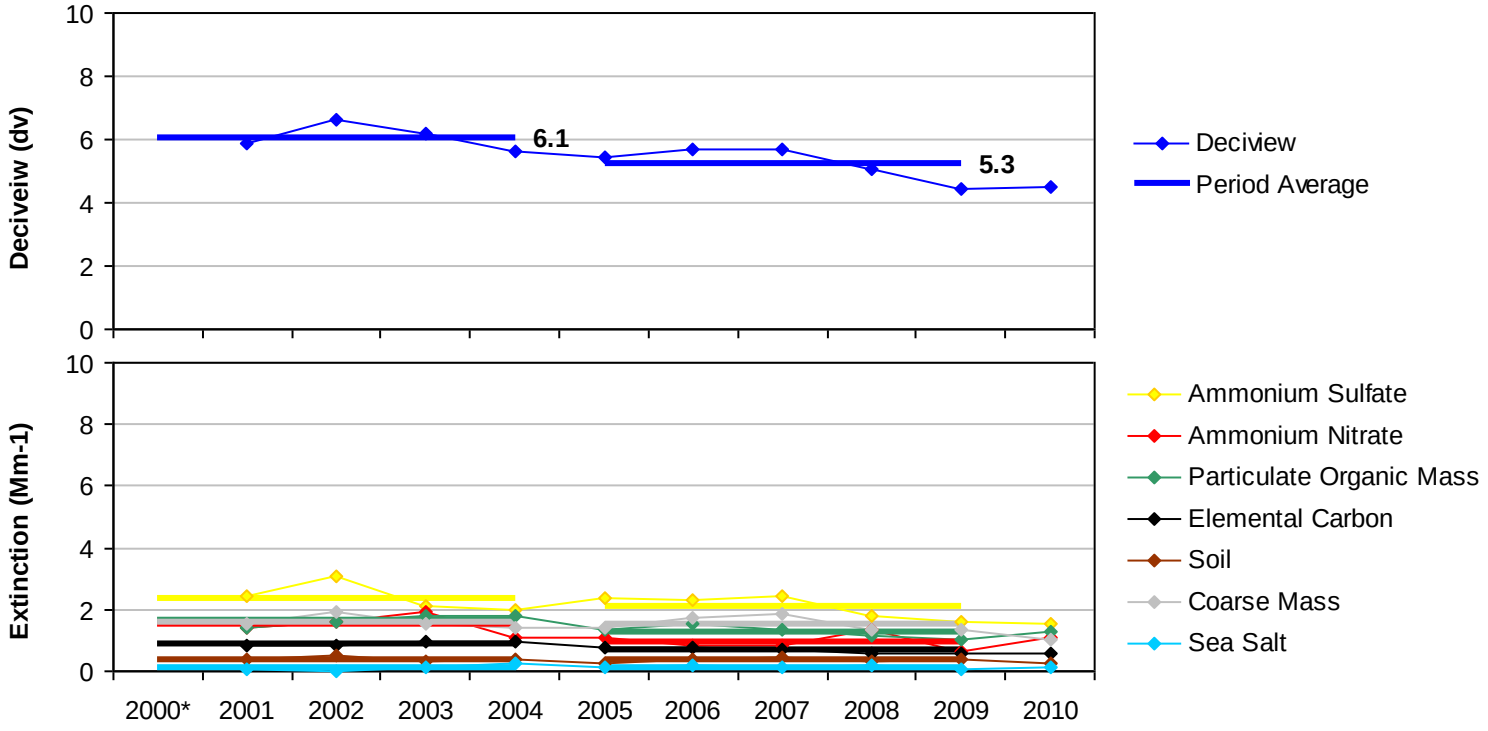
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure C.11-1
Joshua Tree NP, CA (JOSH1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



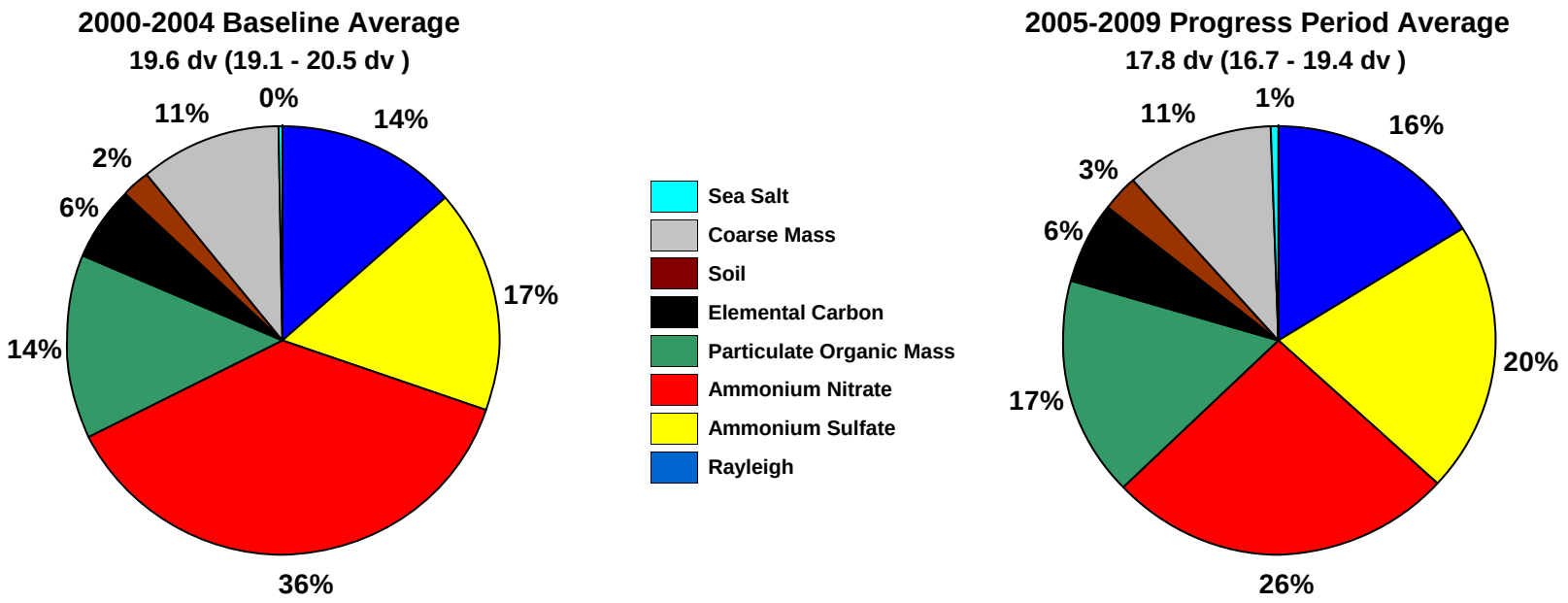
*Missing years did not meet RHR data completeness criteria.

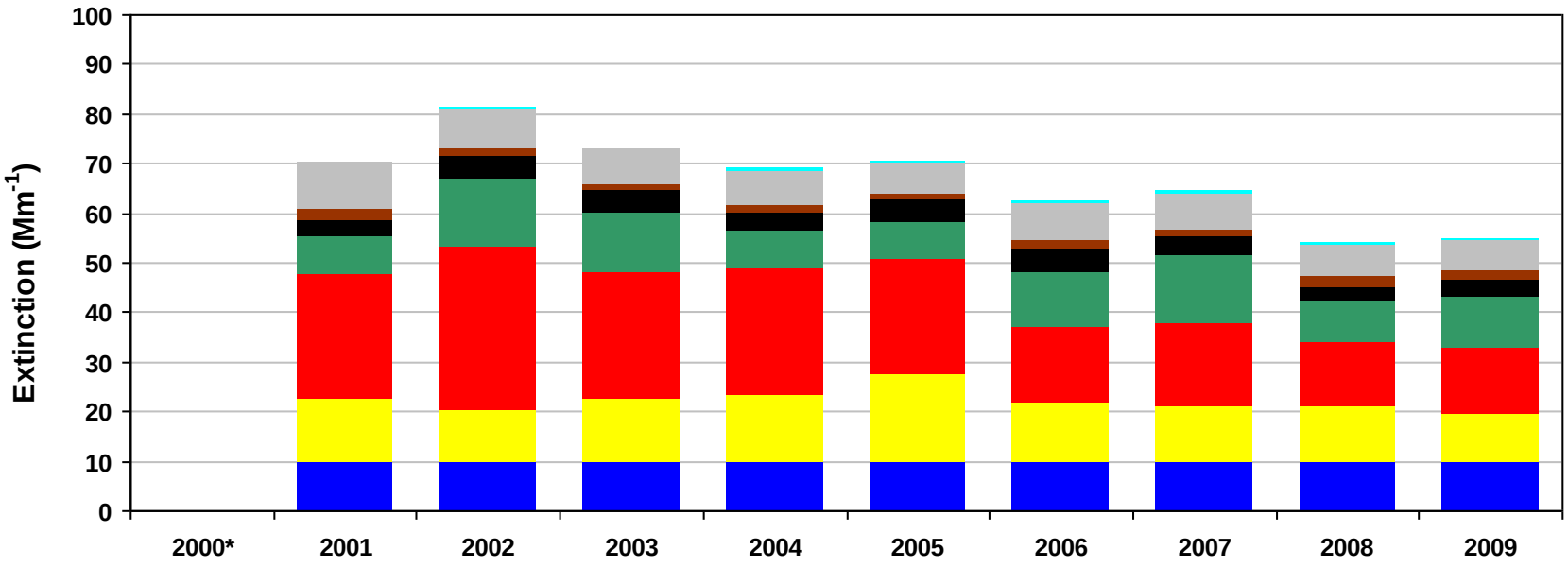
Figure C.11-2
Joshua Tree NP, CA (JOSH1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

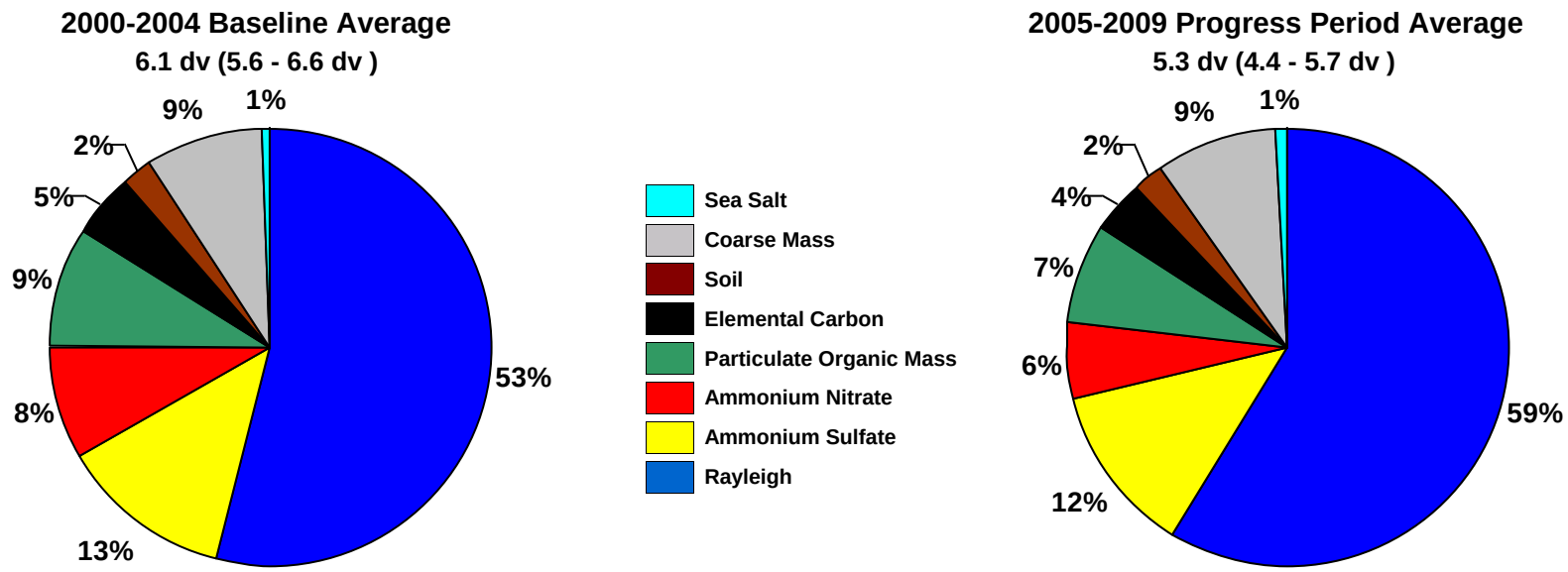
Figure C.11-3
Joshua Tree NP, CA (JOSH1 Site)
20% Most Impaired Visibility Days

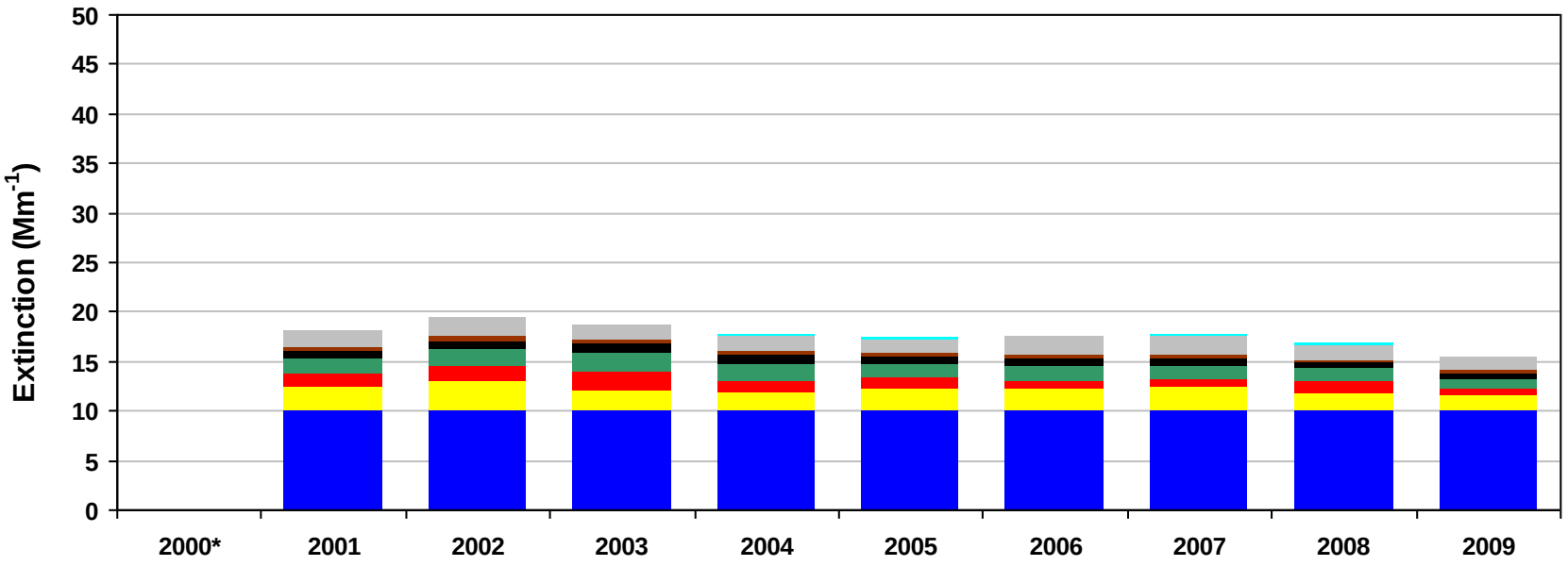




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

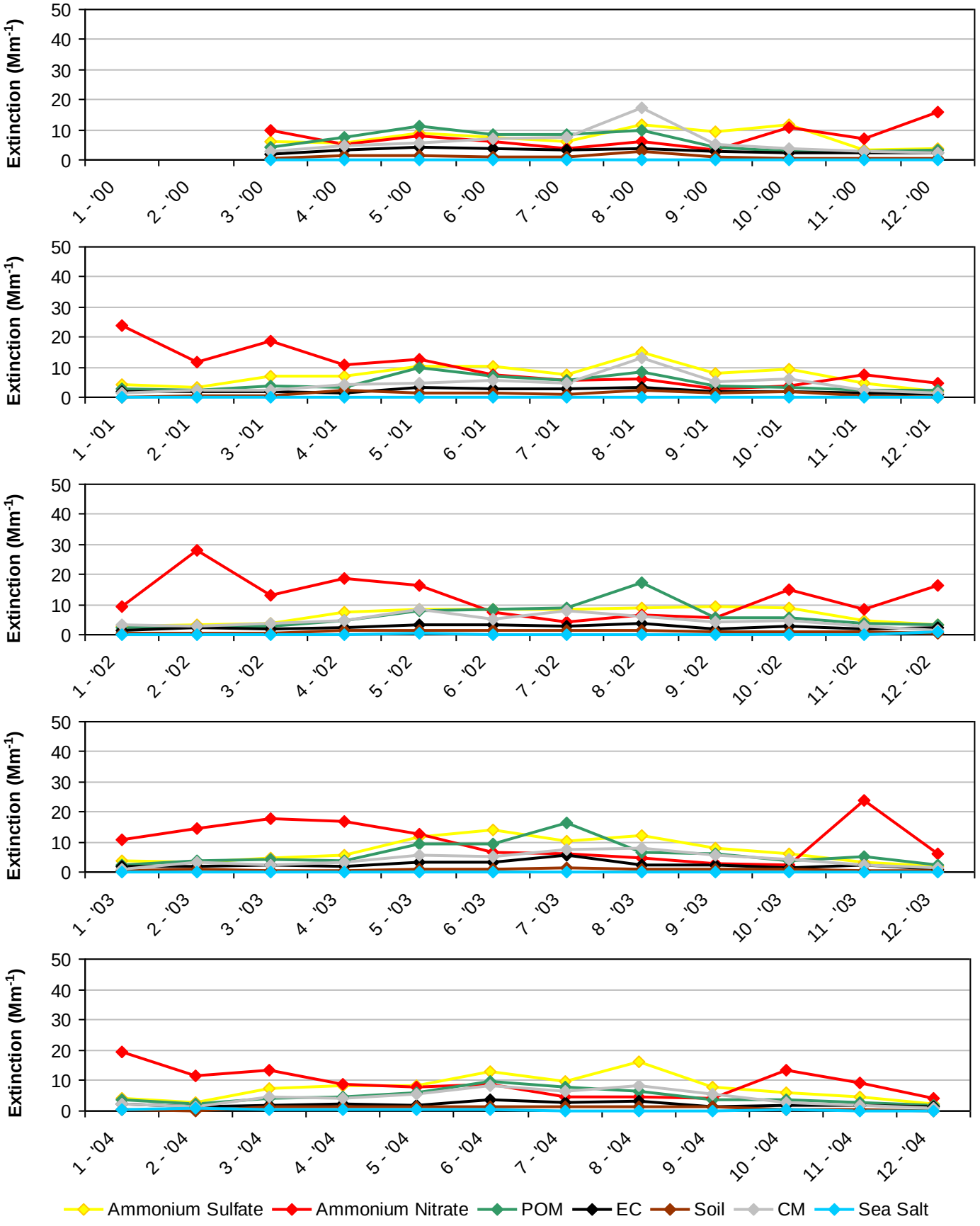
Figure C.11-4
Joshua Tree NP, CA (JOSH1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure C.11-5
Joshua Tree NP, CA (JOSH1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure C.11-6
Joshua Tree NP, CA (JOSH1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

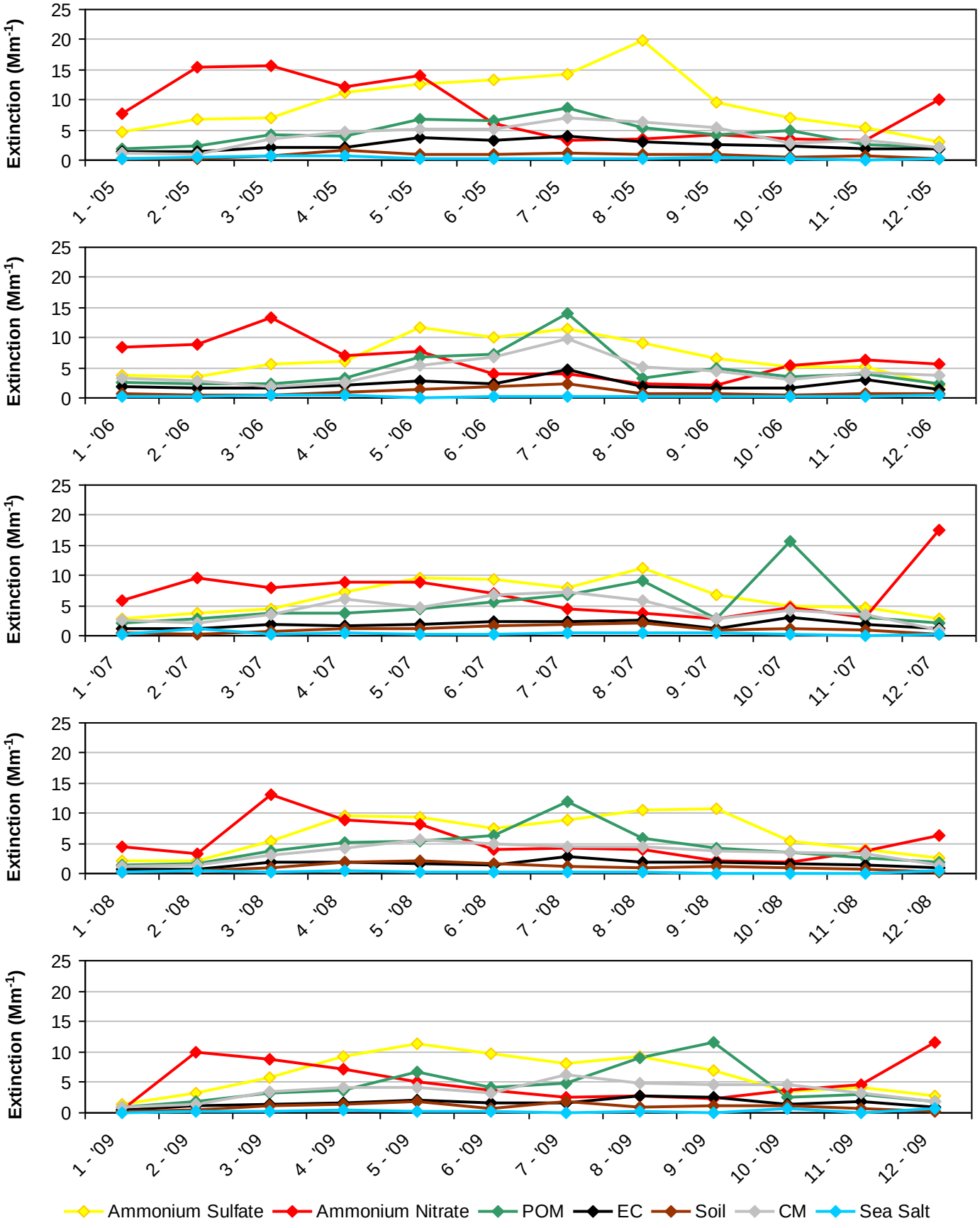
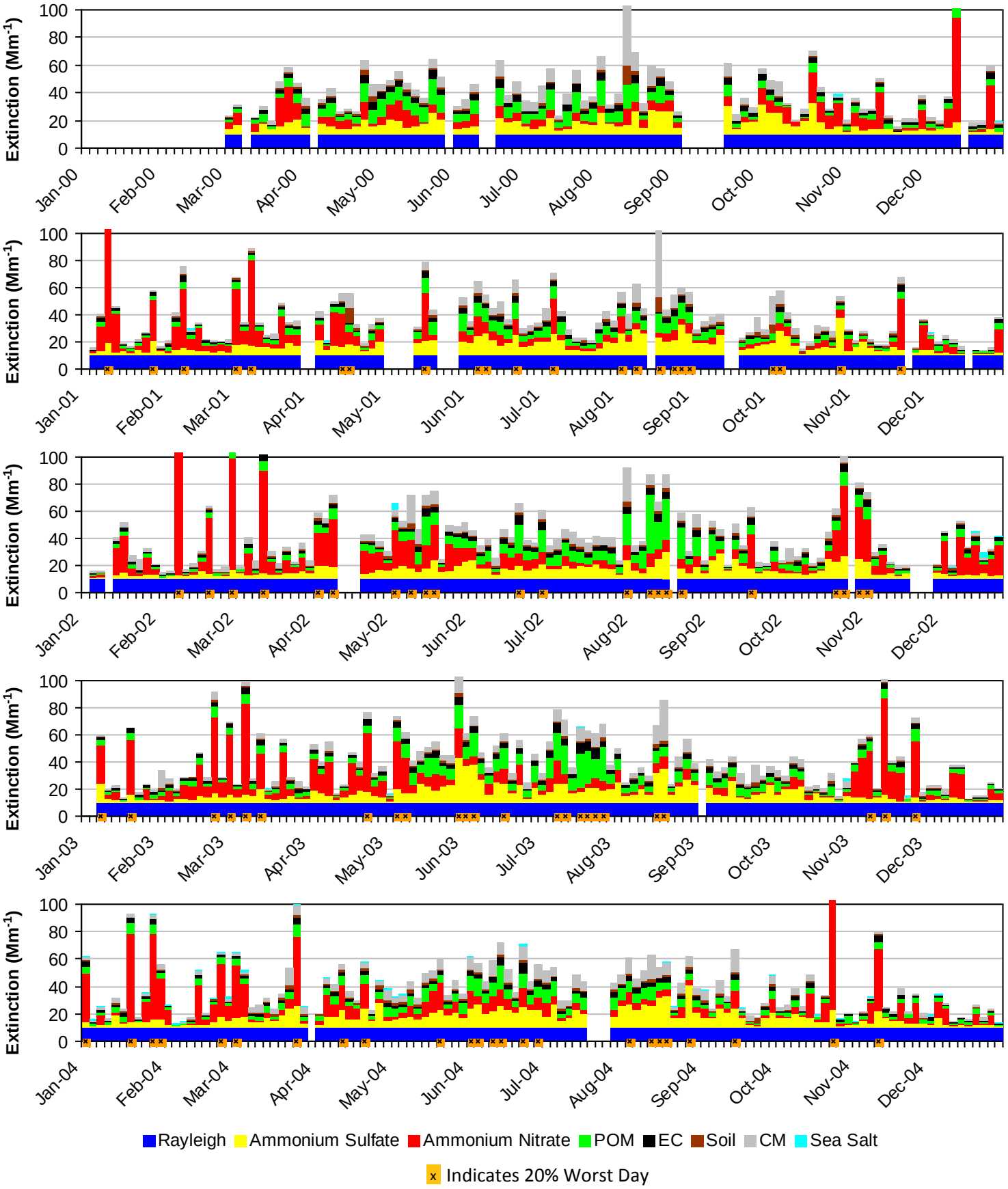
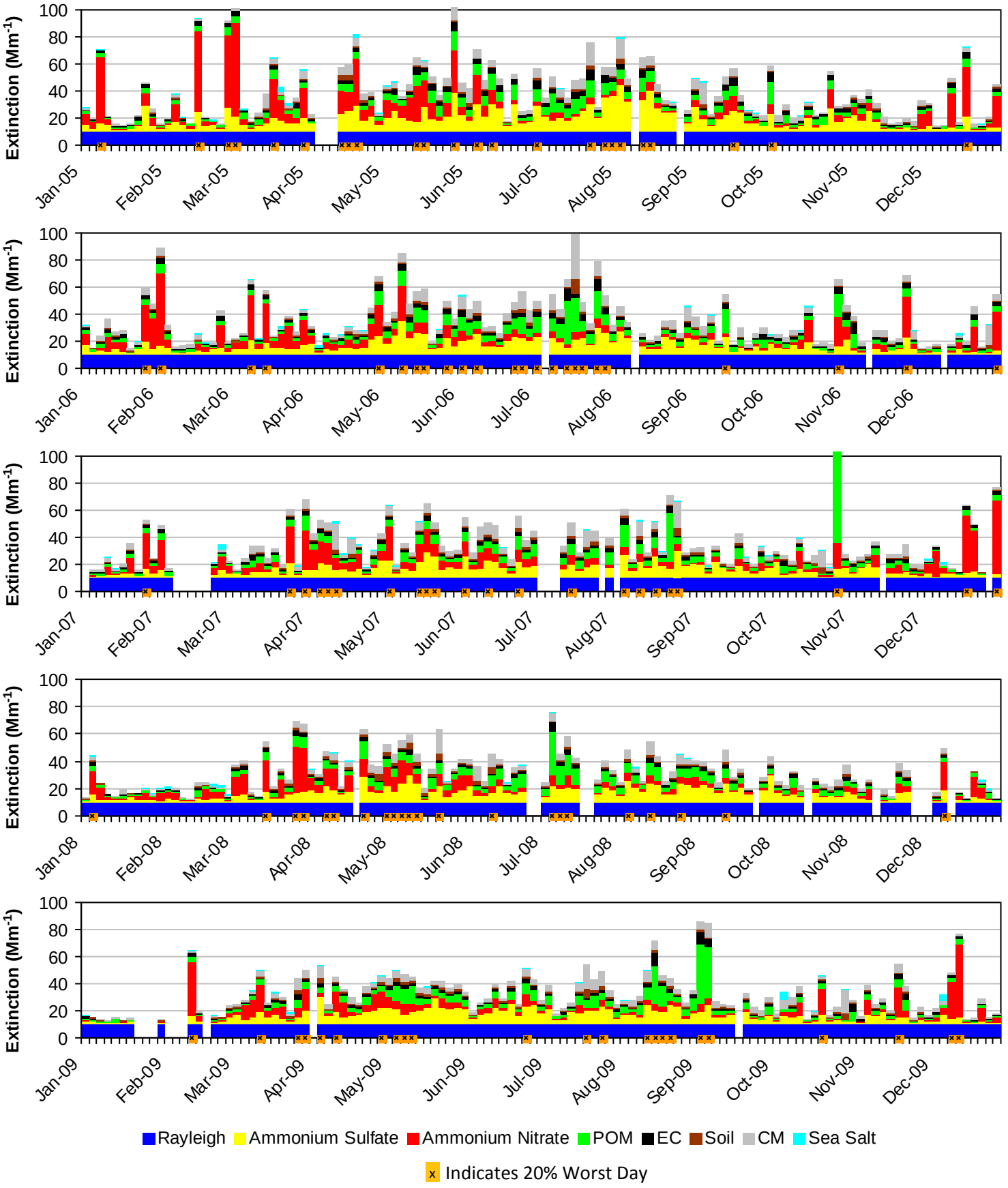


Figure C.11-7
Joshua Tree NP, CA (JOSH1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure C.11-8
Joshua Tree NP, CA (JOSH1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



C.12. SAN GABRIEL WA AND CUCAMONGA WA (SAGA1)

The following tables and figures are presented in this section for the San Gabriel WA and Cucamonga WA represented by the SAGA1 IMPROVE Monitor:

- **Table C.12-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure C.12-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.12-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.12-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure C.12-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure C.12-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure C.12-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure C.12-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

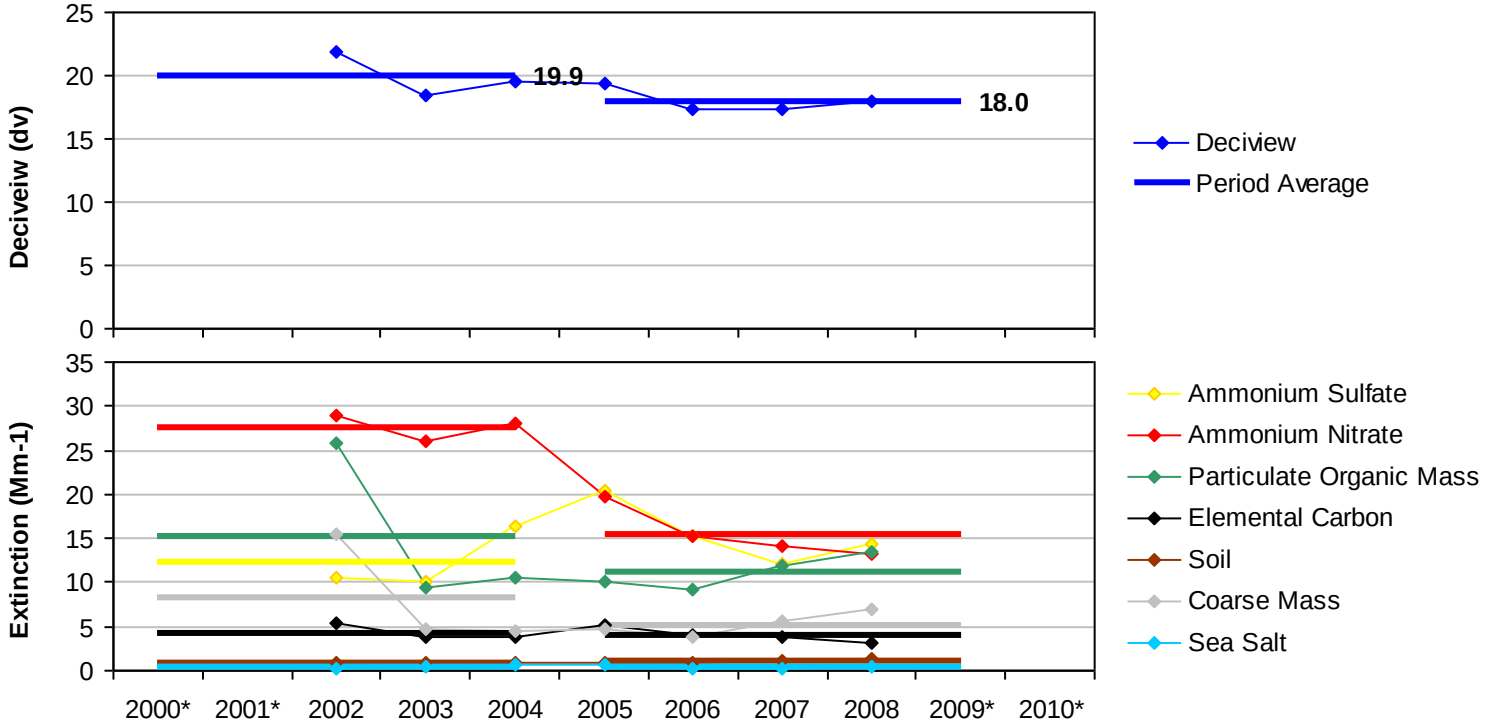
- **Figure C.12-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table C.12-1
San Gabriel WA and Cucamonga WA, CA (SAGA1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period						2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	---	6.4	4.4	3.7	4.3	4.4	5.4	3.7	---	---	-0.1	0.3	4.8	4.5	-0.3	-6%
Worst 20% Days	---	---	21.8	18.4	19.6	19.4	17.4	17.4	17.9	---	---	-0.5	0.0	19.9	18.0	-1.9	-10%
All Days	---	---	14.1	11.9	12.0	12.3	10.8	11.5	10.8	---	---	-0.4	0.1	12.7	11.3	-1.4	-11%
Total Extinction (Mm-1)																	
Best 20% Days	---	---	19.3	15.9	14.7	15.6	15.8	17.4	14.8	---	---	-0.2	0.3	16.6	15.9	-0.7	-4%
Worst 20% Days	---	---	95.9	64.4	74.1	70.5	57.8	57.8	62.1	---	---	-3.5	0.1	78.2	62.0	-16.2	-21%
All Days	---	---	48.4	37.1	38.8	39.4	32.6	34.4	33.6	---	---	-1.5	0.1	41.4	35.0	-6.4	-16%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	---	2.1	1.7	1.8	2.1	2.1	2.4	1.6	---	---	0.0	0.5	1.9	2.1	0.2	11%
Worst 20% Days	---	---	10.5	10.1	16.5	20.4	15.2	12.2	14.3	---	---	0.5	0.4	12.3	15.5	3.2	26%
All Days	---	---	7.4	6.5	8.6	10.7	7.4	6.9	7.2	---	---	0.0	0.4	7.5	8.1	0.6	8%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	---	3.2	1.7	1.3	1.5	1.3	1.8	1.5	---	---	-0.1	0.3	2.1	1.5	-0.6	-29%
Worst 20% Days	---	---	28.9	26.1	28.0	19.7	15.3	14.0	13.2	---	---	-3.0	0.0	27.7	15.5	-12.2	-44%
All Days	---	---	12.0	10.2	9.9	8.5	6.6	7.4	5.8	---	---	-1.0	0.0	10.7	7.1	-3.6	-34%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	---	2.1	1.3	1.0	1.3	1.3	1.4	0.8	---	---	-0.1	0.3	1.5	1.2	-0.3	-20%
Worst 20% Days	---	---	25.7	9.4	10.6	10.2	9.1	12.0	13.4	---	---	0.4	0.5	15.3	11.2	-4.1	-27%
All Days	---	---	9.6	5.3	5.2	5.1	4.2	4.9	5.3	---	---	-0.1	0.1	6.7	4.9	-1.8	-27%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	---	1.0	0.7	0.4	0.7	0.7	0.6	0.3	---	---	-0.1	0.0	0.7	0.6	-0.1	-14%
Worst 20% Days	---	---	5.3	3.8	3.8	5.2	4.1	3.8	3.2	---	---	-0.2	0.1	4.3	4.1	-0.2	-5%
All Days	---	---	2.8	2.3	2.1	2.6	2.1	2.0	1.6	---	---	-0.2	0.0	2.4	2.1	-0.3	-13%
Soil Extinction (Mm-1)																	
Best 20% Days	---	---	0.4	0.2	0.1	0.2	0.3	0.3	0.2	---	---	0.0	0.5	0.3	0.3	0.0	0%
Worst 20% Days	---	---	0.8	0.8	1.0	0.9	0.9	1.0	1.4	---	---	0.1	0.0	0.9	1.1	0.2	22%
All Days	---	---	0.8	0.6	0.7	0.5	0.6	0.7	0.8	---	---	0.0	0.5	0.7	0.6	-0.1	-14%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	---	1.4	1.3	0.9	0.8	0.9	1.7	1.1	---	---	0.0	0.5	1.2	1.1	-0.1	-8%
Worst 20% Days	---	---	15.5	4.8	4.5	4.6	3.8	5.5	7.0	---	---	-0.1	0.5	8.3	5.2	-3.1	-37%
All Days	---	---	6.5	3.2	3.0	2.7	2.5	3.2	3.6	---	---	-0.2	0.4	4.2	3.0	-1.2	-29%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	---	0.1	0.0	0.1	0.1	0.2	0.2	0.3	---	---	0.0	0.0	0.1	0.2	0.1	100%
Worst 20% Days	---	---	0.3	0.4	0.6	0.6	0.3	0.3	0.6	---	---	0.0	0.5	0.4	0.4	0.0	0%
All Days	---	---	0.1	0.1	0.3	0.3	0.2	0.3	0.3	---	---	0.0	0.2	0.2	0.3	0.1	50%

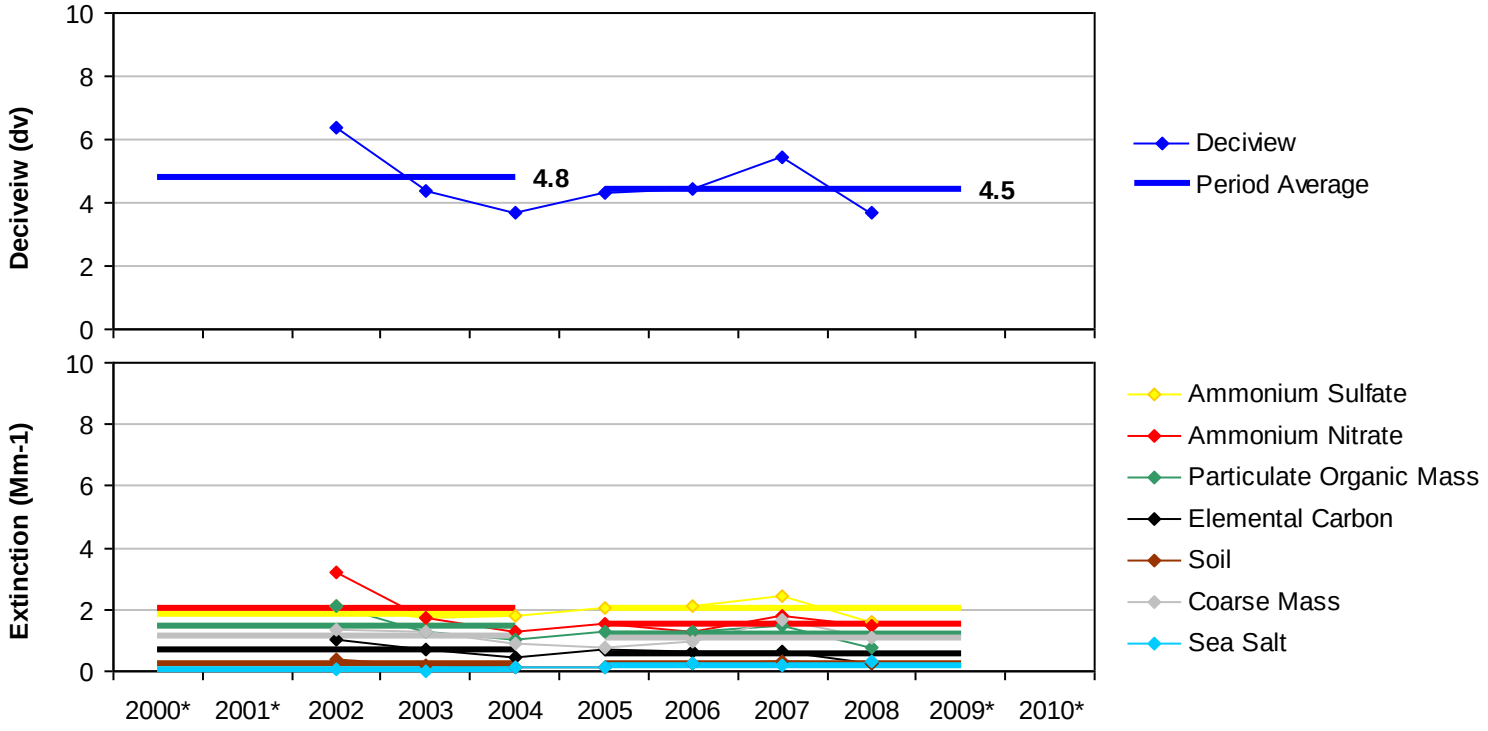
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure C.12-1
San Gabriel WA and Cucamonga WA, CA (SAGA1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure C.12-2
San Gabriel WA and Cucamonga WA, CA (SAGA1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

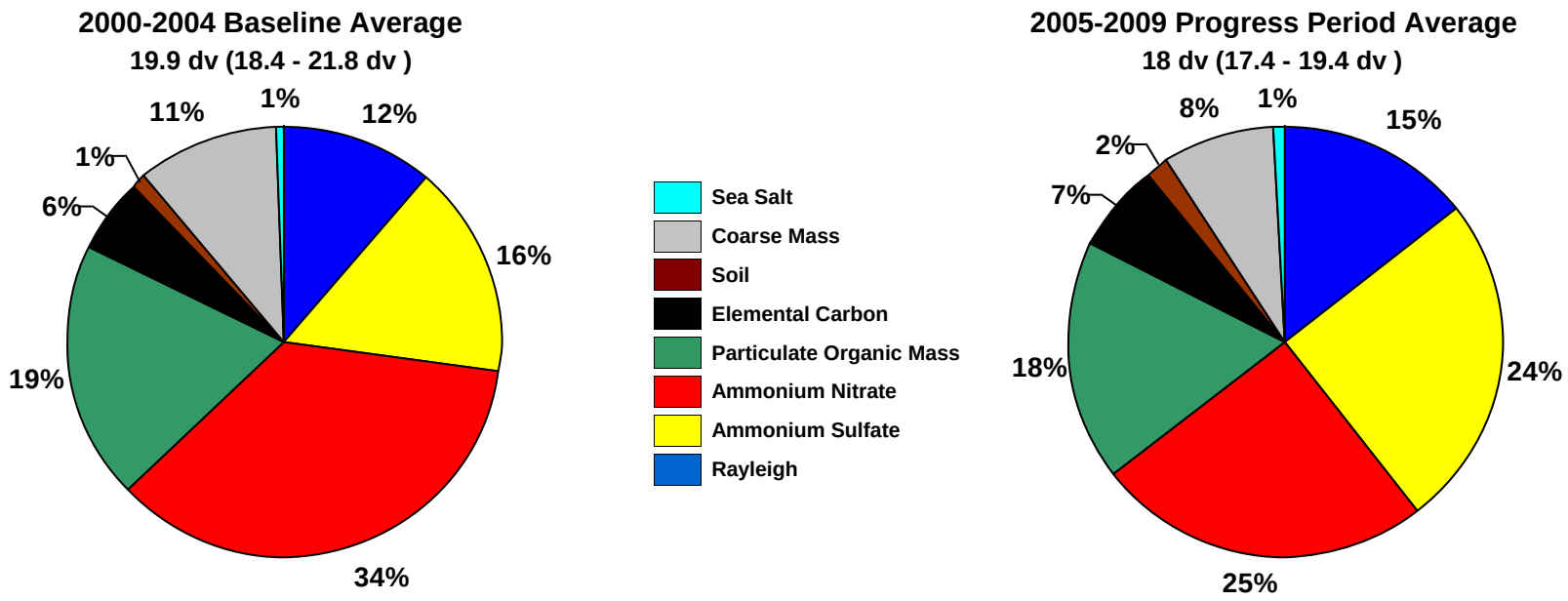


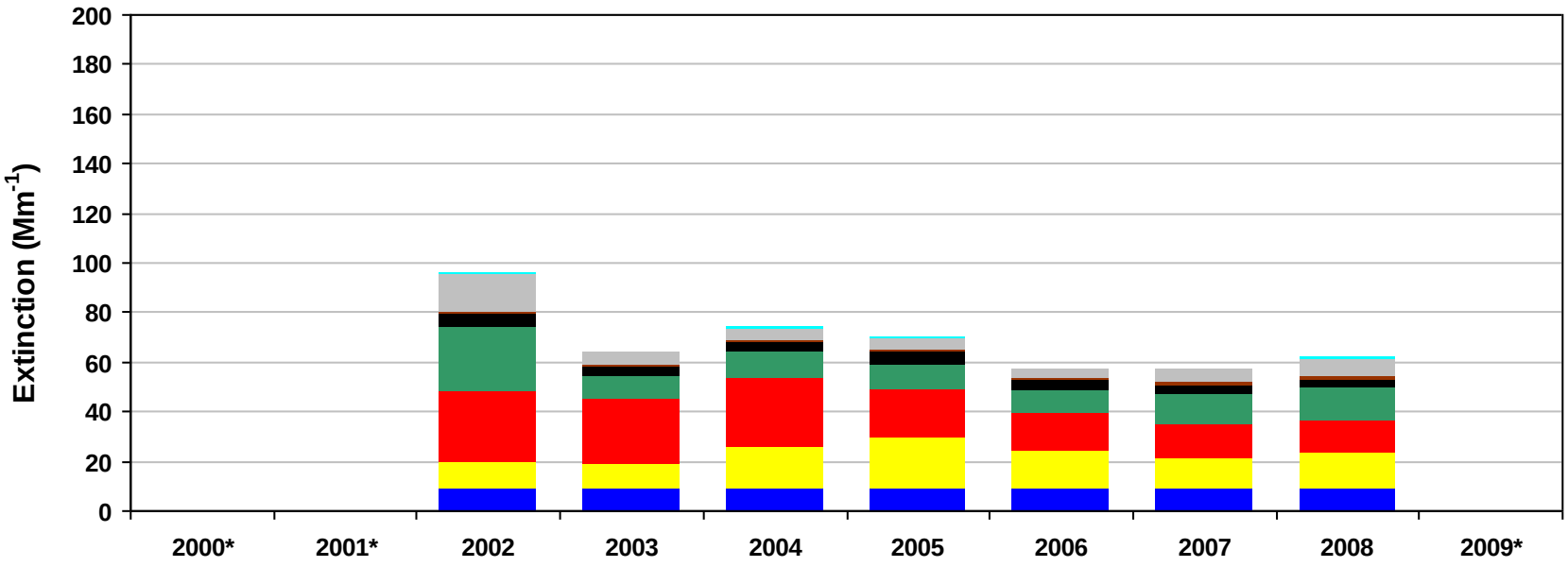
*Missing years did not meet RHR data completeness criteria.

Figure C.12-3

San Gabriel WA and Cucamonga WA, CA (SAGA1 Site)

20% Most Impaired Visibility Days



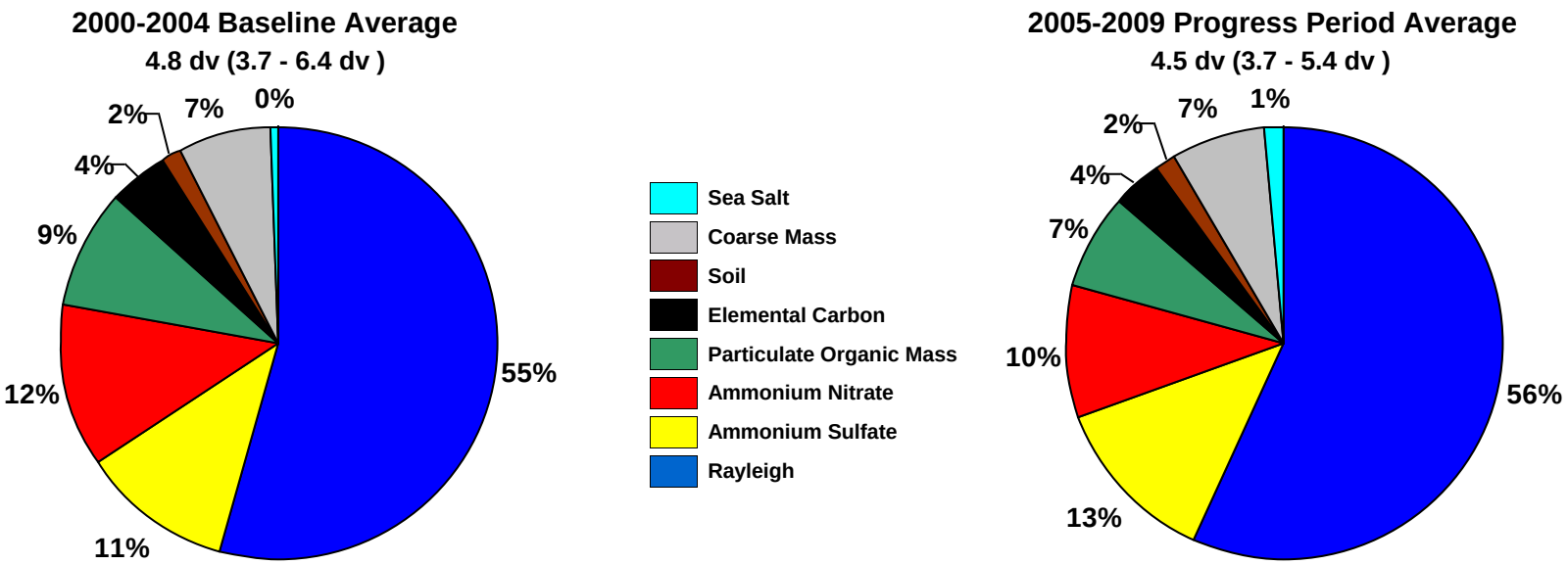


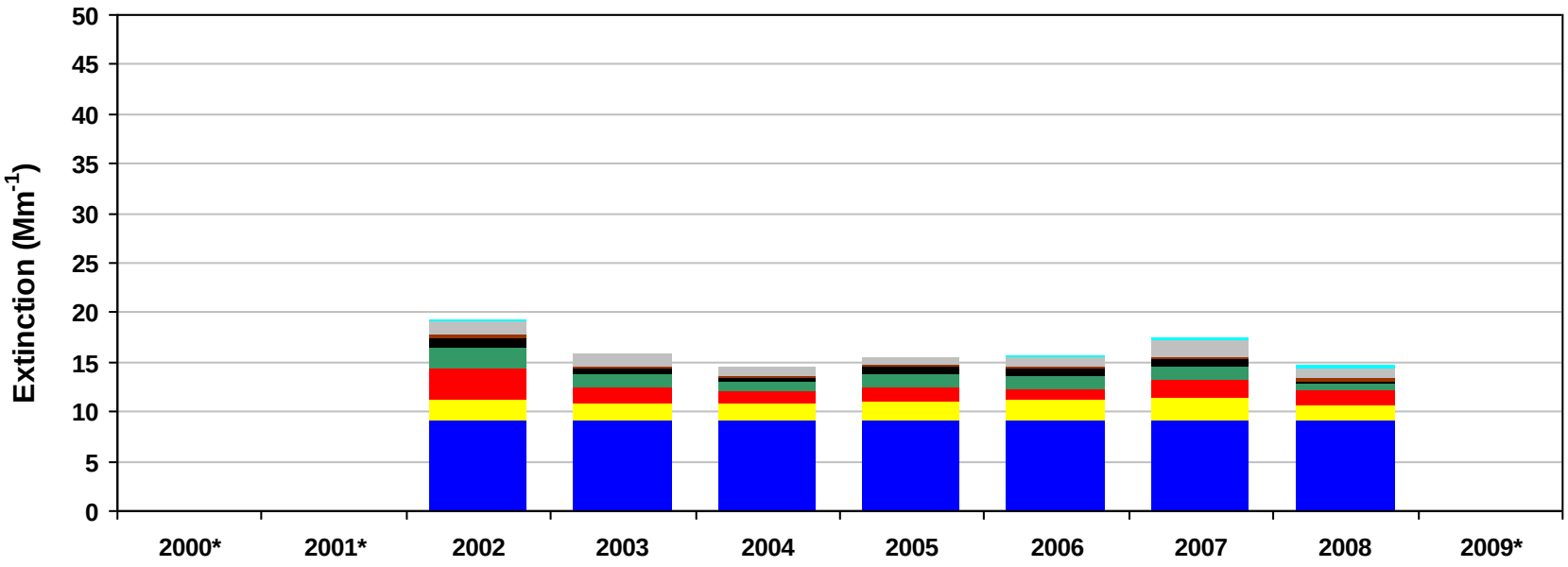
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure C.12-4

San Gabriel WA and Cucamonga WA, CA (SAGA1 Site)

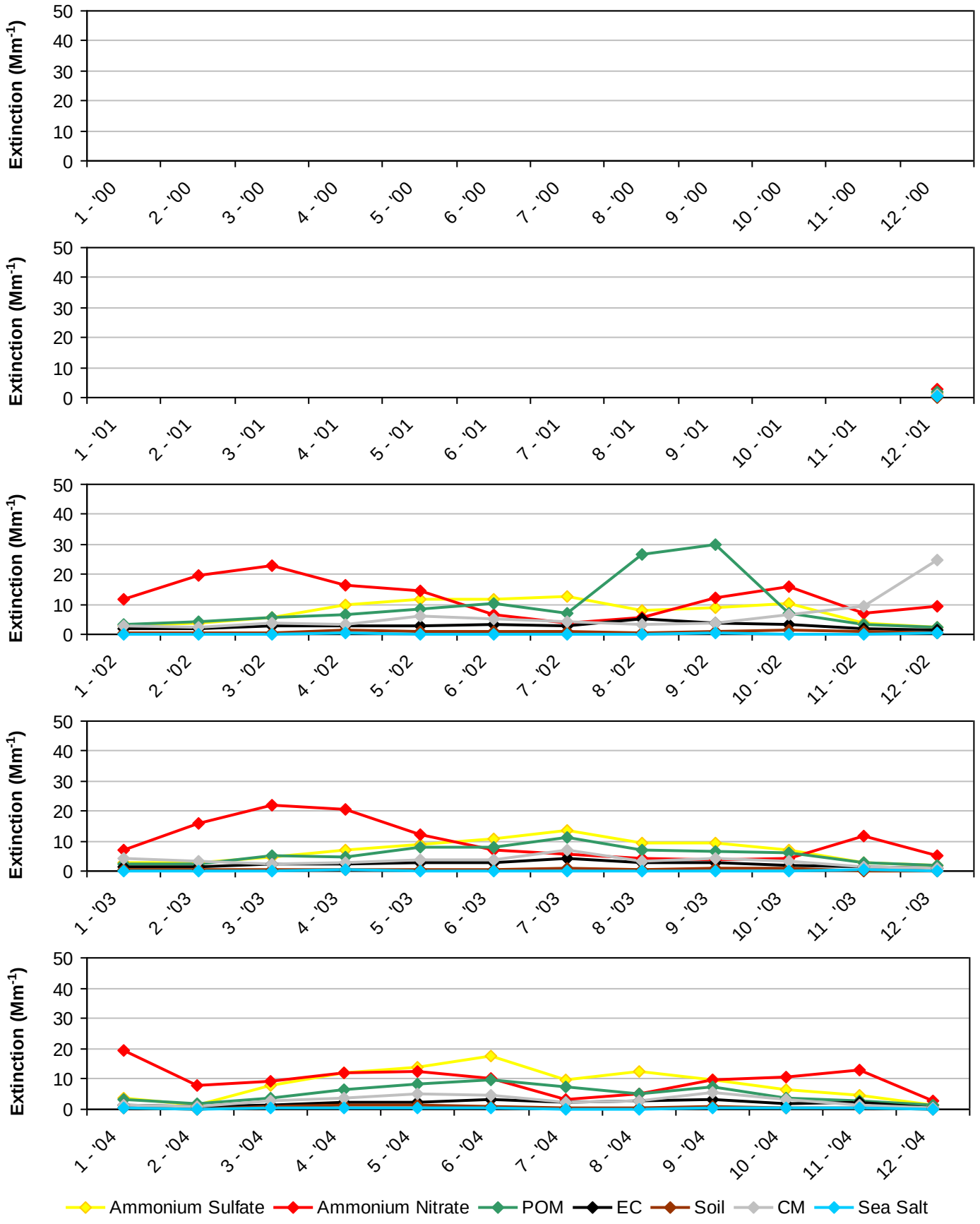
20% Least Impaired Visibility Days





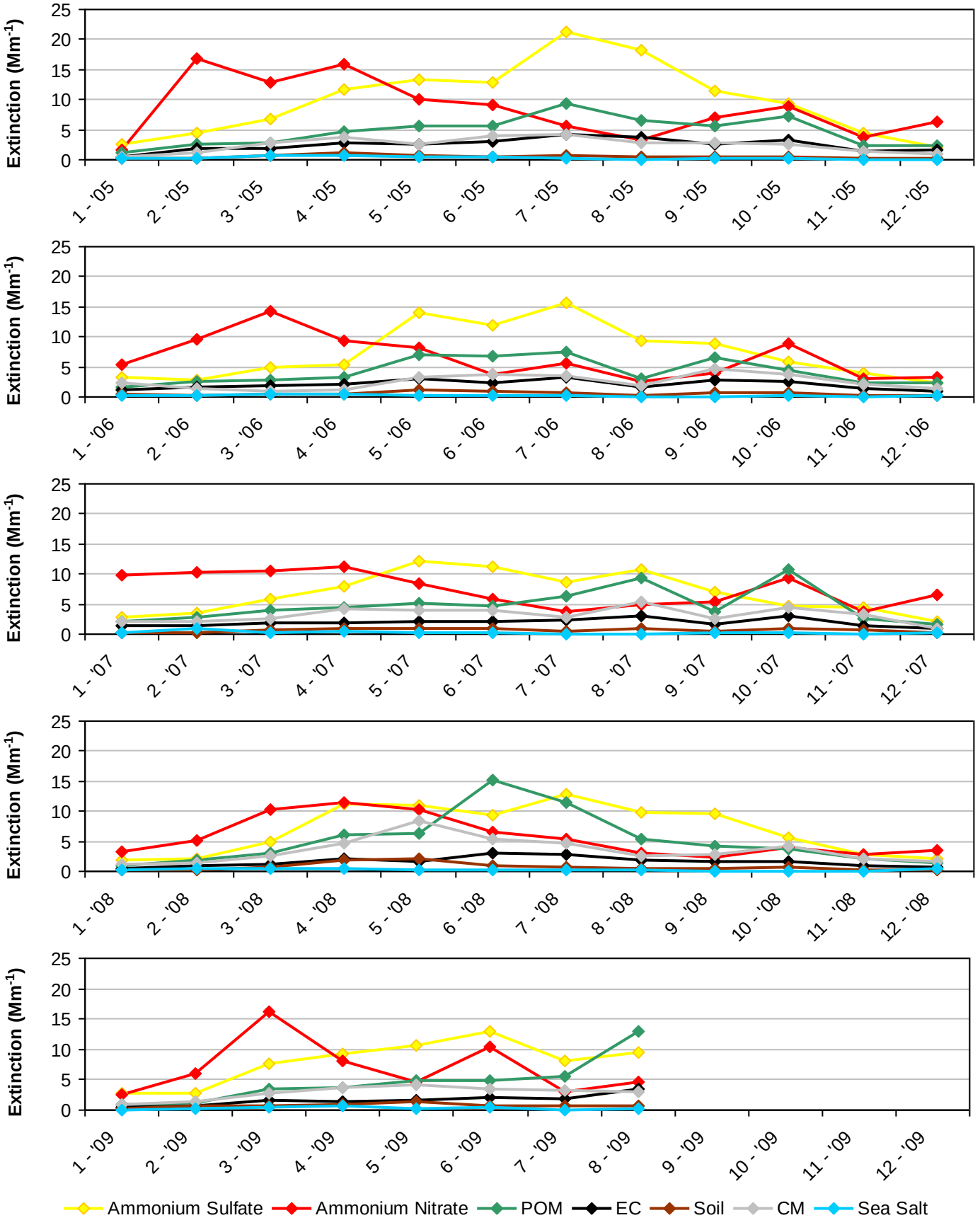
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure C.12-5
San Gabriel WA and Cucamonga WA, CA (SAGA1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



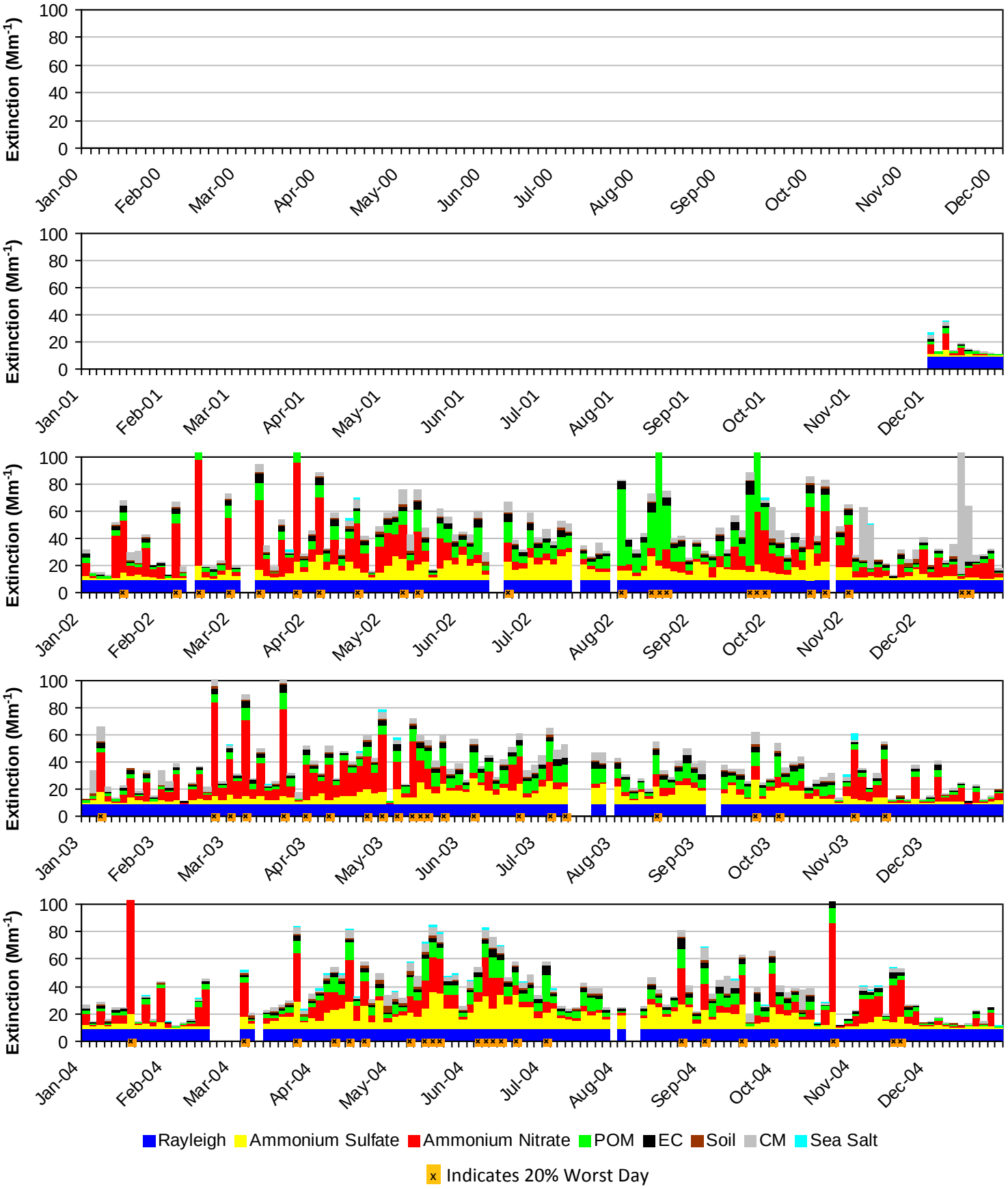
*Note that monthly averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure C.12-6
San Gabriel WA and Cucamonga WA, CA (SAGA1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days



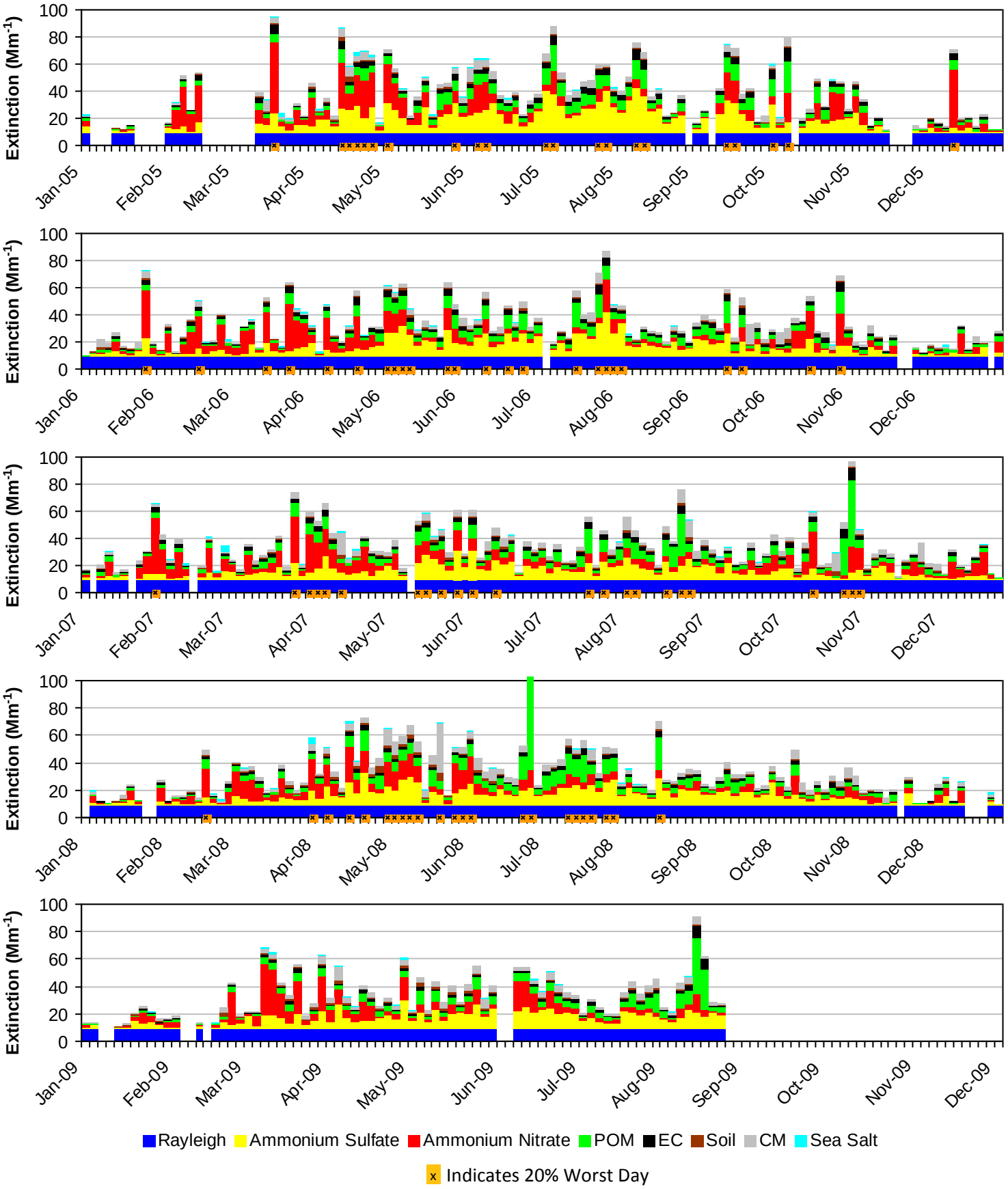
*Note that monthly averages for the year 2009 are shown here, but this year did not meet RHR data completeness criteria.

Figure C.12-7
San Gabriel WA and Cucamonga WA, CA (SAGA1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure C.12-8
San Gabriel WA and Cucamonga WA, CA (SAGA1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2009 are shown here, but this year did not meet RHR data completeness criteria.

C.13. SAN GORGONIO WA AND SAN JACINTO WA (SAGO1)

The following tables and figures are presented in this section for the San Gorgonio WA and San Jacinto WA represented by the SAGO1 IMPROVE Monitor:

- **Table C.13-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure C.13-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.13-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.13-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure C.13-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure C.13-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure C.13-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure C.13-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

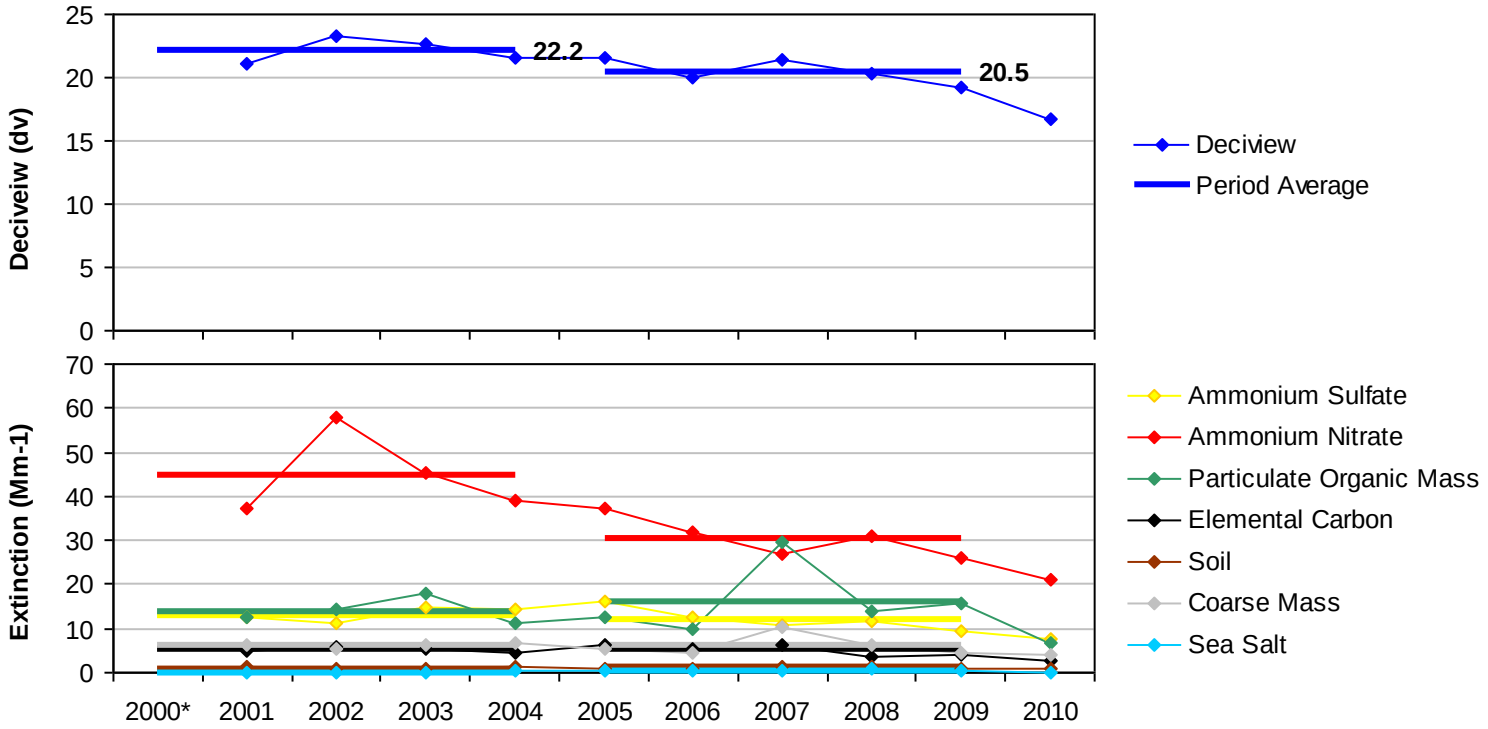
- **Figure C.13-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table C.13-1
San Gorgonio WA and San Jacinto WA, CA (SAGO1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	5.0	6.2	5.1	5.3	4.1	5.0	5.5	4.4	3.6	3.0	-0.2	0.1	5.4	4.5	-0.9	-17%
Worst 20% Days	---	21.2	23.3	22.6	21.6	21.5	19.9	21.5	20.2	19.2	16.7	-0.5	0.0	22.2	20.5	-1.7	-8%
All Days	---	14.2	15.0	14.3	14.3	13.2	12.7	13.3	12.2	11.7	10.4	-0.4	0.0	14.4	12.6	-1.8	-13%
Total Extinction (Mm-1)																	
Best 20% Days	---	16.8	18.8	16.9	17.2	15.1	16.7	17.5	15.6	14.5	13.6	-0.3	0.1	17.4	15.9	-1.5	-9%
Worst 20% Days	---	84.7	105.9	100.8	87.7	89.0	75.3	96.3	78.5	71.0	53.2	-3.4	0.1	94.8	82.0	-12.8	-14%
All Days	---	47.8	53.5	50.4	49.1	45.8	41.0	46.1	39.9	37.8	31.7	-2.1	0.0	50.2	42.1	-8.1	-16%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	1.6	2.1	1.6	2.0	1.5	2.1	2.1	1.6	1.4	1.1	0.0	0.5	1.8	1.7	-0.1	-6%
Worst 20% Days	---	12.5	11.2	14.6	14.5	16.0	12.4	10.8	11.5	9.3	7.6	-0.4	0.1	13.2	12.0	-1.2	-9%
All Days	---	7.5	6.7	7.4	8.2	8.7	6.7	6.2	6.7	6.0	4.8	-0.1	0.1	7.4	6.9	-0.5	-7%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	1.7	2.6	1.7	1.3	0.6	0.8	1.3	1.2	0.6	0.6	-0.2	0.0	1.8	0.9	-0.9	-50%
Worst 20% Days	---	37.4	58.0	45.5	39.0	37.0	31.8	27.0	31.0	26.0	20.9	-3.1	0.0	44.9	30.6	-14.3	-32%
All Days	---	16.2	21.5	17.6	16.4	14.1	11.7	11.8	10.0	9.5	8.0	-1.4	0.0	17.9	11.4	-6.5	-36%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	1.4	1.7	1.5	1.6	1.2	1.1	1.3	1.0	0.7	0.7	-0.1	0.0	1.6	1.1	-0.5	-31%
Worst 20% Days	---	12.4	14.5	17.9	11.3	12.6	9.9	29.8	13.7	15.5	6.7	0.3	0.3	14.0	16.3	2.3	16%
All Days	---	6.7	7.5	8.1	6.4	5.8	5.4	9.2	6.2	5.9	3.8	-0.2	0.2	7.2	6.5	-0.7	-10%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	1.1	1.2	0.9	0.8	0.7	0.8	0.7	0.4	0.3	0.3	-0.1	0.0	1.0	0.6	-0.4	-40%
Worst 20% Days	---	4.9	5.8	5.4	4.6	6.5	5.3	6.3	3.8	4.1	2.8	-0.1	0.2	5.2	5.2	0.0	0%
All Days	---	3.1	3.2	3.0	2.9	3.3	2.9	2.8	2.1	2.0	1.5	-0.1	0.0	3.0	2.6	-0.4	-13%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.4	0.2	0.2	0.1	0.3	0.3	0.2	0.2	0.1	0.0	0.4	0.2	0.2	0.0	0%
Worst 20% Days	---	1.2	1.1	0.9	1.2	0.9	0.9	1.5	1.4	1.0	1.0	0.0	0.5	1.1	1.2	0.1	9%
All Days	---	0.7	0.9	0.6	0.8	0.5	0.6	0.8	0.8	0.7	0.6	0.0	0.4	0.8	0.7	-0.1	-13%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.5	0.9	0.9	1.1	1.0	1.5	1.6	0.9	1.1	0.5	0.1	0.0	0.8	1.2	0.4	50%
Worst 20% Days	---	6.2	5.4	6.4	6.6	5.4	4.5	10.4	6.3	4.4	4.1	0.0	0.4	6.1	6.2	0.1	2%
All Days	---	3.5	3.6	3.5	4.1	3.0	3.4	5.0	3.8	3.4	2.8	0.0	0.5	3.7	3.7	0.0	0%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.3	0.0	0.2	0.2	0.1	0.1	0.1	0.3	0.1	0.2	0.0	0.5	0.2	0.1	-0.1	-50%
Worst 20% Days	---	0.1	0.1	0.1	0.6	0.6	0.4	0.5	0.8	0.6	0.2	0.1	0.0	0.2	0.6	0.4	>100%
All Days	---	0.2	0.1	0.2	0.4	0.3	0.3	0.2	0.3	0.3	0.3	0.0	0.0	0.2	0.3	0.1	50%

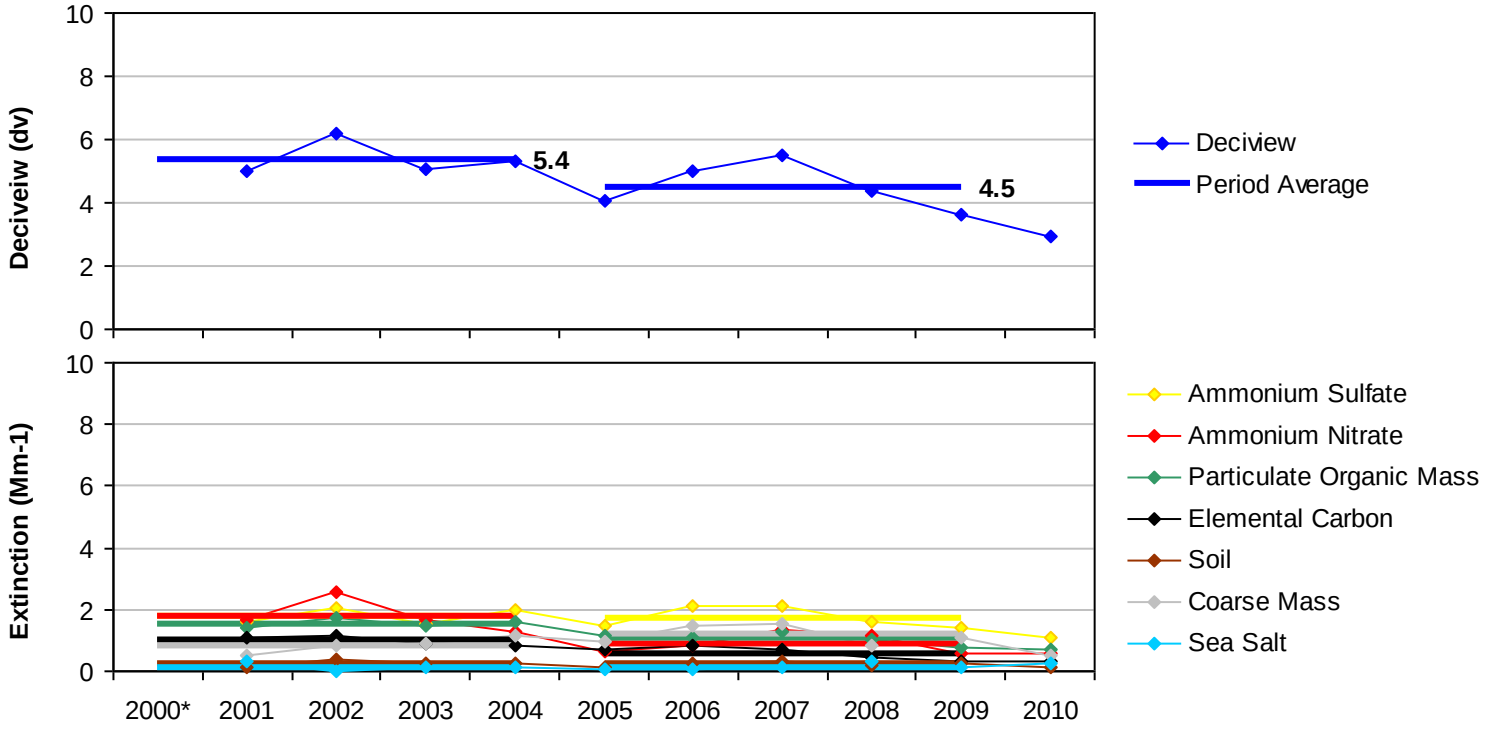
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure C.13-1
San Gorgonio WA and San Jacinto WA, CA (SAGO1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure C.13-2
San Gorgonio WA and San Jacinto WA, CA (SAGO1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

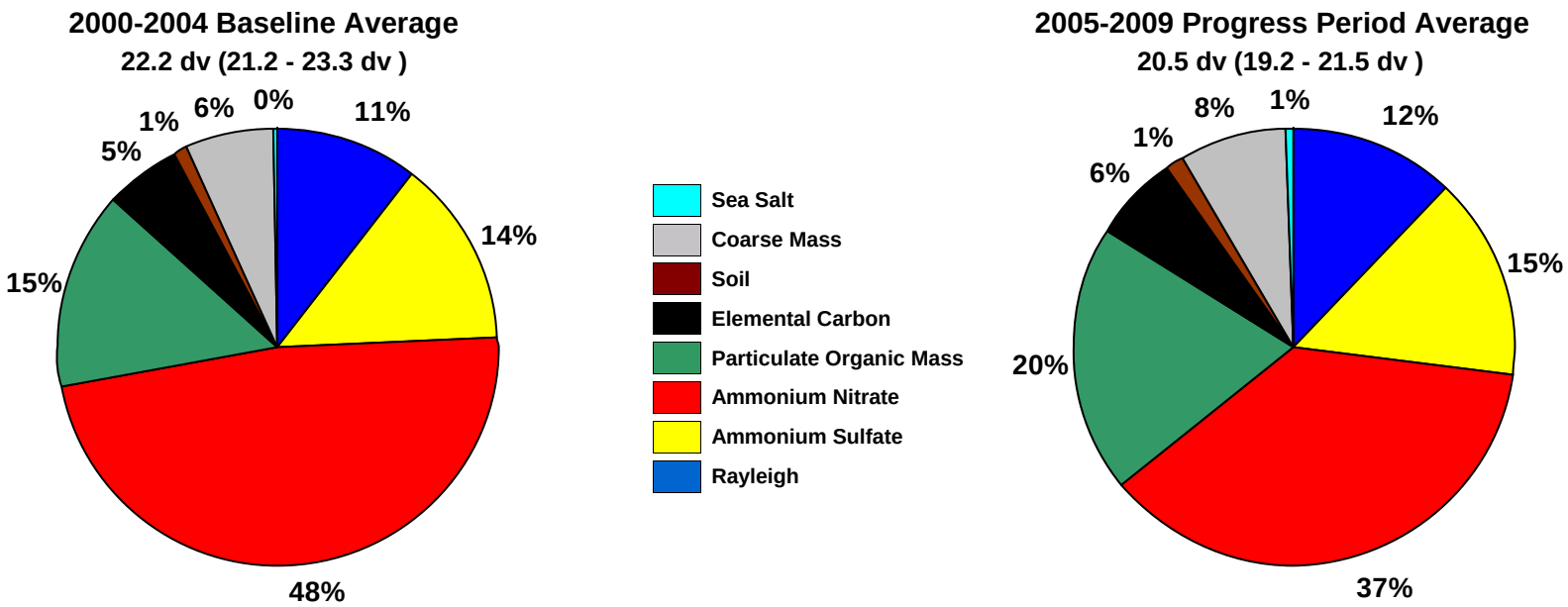


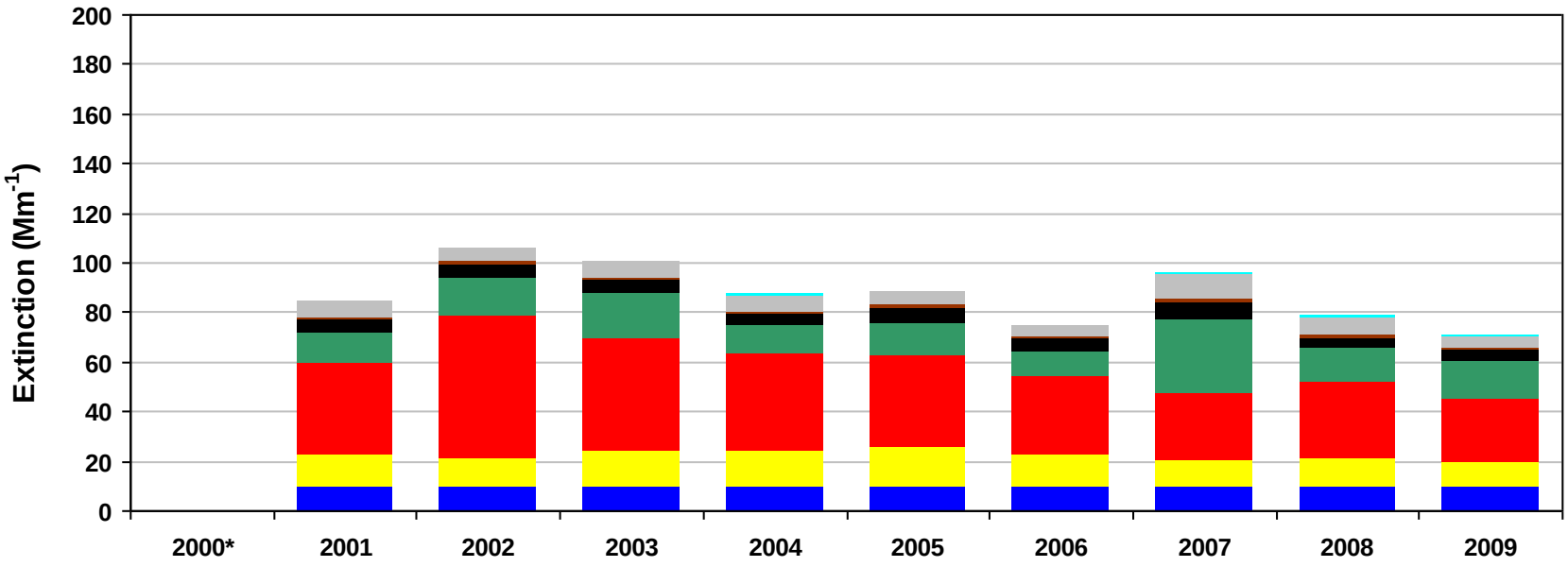
*Missing years did not meet RHR data completeness criteria.

Figure C.13-3

San Gorgonio WA and San Jacinto WA, CA (SAGO1 Site)

20% Most Impaired Visibility Days



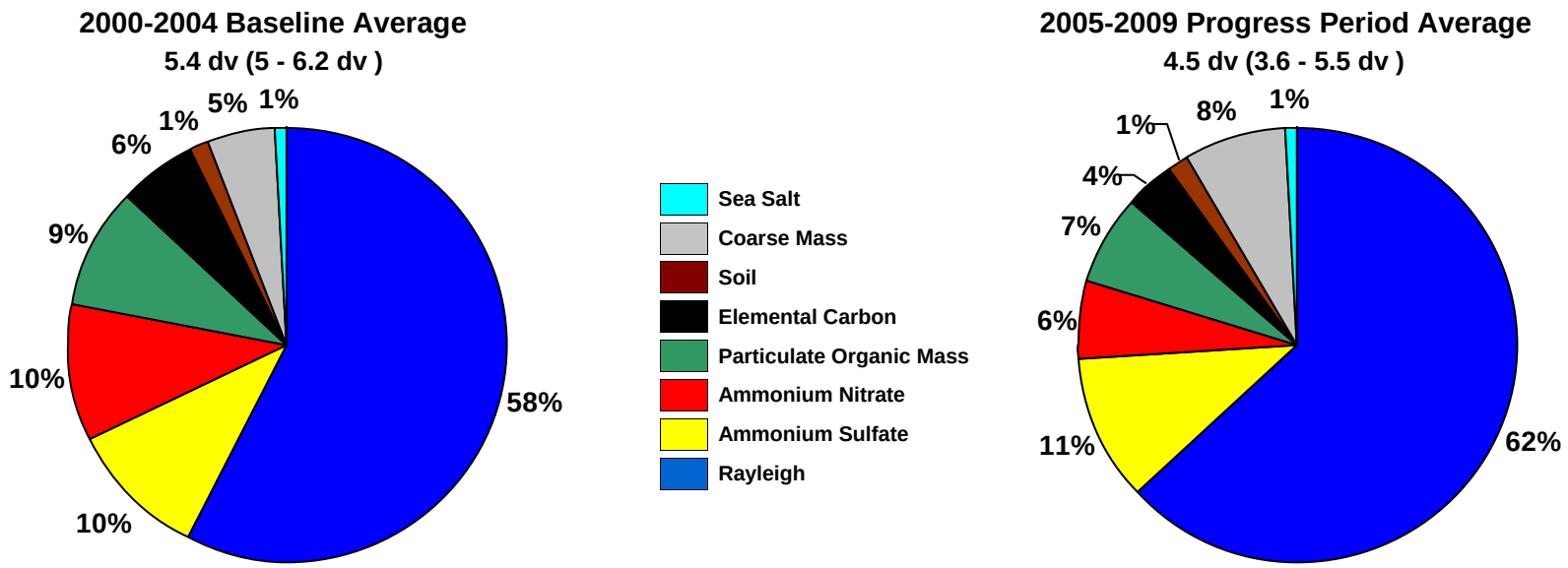


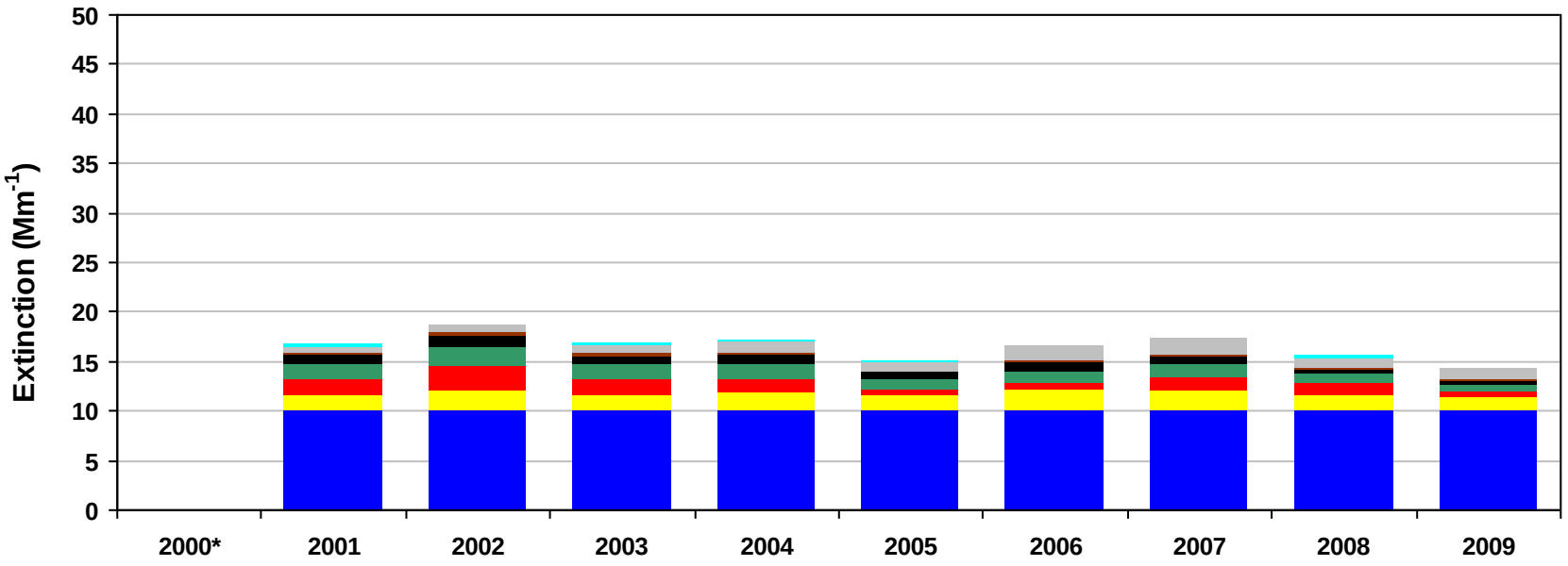
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure C.13-4

San Gorgonio WA and San Jacinto WA, CA (SAGO1 Site)

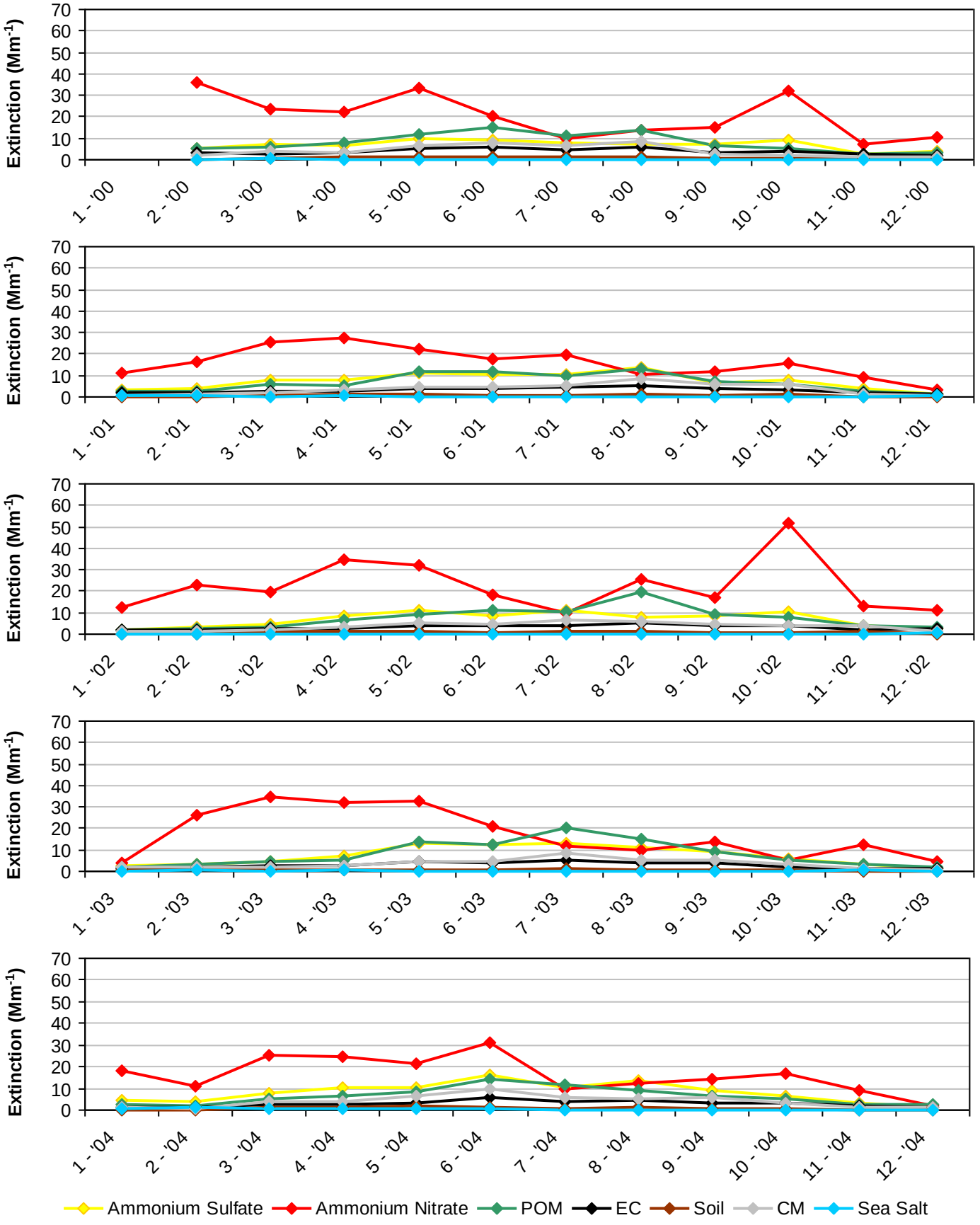
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure C.13-5
San Gorgonio WA and San Jacinto WA, CA (SAGO1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure C.13-6
San Gorgonio WA and San Jacinto WA, CA (SAGO1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

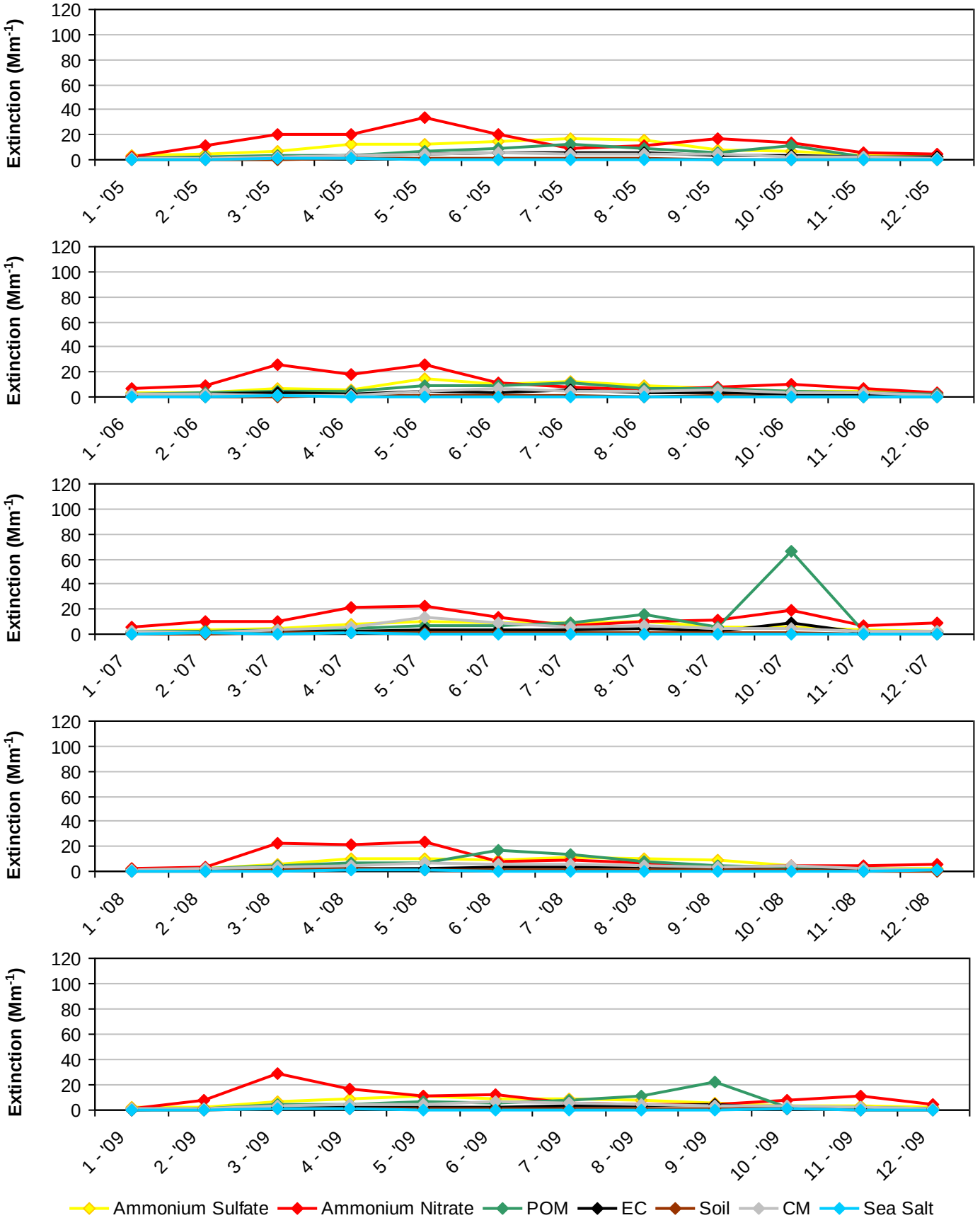
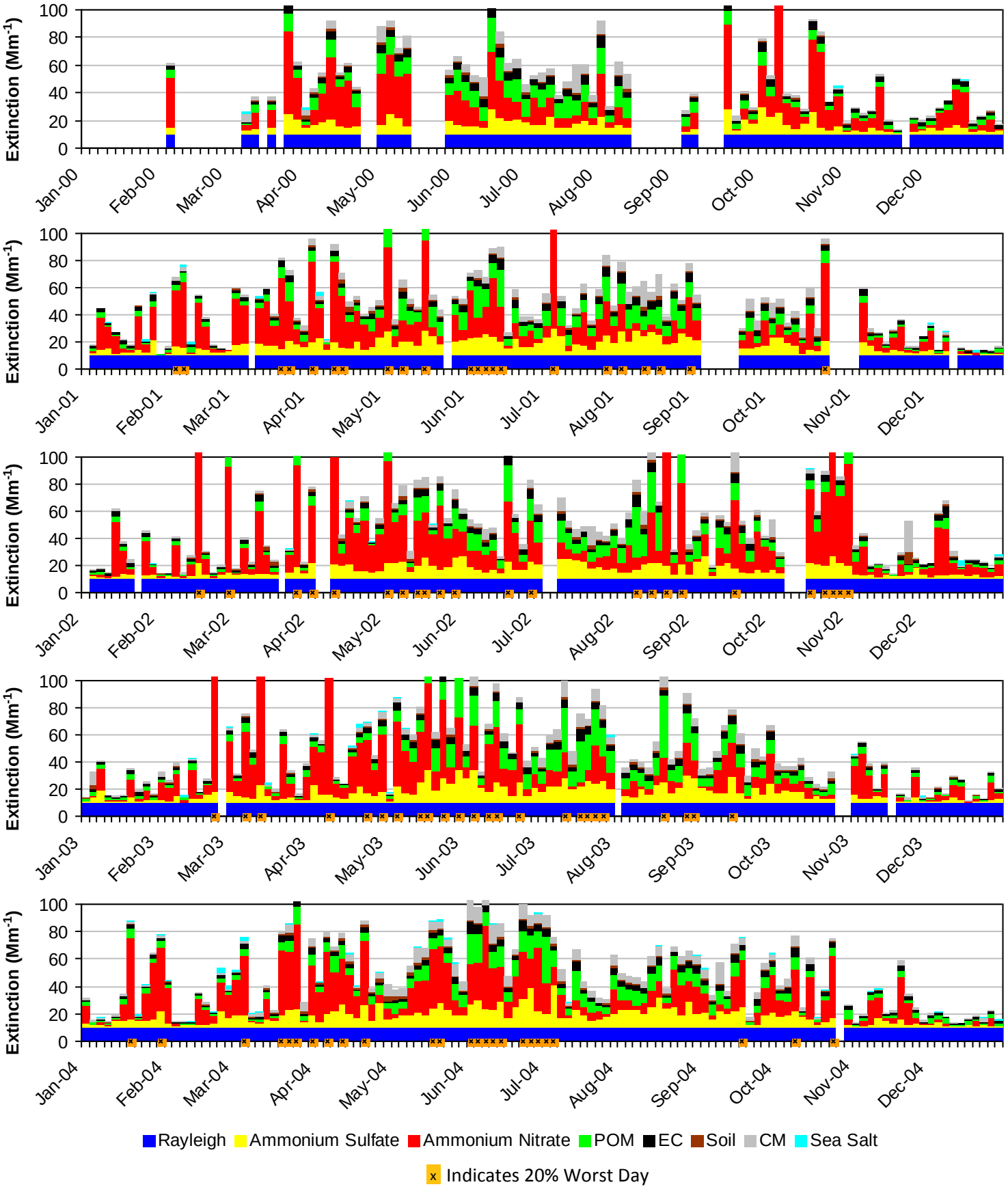
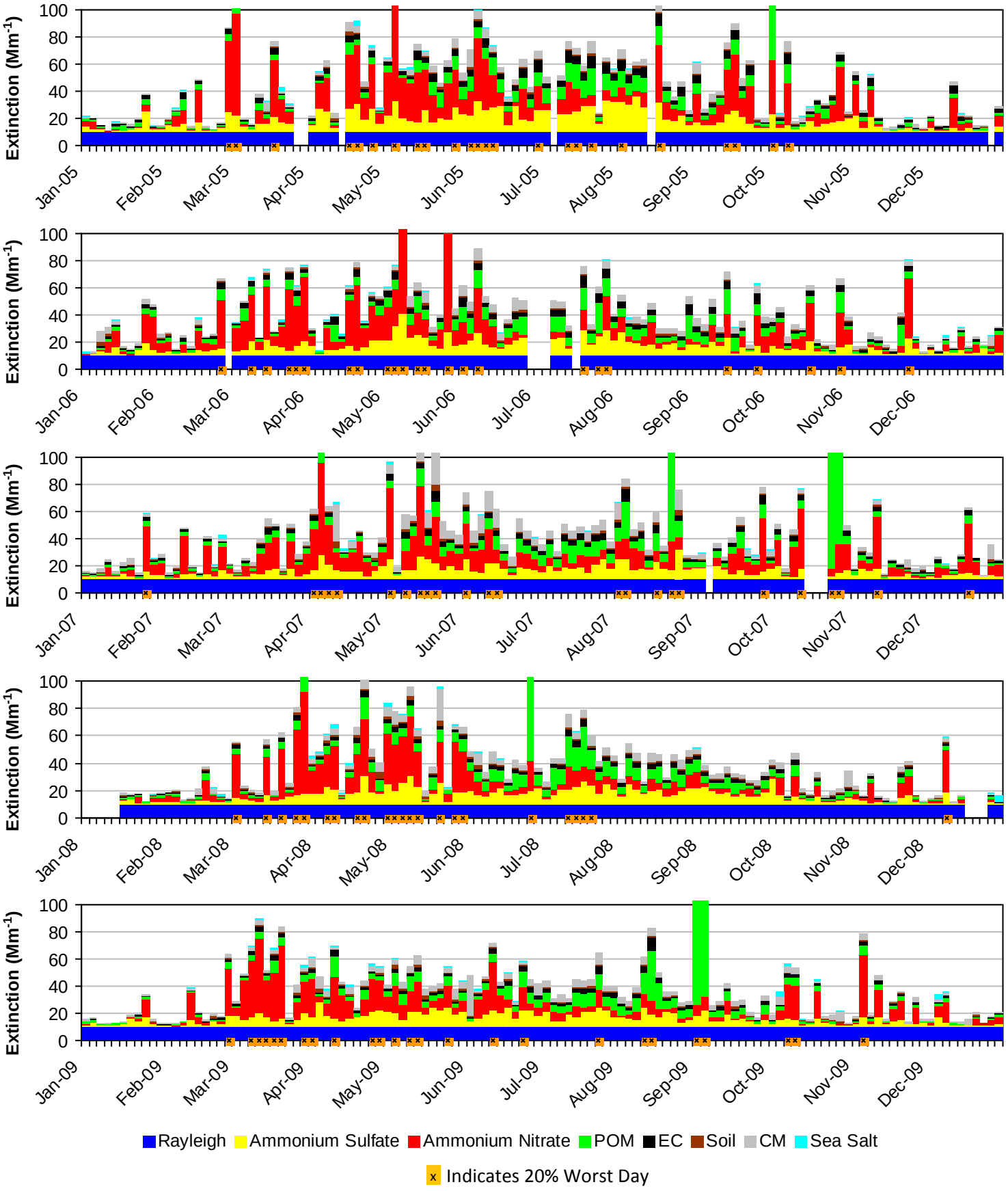


Figure C.13-7
San Gorgonio WA and San Jacinto WA, CA (SAGO1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure C.13-8
San Gorgonio WA and San Jacinto WA, CA (SAGO1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



C.14. PINNACLES NM AND VENTANA WA (PINN1)

The following tables and figures are presented in this section for the Pinnacles NM and Ventana WA represented by the PINN1 IMPROVE Monitor:

- **Table C.14-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure C.14-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.14-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.14-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure C.14-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure C.14-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure C.14-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure C.14-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

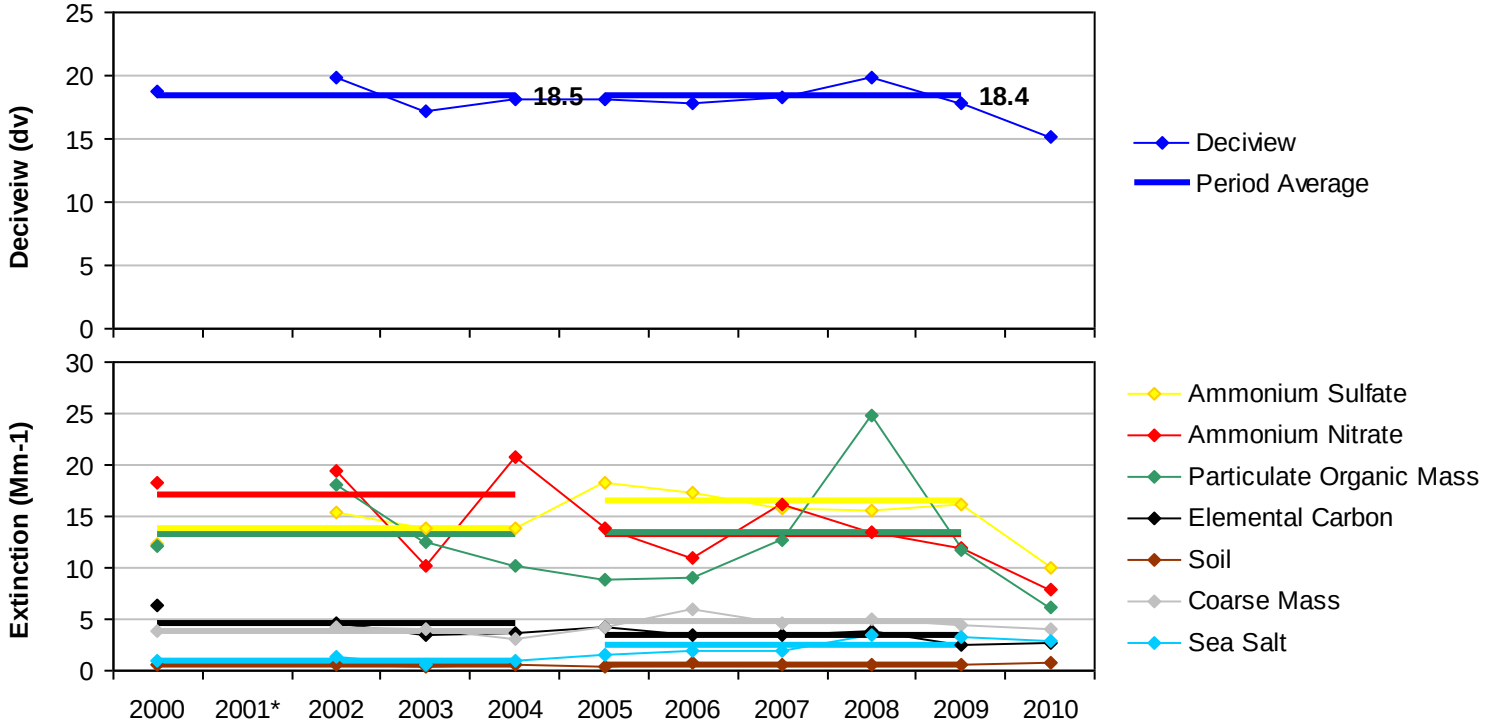
- **Figure C.14-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table C.14-1
Pinnacles NP and Ventana WA, CA (PINN1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	9.8	---	8.6	8.4	8.7	8.0	7.9	8.5	8.4	7.2	7.2	-0.2	0.0	8.9	8.0	-0.9	-10%
Worst 20% Days	18.7	---	19.9	17.1	18.1	18.1	17.9	18.3	19.8	17.8	15.1	0.0	0.4	18.5	18.4	-0.1	-1%
All Days	14.3	---	14.0	12.7	13.5	13.4	12.9	13.0	13.7	12.4	11.3	-0.2	0.1	13.6	13.1	-0.5	-4%
Total Extinction (Mm-1)																	
Best 20% Days	26.9	---	24.1	23.4	24.3	22.6	22.0	23.5	23.5	20.7	20.6	-0.5	0.0	24.7	22.5	-2.2	-9%
Worst 20% Days	65.6	---	74.7	56.0	64.0	62.3	60.4	66.0	78.0	61.7	45.6	0.0	0.5	65.1	65.7	0.6	1%
All Days	44.1	---	44.1	37.4	41.0	40.7	38.9	39.8	43.8	37.4	32.2	-0.6	0.1	41.7	40.1	-1.6	-4%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	4.9	---	4.2	4.5	4.1	4.4	3.3	3.5	3.5	3.5	3.3	-0.2	0.0	4.4	3.6	-0.8	-18%
Worst 20% Days	12.4	---	15.4	13.8	13.9	18.2	17.3	15.7	15.5	16.1	10.1	0.4	0.1	13.9	16.6	2.7	19%
All Days	9.1	---	9.4	7.9	9.1	10.3	9.5	8.5	8.9	8.3	6.7	-0.1	0.3	8.9	9.1	0.2	2%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	2.8	---	2.6	2.6	2.4	1.7	1.5	2.2	2.1	1.5	1.5	-0.1	0.0	2.6	1.8	-0.8	-31%
Worst 20% Days	18.3	---	19.3	10.1	20.7	13.9	10.9	16.2	13.5	12.0	7.8	-0.7	0.2	17.1	13.3	-3.8	-22%
All Days	8.7	---	7.8	6.0	8.3	6.2	5.7	7.3	6.6	5.7	4.3	-0.3	0.0	7.7	6.3	-1.4	-18%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	2.8	---	2.7	2.3	2.6	2.0	2.1	2.4	2.6	1.6	1.7	-0.1	0.0	2.6	2.1	-0.5	-19%
Worst 20% Days	12.1	---	18.1	12.5	10.2	8.9	9.0	12.6	24.8	11.8	6.2	0.0	0.5	13.2	13.4	0.2	2%
All Days	7.0	---	8.1	6.3	6.0	5.4	5.3	5.6	8.8	5.6	3.7	-0.2	0.1	6.8	6.2	-0.6	-9%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	1.5	---	1.2	1.1	1.2	1.1	1.1	1.1	0.8	0.7	0.6	-0.1	0.0	1.2	1.0	-0.2	-17%
Worst 20% Days	6.4	---	4.7	3.5	3.6	4.2	3.4	3.4	3.9	2.5	2.8	-0.3	0.0	4.6	3.5	-1.1	-24%
All Days	3.6	---	2.7	2.3	2.2	2.5	2.3	2.0	2.0	1.6	1.4	-0.2	0.0	2.7	2.1	-0.6	-22%
Soil Extinction (Mm-1)																	
Best 20% Days	0.2	---	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.0	0.5	0.2	0.2	0.0	0%
Worst 20% Days	0.6	---	0.6	0.5	0.6	0.4	0.8	0.5	0.6	0.6	0.7	0.0	0.4	0.6	0.6	0.0	0%
All Days	0.4	---	0.4	0.3	0.4	0.3	0.4	0.4	0.5	0.4	0.4	0.0	0.2	0.4	0.4	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	1.9	---	1.7	1.4	1.7	1.7	1.3	2.1	1.7	1.5	1.5	0.0	0.1	1.7	1.7	0.0	0%
Worst 20% Days	3.8	---	4.3	4.0	3.0	4.2	6.0	4.7	5.1	4.4	4.1	0.1	0.1	3.8	4.9	1.1	29%
All Days	3.5	---	3.6	2.8	2.8	3.5	3.2	3.3	3.9	3.1	3.0	0.0	0.5	3.2	3.4	0.2	6%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	1.7	---	0.4	0.4	1.1	0.6	1.6	1.0	1.6	0.8	0.8	0.1	0.4	0.9	1.1	0.2	22%
Worst 20% Days	0.9	---	1.3	0.6	0.9	1.5	2.0	2.0	3.5	3.4	2.9	0.3	0.0	0.9	2.5	1.6	>100%
All Days	0.9	---	1.0	0.8	1.2	1.5	1.5	1.6	2.1	1.7	1.7	0.1	0.0	1.0	1.7	0.7	70%

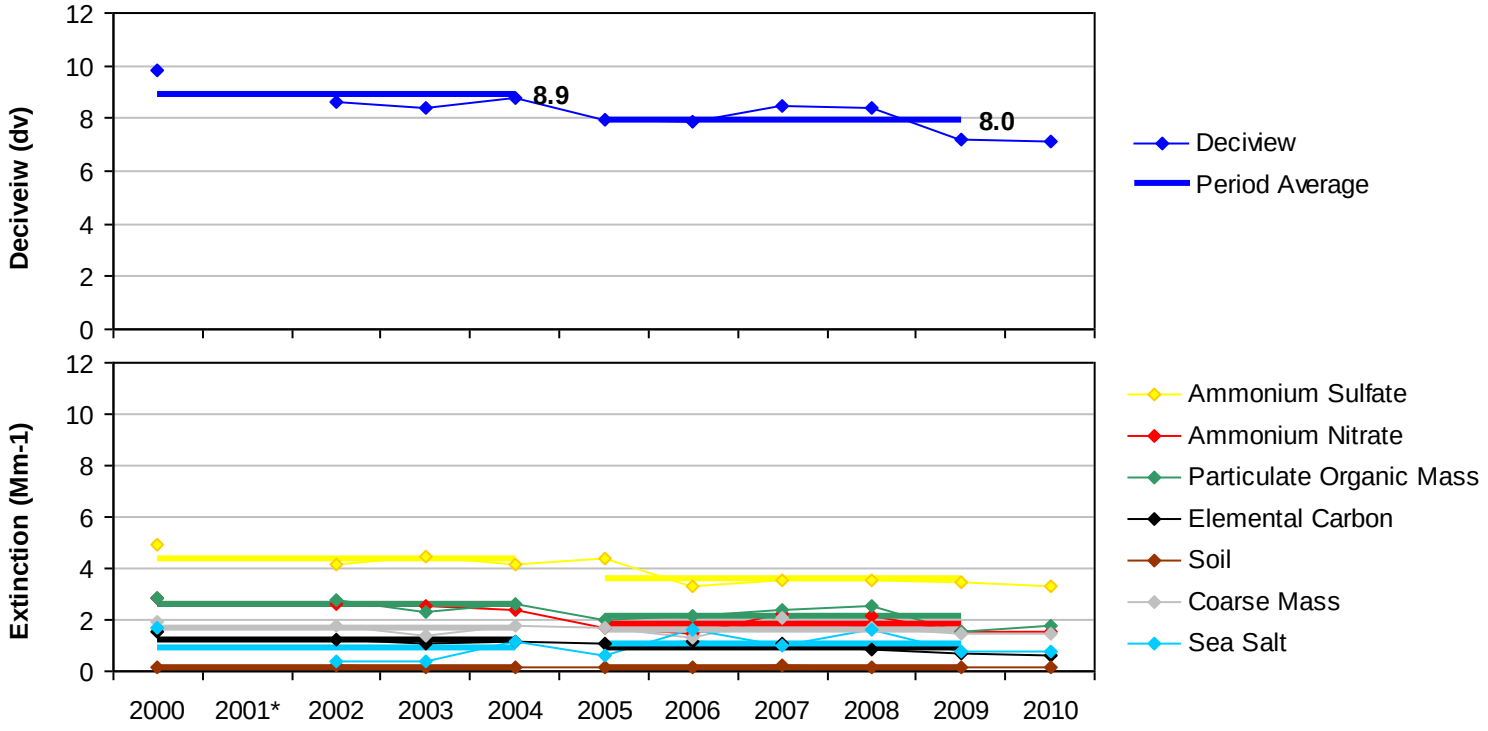
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure C.14-1
Pinnacles NP and Ventana WA, CA (PINN1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure C.14-2
Pinnacles NP and Ventana WA, CA (PINN1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

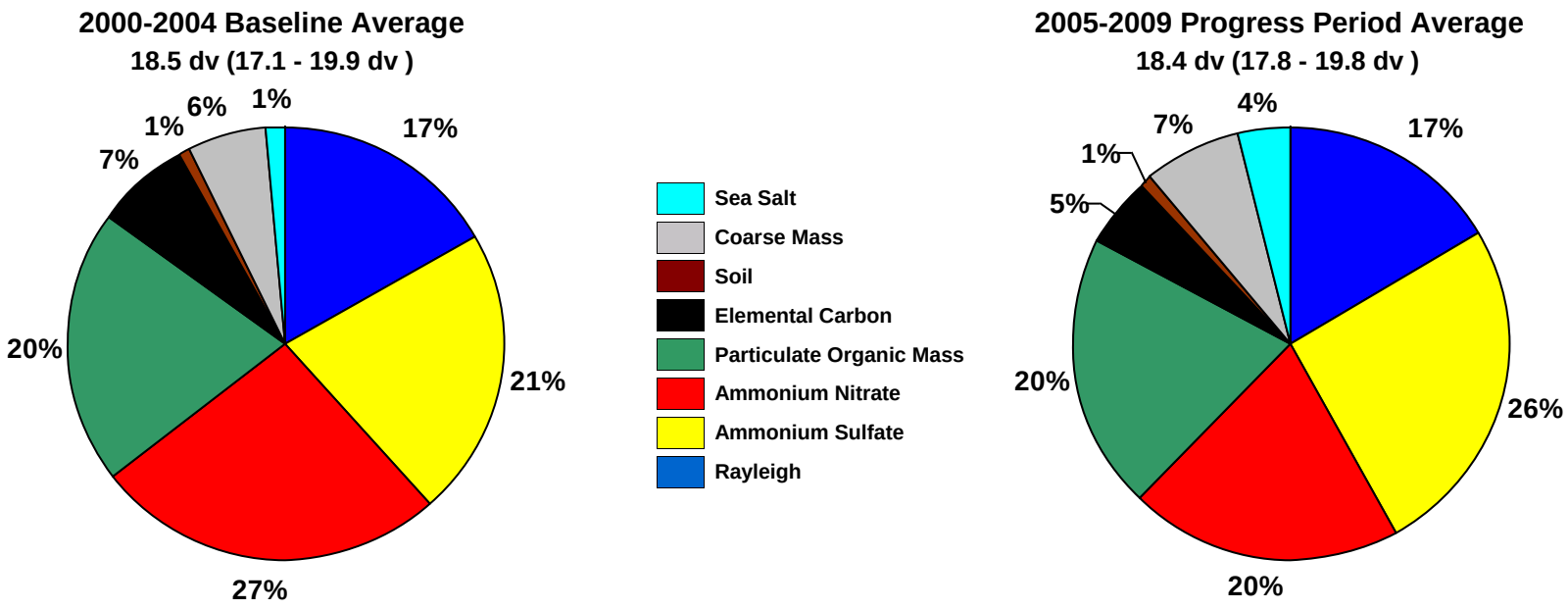


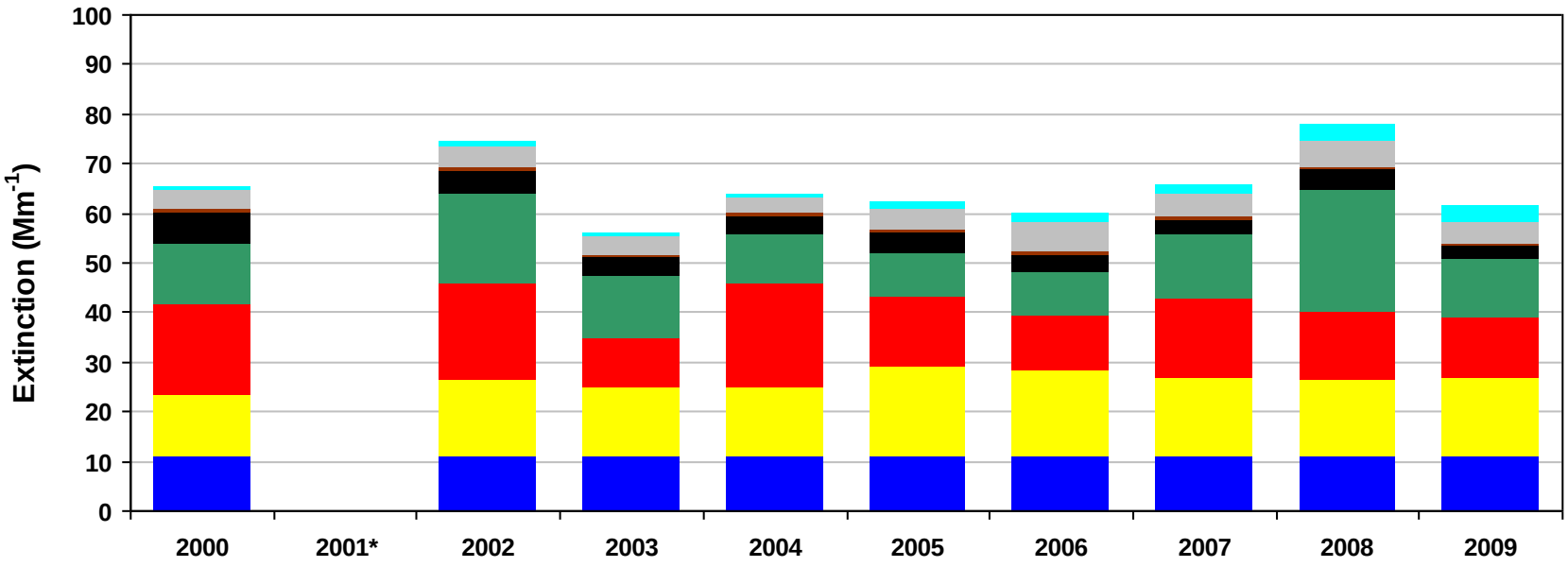
*Missing years did not meet RHR data completeness criteria.

Figure C.14-3

Pinnacles NP and Ventana WA, CA (PINN1 Site)

20% Most Impaired Visibility Days



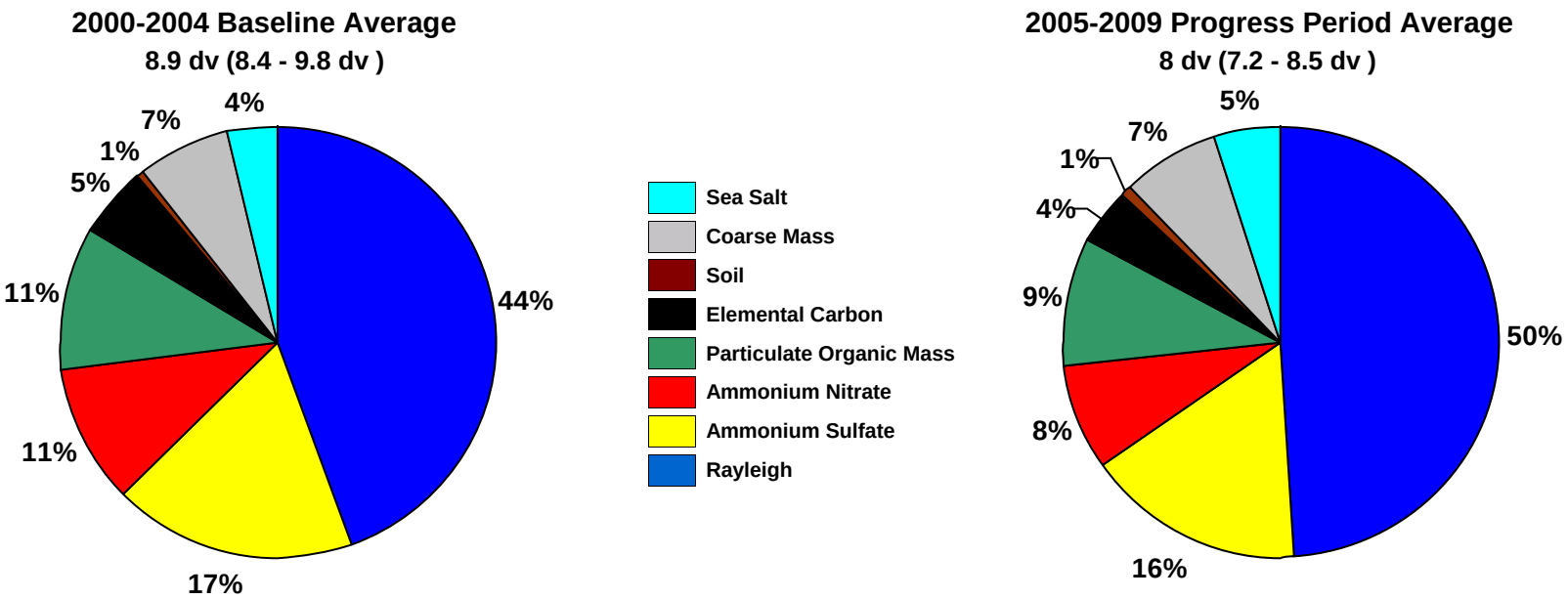


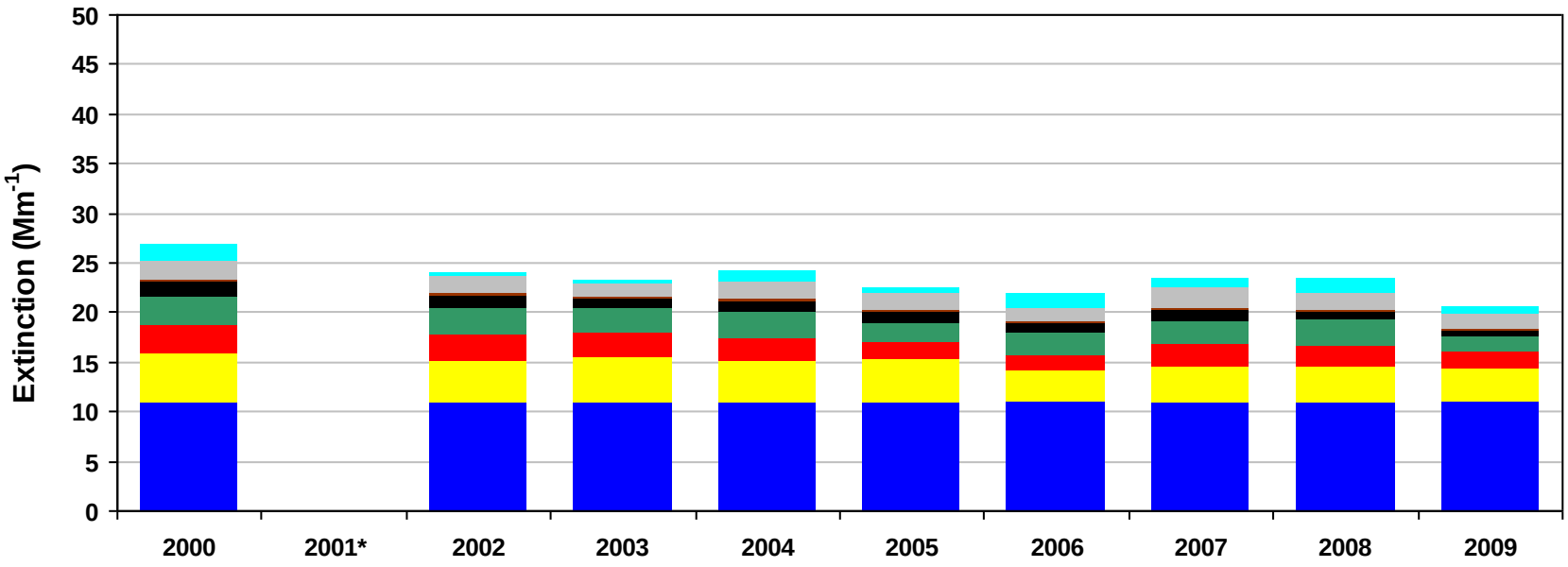
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure C.14-4

Pinnacles NP and Ventana WA, CA (PINN1 Site)

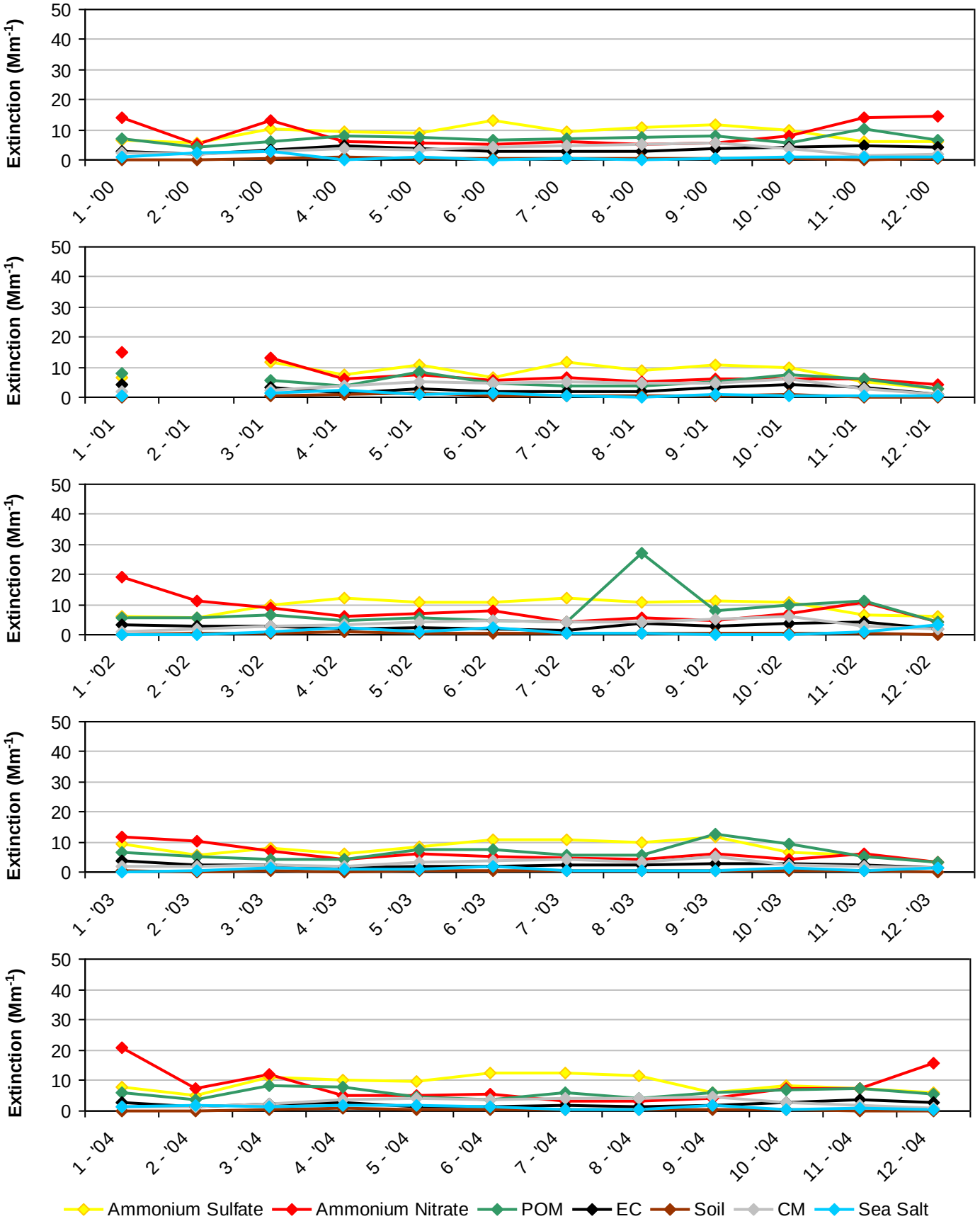
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure C.14-5
Pinnacles NP and Ventana WA, CA (PINN1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2001 are shown here, but this year did not meet RHR data completeness criteria.

Figure C.14-6
Pinnacles NP and Ventana WA, CA (PINN1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

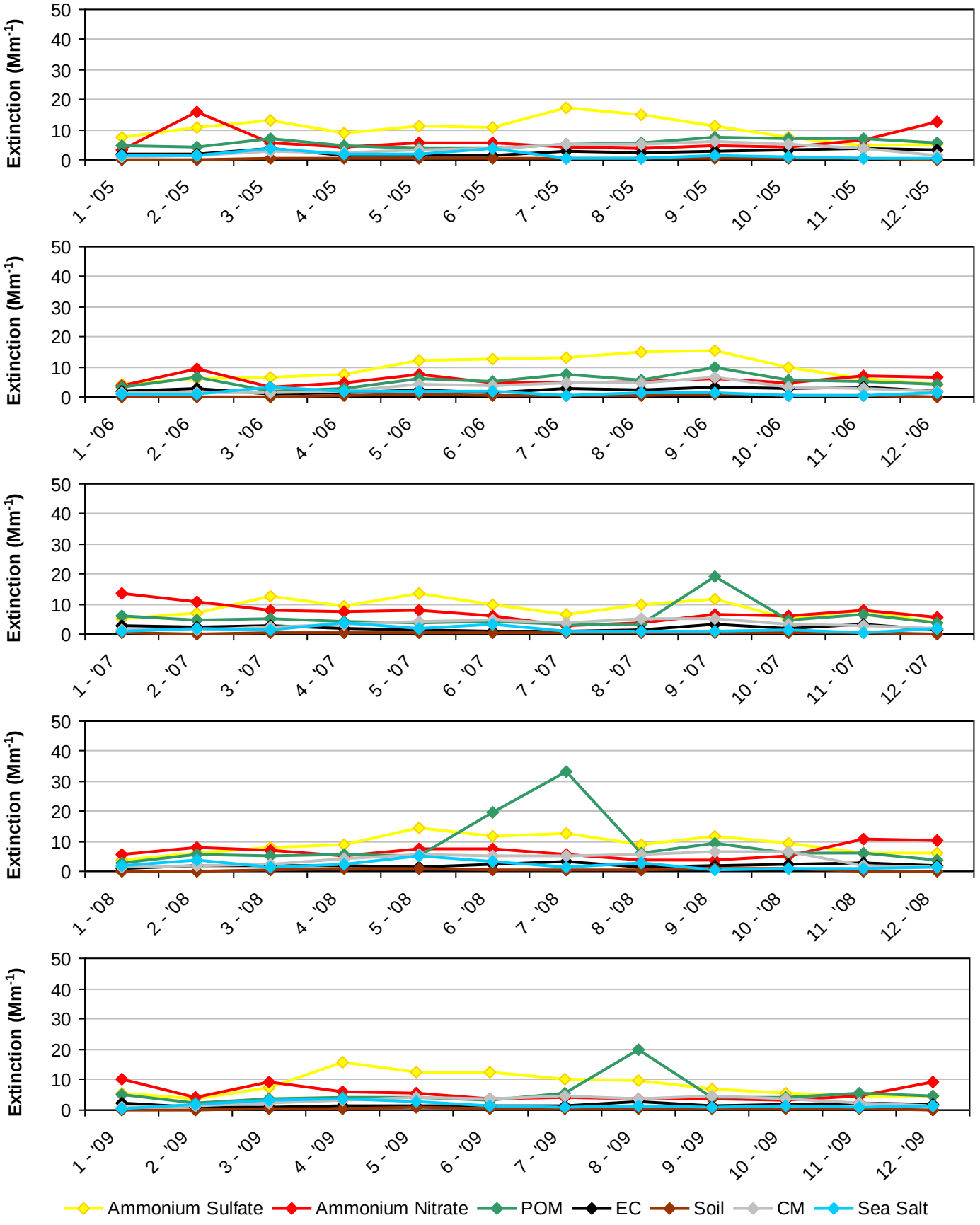
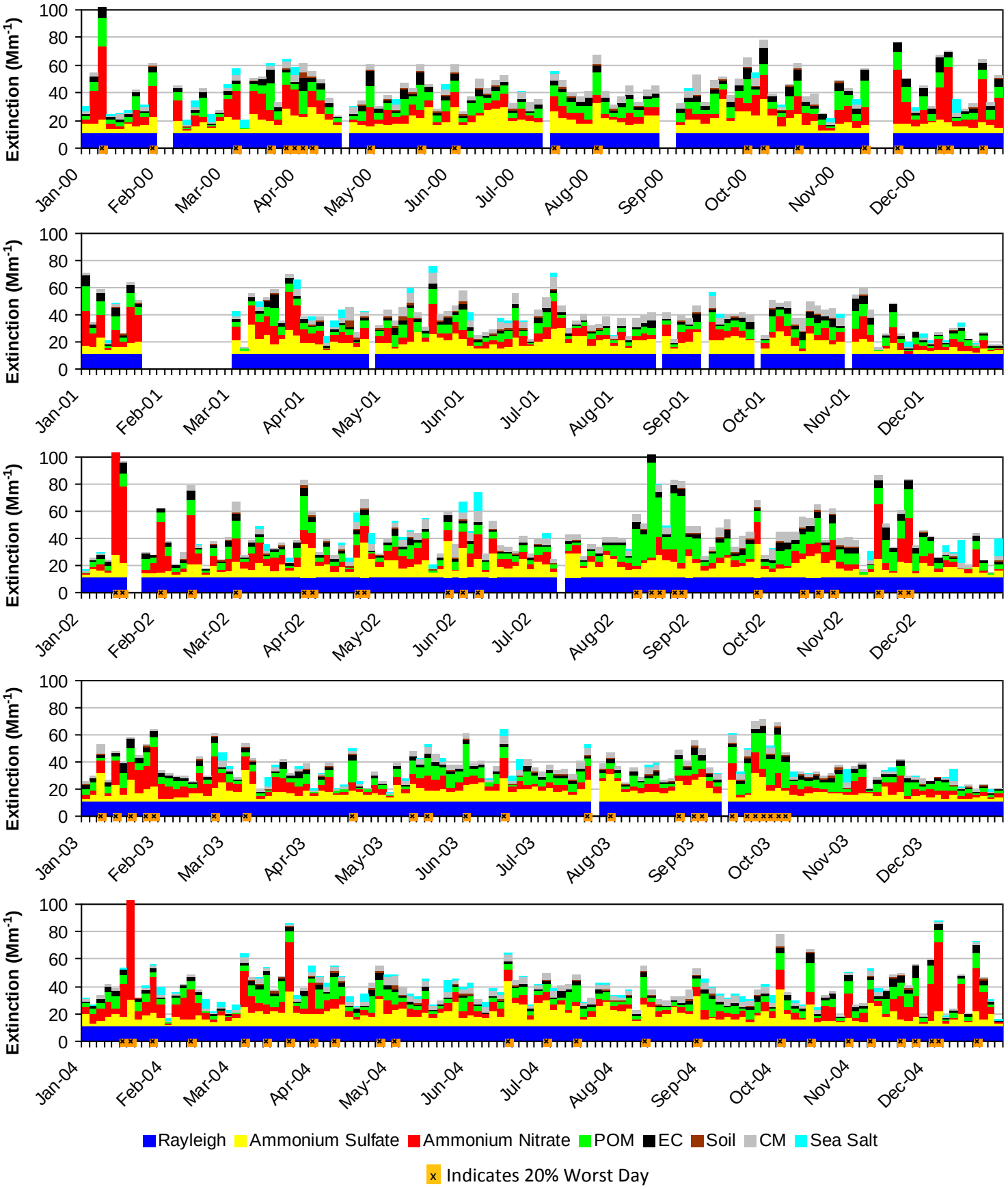
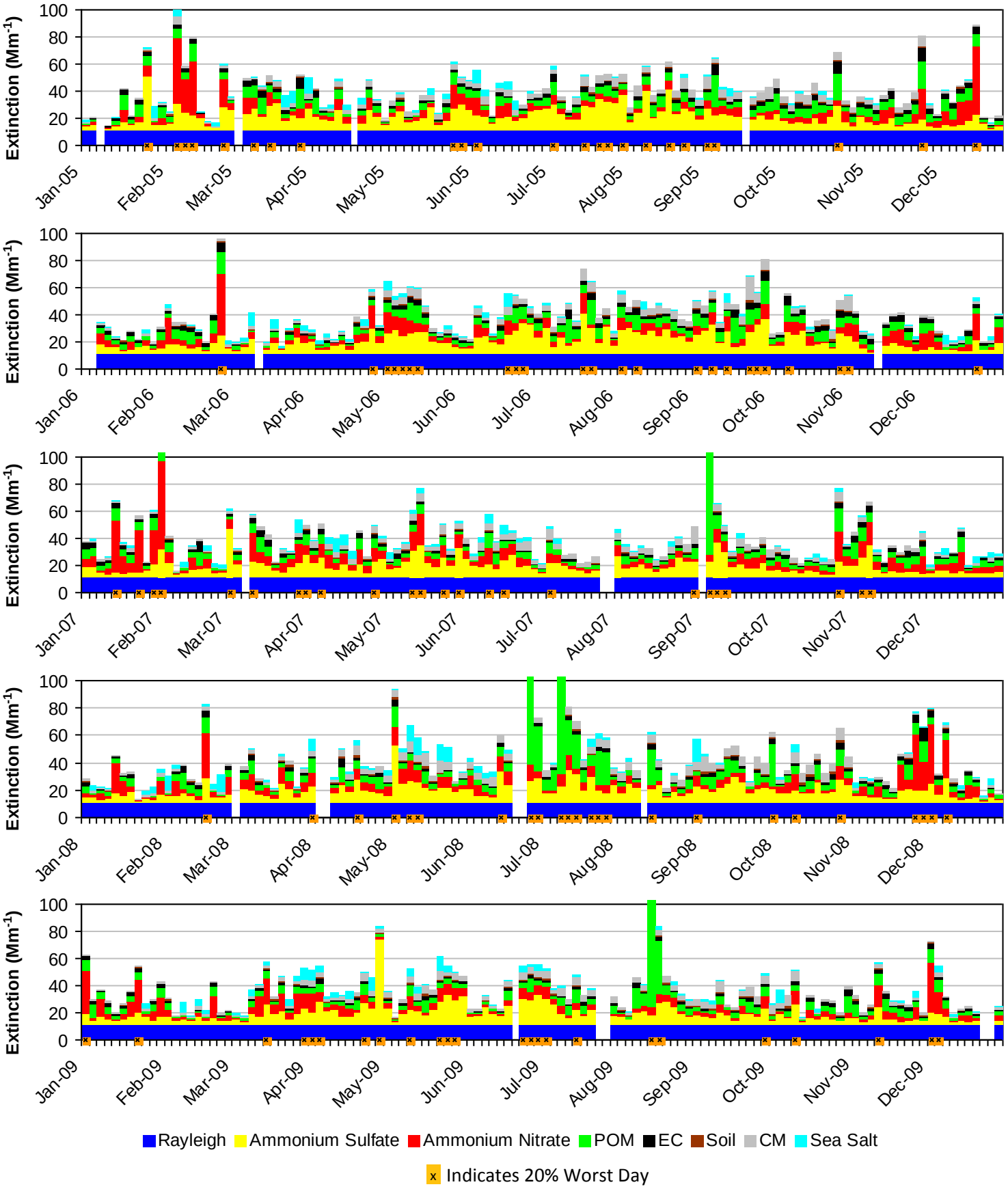


Figure C.14-7
Pinnacles NP and Ventana WA, CA (PINN1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2001 are shown here, but this year did not meet RHR data completeness criteria.

Figure C.14-8
Pinnacles NP and Ventana WA, CA (PINN1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



C.15. POINT REYES NATIONAL SEASHORE (PORE1)

The following tables and figures are presented in this section for the Point Reyes National Seashore represented by the PORE1 IMPROVE Monitor:

- **Table C.15-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure C.15-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.15-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.15-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure C.15-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure C.15-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure C.15-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure C.15-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

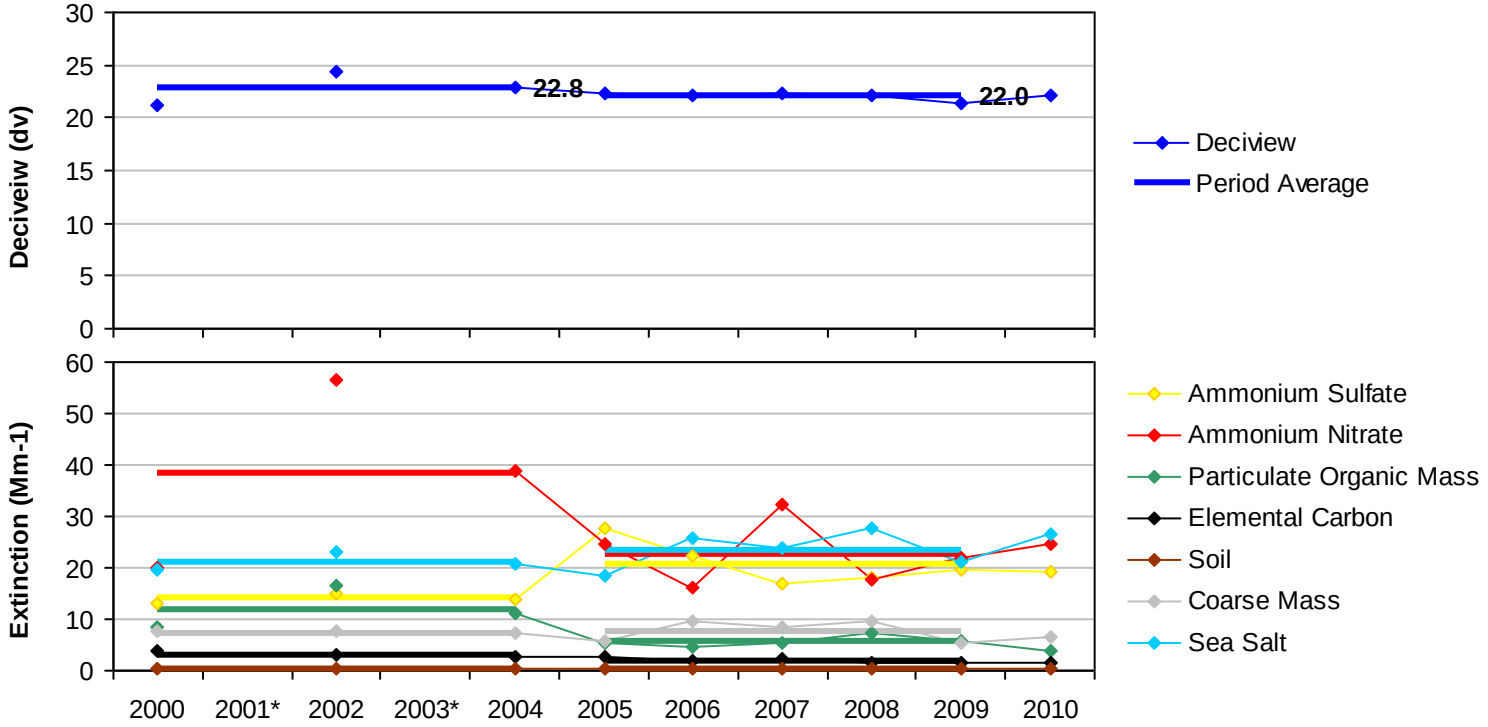
- **Figure C.15-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table C.15-1
Point Reyes National Seashore, CA (PORE1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	10.5	---	10.5	---	10.5	9.8	9.6	8.9	9.5	7.8	8.0	-0.2	0.0	10.5	9.1	-1.4	-13%
Worst 20% Days	21.2	---	24.3	---	22.9	22.3	22.0	22.4	22.1	21.3	22.0	-0.2	0.2	22.8	22.0	-0.8	-4%
All Days	15.7	---	16.9	---	16.2	15.9	15.7	15.5	15.8	14.6	14.7	-0.2	0.1	16.3	15.5	-0.8	-5%
Total Extinction (Mm-1)																	
Best 20% Days	29.0	---	28.9	---	29.1	26.9	26.5	24.9	26.4	22.1	22.6	-0.7	0.0	29.0	25.4	-3.6	-12%
Worst 20% Days	85.3	---	134.7	---	106.7	96.8	92.6	101.8	94.1	87.7	94.7	-2.7	0.2	108.9	94.6	-14.3	-13%
All Days	51.9	---	65.2	---	57.0	54.6	53.3	54.3	53.7	48.9	49.8	-1.1	0.1	58.0	53.0	-5.0	-9%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	6.8	---	6.1	---	7.3	6.0	5.7	6.0	5.9	4.4	4.8	-0.2	0.0	6.7	5.6	-1.1	-16%
Worst 20% Days	13.1	---	15.2	---	13.9	27.6	22.2	17.1	17.9	19.7	19.2	0.7	0.1	14.1	20.9	6.8	48%
All Days	10.0	---	11.3	---	10.9	14.8	12.9	10.9	11.7	11.1	10.5	0.1	0.4	10.7	12.3	1.6	15%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	2.4	---	2.4	---	2.3	1.9	1.6	1.6	1.6	1.2	1.1	-0.2	0.0	2.4	1.6	-0.8	-33%
Worst 20% Days	19.9	---	56.6	---	38.7	24.8	16.0	32.4	17.7	21.7	24.8	-2.2	0.2	38.4	22.5	-15.9	-41%
All Days	7.8	---	15.5	---	11.4	8.3	6.6	9.1	6.8	7.5	7.6	-0.6	0.1	11.6	7.7	-3.9	-34%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.3	---	1.5	---	1.7	1.5	0.7	0.6	1.5	0.6	0.6	-0.1	0.1	1.5	1.0	-0.5	-33%
Worst 20% Days	8.6	---	16.4	---	11.2	5.4	4.6	5.3	7.2	5.8	4.0	-0.7	0.1	12.1	5.7	-6.4	-53%
All Days	4.1	---	5.7	---	4.3	3.4	2.9	2.5	3.2	2.7	1.9	-0.3	0.0	4.7	2.9	-1.8	-38%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.5	---	0.6	---	0.6	0.5	0.3	0.3	0.4	0.2	0.2	0.0	0.0	0.6	0.3	-0.3	-50%
Worst 20% Days	3.9	---	3.1	---	2.8	2.6	1.9	2.2	1.5	1.6	1.5	-0.3	0.0	3.3	2.0	-1.3	-39%
All Days	1.7	---	1.3	---	1.2	1.1	1.1	0.8	0.8	0.8	0.6	-0.1	0.0	1.4	0.9	-0.5	-36%
Soil Extinction (Mm-1)																	
Best 20% Days	0.1	---	0.1	---	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0%
Worst 20% Days	0.4	---	0.5	---	0.3	0.2	0.3	0.2	0.4	0.3	0.3	0.0	0.2	0.4	0.3	-0.1	-25%
All Days	0.2	---	0.3	---	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.0	0.4	0.2	0.2	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	2.6	---	2.5	---	1.8	1.6	2.1	1.6	1.5	1.1	1.2	-0.1	0.0	2.3	1.6	-0.7	-30%
Worst 20% Days	7.6	---	7.7	---	7.1	5.8	9.6	8.6	9.8	5.4	6.5	0.1	0.5	7.5	7.8	0.3	4%
All Days	5.0	---	5.0	---	4.6	4.0	5.2	5.2	5.1	3.6	4.0	-0.1	0.5	4.9	4.6	-0.3	-6%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	3.2	---	3.7	---	3.4	3.3	4.0	2.7	3.5	2.4	2.6	-0.1	0.3	3.4	3.2	-0.2	-6%
Worst 20% Days	19.8	---	23.2	---	20.6	18.5	26.0	24.0	27.6	21.2	26.4	0.7	0.1	21.2	23.4	2.2	10%
All Days	11.1	---	14.0	---	12.4	10.9	12.4	13.7	13.9	11.0	13.0	0.0	0.5	12.5	12.4	-0.1	-1%

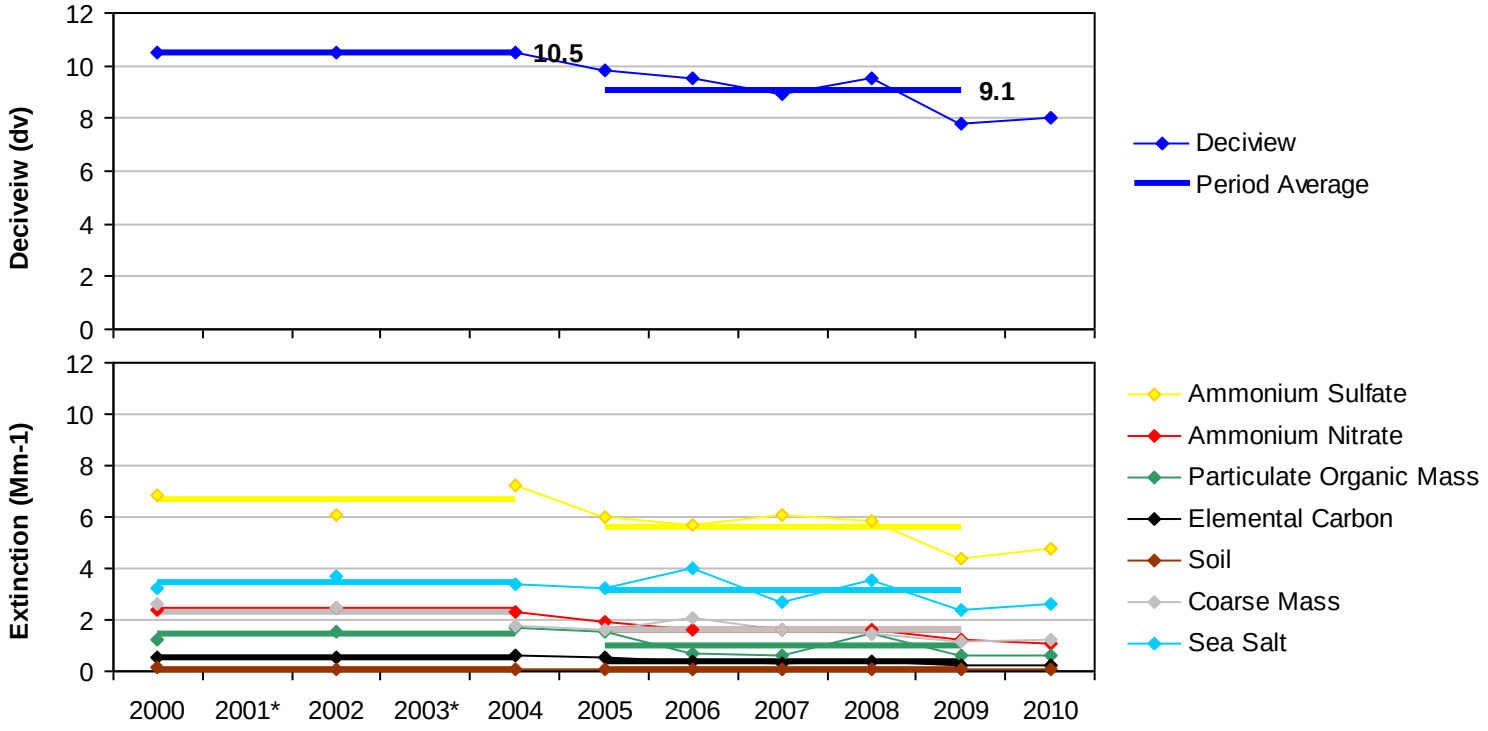
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure C.15-1
Point Reyes National Seashore, CA (PORE1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure C.15-2
Point Reyes National Seashore, CA (PORE1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

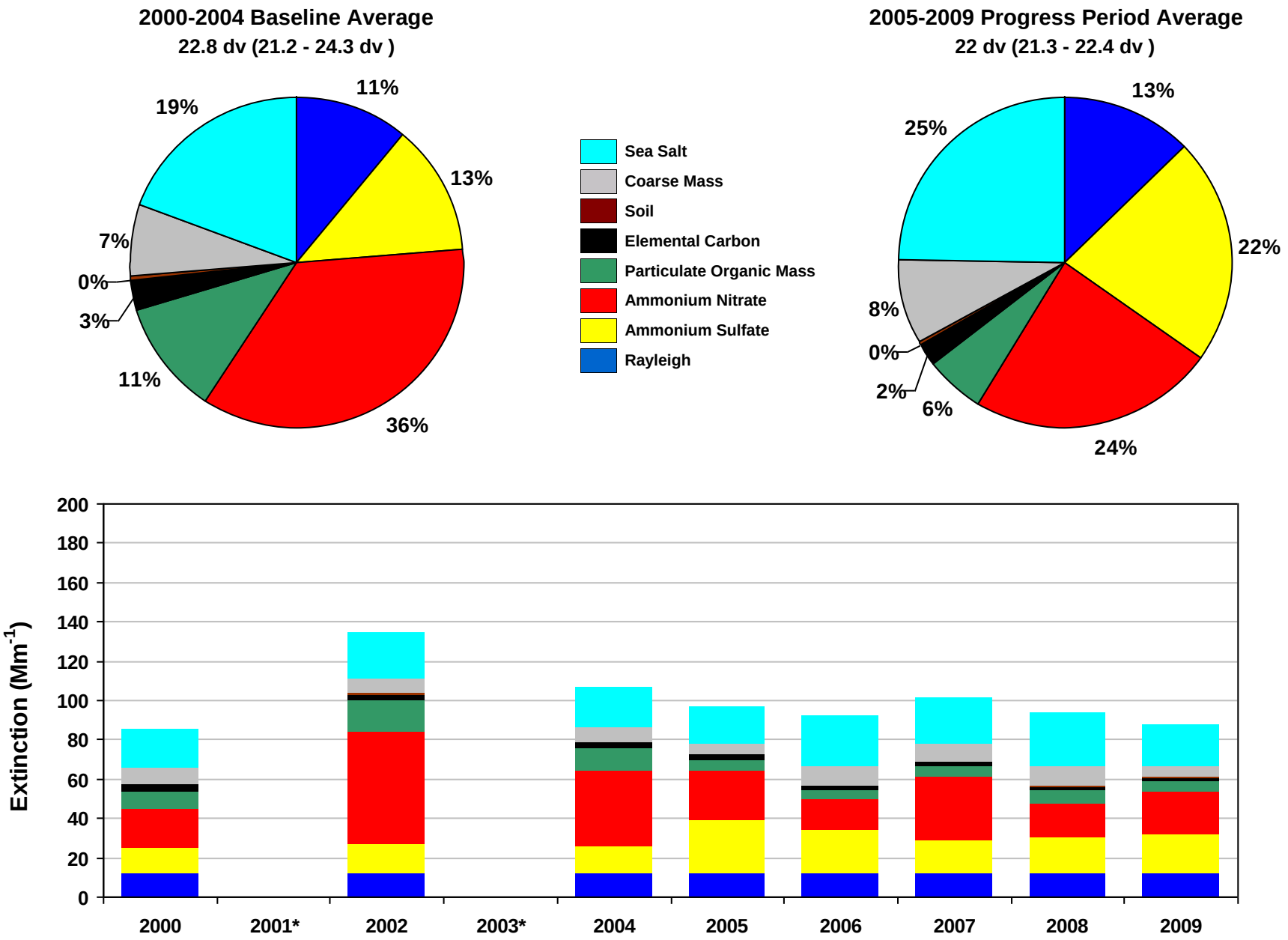


*Missing years did not meet RHR data completeness criteria.

Figure C.15-3

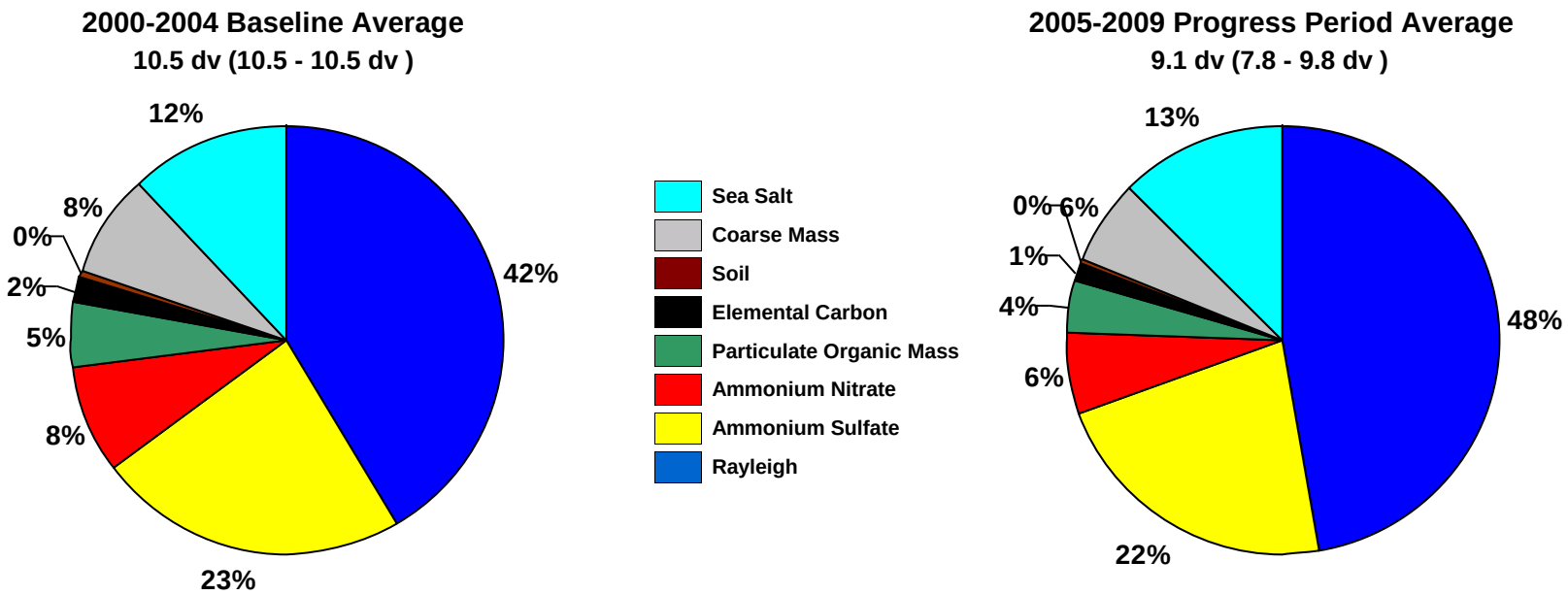
Point Reyes National Seashore, CA (PORE1 Site)

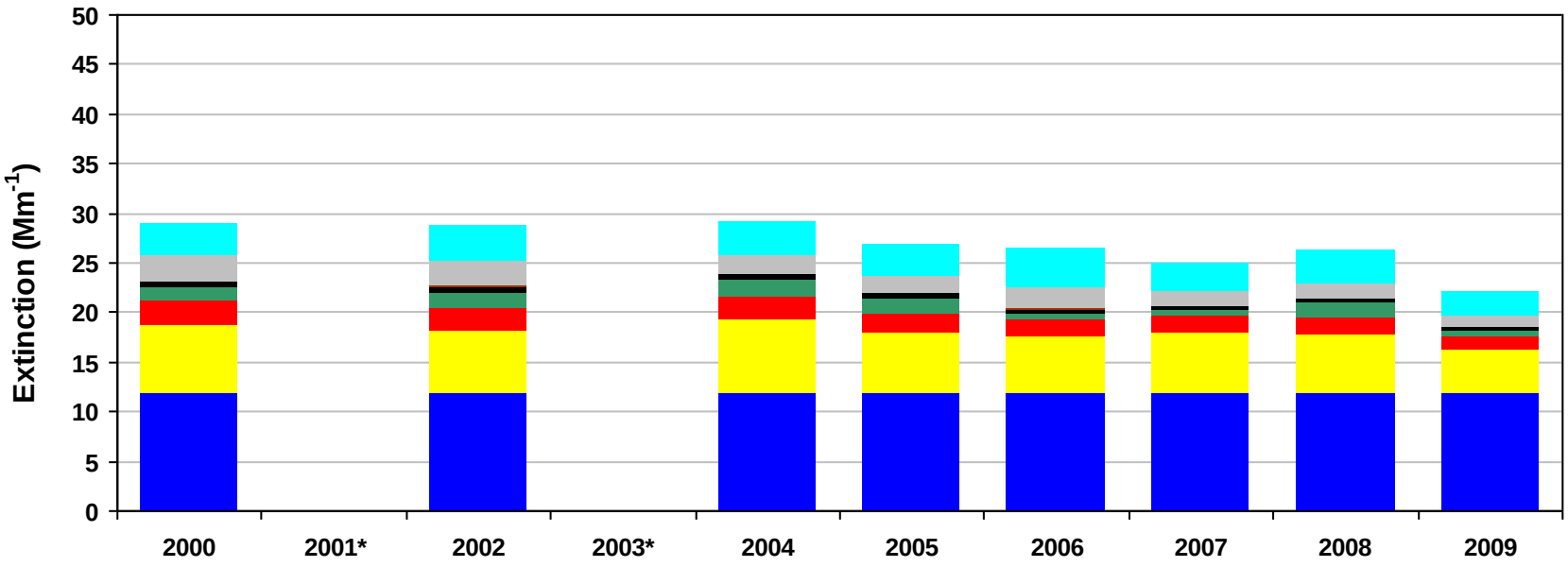
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

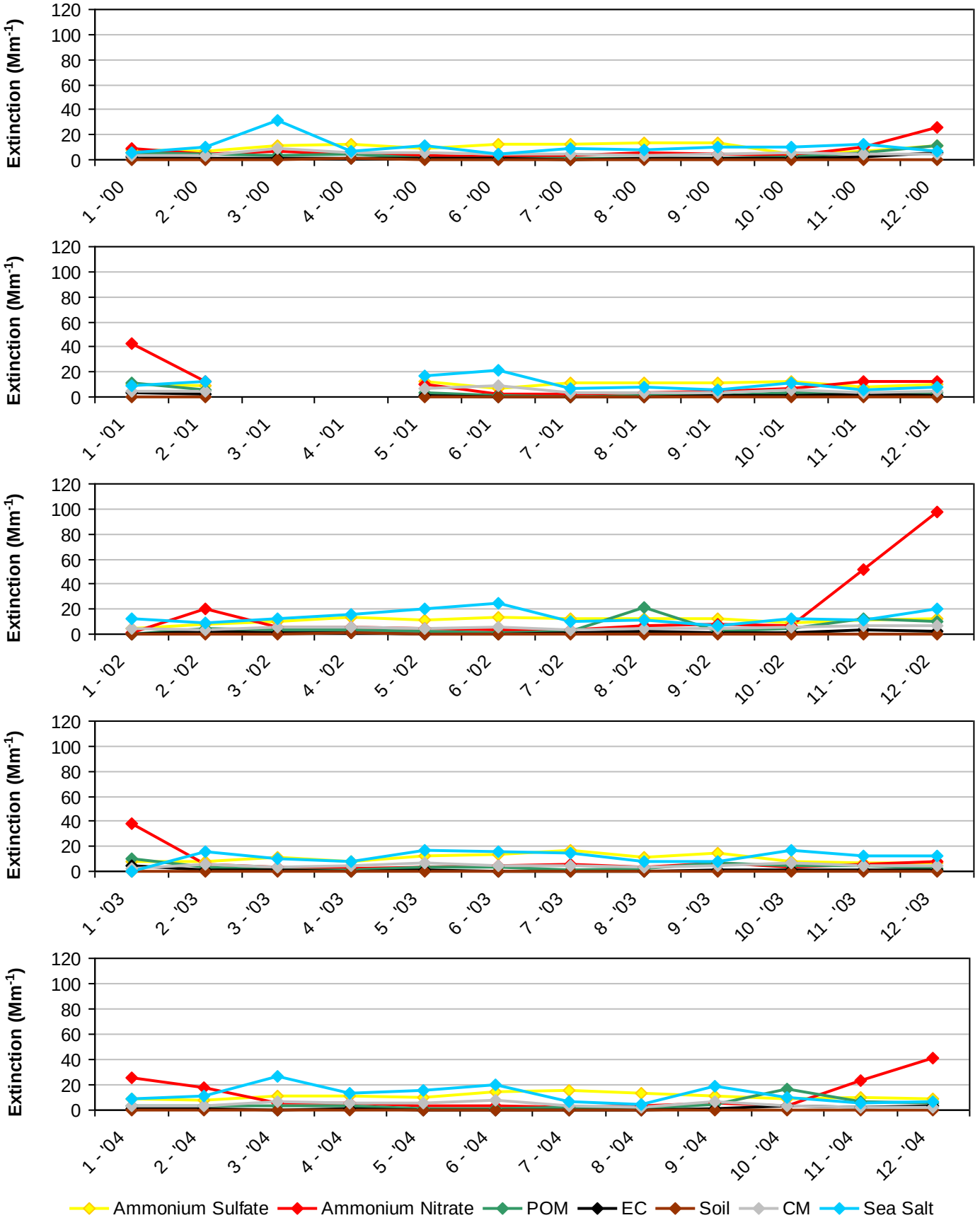
Figure C.15-4
Point Reyes National Seashore, CA (PORE1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure C.15-5
Point Reyes National Seashore, CA (PORE1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the years 2001 and 2003 are shown here, but these years did not meet RHR data completeness criteria.

Figure C.15-6
Point Reyes National Seashore, CA (PORE1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

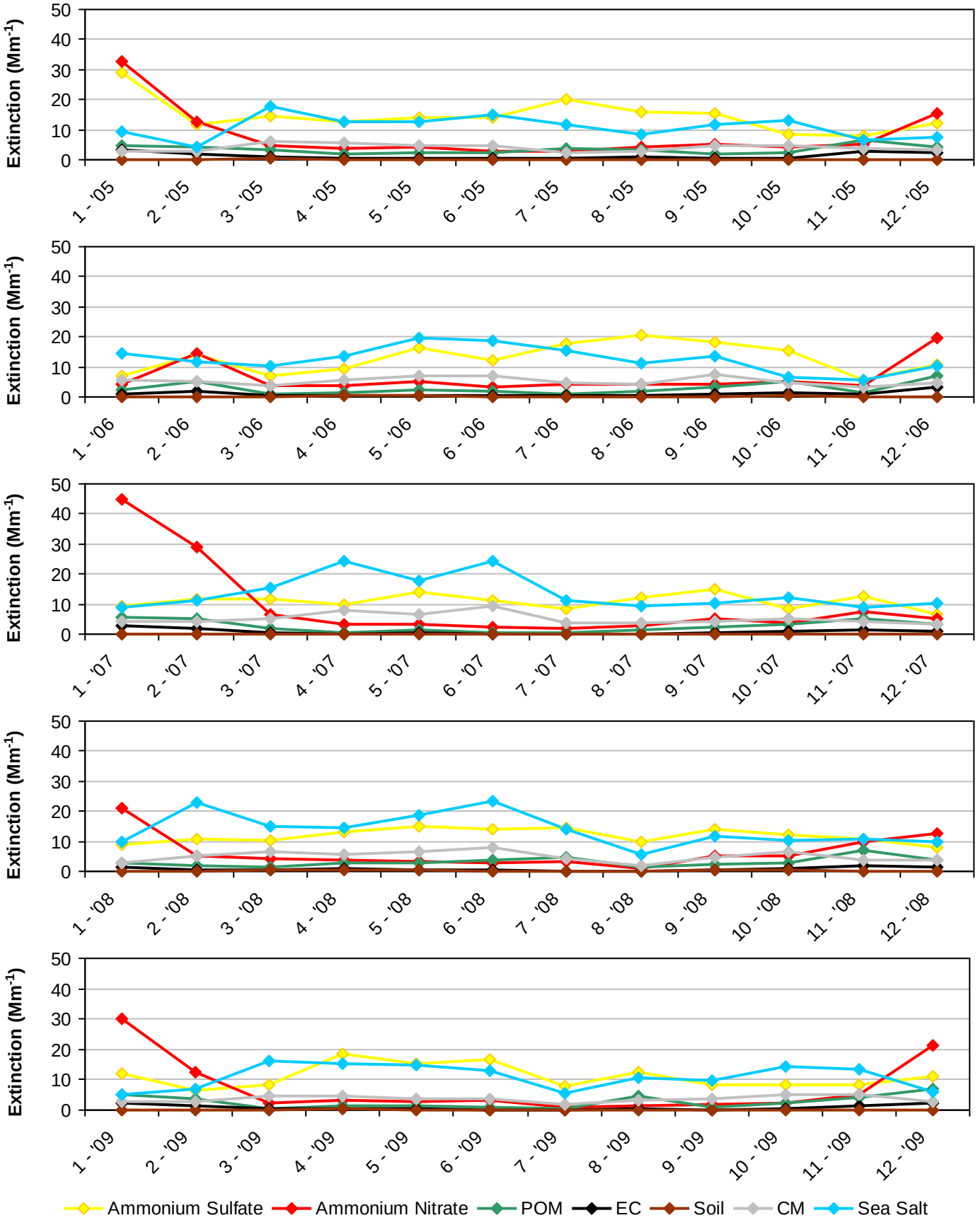
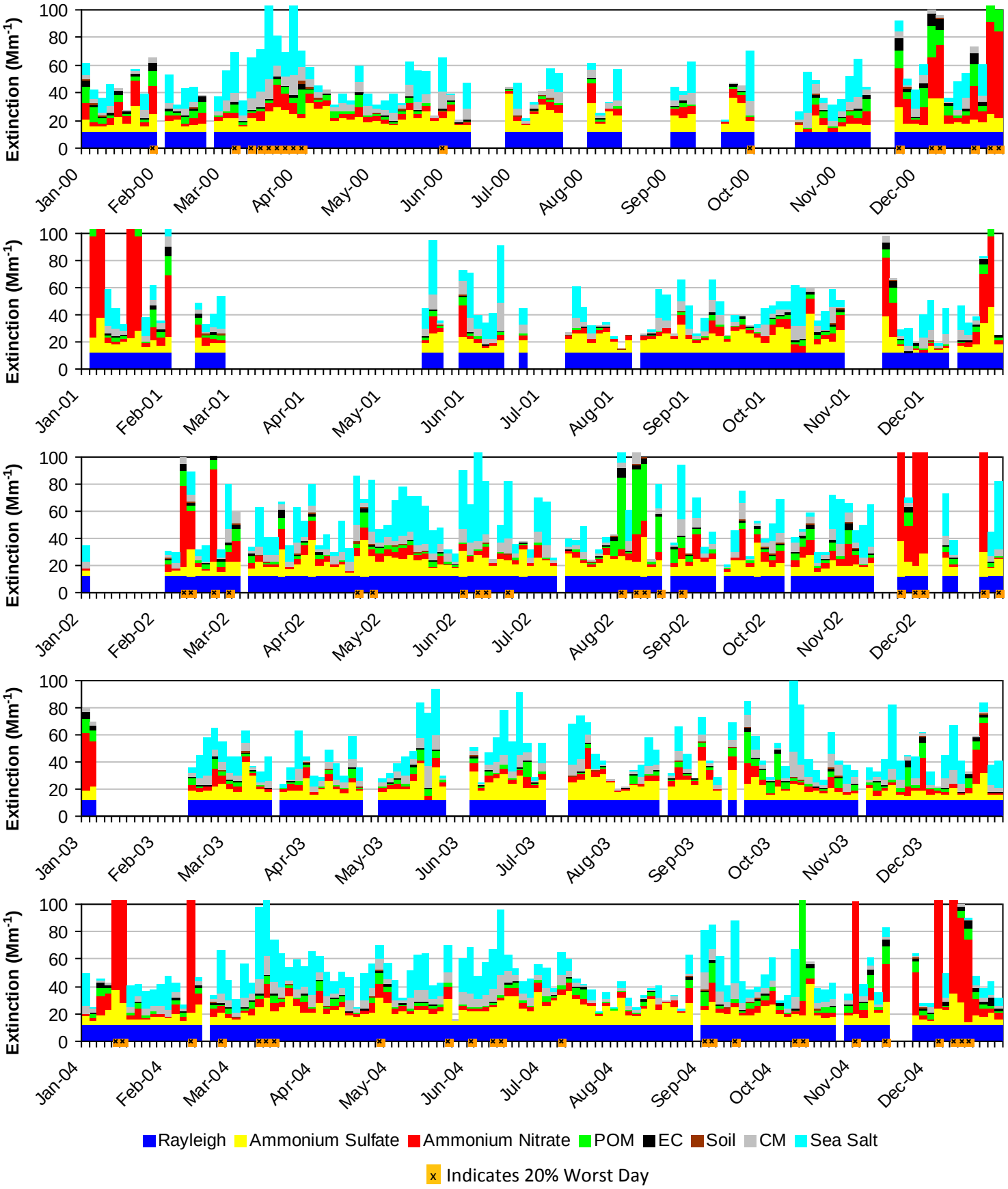
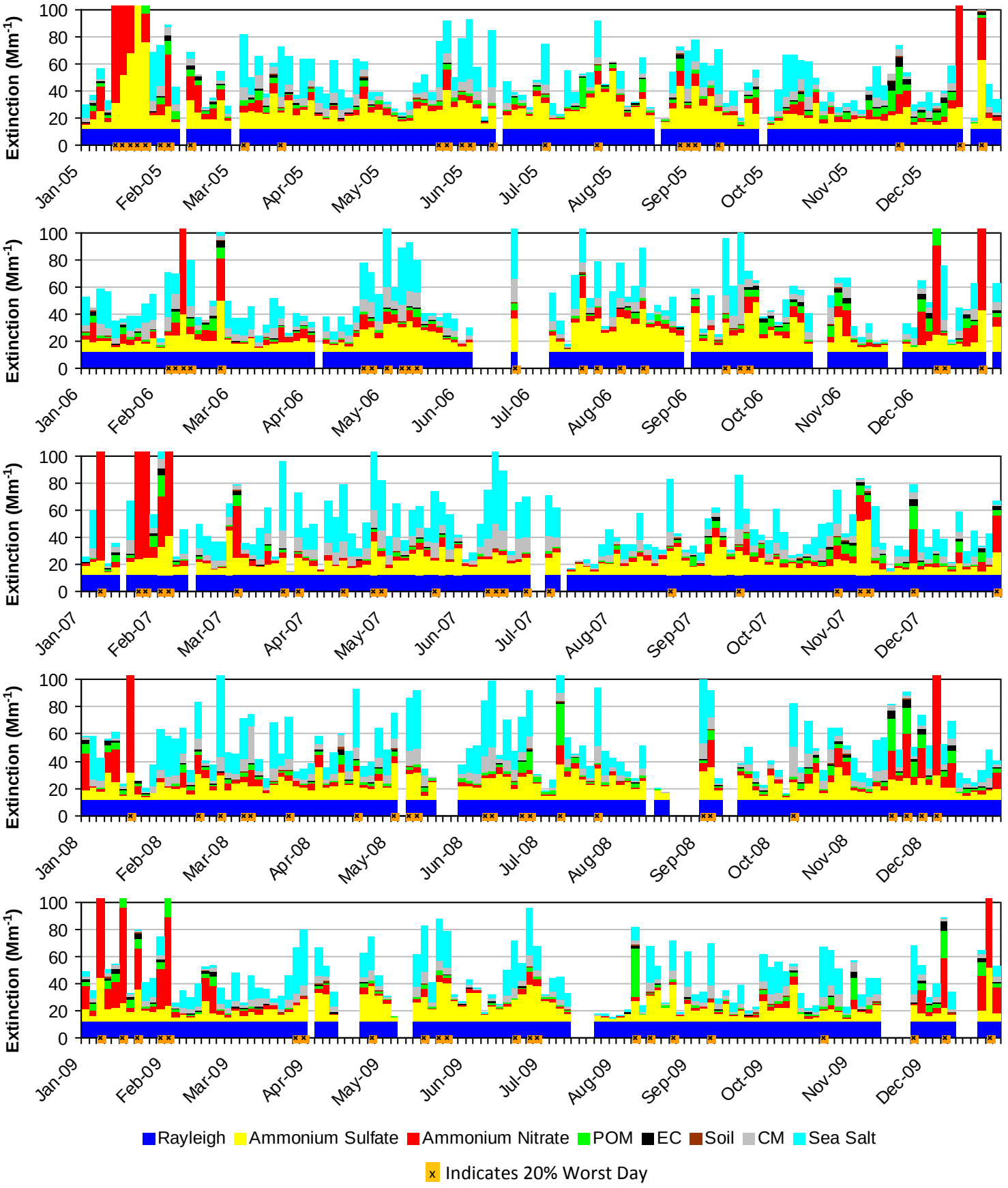


Figure C.15-7
Point Reyes National Seashore, CA (PORE1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2001 and 2003 are shown here, but these years did not meet RHR data completeness criteria.

Figure C.15-8
Point Reyes National Seashore, CA (PORE1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



C.16. SAN RAFAEL WA (RAFA1)

The following tables and figures are presented in this section for the San Rafael WA represented by the RAFA1 IMPROVE Monitor:

- **Table C.16-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure C.16-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.16-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.16-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure C.16-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure C.16-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure C.16-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure C.16-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure C.16-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table C.16-1
San Rafael WA, CA (RAFA1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	7.1	5.7	7.2	5.7	6.7	5.0	5.2	6.8	5.9	4.6	4.2	-0.2	0.1	6.5	5.5	-1.0	-15%
Worst 20% Days	18.9	17.8	19.7	18.7	19.0	18.7	20.2	20.6	19.6	17.0	16.6	0.1	0.3	18.8	19.2	0.4	2%
All Days	13.4	12.7	14.0	12.6	13.8	12.8	12.6	13.7	12.9	11.1	10.8	-0.1	0.2	13.3	12.6	-0.7	-5%
Total Extinction (Mm-1)																	
Best 20% Days	20.6	18.0	21.0	17.8	20.0	16.7	16.9	20.1	18.4	16.0	15.4	-0.3	0.1	19.5	17.6	-1.9	-10%
Worst 20% Days	66.5	60.5	73.8	66.7	67.6	65.5	89.6	86.3	73.3	55.8	52.9	0.9	0.4	67.0	74.1	7.1	11%
All Days	41.4	38.9	44.8	39.2	43.4	40.2	43.2	45.5	41.1	33.6	32.5	0.0	0.5	41.6	40.7	-0.9	-2%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	3.2	2.1	3.2	2.5	3.1	2.3	2.5	3.0	2.7	2.2	1.8	0.0	0.2	2.8	2.5	-0.3	-11%
Worst 20% Days	22.6	20.0	18.4	19.8	21.3	22.7	25.9	17.7	18.8	15.9	12.8	-0.4	0.2	20.4	20.2	-0.2	-1%
All Days	11.4	10.5	10.8	9.6	11.5	12.5	12.1	10.2	10.3	8.2	7.3	-0.1	0.2	10.7	10.7	0.0	0%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	2.3	2.2	2.8	1.3	2.0	1.1	1.3	2.4	1.5	1.0	0.9	-0.1	0.1	2.1	1.4	-0.7	-33%
Worst 20% Days	13.6	11.4	14.8	10.0	13.1	13.1	11.8	14.5	9.2	9.2	9.7	-0.3	0.1	12.6	11.6	-1.0	-8%
All Days	7.4	6.6	8.4	6.2	7.4	6.1	5.5	7.8	5.2	4.5	4.6	-0.3	0.0	7.2	5.8	-1.4	-19%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.9	1.5	2.0	1.8	2.0	1.4	1.0	1.3	1.3	0.8	1.0	-0.1	0.0	1.8	1.2	-0.6	-33%
Worst 20% Days	8.6	7.8	19.5	15.2	10.8	8.9	21.8	29.7	21.5	7.7	7.5	0.6	0.2	12.4	17.9	5.5	44%
All Days	5.3	4.7	7.6	6.6	6.2	4.9	7.1	8.8	7.4	3.8	3.9	0.2	0.4	6.1	6.4	0.3	5%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.9	0.7	0.9	0.6	0.7	0.6	0.4	0.5	0.5	0.3	0.3	-0.1	0.0	0.7	0.5	-0.2	-29%
Worst 20% Days	3.6	2.6	3.3	3.2	2.4	3.0	9.6	5.4	3.0	1.7	1.7	-0.1	0.2	3.0	4.5	1.5	50%
All Days	2.1	1.7	1.9	1.7	1.6	1.6	3.0	2.0	1.4	1.0	1.0	-0.1	0.1	1.8	1.8	0.0	0%
Soil Extinction (Mm-1)																	
Best 20% Days	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.2	0.1	0.2	0.1	100%
Worst 20% Days	0.9	1.4	0.9	1.1	1.0	0.7	1.1	0.9	1.5	1.1	1.2	0.0	0.2	1.0	1.1	0.1	10%
All Days	0.6	0.7	0.7	0.6	0.7	0.5	0.6	0.7	0.9	0.7	0.6	0.0	0.2	0.7	0.7	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	1.6	1.2	1.4	1.2	1.1	0.8	0.9	1.9	1.1	1.0	0.9	0.0	0.1	1.3	1.2	-0.1	-8%
Worst 20% Days	6.5	7.3	6.1	6.8	7.7	6.0	7.5	7.1	7.2	7.2	5.6	0.1	0.2	6.9	7.0	0.1	1%
All Days	4.2	4.4	4.6	4.0	4.9	3.6	3.8	4.7	4.6	4.2	3.6	0.0	0.5	4.4	4.2	-0.2	-5%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.7	0.3	0.5	0.3	0.9	0.6	0.7	0.8	1.1	0.5	0.3	0.0	0.1	0.5	0.7	0.2	40%
Worst 20% Days	0.8	0.1	0.8	0.5	1.5	1.1	1.8	1.0	2.1	3.0	4.4	0.2	0.0	0.8	1.8	1.0	>100%
All Days	0.4	0.3	0.8	0.5	1.1	1.1	1.2	1.3	1.3	1.3	1.5	0.1	0.0	0.6	1.2	0.6	100%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure C.16-1
San Rafael WA, CA (RAFA1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

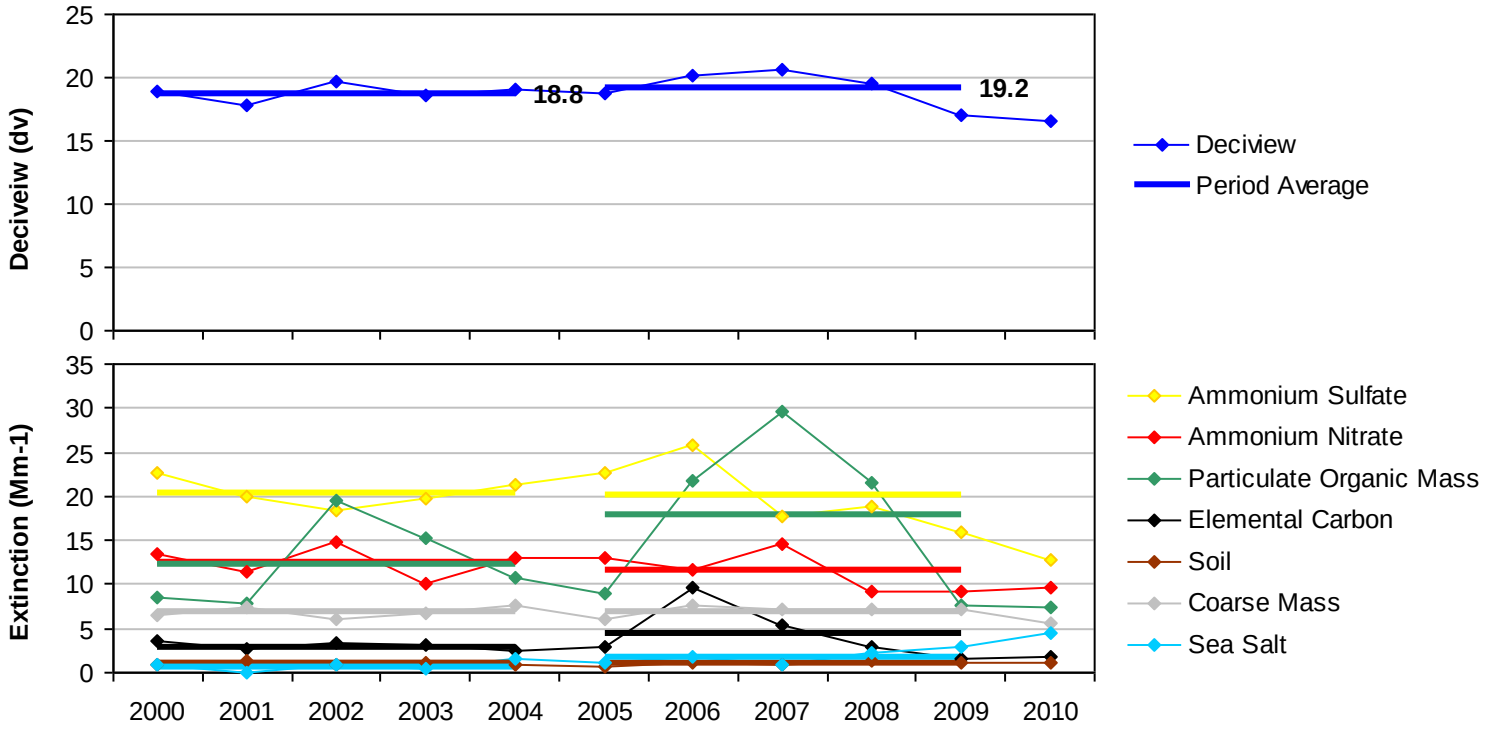


Figure C.16-2
San Rafael WA, CA (RAFA1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

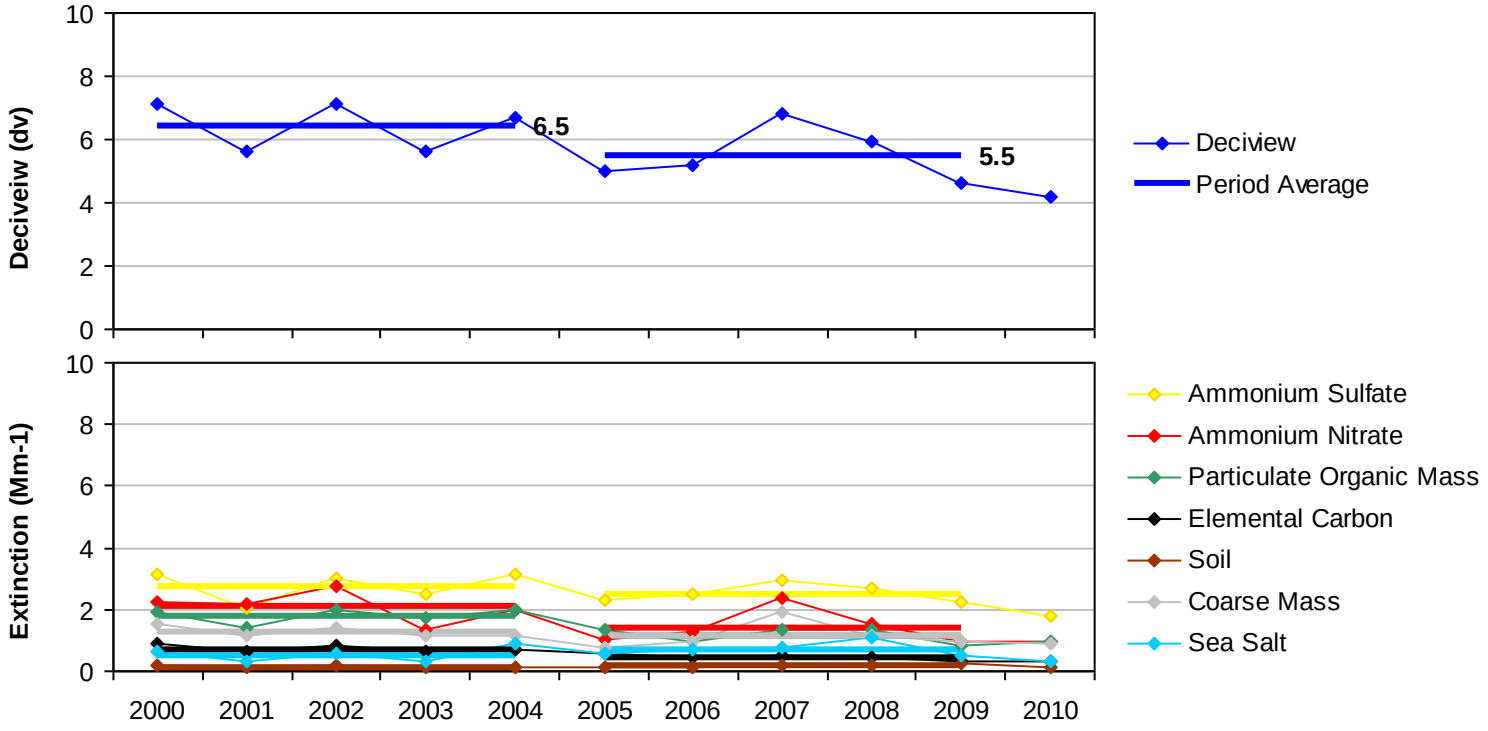
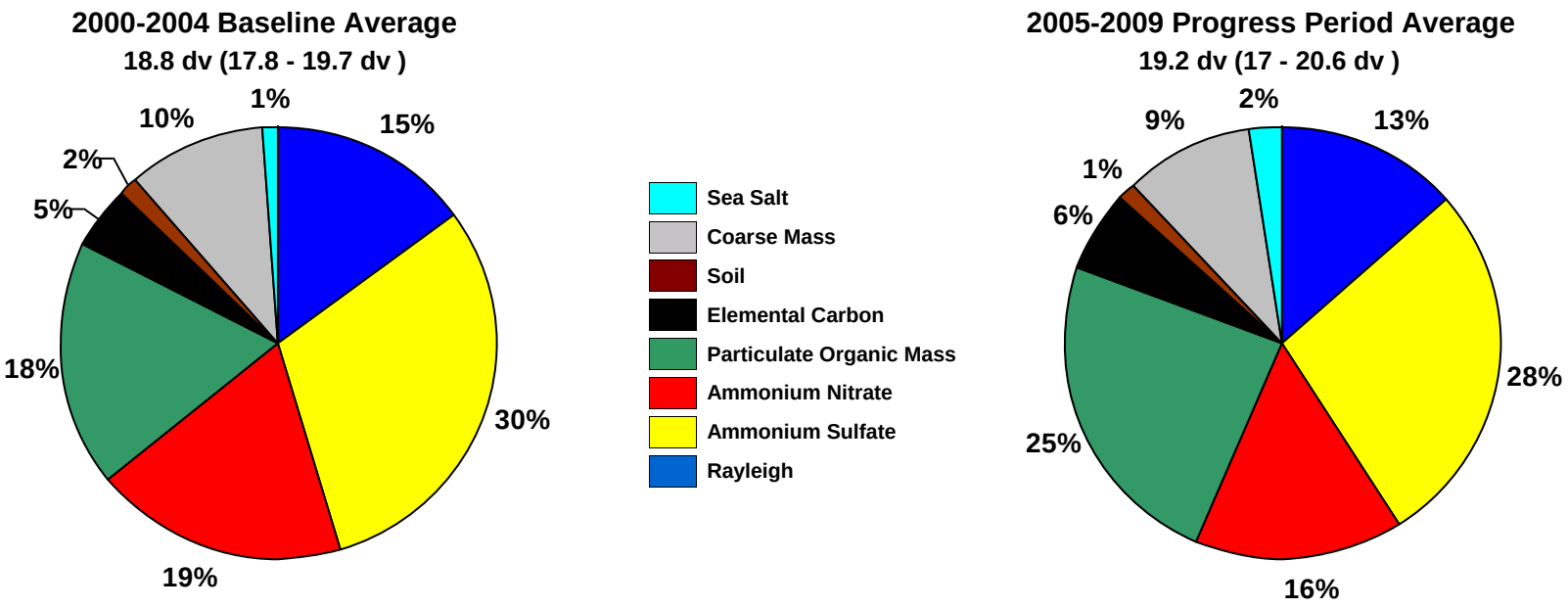


Figure C.16-3
San Rafael WA, CA (RAFA1 Site)
20% Most Impaired Visibility Days



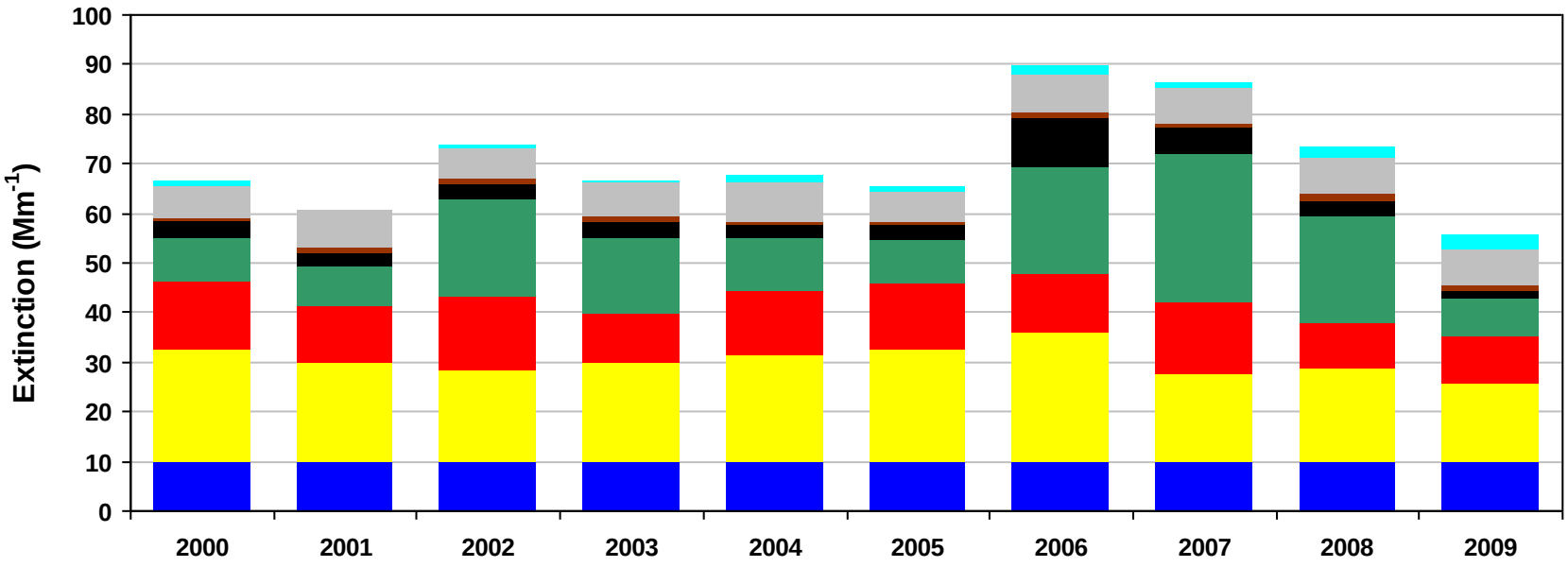
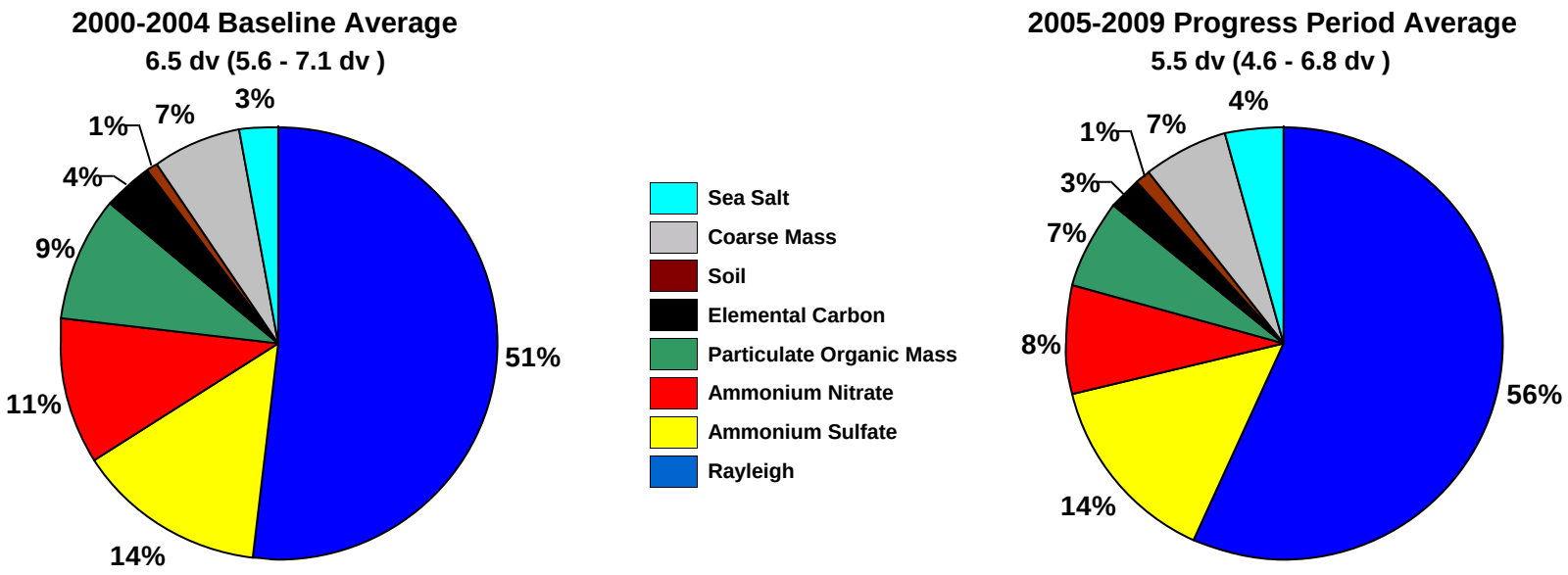


Figure C.16-4
San Rafael WA, CA (RAFA1 Site)
20% Least Impaired Visibility Days



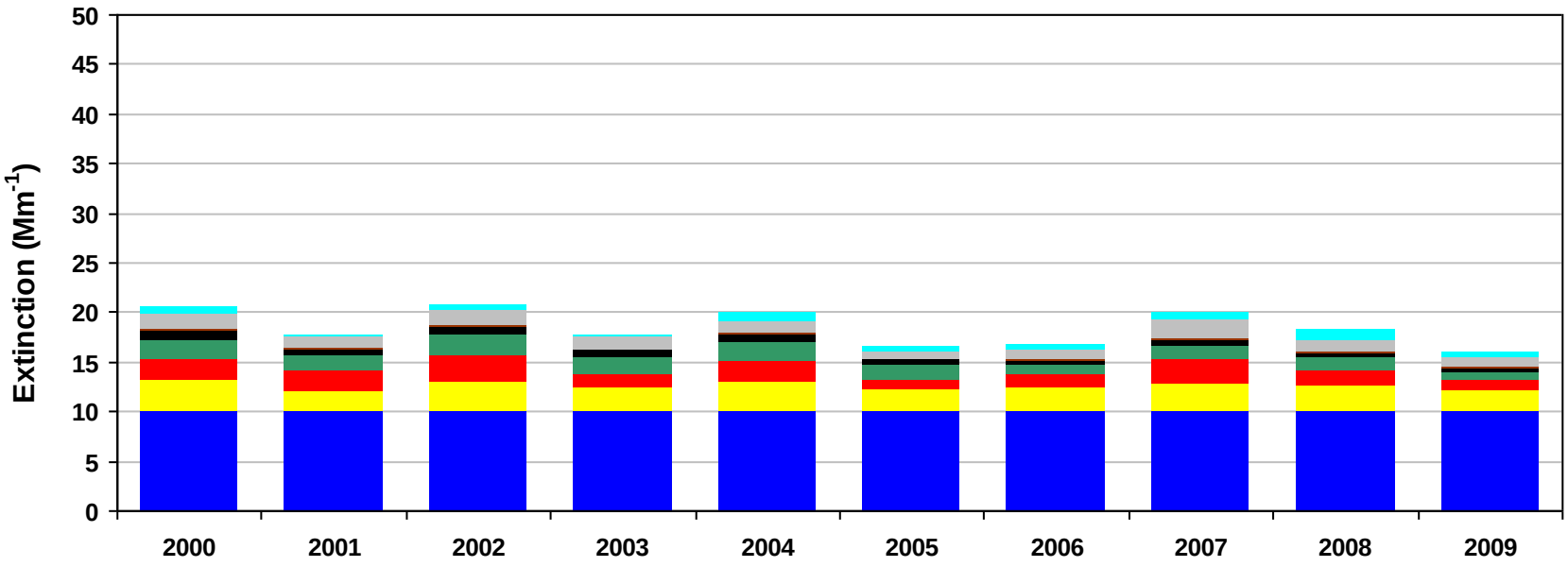


Figure C.16-5
San Rafael WA, CA (RAFA1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

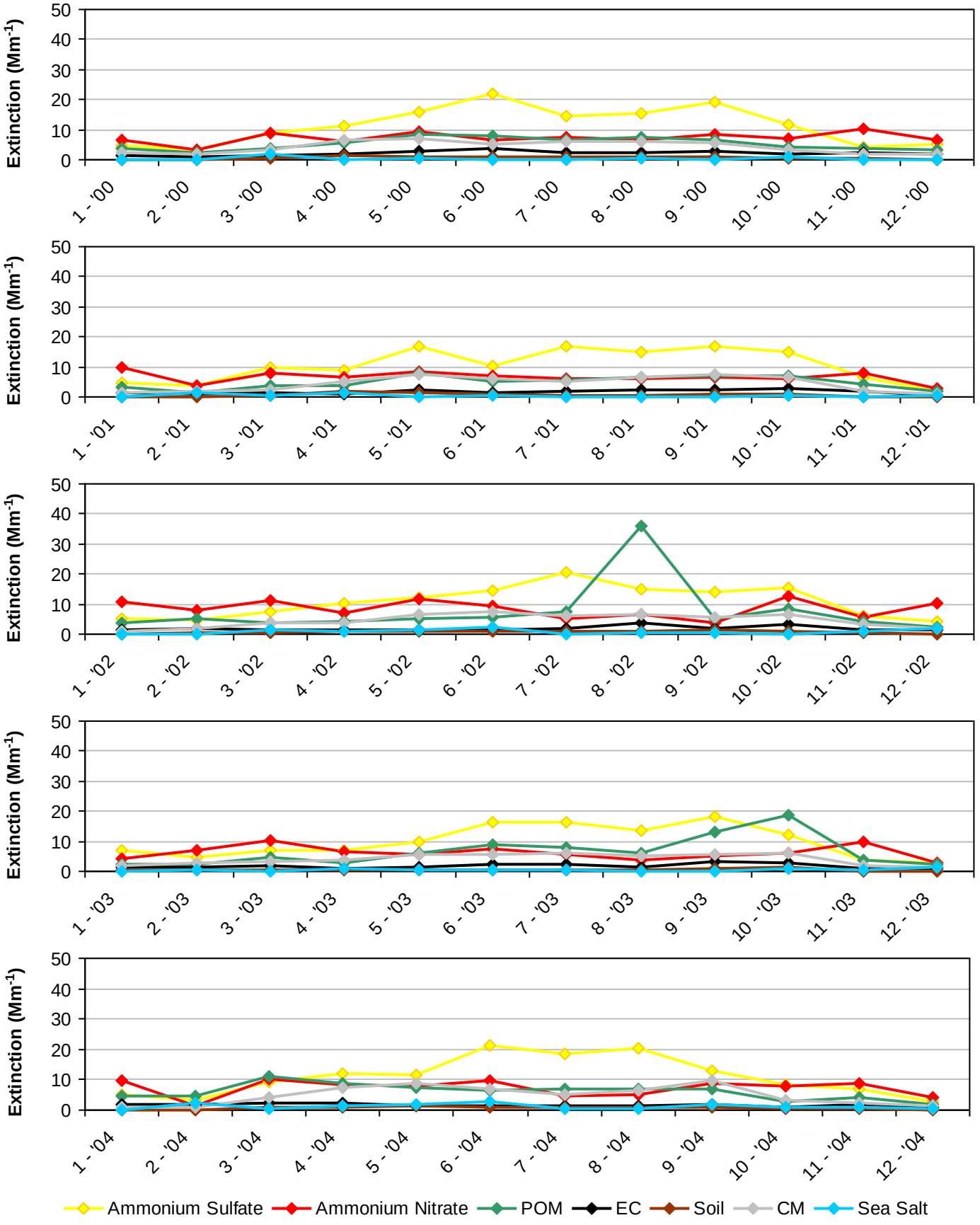


Figure C.16-6
San Rafael WA, CA (RAFA1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

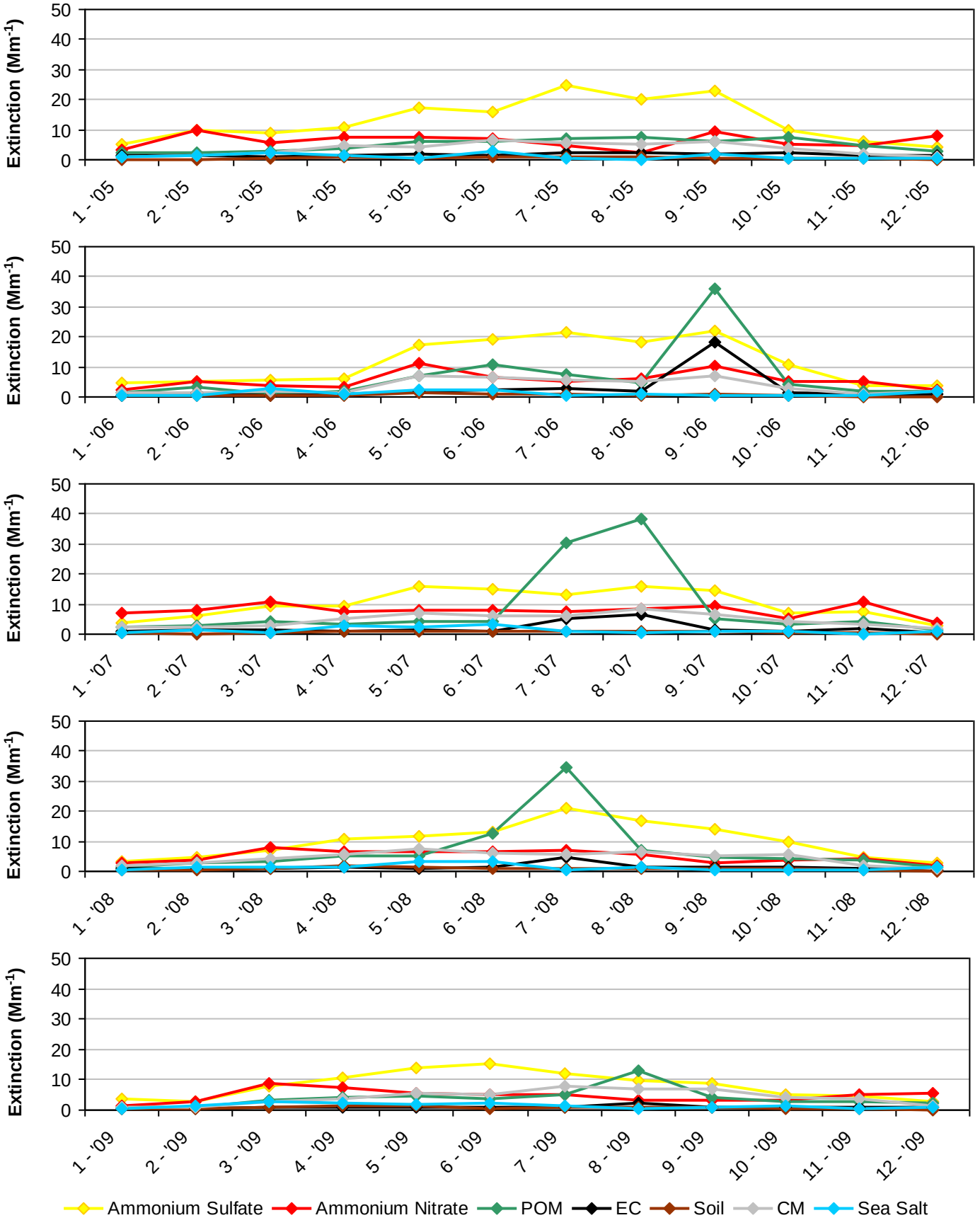


Figure C.16-7
San Rafael WA, CA (RAFA1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

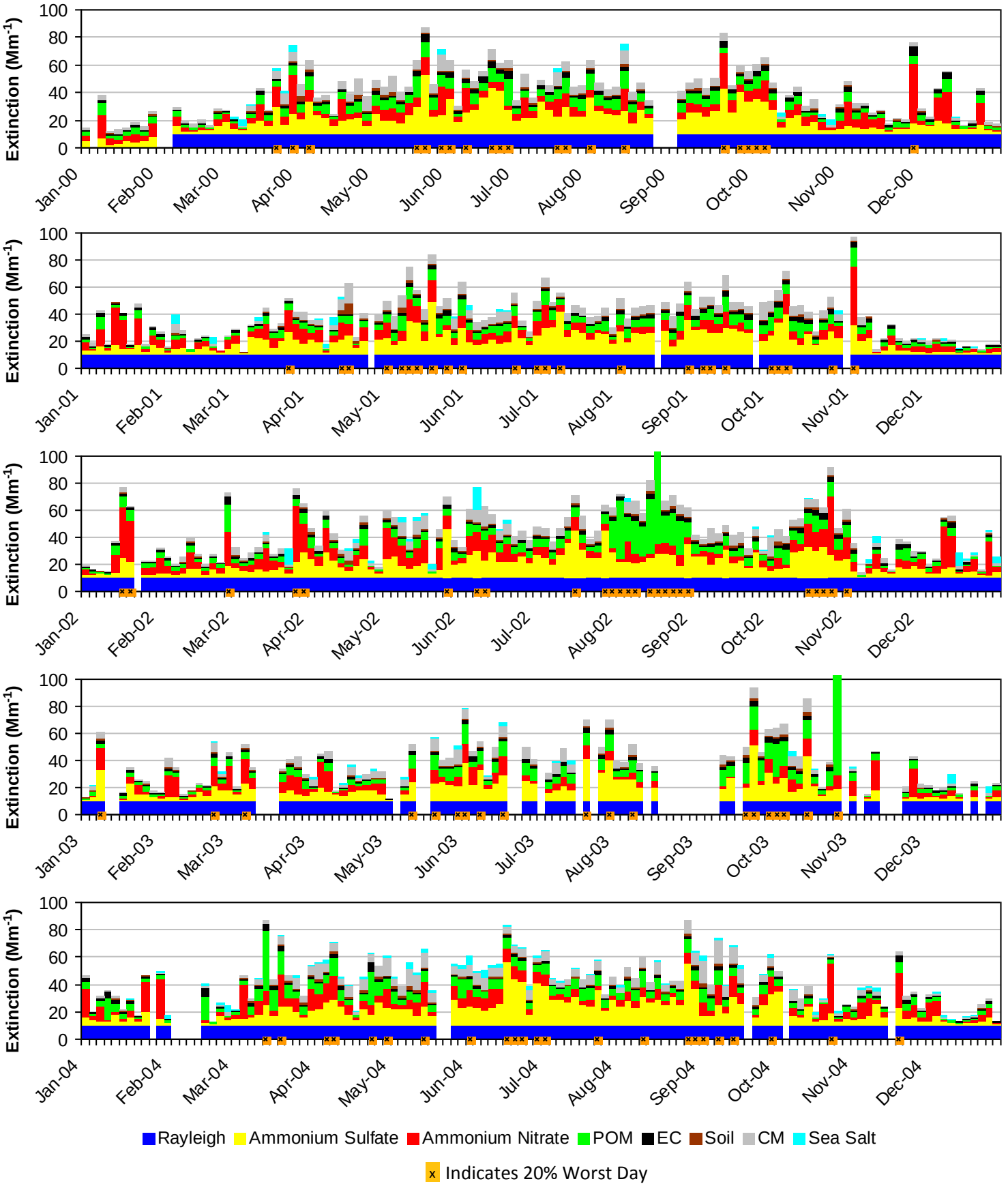
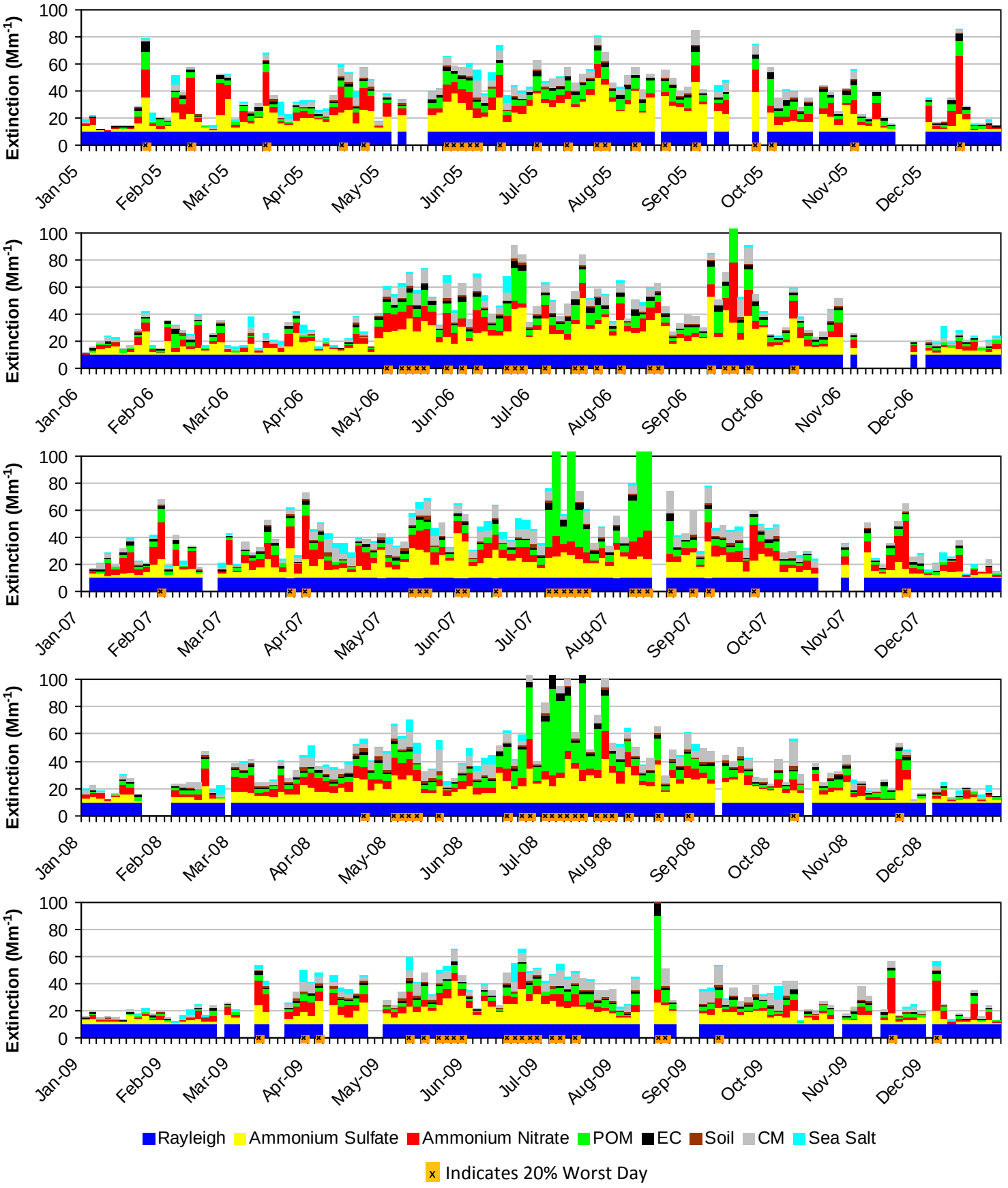


Figure C.16-8
San Rafael WA, CA (RAFA1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



C.17. REDWOOD NP (REDW1)

The following tables and figures are presented in this section for the Redwood NP represented by the REDW1 IMPROVE Monitor:

- **Table C.17-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure C.17-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.17-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure C.17-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure C.17-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure C.17-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure C.17-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure C.17-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure C.17-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table C.17-1
Redwood NP, CA (REDW1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	7.3	6.0	5.9	5.4	5.8	5.7	5.9	6.0	5.4	4.9	---	-0.1	0.0	6.1	5.6	-0.5	-8%
Worst 20% Days	19.0	18.9	18.7	17.2	18.6	18.1	20.8	18.2	19.8	18.9	---	0.0	0.5	18.5	19.1	0.6	3%
All Days	13.1	12.1	12.7	11.3	12.4	12.0	12.7	11.9	12.3	11.2	---	-0.1	0.1	12.3	12.0	-0.3	-2%
Total Extinction (Mm-1)																	
Best 20% Days	21.0	18.3	18.4	17.5	18.2	17.8	18.2	18.4	17.5	16.4	---	-0.2	0.0	18.7	17.7	-1.0	-5%
Worst 20% Days	67.7	66.7	65.5	56.5	64.8	62.4	84.4	62.9	76.4	70.4	---	0.3	0.4	64.2	71.3	7.1	11%
All Days	40.4	37.3	39.1	33.9	38.0	36.7	41.8	36.2	39.5	35.6	---	-0.3	0.2	37.7	37.9	0.2	1%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	2.9	2.1	2.7	1.9	2.0	2.6	2.6	2.7	2.1	2.0	---	0.0	0.2	2.3	2.4	0.1	4%
Worst 20% Days	12.2	14.6	15.7	16.4	15.6	19.3	22.1	16.8	17.0	22.2	---	0.9	0.0	14.9	19.5	4.6	31%
All Days	8.3	8.4	9.4	8.6	9.2	9.6	10.3	8.9	9.0	9.1	---	0.1	0.1	8.8	9.4	0.6	7%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.9	0.7	0.7	0.5	0.6	0.6	0.5	0.7	0.5	0.4	---	0.0	0.0	0.7	0.5	-0.2	-29%
Worst 20% Days	7.5	9.8	6.5	4.5	6.4	6.5	7.5	7.4	5.1	4.4	---	-0.3	0.1	7.0	6.2	-0.8	-11%
All Days	3.5	3.7	3.3	2.4	2.8	2.8	3.2	3.0	2.5	2.0	---	-0.1	0.0	3.2	2.7	-0.5	-16%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.9	1.4	1.3	1.5	1.4	1.1	0.9	1.3	1.3	0.8	---	-0.1	0.0	1.5	1.1	-0.4	-27%
Worst 20% Days	8.2	6.6	11.0	5.0	9.1	4.9	9.0	4.4	15.9	10.2	---	0.2	0.4	8.0	8.9	0.9	11%
All Days	4.6	3.3	5.2	3.5	4.5	3.3	4.2	2.9	5.7	3.6	---	-0.1	0.4	4.2	3.9	-0.3	-7%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.8	0.5	0.4	0.3	0.5	0.4	0.2	0.3	0.3	0.2	---	0.0	0.0	0.5	0.3	-0.2	-40%
Worst 20% Days	1.9	1.4	1.8	0.7	1.5	0.9	1.5	0.9	1.4	1.2	---	-0.1	0.2	1.5	1.2	-0.3	-20%
All Days	1.3	0.8	1.1	0.7	0.9	0.7	0.9	0.6	0.7	0.6	---	-0.1	0.0	1.0	0.7	-0.3	-30%
Soil Extinction (Mm-1)																	
Best 20% Days	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	---	0.0	0.3	0.1	0.0	-0.1	-100%
Worst 20% Days	0.2	0.4	0.4	0.2	0.3	0.2	0.3	0.2	0.2	0.3	---	0.0	0.4	0.3	0.2	-0.1	-33%
All Days	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	---	0.0	0.2	0.2	0.1	-0.1	-50%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	1.2	0.8	0.8	0.9	0.8	0.7	0.9	0.8	0.8	0.7	---	0.0	0.1	0.9	0.8	-0.1	-11%
Worst 20% Days	4.8	3.4	4.0	3.8	4.3	3.3	5.4	3.3	4.0	3.5	---	-0.1	0.4	4.1	3.9	-0.2	-5%
All Days	2.6	2.0	2.4	2.0	2.2	1.8	2.4	1.9	2.0	2.0	---	0.0	0.1	2.2	2.0	-0.2	-9%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	2.2	1.7	1.5	1.2	1.8	1.4	2.2	1.6	1.4	1.2	---	-0.1	0.1	1.7	1.6	-0.1	-6%
Worst 20% Days	22.0	19.5	15.2	14.8	16.7	16.4	27.6	18.9	21.7	17.6	---	0.3	0.4	17.6	20.4	2.8	16%
All Days	9.0	7.8	6.5	5.6	7.1	7.2	9.7	7.9	8.4	7.2	---	0.1	0.4	7.2	8.1	0.9	13%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure C.17-1
Redwood NP, CA (REDW1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

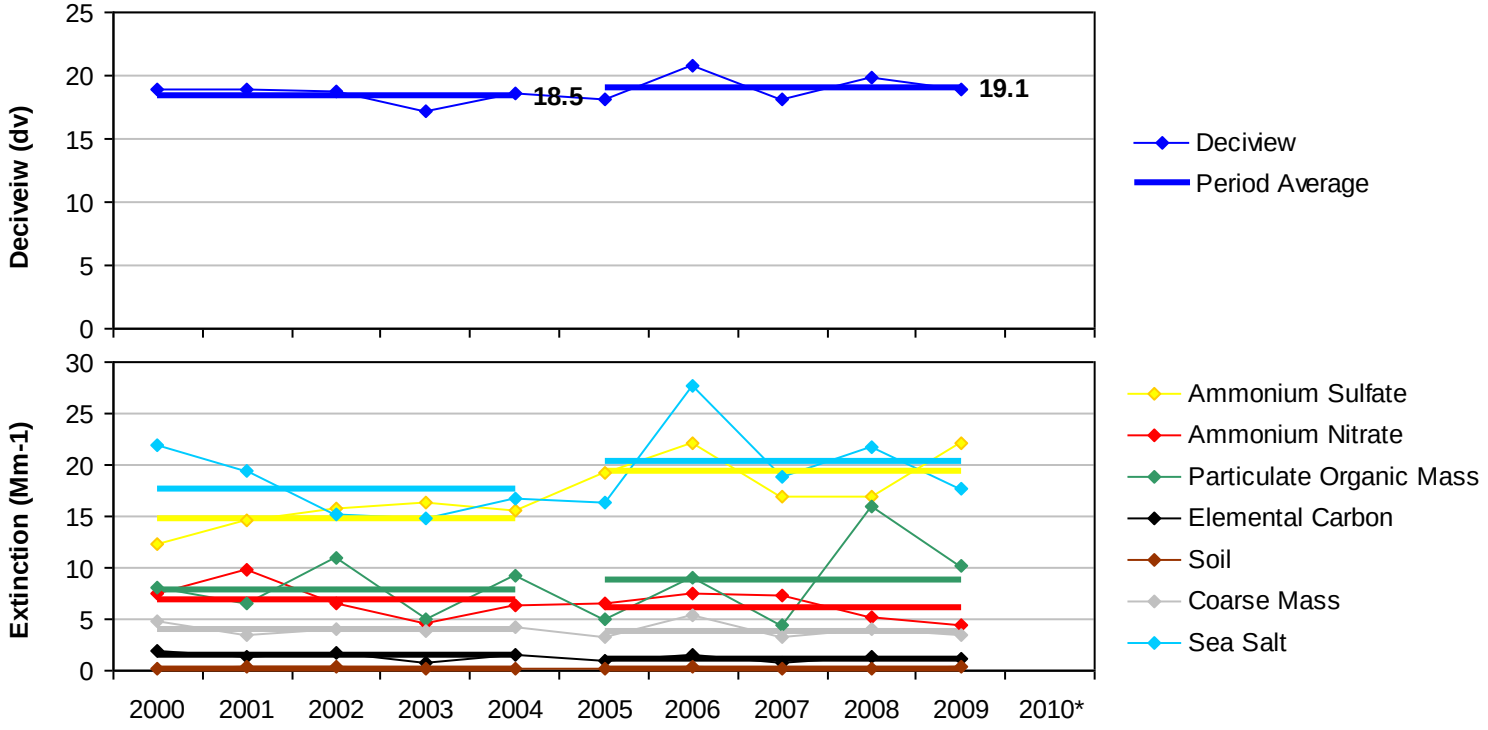


Figure C.17-2
Redwood NP, CA (REDW1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

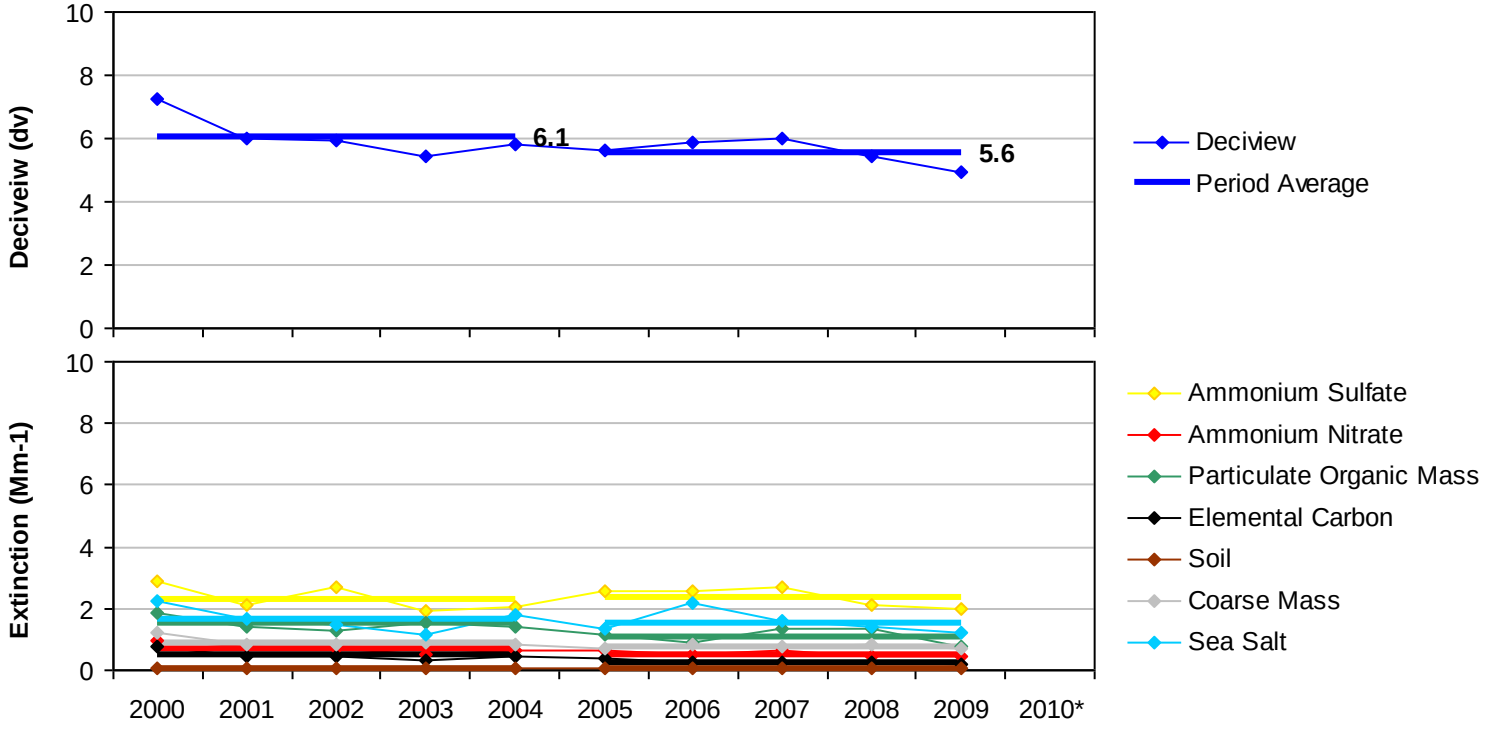


Figure C.17-3
Redwood NP, CA (REDW1 Site)
20% Most Impaired Visibility Days

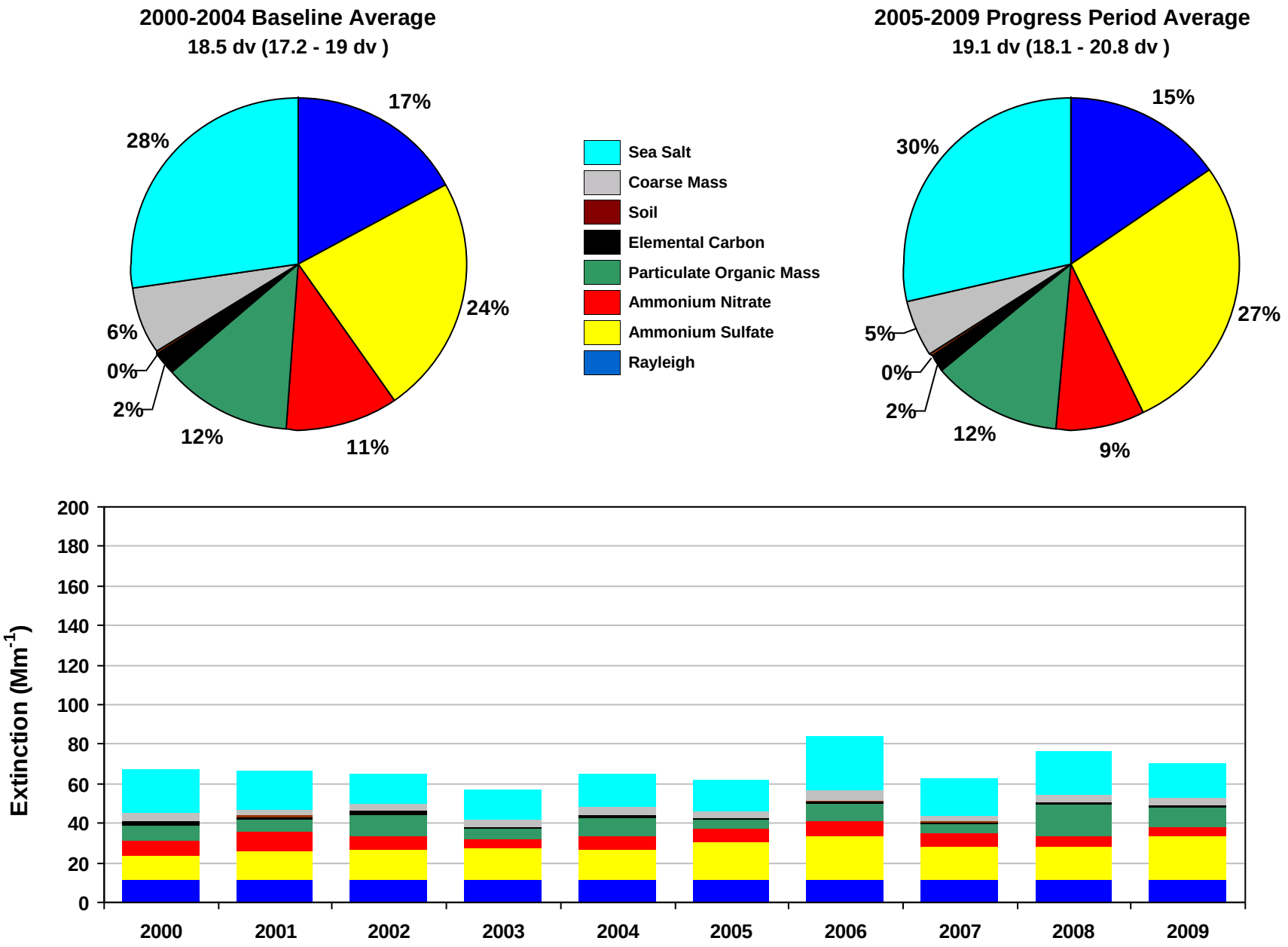
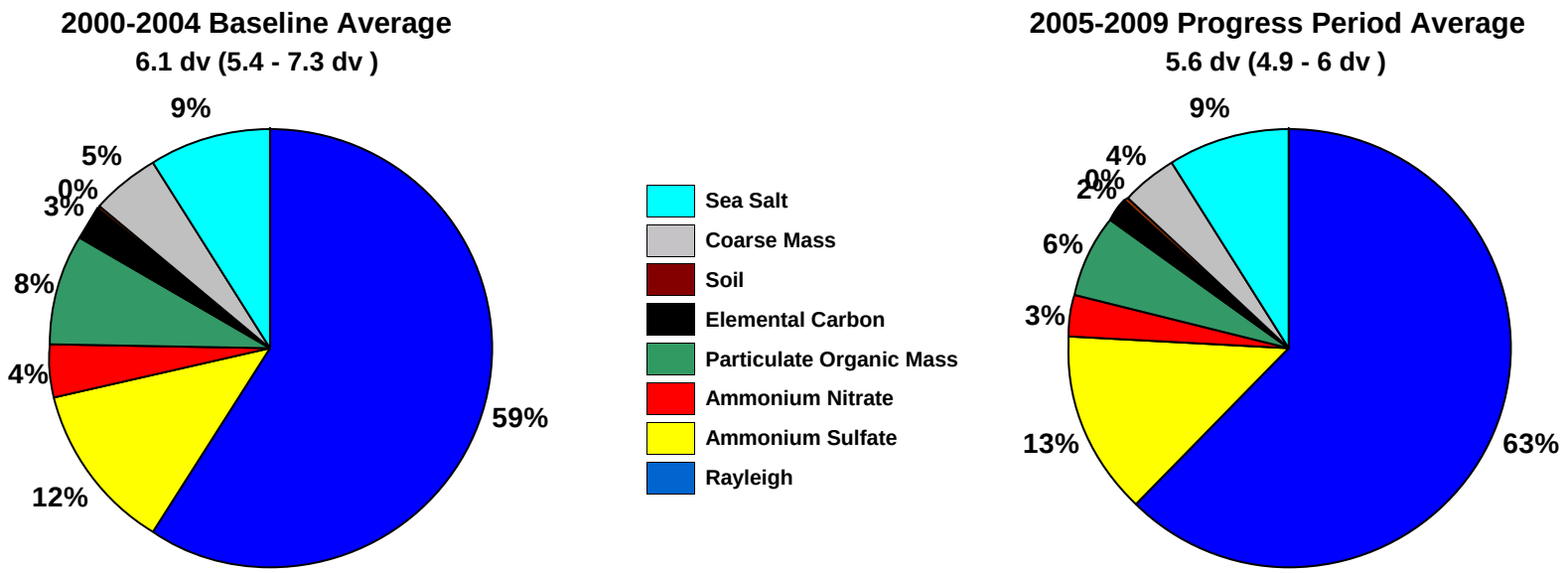


Figure C.17-4
Redwood NP, CA (REDW1 Site)
20% Least Impaired Visibility Days



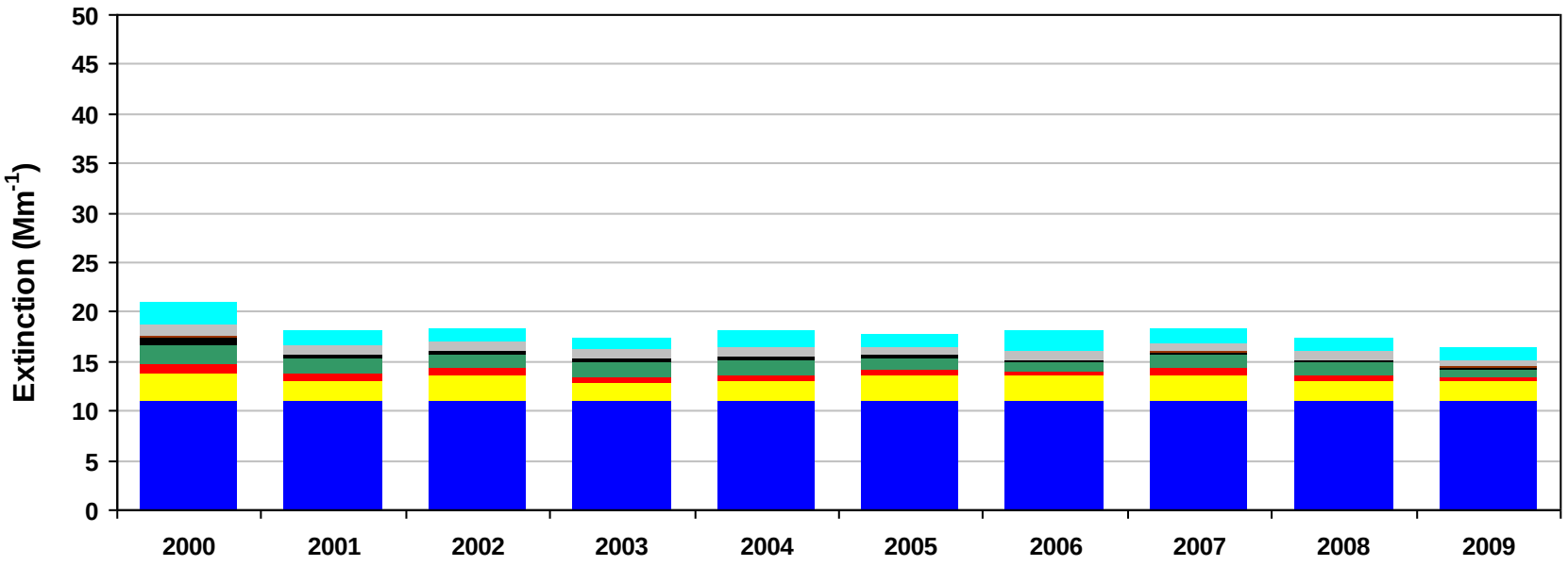


Figure C.17-5
Redwood NP, CA (REDW1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

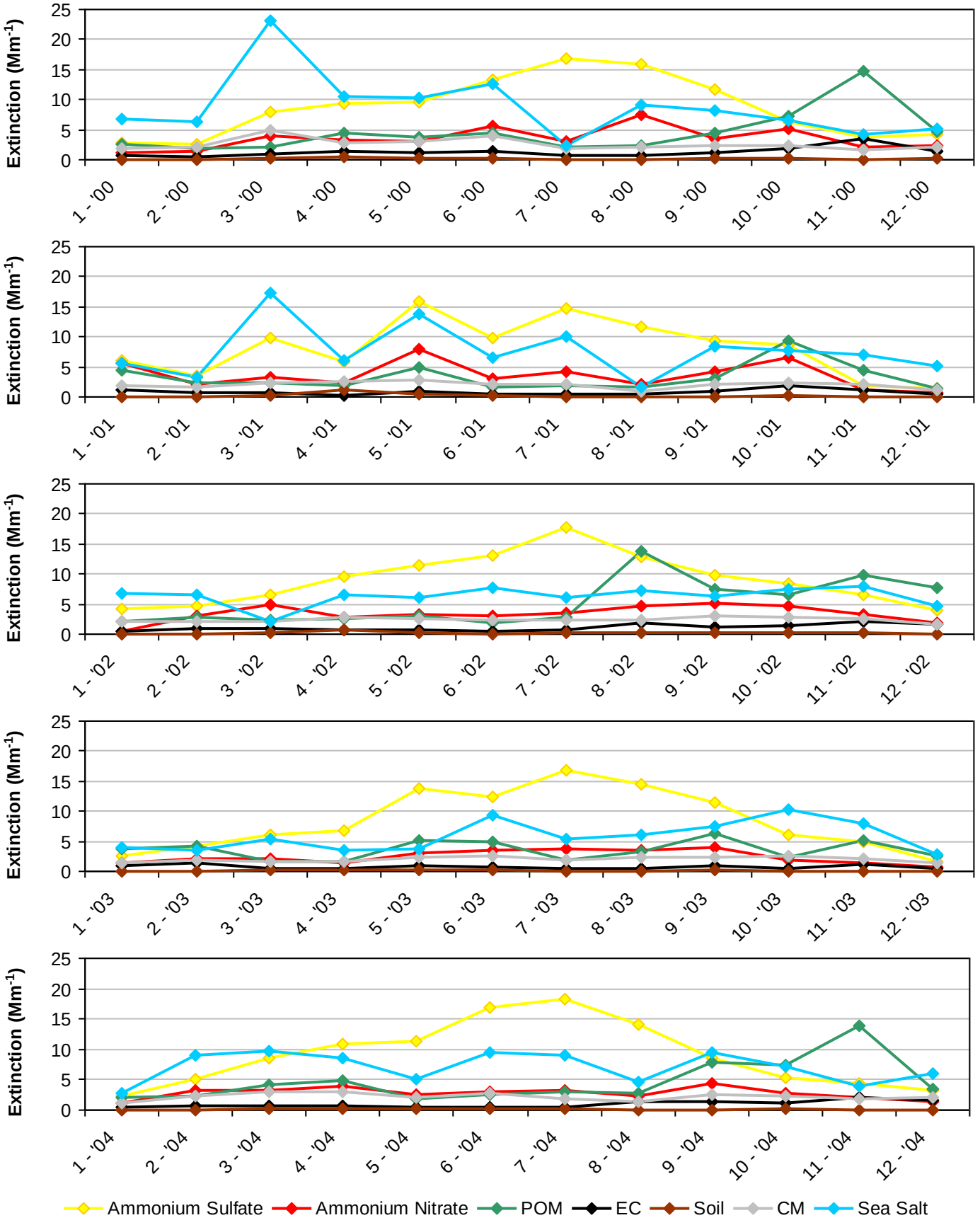


Figure C.17-6
Redwood NP, CA (REDW1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

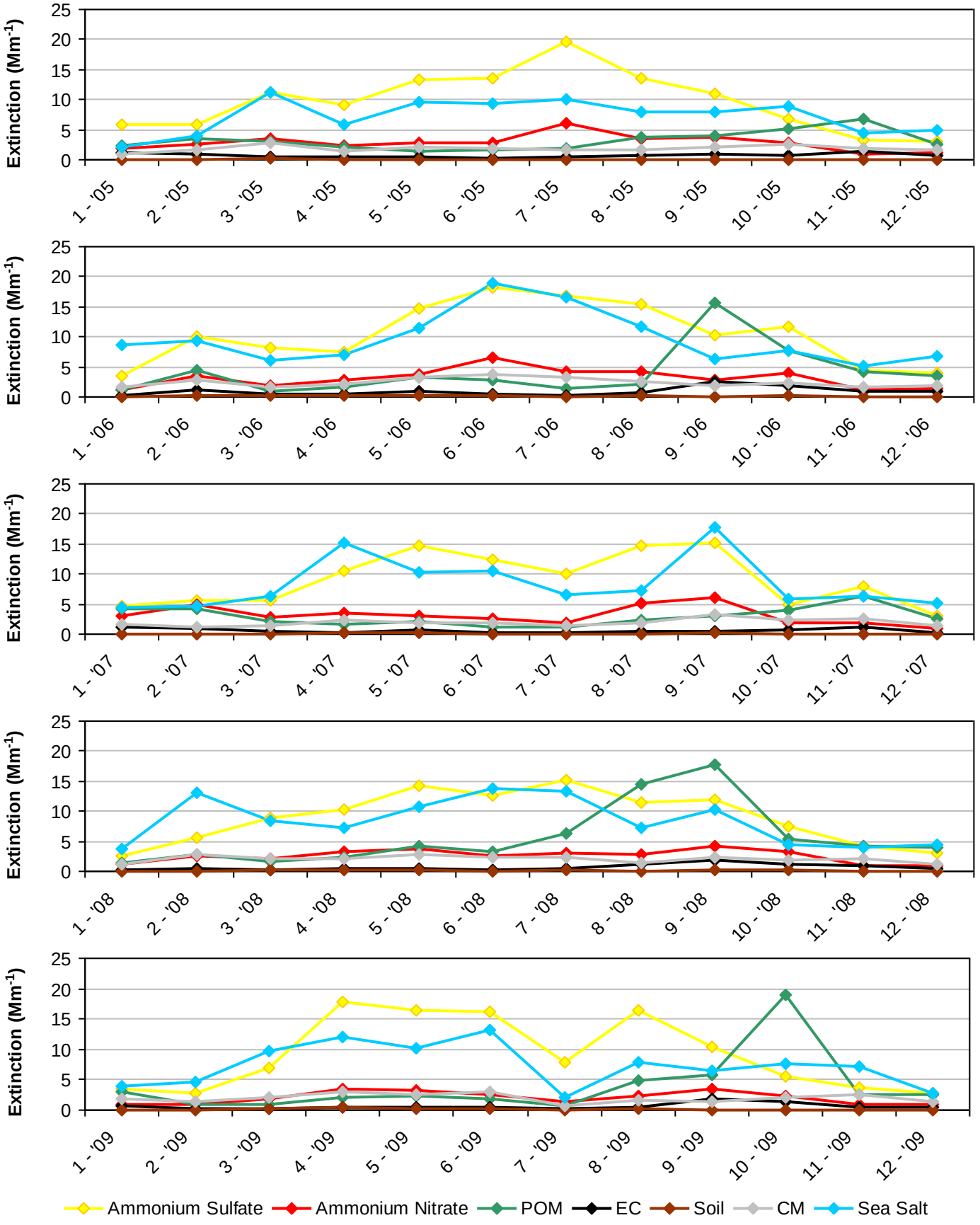


Figure C.17-7
Redwood NP, CA (REDW1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

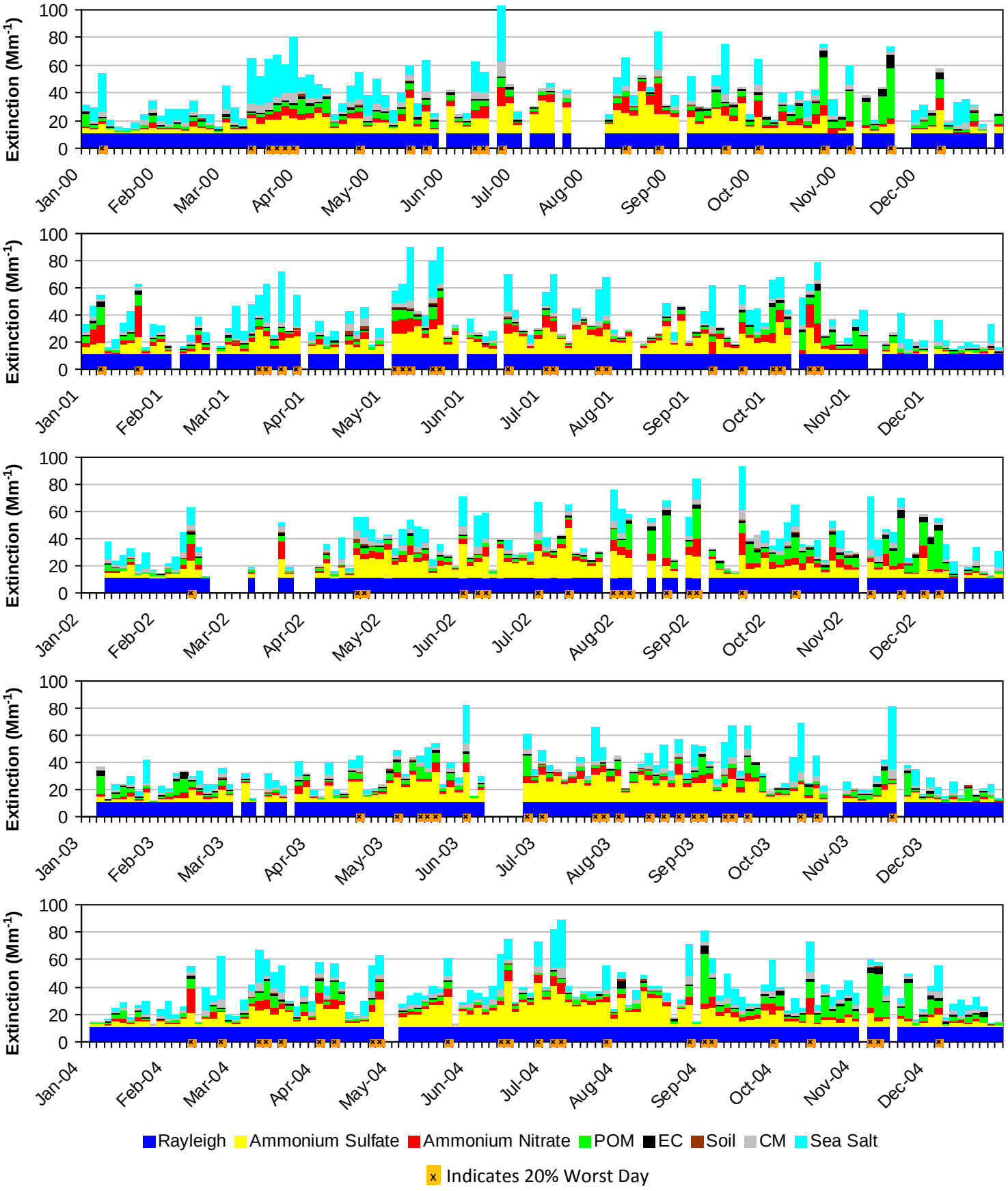
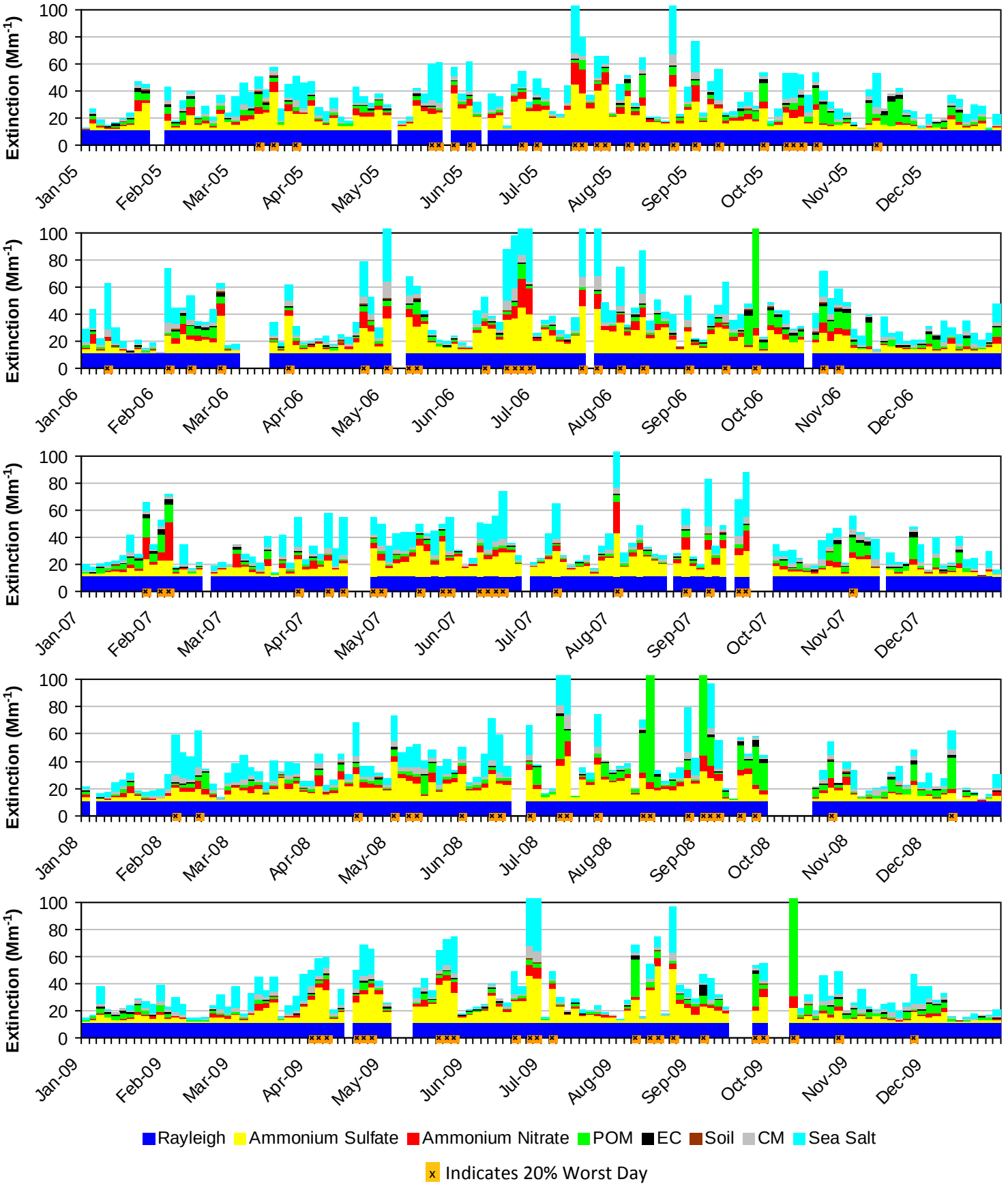


Figure C.17-8
Redwood NP, CA (REDW1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



APPENDIX D:

Colorado Class I Area Monitoring Data Summary Tables and Charts

Includes the following subsections:

Subsection	IMPROVE Monitor	Class I Area(s) Represented
D.1	GRSA1	Great Sand Dunes NP
D.2	MEVE1	Mesa Verde NP
D.3	MOZI1	Mount Zirkel WA and Rawah WA
D.4	ROMO1	Rocky Mountain NP
D.5	WEMI1	Weminuche WA, Black Canyon of the Gunnison WA, and La Garita WA
D.6	WHRI1	Eagles Nest WA, Flat Tops WA, Maroon Bells-Snowmass WA, and West Elk WA

D.1. GREAT SAND DUNES NP (GRSA1)

The following tables and figures are presented in this section for the Great Sand Dunes NP represented by the GRSA1 IMPROVE Monitor:

- **Table D.1-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure D.1-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure D.1-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure D.1-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure D.1-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure D.1-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure D.1-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure D.1-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure D.1-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table D.1-1
Great Sand Dunes NP, CO (GRSA1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	4.4	4.5	5.0	4.5	4.1	3.3	3.9	3.6	3.4	3.6	3.3	-0.1	0.0	4.5	3.6	-0.9	-20%
Worst 20% Days	14.1	11.4	14.3	12.9	11.2	12.5	11.6	11.0	11.4	10.8	9.8	-0.3	0.0	12.8	11.4	-1.4	-11%
All Days	8.8	8.1	8.9	8.2	7.5	7.6	7.5	7.3	7.5	7.1	6.4	-0.2	0.0	8.3	7.4	-0.9	-11%
Total Extinction (Mm-1)																	
Best 20% Days	15.6	15.8	16.5	15.7	15.0	13.9	14.9	14.3	14.2	14.4	14.0	-0.2	0.0	15.7	14.3	-1.4	-9%
Worst 20% Days	42.0	32.2	44.3	36.7	31.1	35.8	32.5	30.3	32.0	29.7	27.4	-1.3	0.0	37.3	32.1	-5.2	-14%
All Days	25.7	23.2	26.2	23.8	21.8	22.7	22.2	21.5	22.1	21.0	19.7	-0.5	0.0	24.1	21.9	-2.2	-9%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	2.4	2.2	2.4	1.7	1.9	1.6	2.2	1.9	1.7	2.1	1.6	0.0	0.1	2.1	1.9	-0.2	-10%
Worst 20% Days	6.2	7.0	5.1	6.3	5.2	8.2	7.1	6.0	6.0	5.9	4.3	0.0	0.4	6.0	6.6	0.6	10%
All Days	4.5	4.7	4.0	4.0	3.9	4.8	4.4	4.1	3.9	3.6	3.1	-0.1	0.1	4.2	4.2	0.0	0%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.6	0.5	0.9	0.6	0.7	0.4	0.4	0.6	0.6	0.5	0.3	0.0	0.2	0.7	0.5	-0.2	-29%
Worst 20% Days	1.7	1.8	2.5	1.1	2.7	1.2	1.0	2.6	1.6	1.4	1.6	0.0	0.4	2.0	1.5	-0.5	-25%
All Days	1.1	1.1	1.5	1.0	1.5	1.0	0.8	1.4	1.1	0.9	1.0	0.0	0.2	1.2	1.1	-0.1	-8%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.6	1.5	1.8	2.2	1.9	1.4	1.2	1.4	1.4	1.5	1.4	0.0	0.2	1.8	1.4	-0.4	-22%
Worst 20% Days	10.6	5.1	10.8	9.1	6.8	7.5	5.9	6.3	5.5	5.2	4.3	-0.6	0.0	8.5	6.1	-2.4	-28%
All Days	4.8	3.1	4.7	4.5	3.5	3.5	3.1	3.5	3.5	3.4	2.7	-0.1	0.0	4.1	3.4	-0.7	-17%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.6	0.6	0.7	0.5	0.6	0.5	0.7	0.5	0.5	0.6	0.5	0.0	0.1	0.6	0.5	-0.1	-17%
Worst 20% Days	2.2	1.2	2.0	1.9	1.3	2.1	2.0	1.5	1.6	1.3	1.5	-0.1	0.2	1.7	1.7	0.0	0%
All Days	1.3	0.9	1.1	1.1	0.9	1.1	1.2	1.0	1.0	1.1	0.9	0.0	0.4	1.1	1.1	0.0	0%
Soil Extinction (Mm-1)																	
Best 20% Days	0.3	0.5	0.4	0.4	0.3	0.2	0.4	0.3	0.2	0.3	0.4	0.0	0.0	0.4	0.3	-0.1	-25%
Worst 20% Days	2.8	2.3	4.1	2.8	2.1	1.9	1.8	0.9	2.5	2.5	2.5	-0.1	0.1	2.8	1.9	-0.9	-32%
All Days	1.2	1.0	1.6	1.3	1.1	0.9	1.0	0.7	1.1	1.0	1.1	0.0	0.1	1.2	0.9	-0.3	-25%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	1.1	1.3	1.3	1.2	0.6	0.7	0.9	0.7	0.7	0.5	0.7	-0.1	0.0	1.1	0.7	-0.4	-36%
Worst 20% Days	9.5	5.8	10.8	6.5	3.7	5.9	5.6	4.0	5.8	4.4	4.2	-0.4	0.0	7.2	5.1	-2.1	-29%
All Days	4.0	3.2	4.1	3.0	1.8	2.3	2.5	1.9	2.5	1.8	1.9	-0.2	0.0	3.2	2.2	-1.0	-31%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0%
Worst 20% Days	0.0	0.0	0.0	0.1	0.2	0.0	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0%
All Days	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure D.1-1
Great Sand Dunes NP, CO (GRSA1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

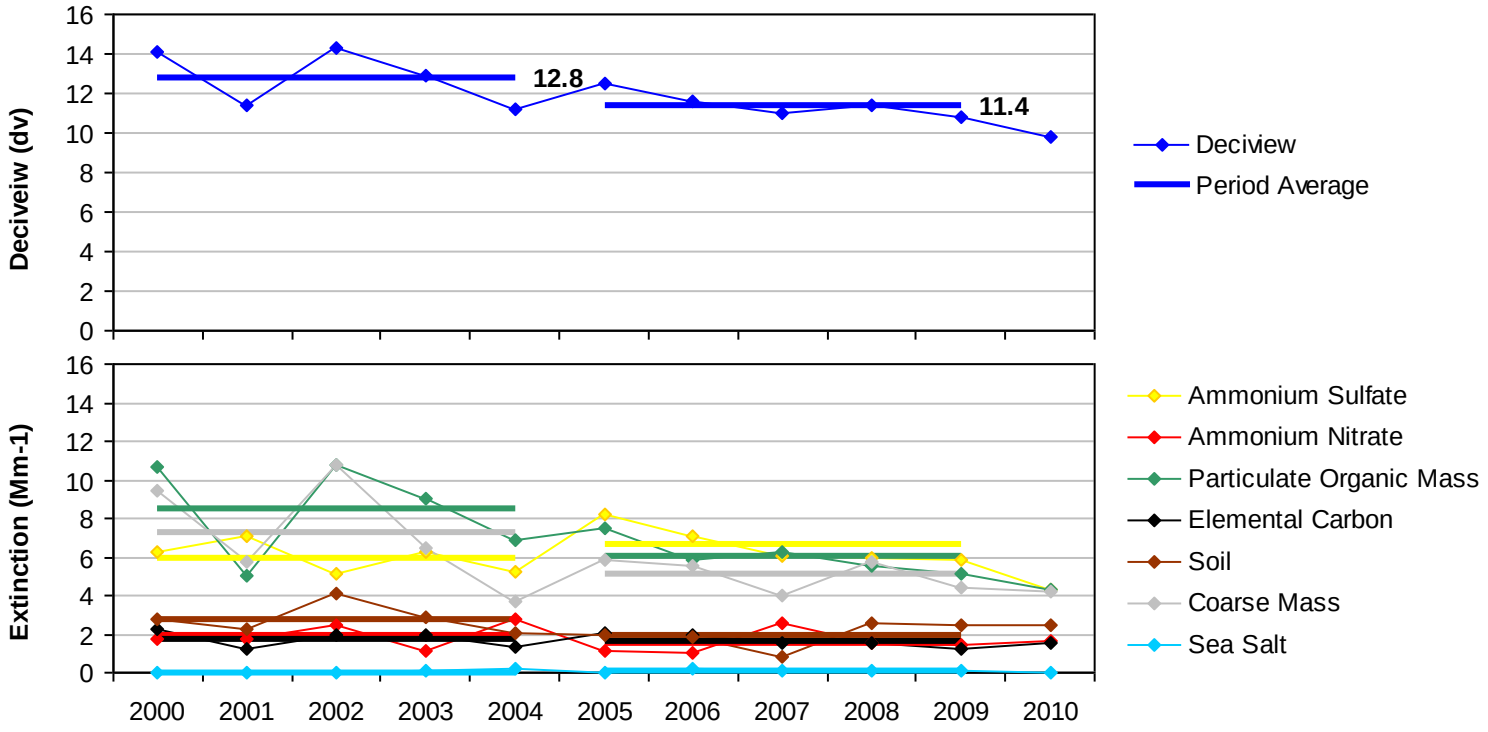


Figure D.1-2
Great Sand Dunes NP, CO (GRSA1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

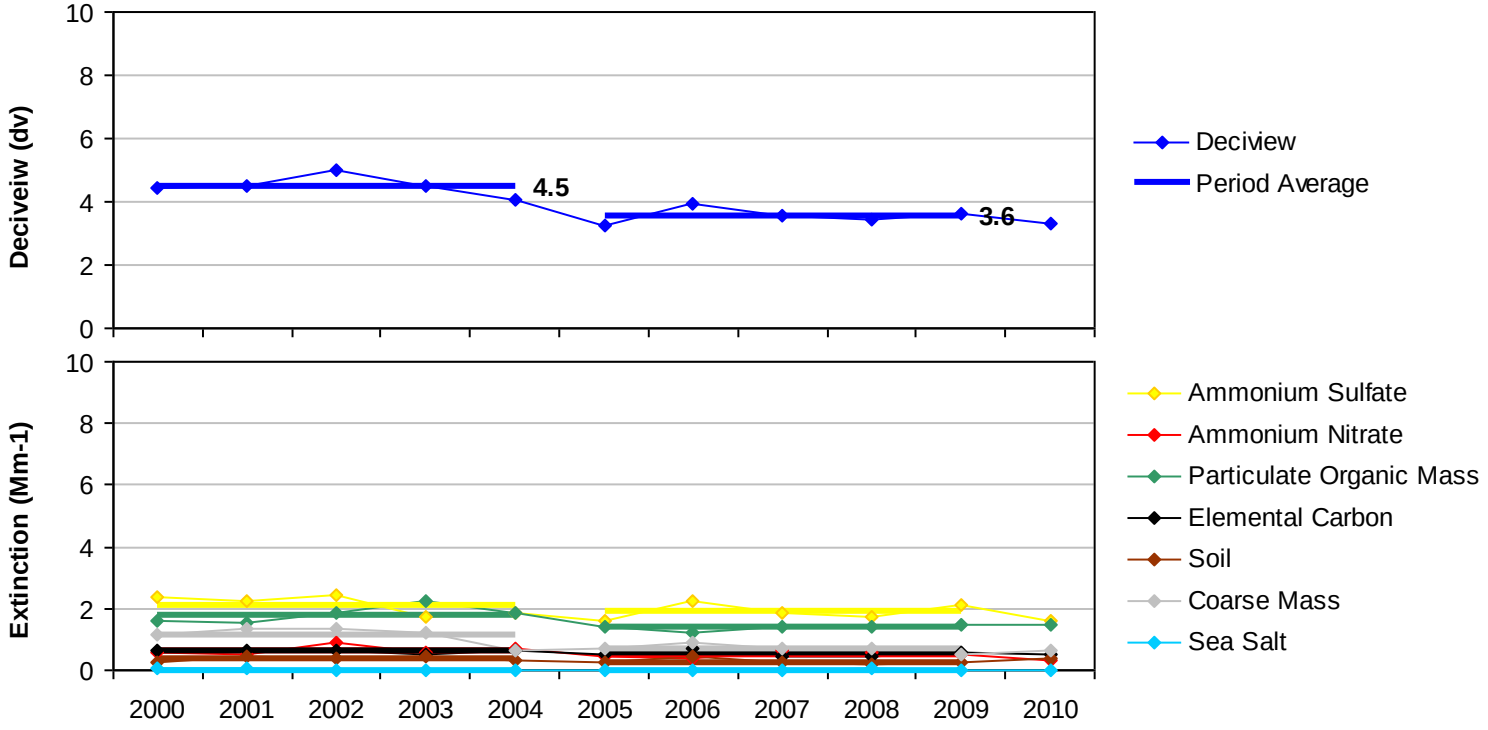
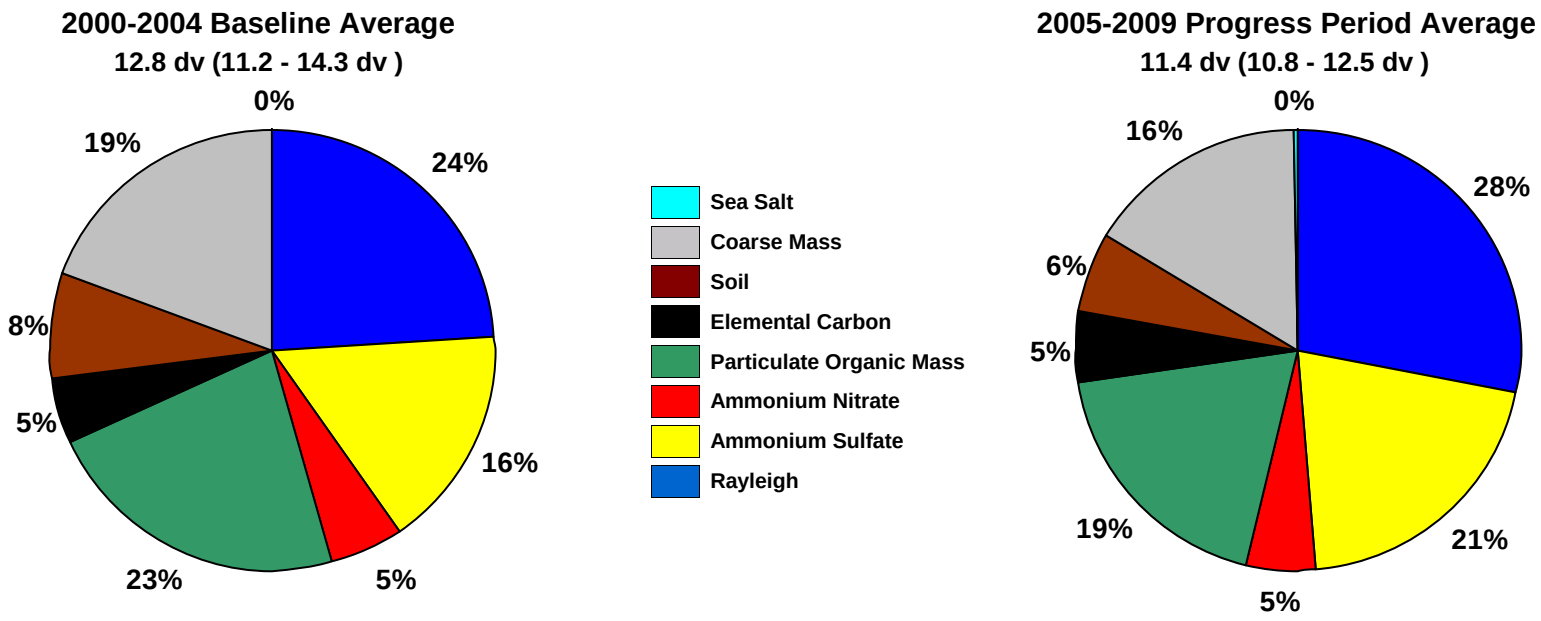


Figure D.1-3
Great Sand Dunes NP, CO (GRSA1 Site)
20% Most Impaired Visibility Days



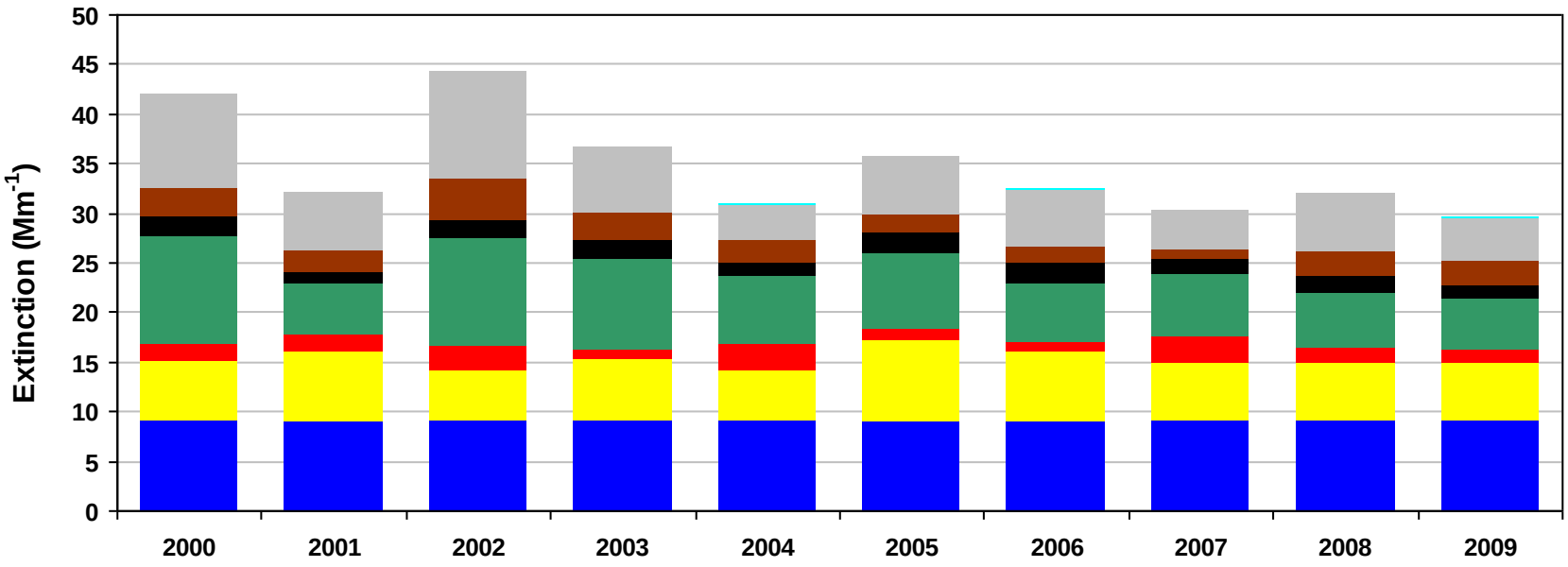


Figure D.1-4
Great Sand Dunes NP, CO (GRSA1 Site)
20% Least Impaired Visibility Days

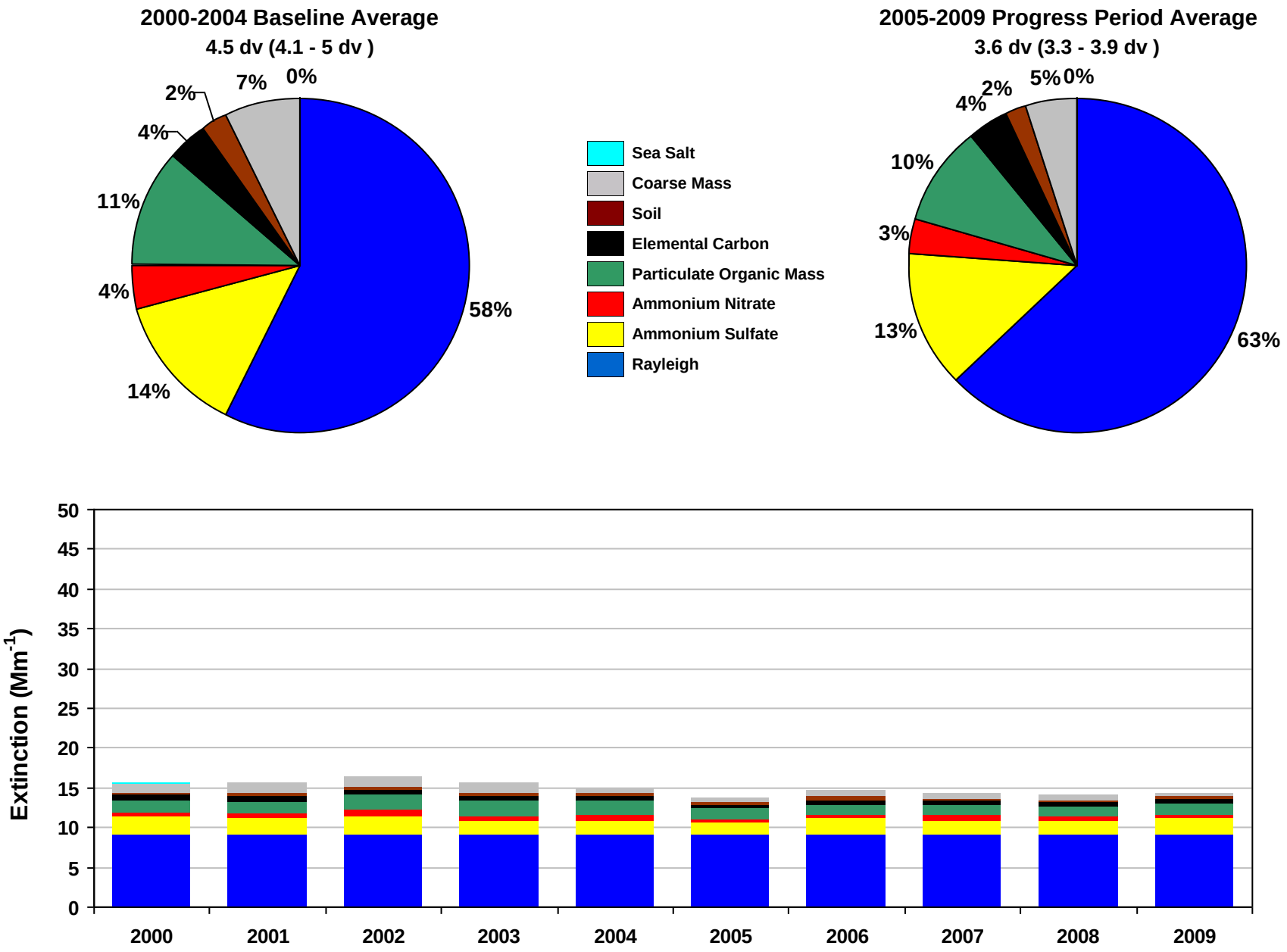


Figure D.1-5
Great Sand Dunes NP, CO (GRSA1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

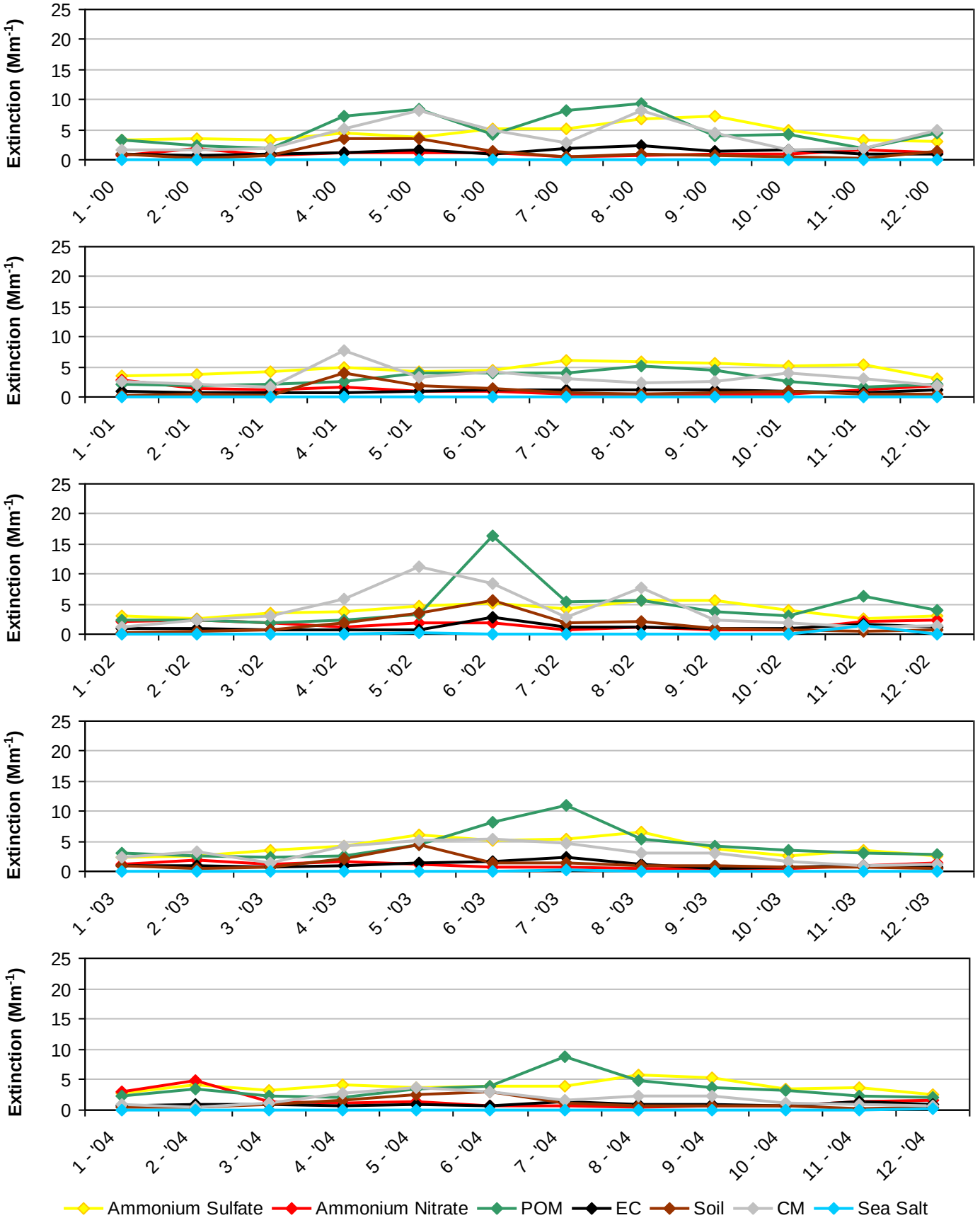


Figure D.1-6
Great Sand Dunes NP, CO (GRSA1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

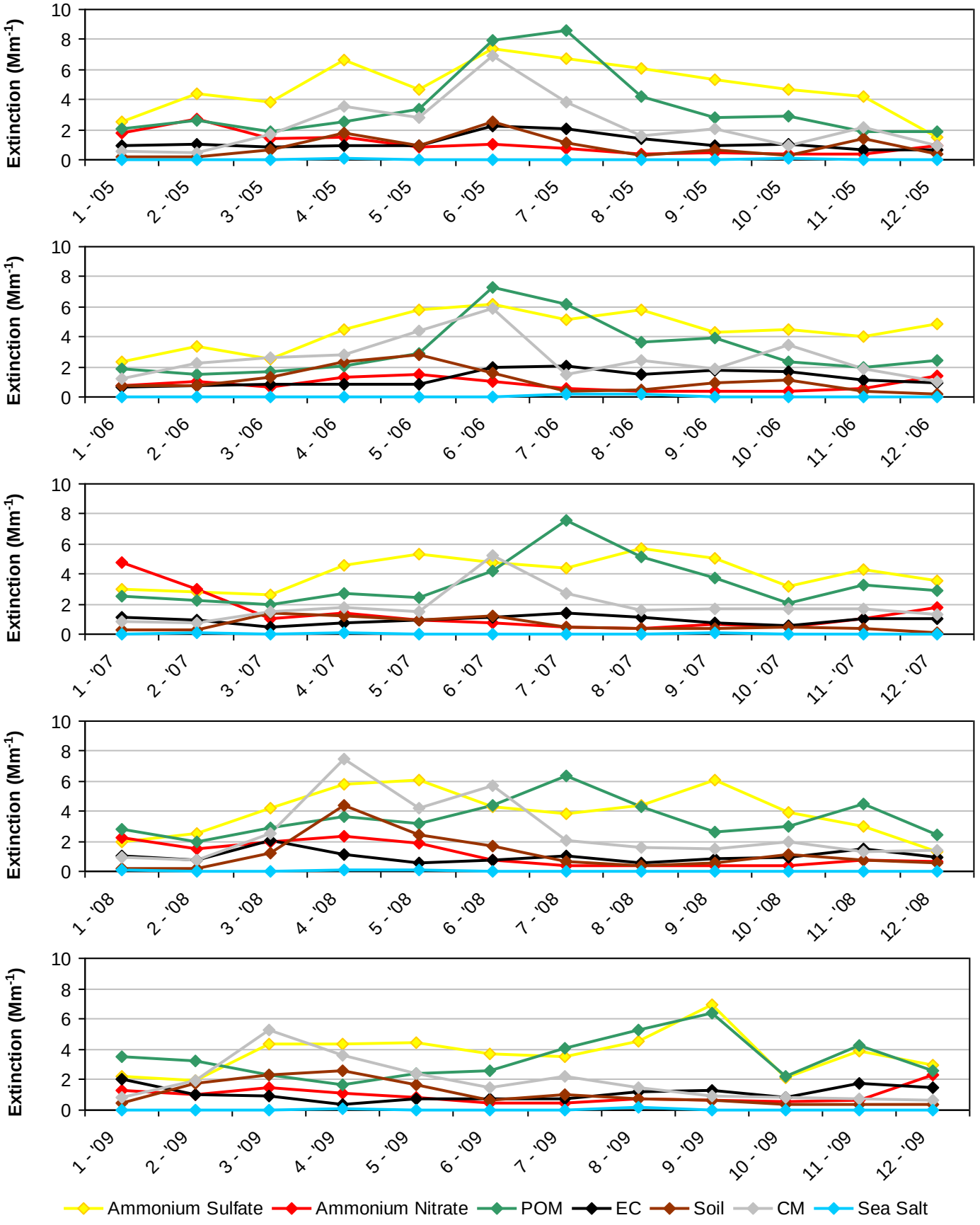


Figure D.1-7
Great Sand Dunes NP, CO (GRSA1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

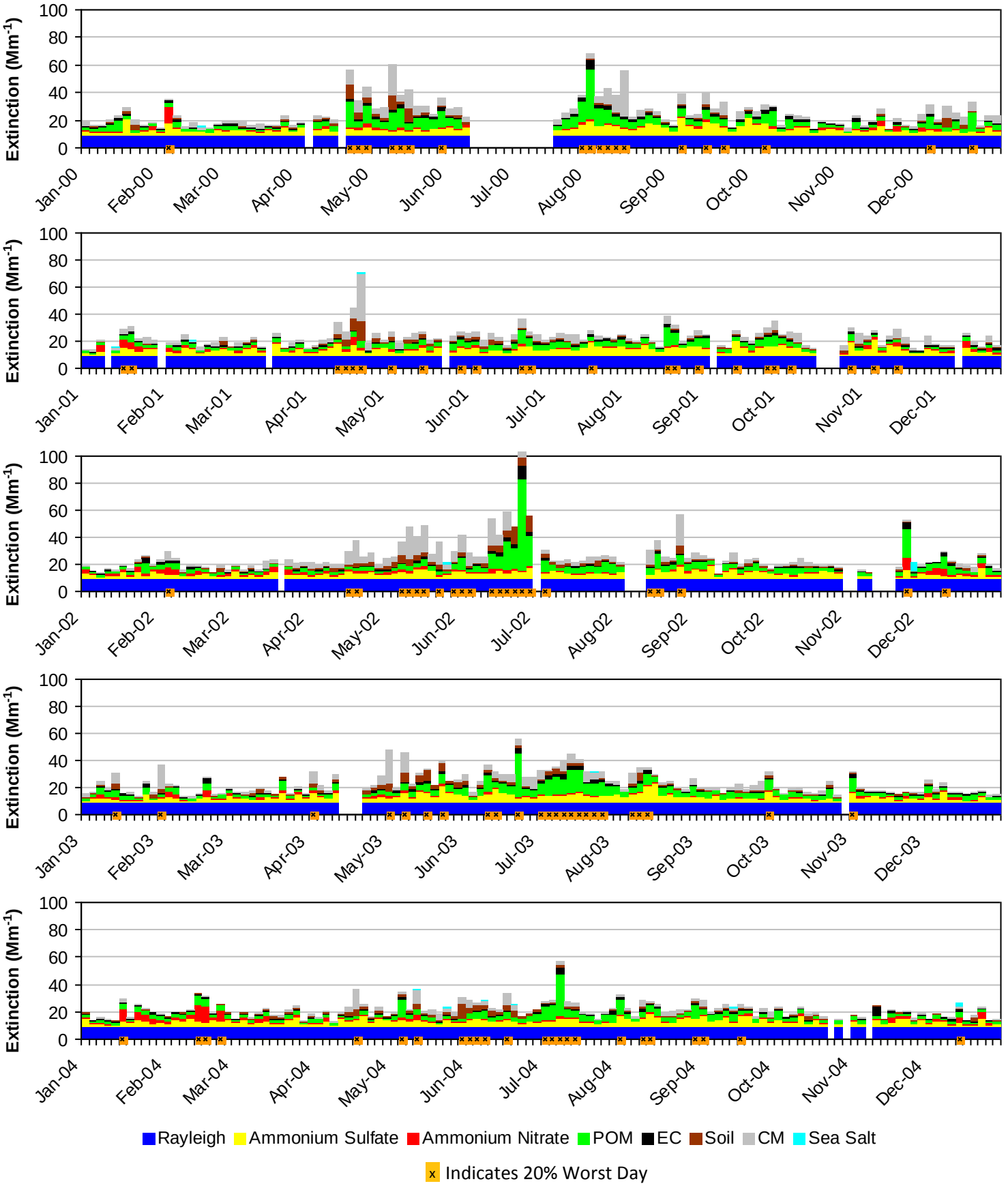
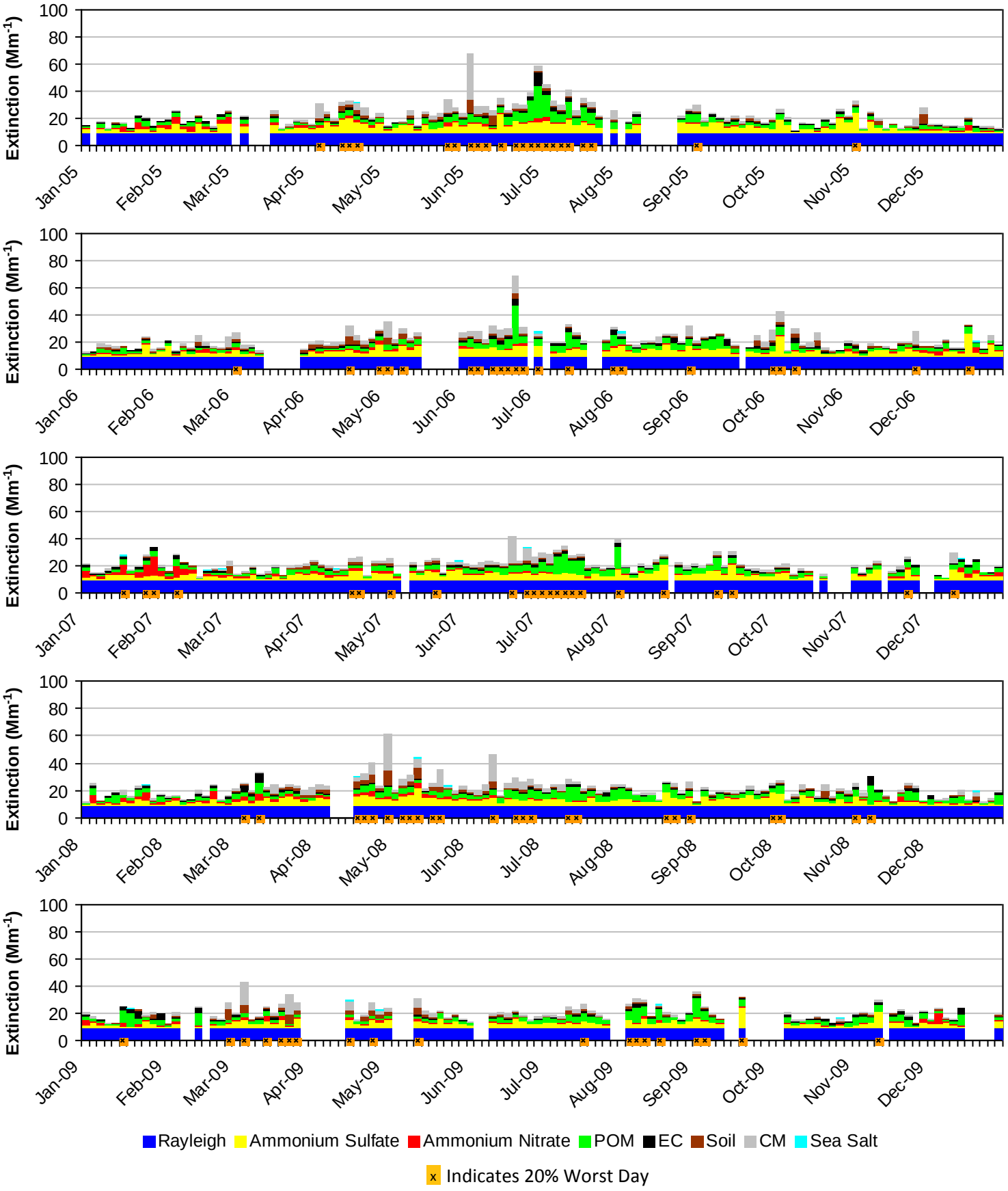


Figure D.1-8
Great Sand Dunes NP, CO (GRSA1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



D.2. MESA VERDE NP (MEVE1)

The following tables and figures are presented in this section for the Mesa Verde NP represented by the MEVE1 IMPROVE Monitor:

- **Table D.2-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure D.2-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure D.2-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure D.2-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure D.2-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure D.2-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure D.2-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure D.2-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure D.2-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table D.2-1
Mesa Verde NP, CO (MEVE1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	4.3	4.0	4.7	4.7	3.9	3.0	3.6	3.3	2.8	3.0	2.9	-0.2	0.0	4.3	3.1	-1.2	-28%
Worst 20% Days	13.0	10.5	14.7	16.8	10.3	12.0	10.7	10.9	11.0	11.7	11.6	-0.1	0.4	13.0	11.3	-1.7	-13%
All Days	8.0	7.5	8.9	9.3	6.9	7.0	6.9	7.1	6.8	6.7	6.6	-0.1	0.0	8.1	6.9	-1.2	-15%
Total Extinction (Mm-1)																	
Best 20% Days	15.5	14.9	16.0	16.1	14.8	13.6	14.4	14.0	13.3	13.5	13.4	-0.3	0.0	15.5	13.8	-1.7	-11%
Worst 20% Days	44.3	28.6	45.1	61.0	28.3	35.2	29.7	30.1	30.8	34.1	36.3	-0.3	0.4	41.5	32.0	-9.5	-23%
All Days	25.0	21.7	26.3	29.5	20.5	21.5	20.7	21.1	20.6	20.9	21.2	-0.3	0.1	24.6	21.0	-3.6	-15%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	2.3	2.7	2.5	2.1	2.3	2.0	2.3	2.1	1.8	2.2	1.8	-0.1	0.0	2.4	2.1	-0.3	-13%
Worst 20% Days	6.6	7.3	5.5	5.9	7.0	7.6	6.2	6.5	6.3	4.9	4.3	-0.1	0.2	6.5	6.3	-0.2	-3%
All Days	4.5	5.2	4.1	4.1	4.3	4.7	4.3	4.2	4.1	3.6	3.5	-0.1	0.0	4.4	4.2	-0.2	-5%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.8	0.7	1.0	1.0	0.8	0.6	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.8	0.6	-0.2	-25%
Worst 20% Days	1.7	1.9	3.5	2.5	2.0	1.5	1.6	3.1	1.3	2.4	2.4	0.0	0.4	2.3	2.0	-0.3	-13%
All Days	1.1	1.2	1.9	1.6	1.2	1.0	0.9	1.5	1.0	1.2	1.2	0.0	0.2	1.4	1.1	-0.3	-21%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.8	1.0	1.3	1.9	1.5	1.0	1.1	1.2	1.0	0.8	0.9	-0.1	0.1	1.5	1.0	-0.5	-33%
Worst 20% Days	17.8	4.1	11.5	23.4	4.7	8.9	6.2	6.3	5.2	5.9	3.7	-0.9	0.2	12.3	6.5	-5.8	-47%
All Days	6.3	2.7	4.6	7.3	2.8	3.4	3.1	3.2	2.9	2.7	2.2	-0.3	0.1	4.8	3.0	-1.8	-38%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.8	0.4	0.6	0.7	0.6	0.4	0.6	0.4	0.3	0.3	0.3	0.0	0.0	0.6	0.4	-0.2	-33%
Worst 20% Days	3.6	1.3	2.2	3.5	1.2	2.6	1.7	1.6	1.0	1.3	1.3	-0.2	0.1	2.4	1.6	-0.8	-33%
All Days	1.6	0.9	1.2	1.5	0.8	1.2	1.0	1.0	0.7	0.7	0.7	-0.1	0.0	1.2	0.9	-0.3	-25%
Soil Extinction (Mm-1)																	
Best 20% Days	0.2	0.4	0.6	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.0	0.0	0.4	0.2	-0.2	-50%
Worst 20% Days	1.9	1.6	3.9	3.9	1.3	1.5	1.9	1.1	2.3	3.2	5.1	0.0	0.4	2.5	2.0	-0.5	-20%
All Days	0.8	0.9	1.6	1.5	0.7	0.7	0.8	0.7	0.9	1.1	1.5	0.0	0.4	1.1	0.8	-0.3	-27%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	0.6	0.9	1.1	0.9	0.4	0.3	0.4	0.5	0.5	0.5	0.4	0.0	0.2	0.7	0.4	-0.3	-43%
Worst 20% Days	3.8	3.5	9.5	12.8	3.0	4.0	3.2	2.4	5.6	7.5	10.4	-0.1	0.5	6.5	4.6	-1.9	-29%
All Days	1.6	1.8	3.8	4.5	1.6	1.5	1.6	1.5	2.2	2.6	3.0	0.0	0.4	2.7	1.9	-0.8	-30%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0%
Worst 20% Days	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0%
All Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure D.2-1
Mesa Verde NP, CO (MEVE1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

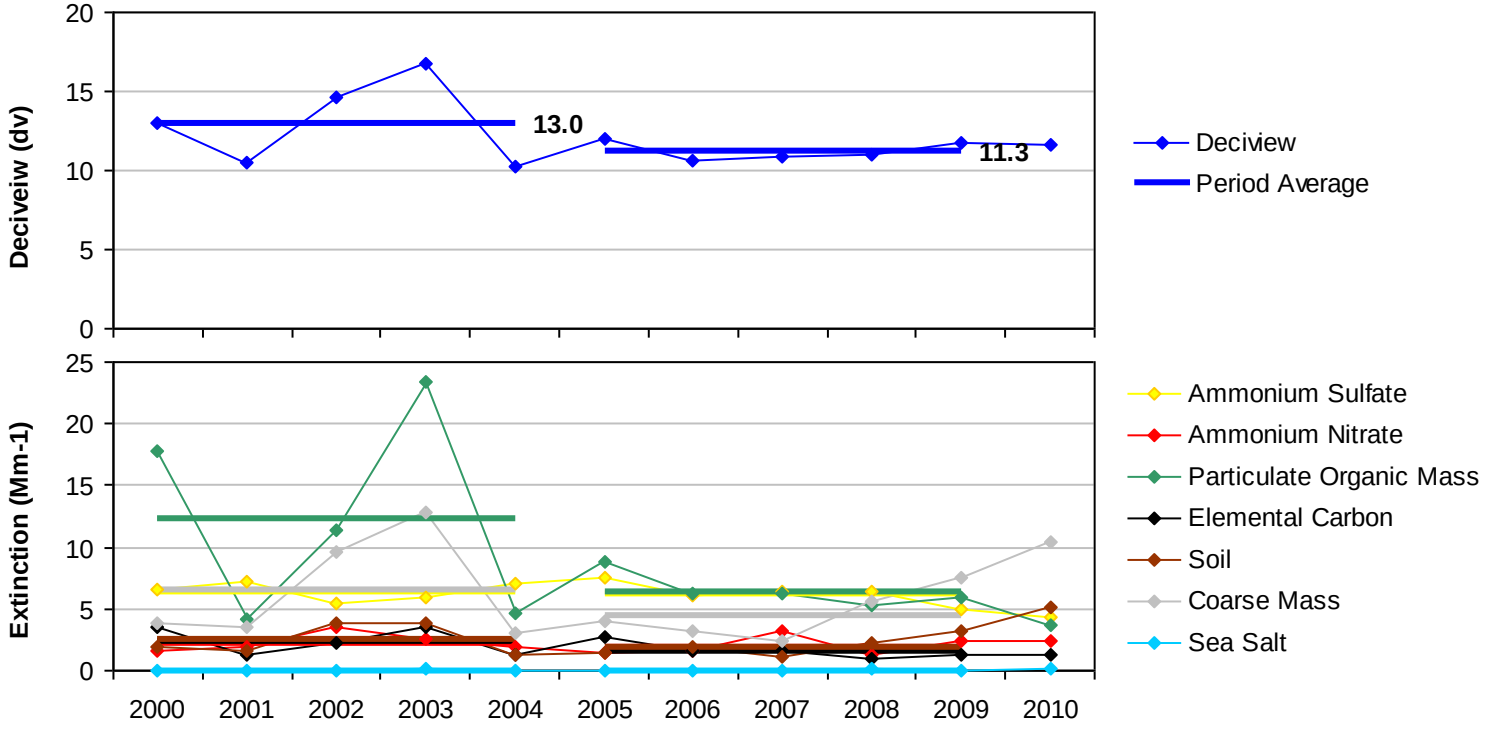


Figure D.2-2
Mesa Verde NP, CO (MEVE1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

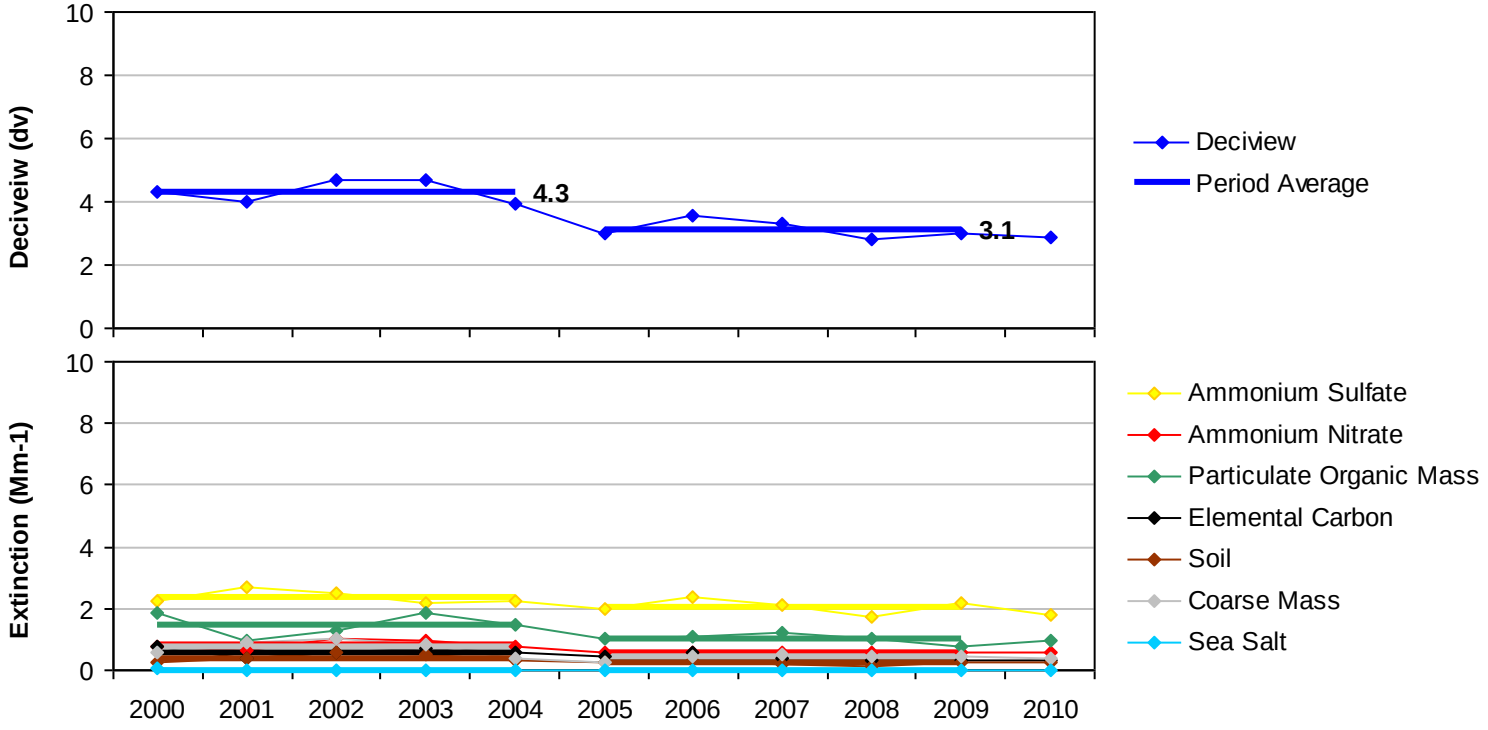


Figure D.2-3
Mesa Verde NP, CO (MEVE1 Site)
20% Most Impaired Visibility Days

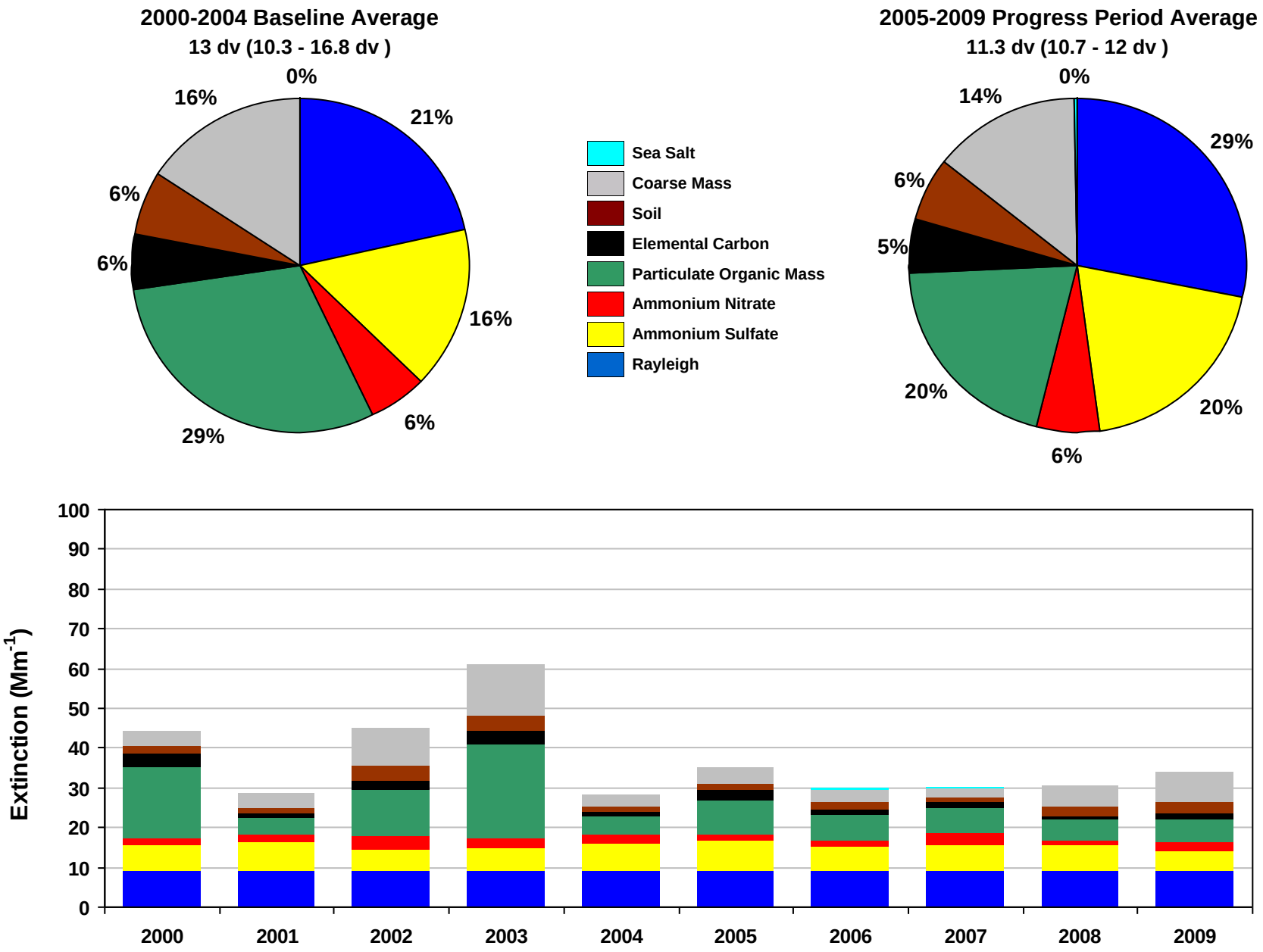


Figure D.2-4
Mesa Verde NP, CO (MEVE1 Site)
20% Least Impaired Visibility Days

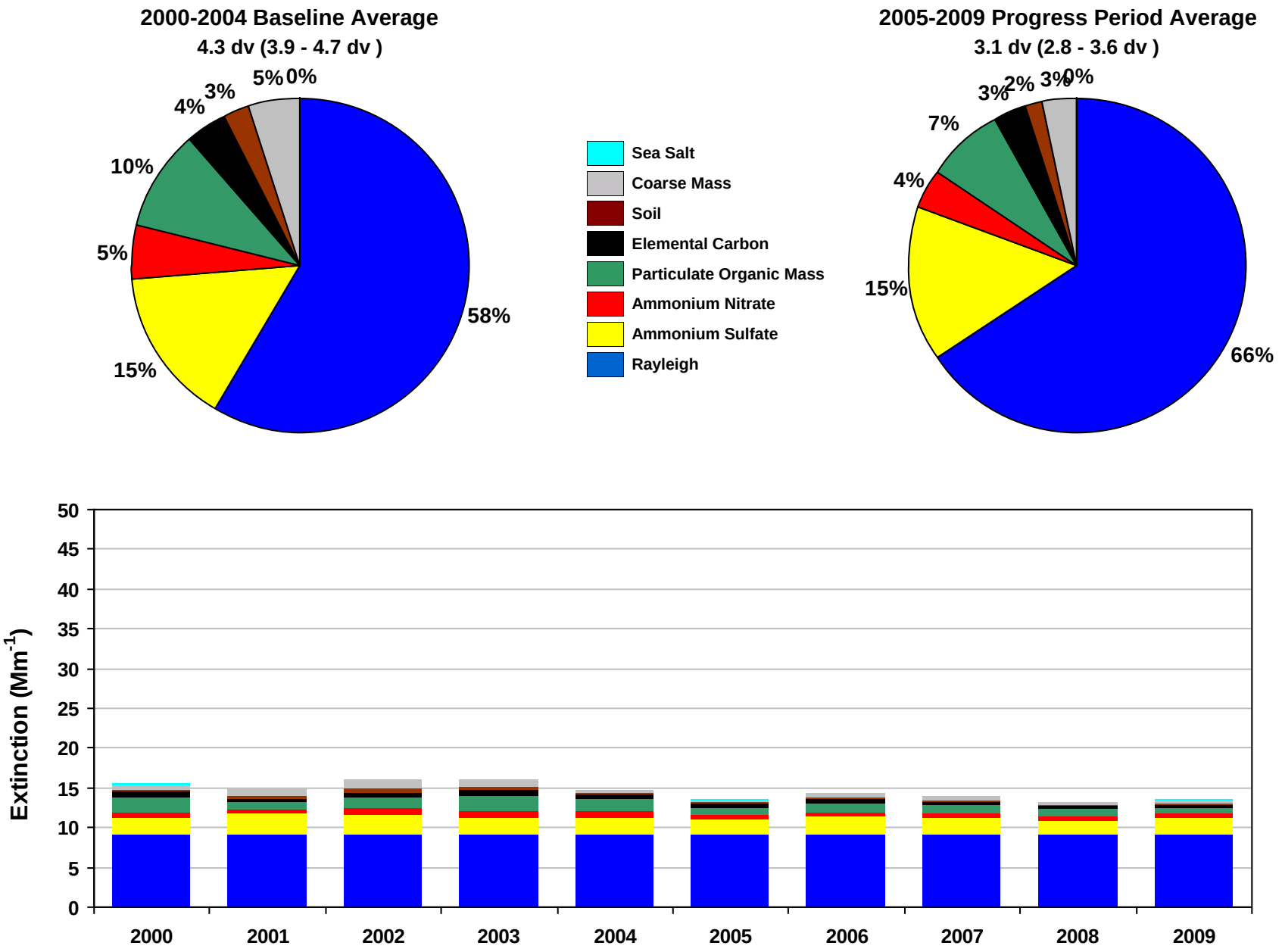


Figure D.2-5
Mesa Verde NP, CO (MEVE1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

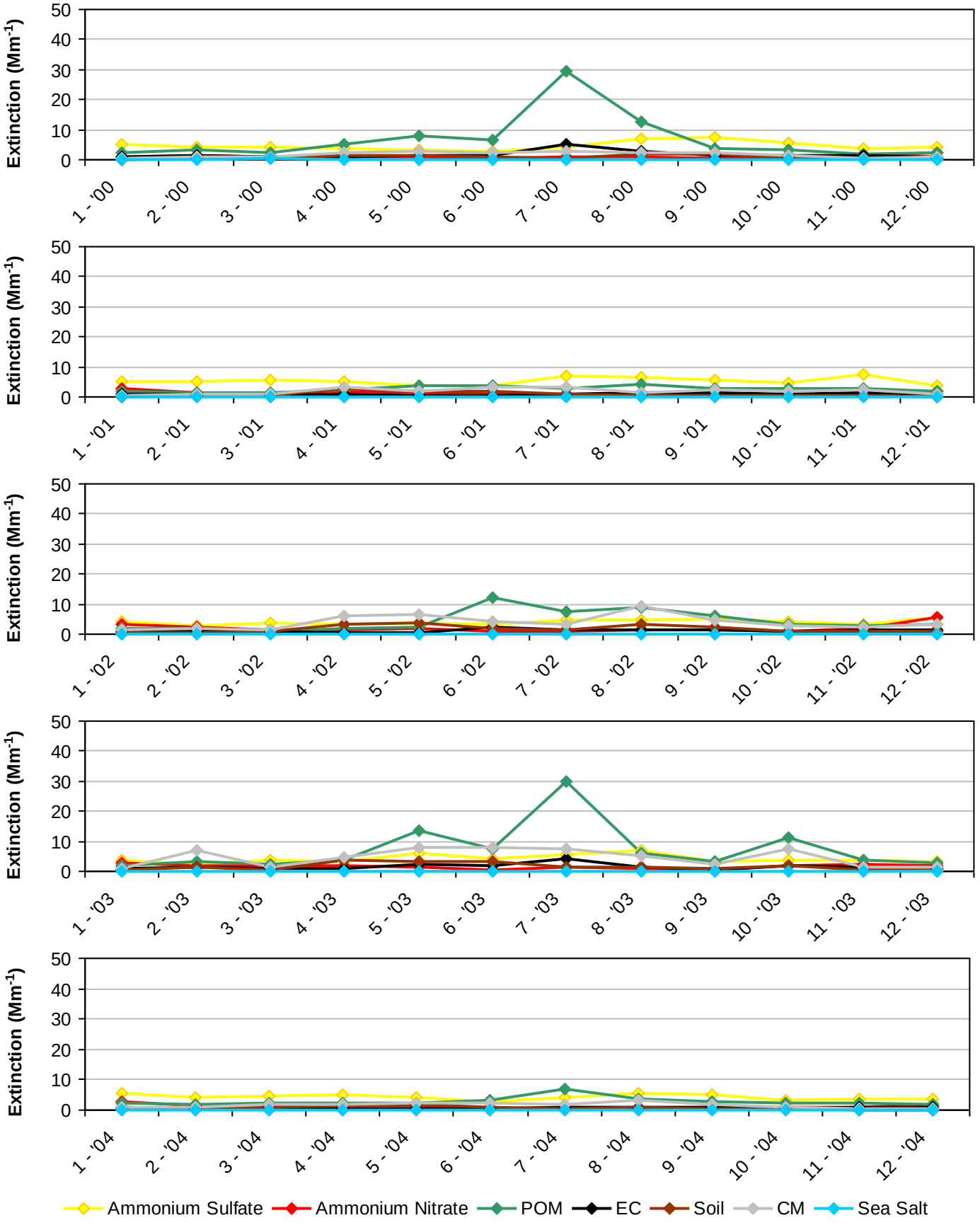


Figure D.2-6
Mesa Verde NP, CO (MEVE1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

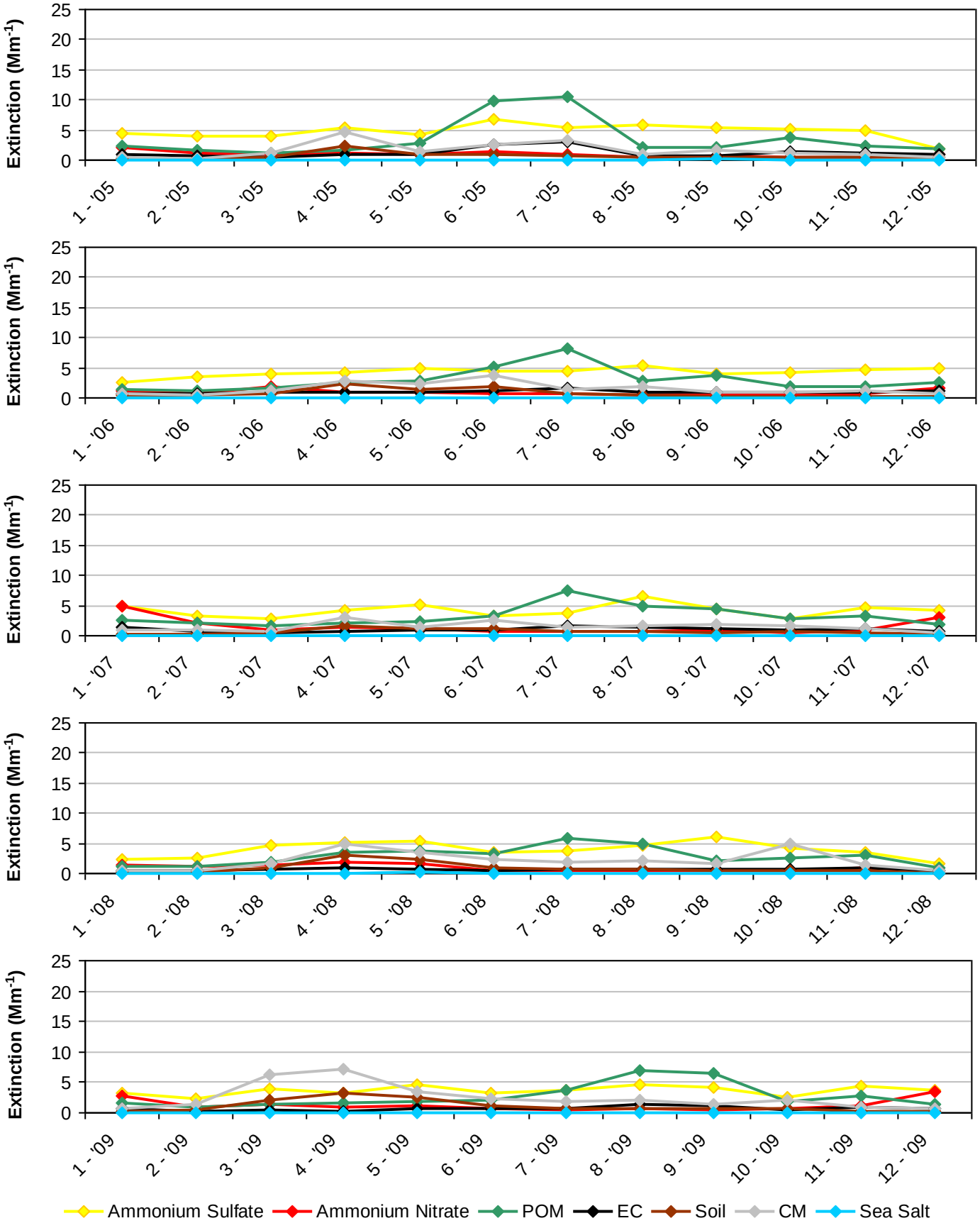


Figure D.2-7
Mesa Verde NP, CO (MEVE1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

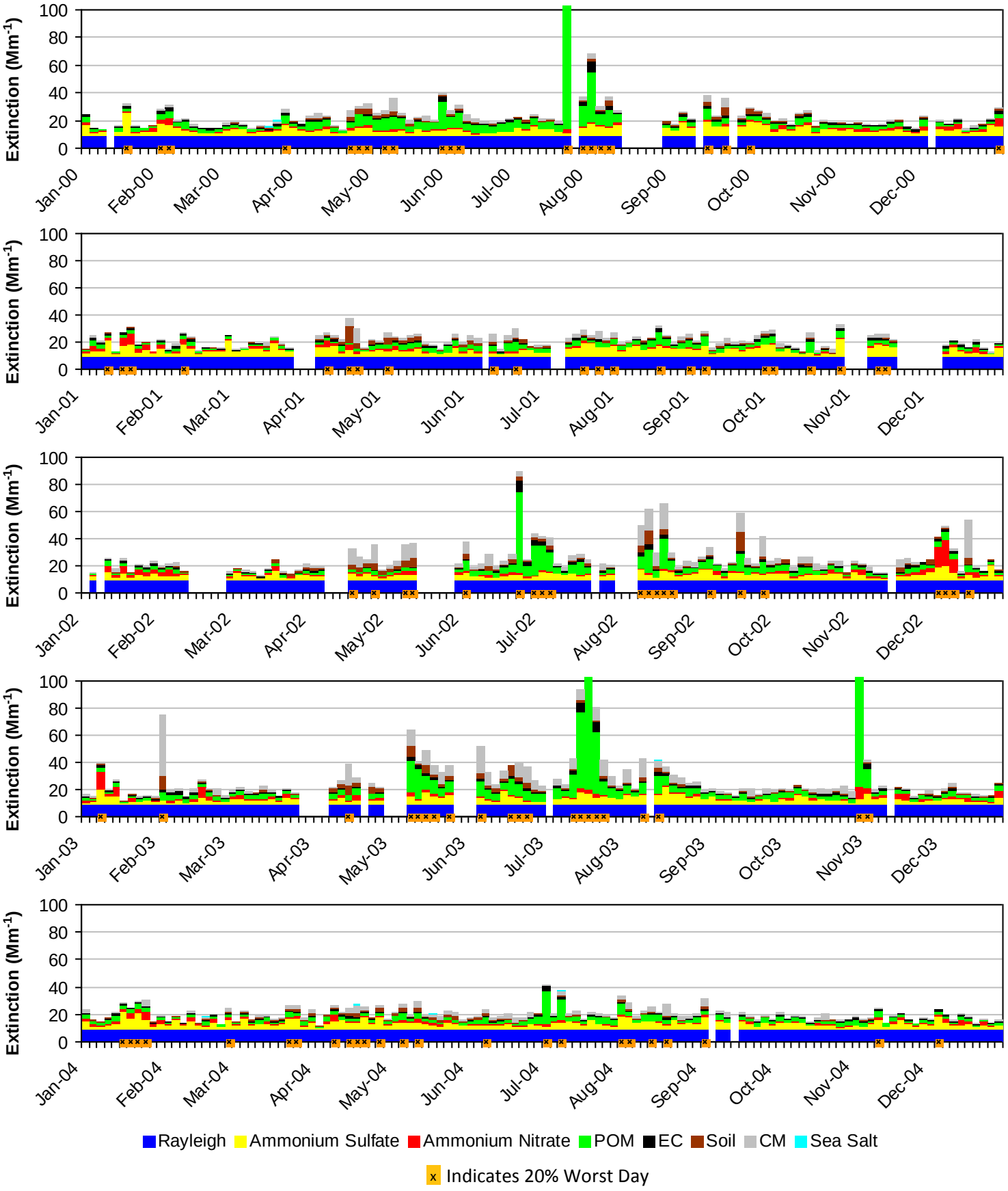
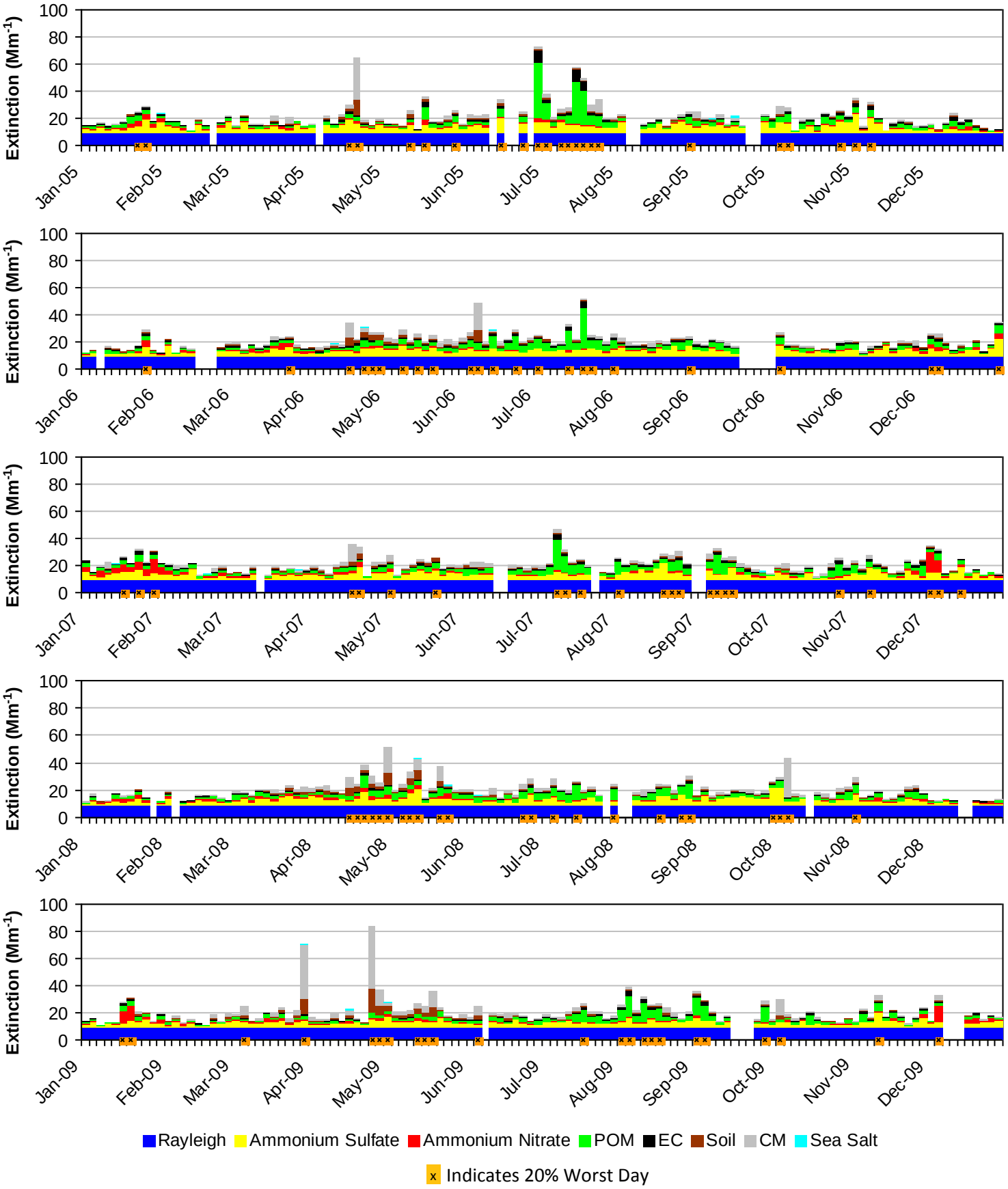


Figure D.2-8
Mesa Verde NP, CO (MEVE1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



D.3. MOUNT ZIRKEL WA AND RAWAH WA (MOZI1)

The following tables and figures are presented in this section for the Mount Zirkel WA and Rawah WA represented by the MOZI1 IMPROVE Monitor:

- **Table D.3-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure D.3-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure D.3-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure D.3-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure D.3-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure D.3-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure D.3-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure D.3-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

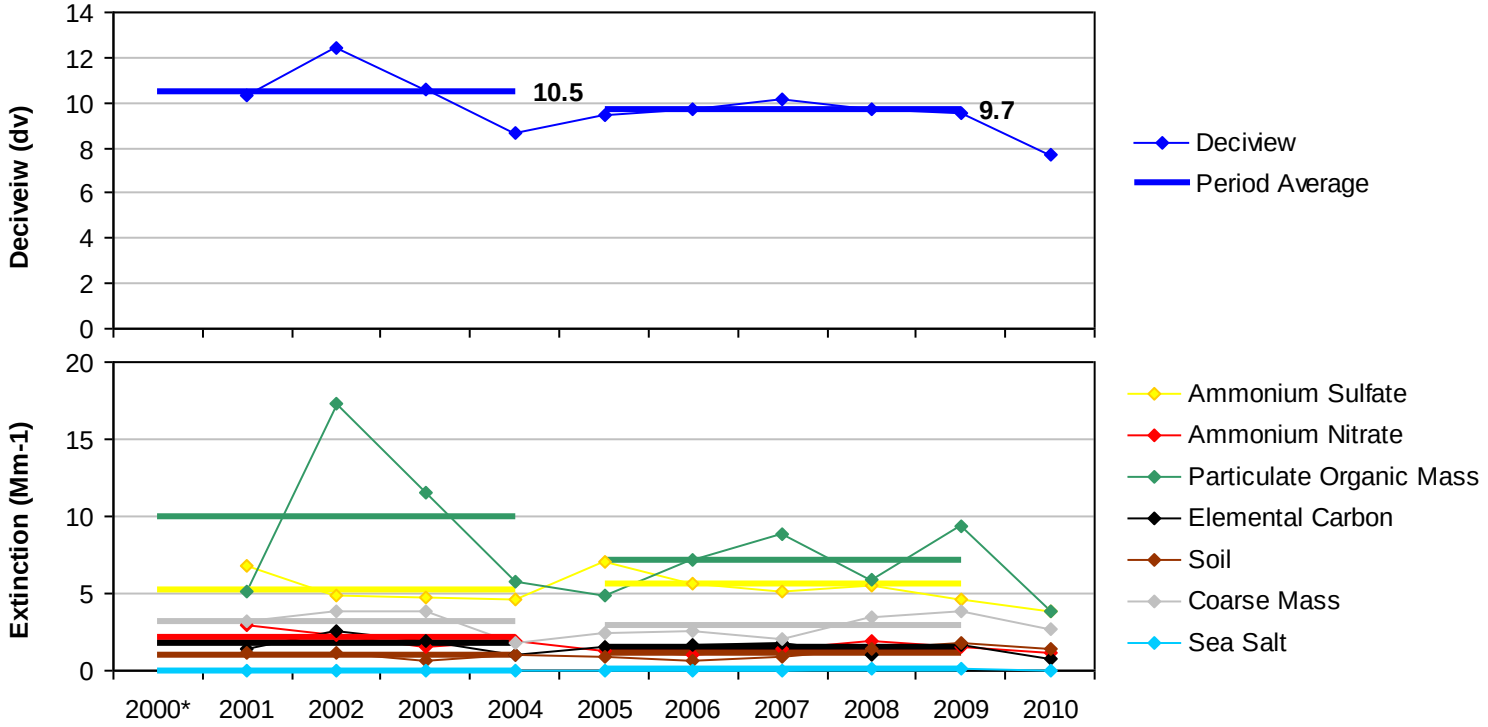
- **Figure D.3-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table D.3-1
Mount Zirkel WA and Rawah WA, CO (MOZI1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period						2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	2.7	1.4	1.2	1.1	0.7	1.0	0.8	0.4	0.6	0.0	-0.2	0.0	1.6	0.7	-0.9	-56%
Worst 20% Days	---	10.3	12.5	10.6	8.7	9.4	9.7	10.1	9.7	9.5	7.7	-0.1	0.1	10.5	9.7	-0.8	-8%
All Days	---	6.4	6.1	5.7	5.0	5.0	5.3	5.4	5.3	4.8	4.1	-0.2	0.0	5.8	5.1	-0.7	-12%
Total Extinction (Mm-1)																	
Best 20% Days	---	13.2	11.6	11.3	11.2	10.8	11.1	10.8	10.5	10.6	10.0	-0.2	0.0	11.8	10.7	-1.1	-9%
Worst 20% Days	---	28.6	40.1	32.3	24.0	25.9	26.8	28.3	27.3	31.0	21.8	-0.1	0.5	31.3	27.8	-3.5	-11%
All Days	---	19.7	20.9	19.4	17.1	17.3	17.8	18.2	18.0	17.9	15.6	-0.2	0.2	19.3	17.9	-1.4	-7%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	2.3	1.3	1.2	1.3	1.2	1.4	1.2	1.1	1.2	1.1	0.0	0.0	1.5	1.2	-0.3	-20%
Worst 20% Days	---	6.8	4.9	4.7	4.6	7.0	5.6	5.2	5.5	4.7	3.9	-0.1	0.3	5.2	5.6	0.4	8%
All Days	---	4.2	3.3	3.1	3.2	4.0	3.8	3.4	3.4	3.1	2.8	0.0	0.2	3.5	3.5	0.0	0%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.6	0.5	0.6	0.4	0.4	0.4	0.4	0.5	0.4	0.2	0.0	0.2	0.5	0.4	-0.1	-20%
Worst 20% Days	---	2.9	2.3	1.5	1.9	1.3	1.0	1.4	1.9	1.5	1.2	-0.2	0.1	2.2	1.4	-0.8	-36%
All Days	---	1.3	1.4	1.0	1.1	0.9	0.8	1.1	1.1	0.8	0.7	0.0	0.1	1.2	0.9	-0.3	-25%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	1.1	0.8	0.7	0.7	0.6	0.6	0.6	0.4	0.5	0.3	0.0	0.0	0.8	0.5	-0.3	-38%
Worst 20% Days	---	5.1	17.3	11.6	5.8	4.8	7.2	8.9	5.9	9.4	3.9	0.1	0.5	9.9	7.2	-2.7	-27%
All Days	---	2.8	5.0	4.0	2.6	2.3	2.8	3.2	2.7	3.2	1.9	0.0	0.4	3.6	2.8	-0.8	-22%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.4	0.3	0.3	0.2	0.3	0.3	0.1	0.2	0.1	0.0	0.0	0.3	0.2	-0.1	-33%
Worst 20% Days	---	1.4	2.6	2.0	1.0	1.5	1.7	1.7	1.0	1.7	0.8	0.0	0.4	1.8	1.5	-0.3	-17%
All Days	---	0.8	1.0	0.9	0.6	0.8	0.9	0.8	0.6	0.7	0.5	0.0	0.1	0.8	0.7	-0.1	-13%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.5	0.1	0.1	0.0	0%
Worst 20% Days	---	1.2	1.2	0.6	1.0	0.9	0.7	1.0	1.4	1.8	1.4	0.0	0.2	1.0	1.1	0.1	10%
All Days	---	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.5	0.0	0.2	0.5	0.5	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.6	0.5	0.5	0.5	0.2	0.3	0.2	0.2	0.2	0.2	0.0	0.0	0.5	0.2	-0.3	-60%
Worst 20% Days	---	3.2	3.8	3.8	1.8	2.4	2.6	2.1	3.5	3.9	2.7	0.0	0.5	3.1	2.9	-0.2	-7%
All Days	---	2.0	1.7	2.0	1.1	1.1	1.2	1.2	1.6	1.5	1.2	0.0	0.2	1.7	1.3	-0.4	-24%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0%
Worst 20% Days	---	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0%
All Days	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0%

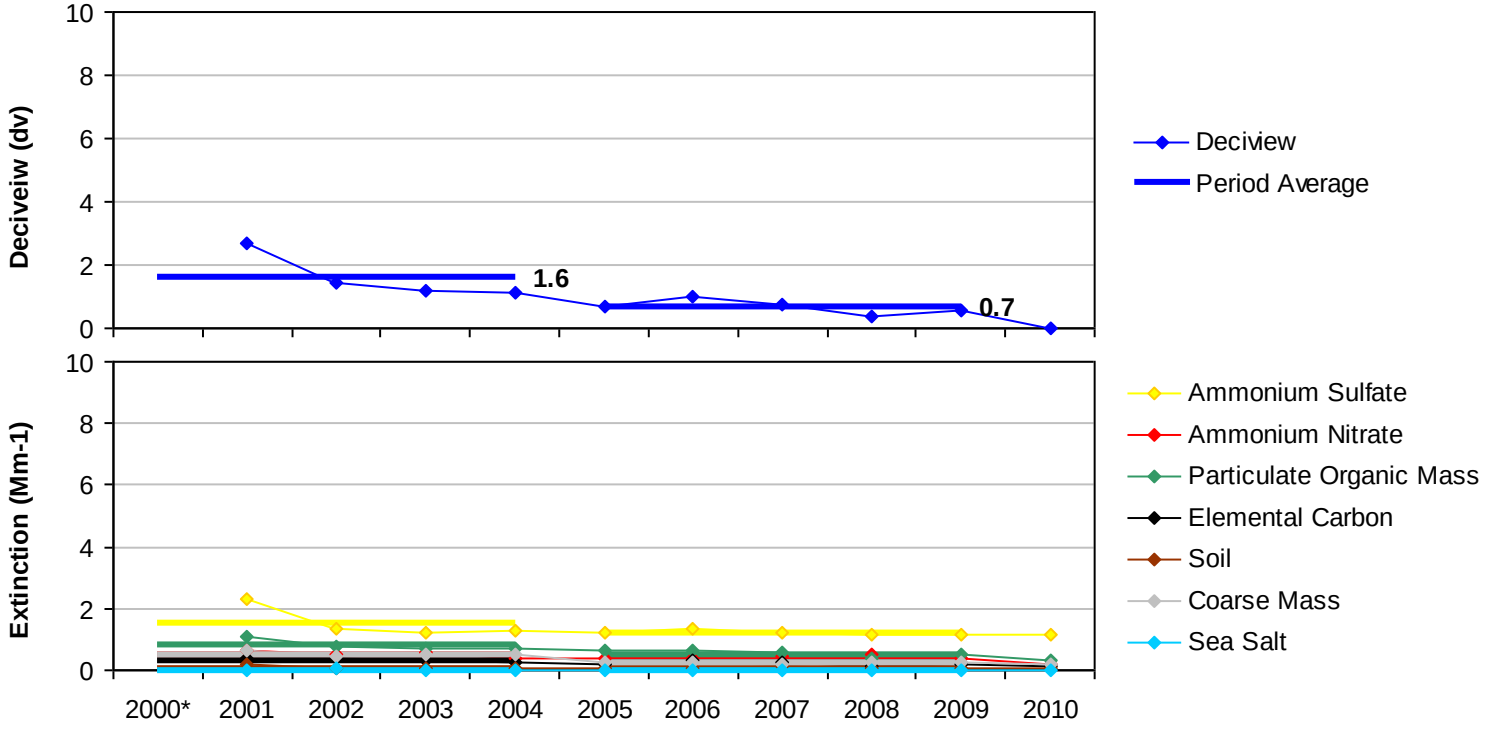
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure D.3-1
Mount Zirkel WA and Rawah WA, CO (MOZI1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



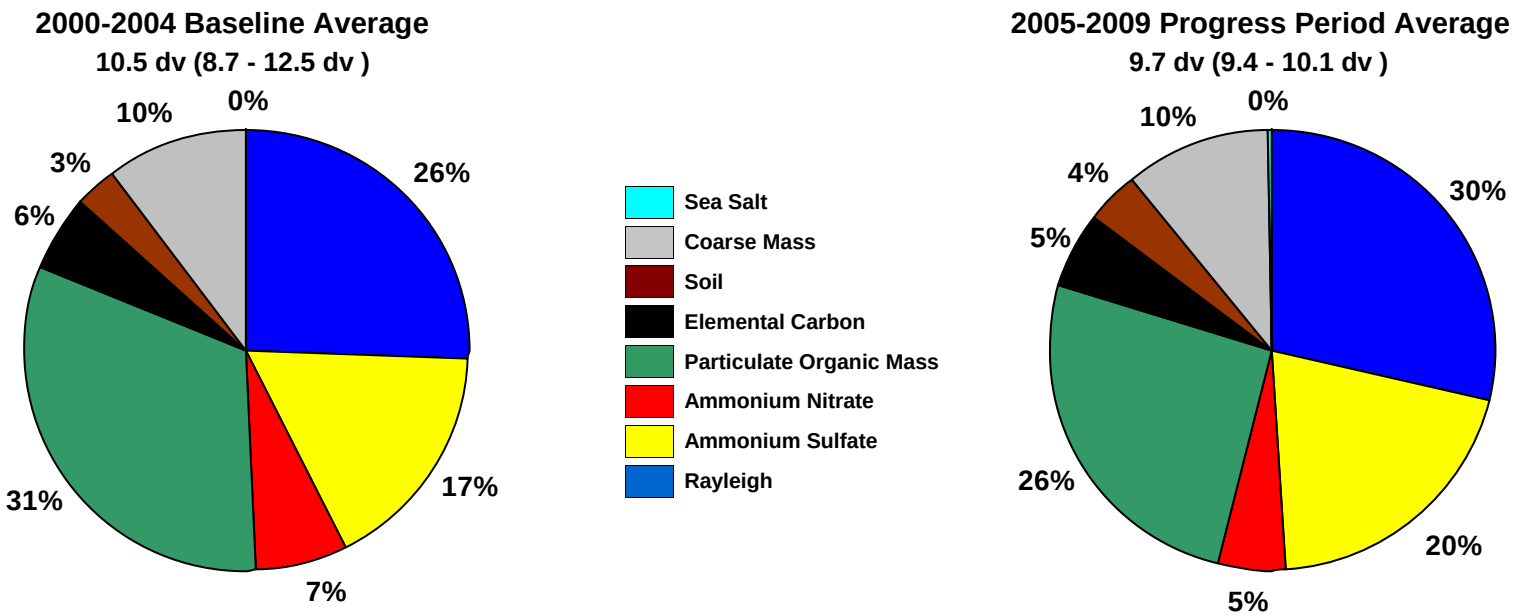
*Missing years did not meet RHR data completeness criteria.

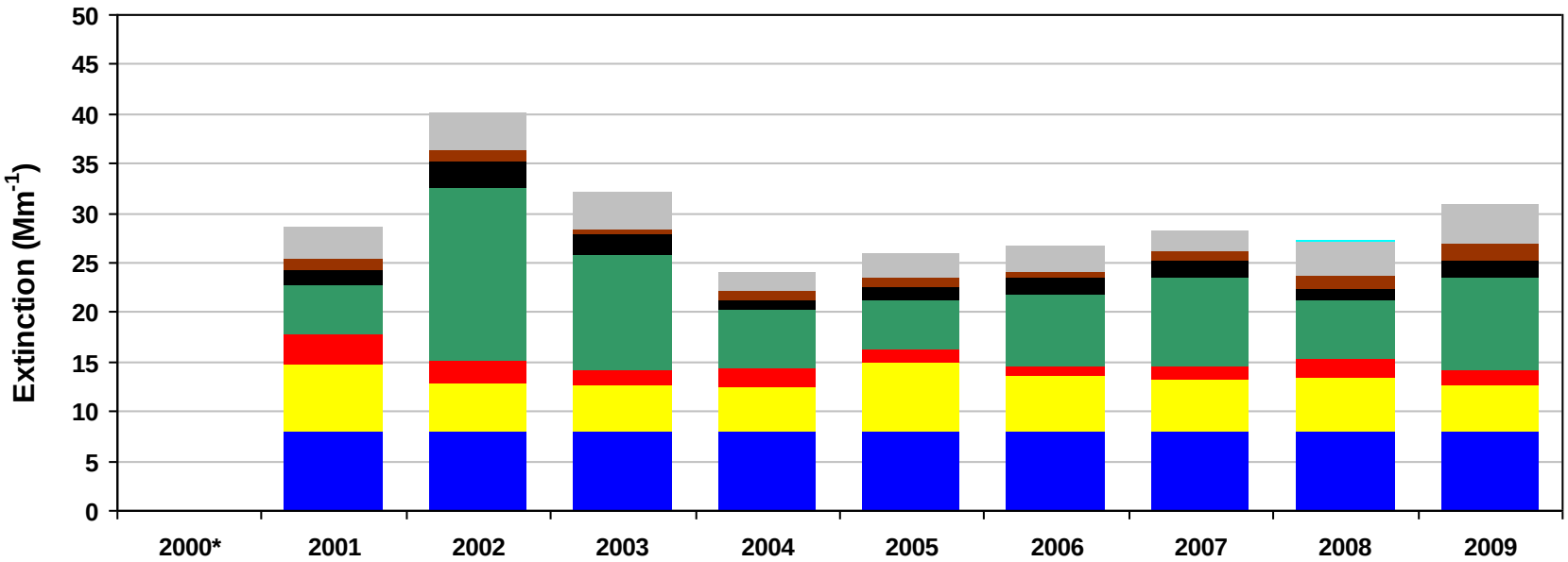
Figure D.3-2
Mount Zirkel WA and Rawah WA, CO (MOZI1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure D.3-3
Mount Zirkel WA and Rawah WA, CO (MOZI1 Site)
20% Most Impaired Visibility Days



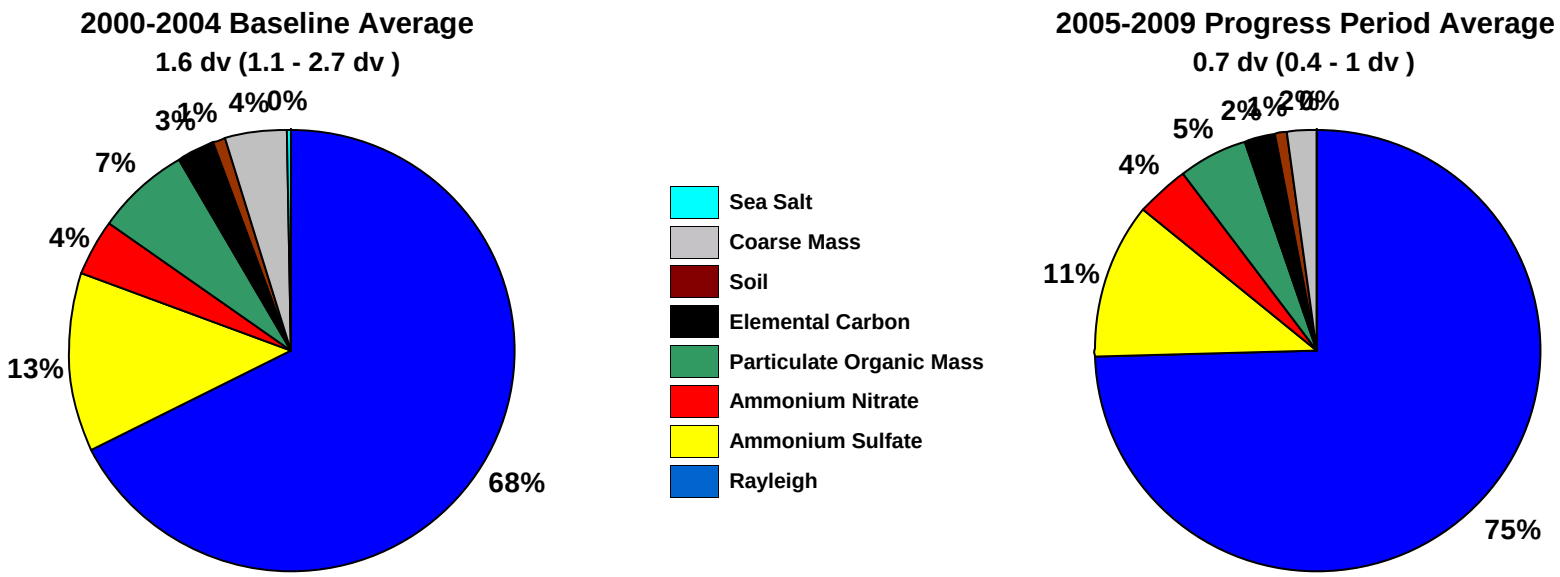


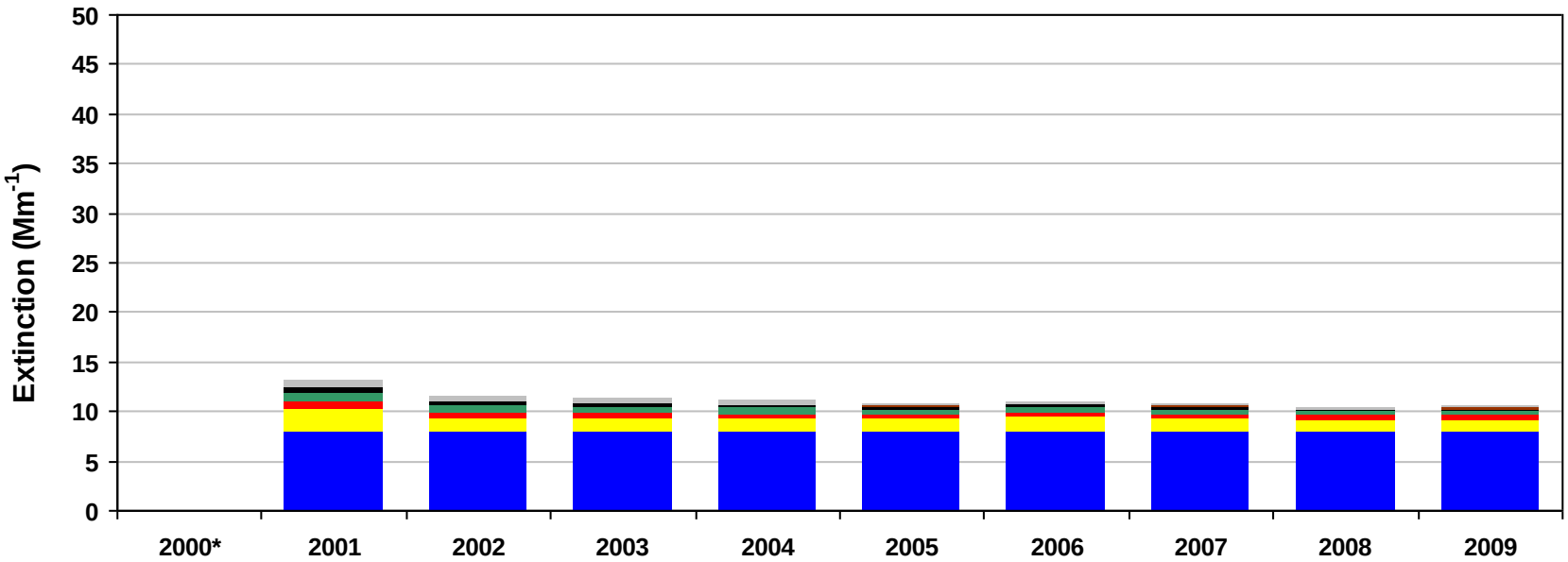
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure D.3-4

Mount Zirkel WA and Rawah WA, CO (MOZI1 Site)

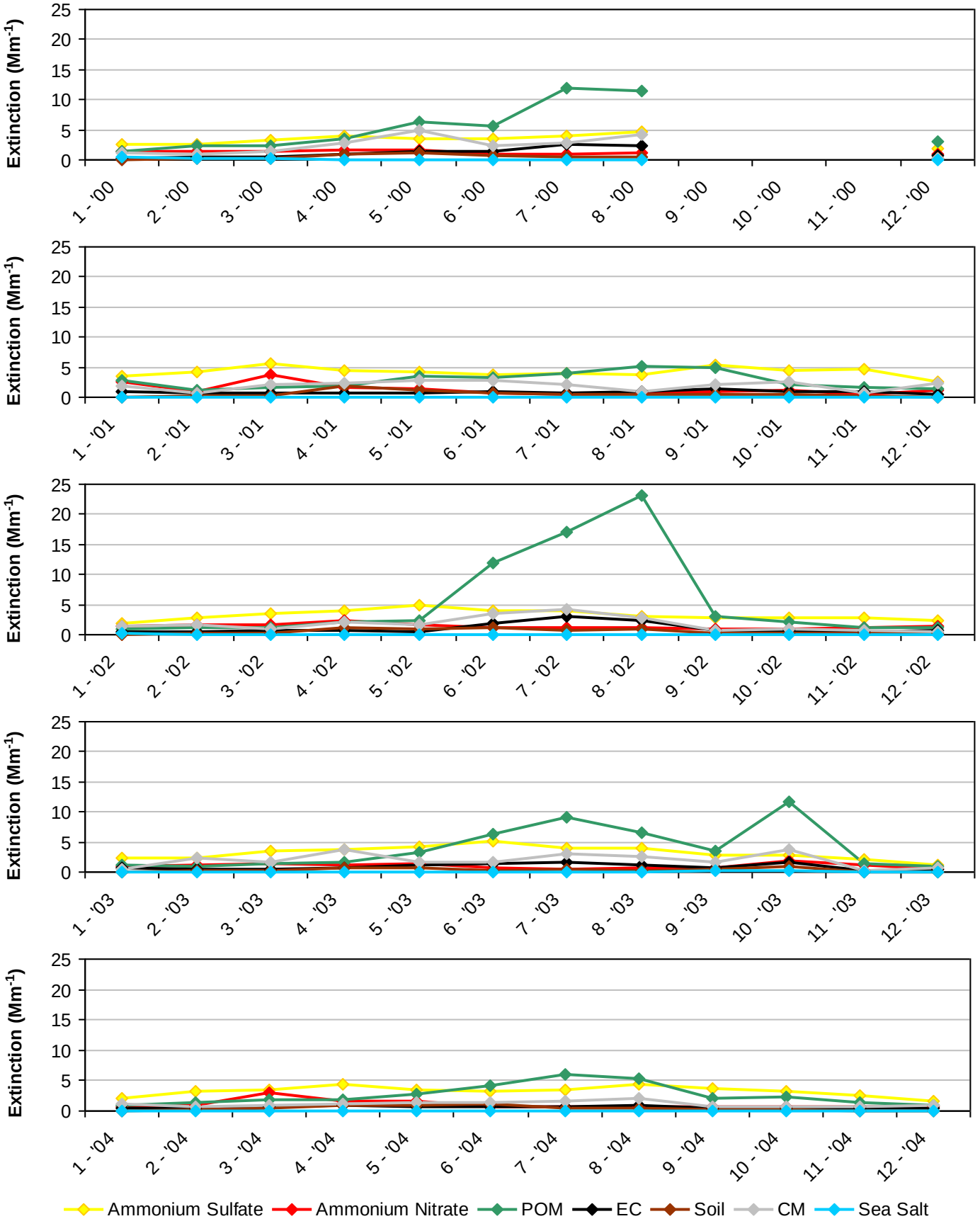
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure D.3-5
Mount Zirkel WA and Rawah WA, CO (MOZI1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure D.3-6
Mount Zirkel WA and Rawah WA, CO (MOZI1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

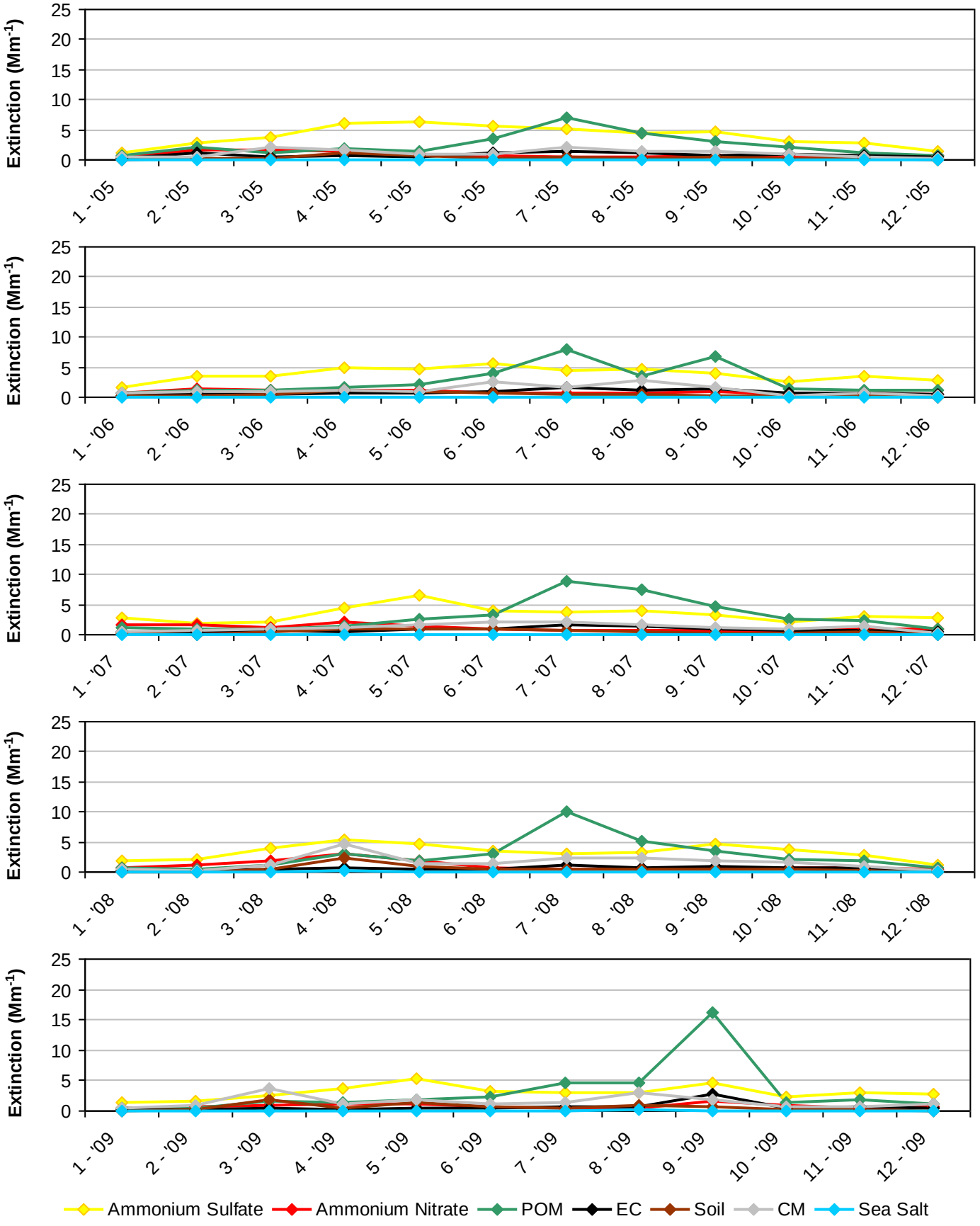
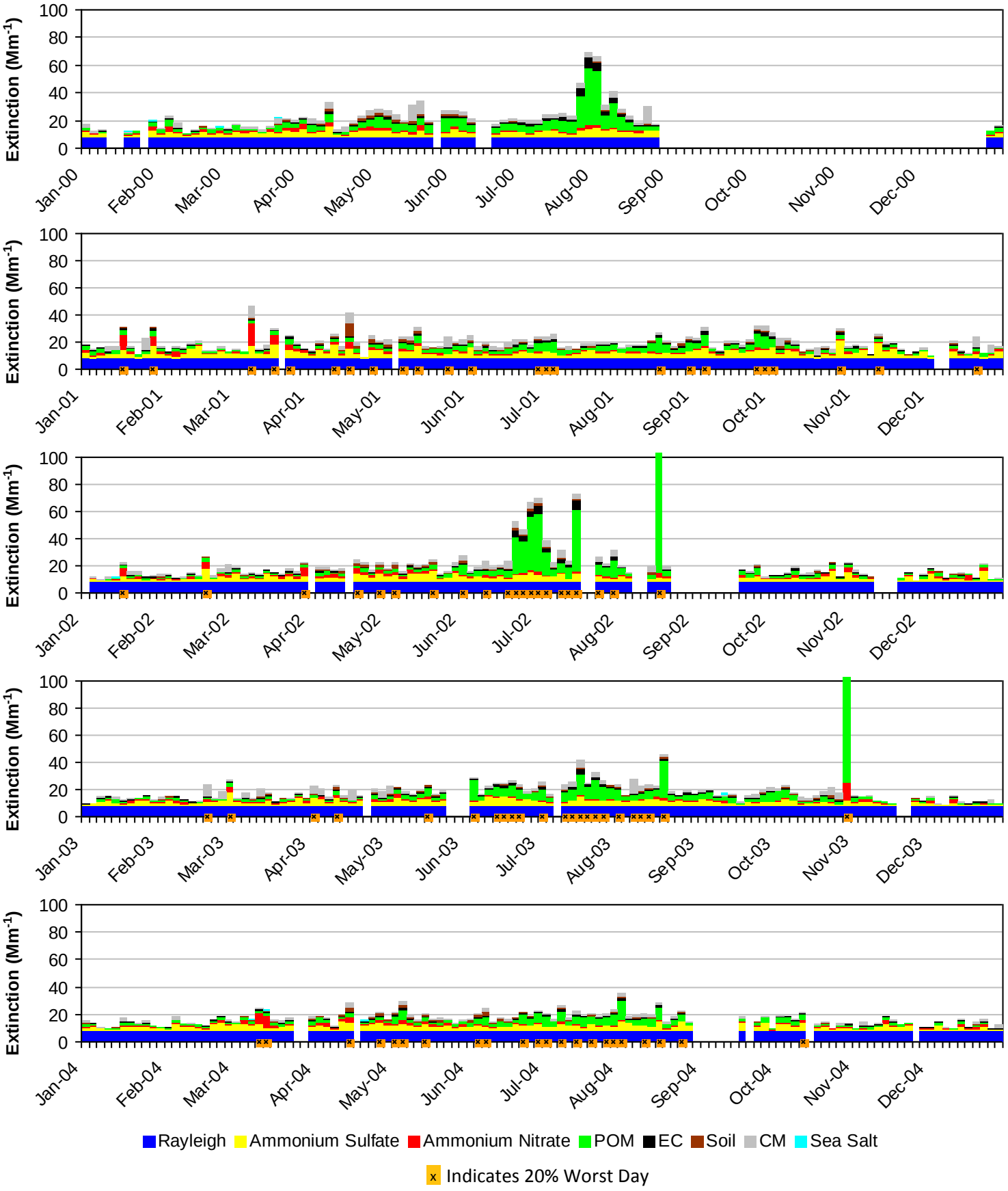
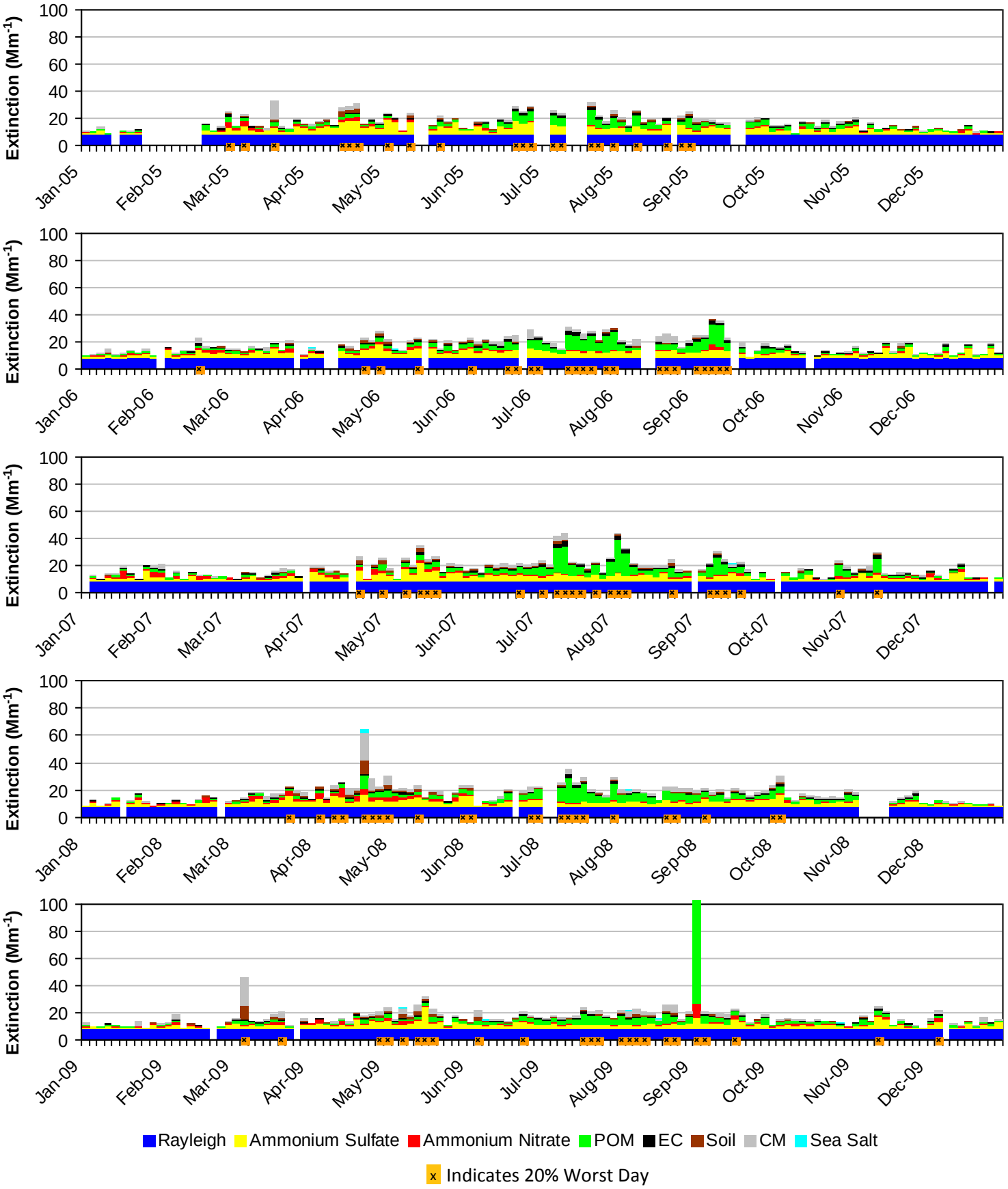


Figure D.3-7
Mount Zirkel WA and Rawah WA, CO (MOZI1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure D.3-8
Mount Zirkel WA and Rawah WA, CO (MOZI1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



D.4. ROCKY MOUNTAIN NP (ROMO1)

The following tables and figures are presented in this section for the Rocky Mountain NP represented by the ROMO1 IMPROVE Monitor:

- **Table D.4-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure D.4-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure D.4-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure D.4-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure D.4-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure D.4-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure D.4-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure D.4-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure D.4-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table D.4-1
Rocky Mountain NP, CO (ROMO1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	2.6	2.4	1.8	2.5	2.1	2.1	2.1	2.3	1.6	2.0	1.4	-0.1	0.1	2.3	2.0	-0.3	-13%
Worst 20% Days	14.0	13.5	16.0	13.7	11.9	13.5	12.5	12.6	12.8	11.7	10.6	-0.2	0.0	13.8	12.6	-1.2	-9%
All Days	7.9	7.7	8.4	8.0	6.9	7.7	7.2	7.7	6.8	6.5	5.9	-0.2	0.0	7.8	7.2	-0.6	-8%
Total Extinction (Mm-1)																	
Best 20% Days	13.0	12.8	12.0	12.9	12.4	12.4	12.4	12.6	11.8	12.2	11.5	-0.1	0.1	12.6	12.3	-0.3	-2%
Worst 20% Days	41.9	39.0	53.4	40.0	33.2	39.0	35.5	35.9	37.4	35.8	29.4	-0.6	0.1	41.5	36.7	-4.8	-12%
All Days	24.1	23.5	26.9	24.2	21.3	23.4	22.1	23.1	21.8	21.0	19.2	-0.3	0.0	24.0	22.3	-1.7	-7%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	1.7	1.5	0.9	1.3	1.2	1.4	1.3	1.2	1.0	1.3	0.9	0.0	0.1	1.3	1.2	-0.1	-8%
Worst 20% Days	6.4	9.7	9.4	6.8	7.3	9.3	7.3	6.9	5.9	6.5	5.4	-0.2	0.1	7.9	7.2	-0.7	-9%
All Days	3.9	4.8	4.5	3.9	3.8	5.1	4.2	4.1	3.7	3.7	3.1	-0.1	0.1	4.2	4.2	0.0	0%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.5	0.3	0.2	0.3	0.4	0.4	0.2	0.3	0.2	0.2	0.2	0.0	0.0	0.3	0.3	0.0	0%
Worst 20% Days	2.5	7.6	8.7	3.2	4.3	4.8	3.7	4.3	4.1	3.2	3.1	-0.2	0.4	5.3	4.0	-1.3	-25%
All Days	1.7	2.5	3.3	1.9	1.9	2.1	1.6	2.1	1.6	1.4	1.4	-0.1	0.1	2.3	1.7	-0.6	-26%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	0.8	0.7	0.8	1.1	1.0	0.7	0.8	1.0	0.7	0.7	0.6	0.0	0.4	0.9	0.8	-0.1	-11%
Worst 20% Days	11.1	6.2	16.5	12.1	6.7	7.8	9.0	8.5	9.1	10.1	5.2	0.2	0.4	10.5	8.9	-1.6	-15%
All Days	4.1	3.3	5.3	4.9	3.4	3.5	3.6	4.1	3.7	3.7	2.6	0.0	0.5	4.2	3.7	-0.5	-12%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.0	0.0	0.3	0.3	0.0	0%
Worst 20% Days	2.9	2.0	3.4	2.5	2.0	2.5	2.4	1.9	1.7	2.3	1.5	-0.1	0.0	2.6	2.2	-0.4	-15%
All Days	1.3	1.1	1.3	1.3	1.1	1.3	1.2	1.1	0.9	0.9	0.8	0.0	0.0	1.2	1.1	-0.1	-8%
Soil Extinction (Mm-1)																	
Best 20% Days	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.1	0.0	0.1	0.1	0.2	0.1	100%
Worst 20% Days	1.3	1.4	1.9	1.2	1.1	1.5	0.9	1.3	2.3	1.5	1.3	0.0	0.3	1.4	1.5	0.1	7%
All Days	0.6	0.8	0.9	0.6	0.6	0.6	0.7	0.7	0.9	0.7	0.6	0.0	0.1	0.7	0.7	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	0.6	0.8	0.6	0.8	0.4	0.5	0.6	0.7	0.5	0.5	0.5	0.0	0.2	0.6	0.6	0.0	0%
Worst 20% Days	8.7	3.2	4.6	5.1	2.9	4.1	3.2	3.8	5.1	3.2	3.7	-0.2	0.2	4.9	3.9	-1.0	-20%
All Days	3.4	1.9	2.5	2.5	1.5	1.9	1.8	2.1	2.1	1.6	1.7	-0.1	0.1	2.4	1.9	-0.5	-21%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0%
Worst 20% Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0%
All Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure D.4-1
Rocky Mountain NP, CO (ROMO1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

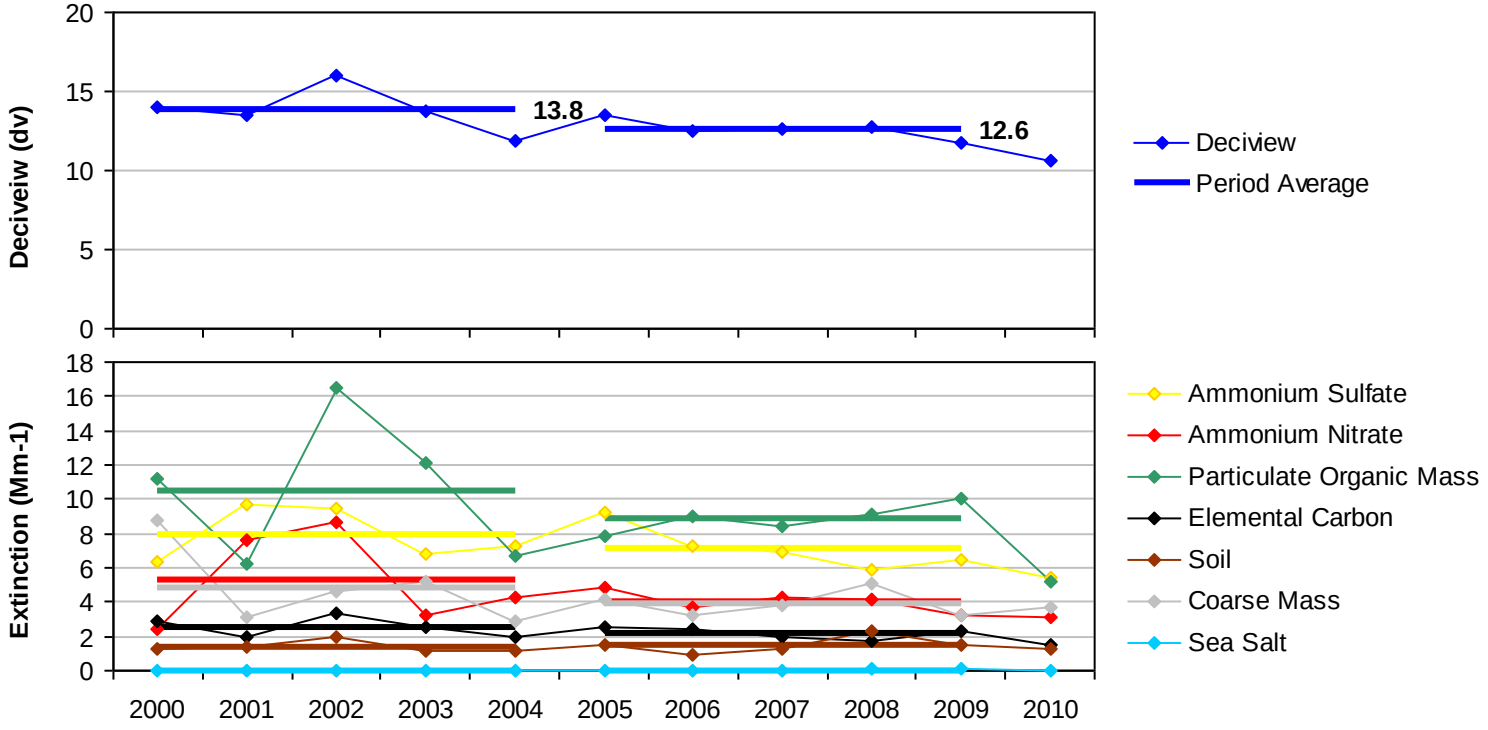


Figure D.4-2
Rocky Mountain NP, CO (ROMO1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

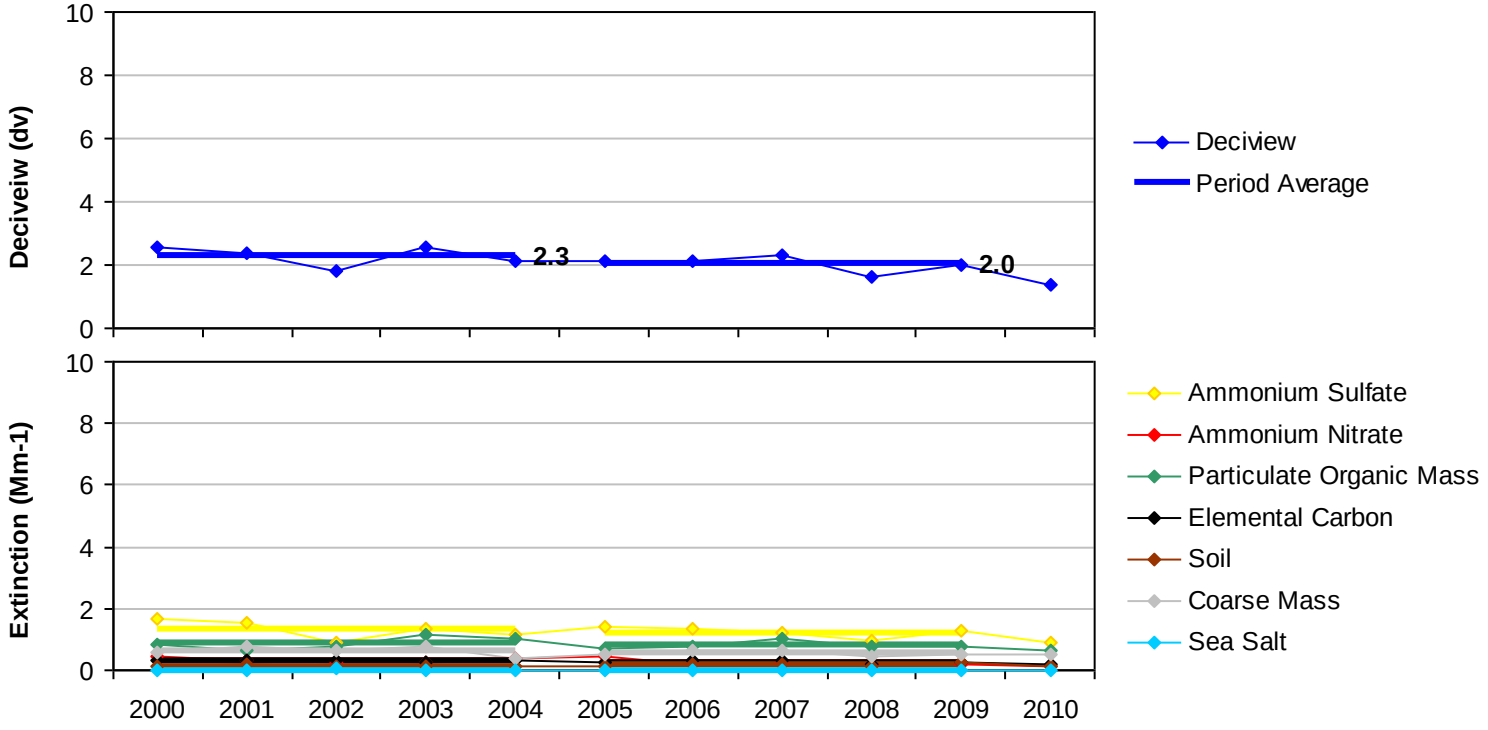


Figure D.4-3
Rocky Mountain NP, CO (ROMO1 Site)
20% Most Impaired Visibility Days

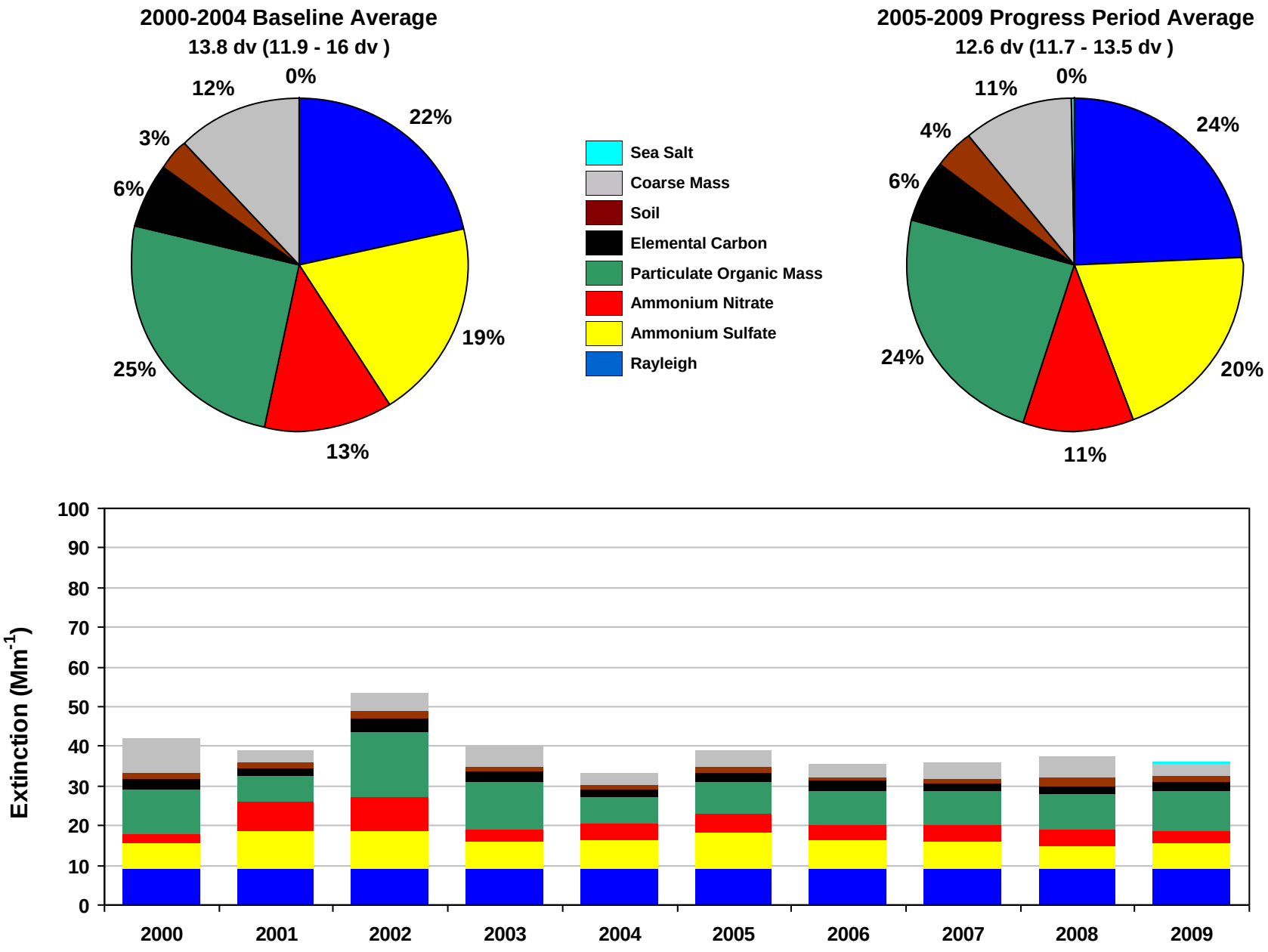
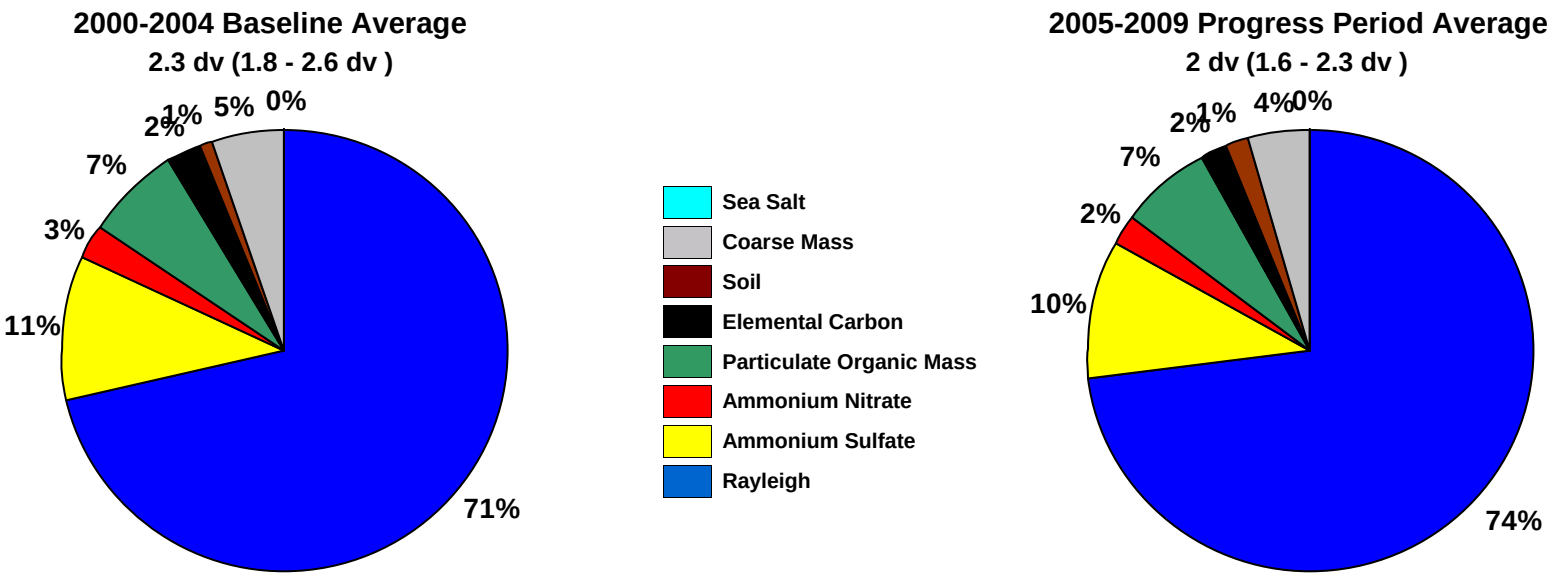


Figure D.4-4
Rocky Mountain NP, CO (ROMO1 Site)
20% Least Impaired Visibility Days



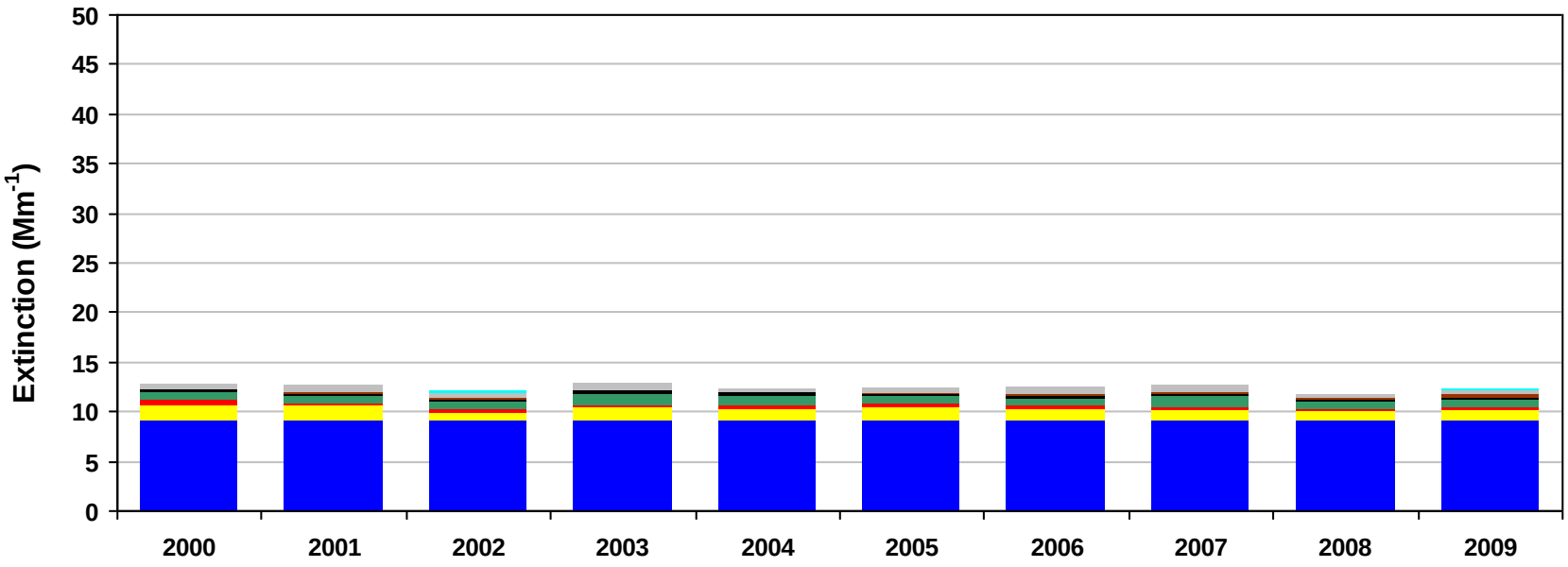


Figure D.4-5
Rocky Mountain NP, CO (ROMO1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

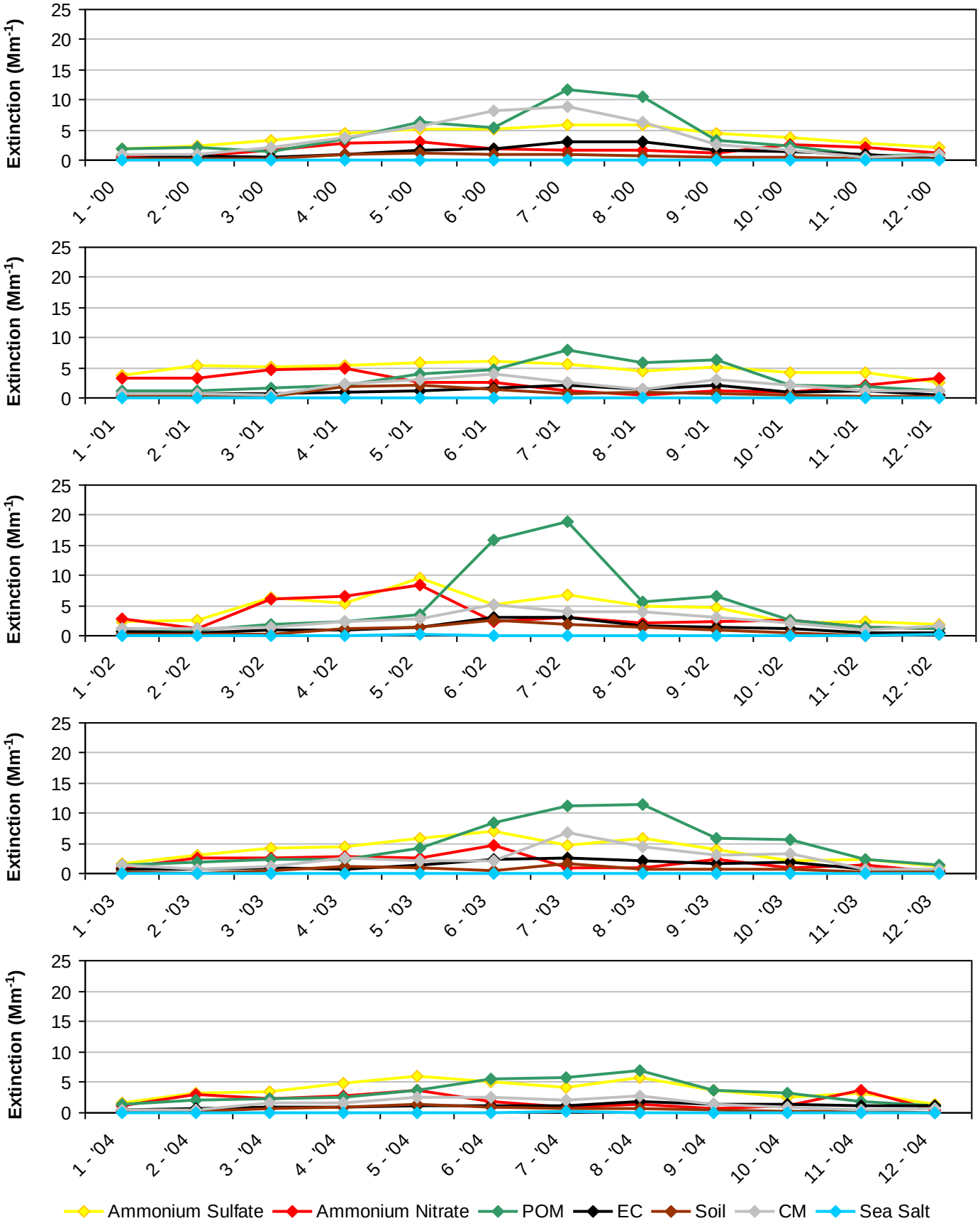


Figure D.4-6
Rocky Mountain NP, CO (ROMO1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

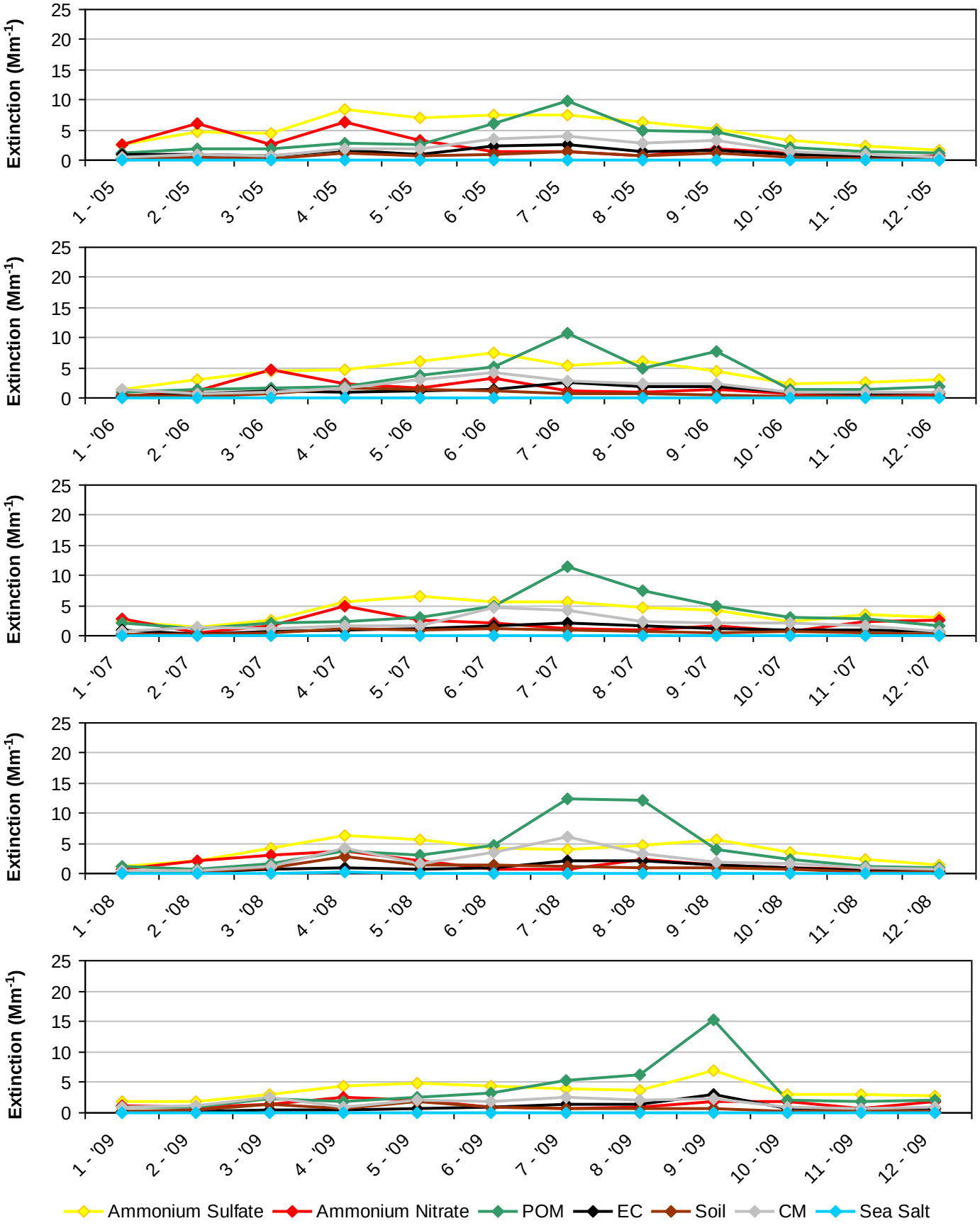


Figure D.4-7
Rocky Mountain NP, CO (ROMO1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

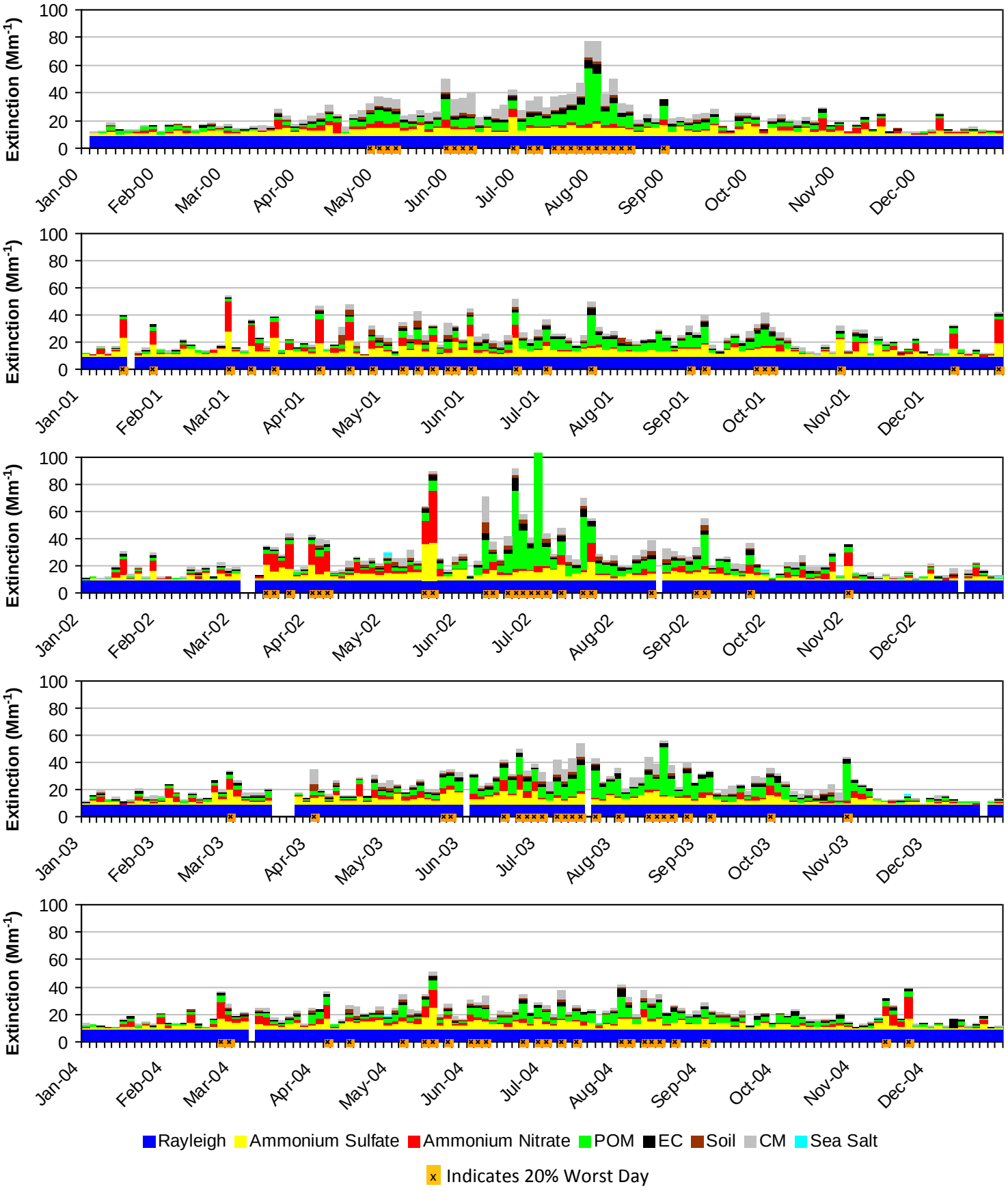
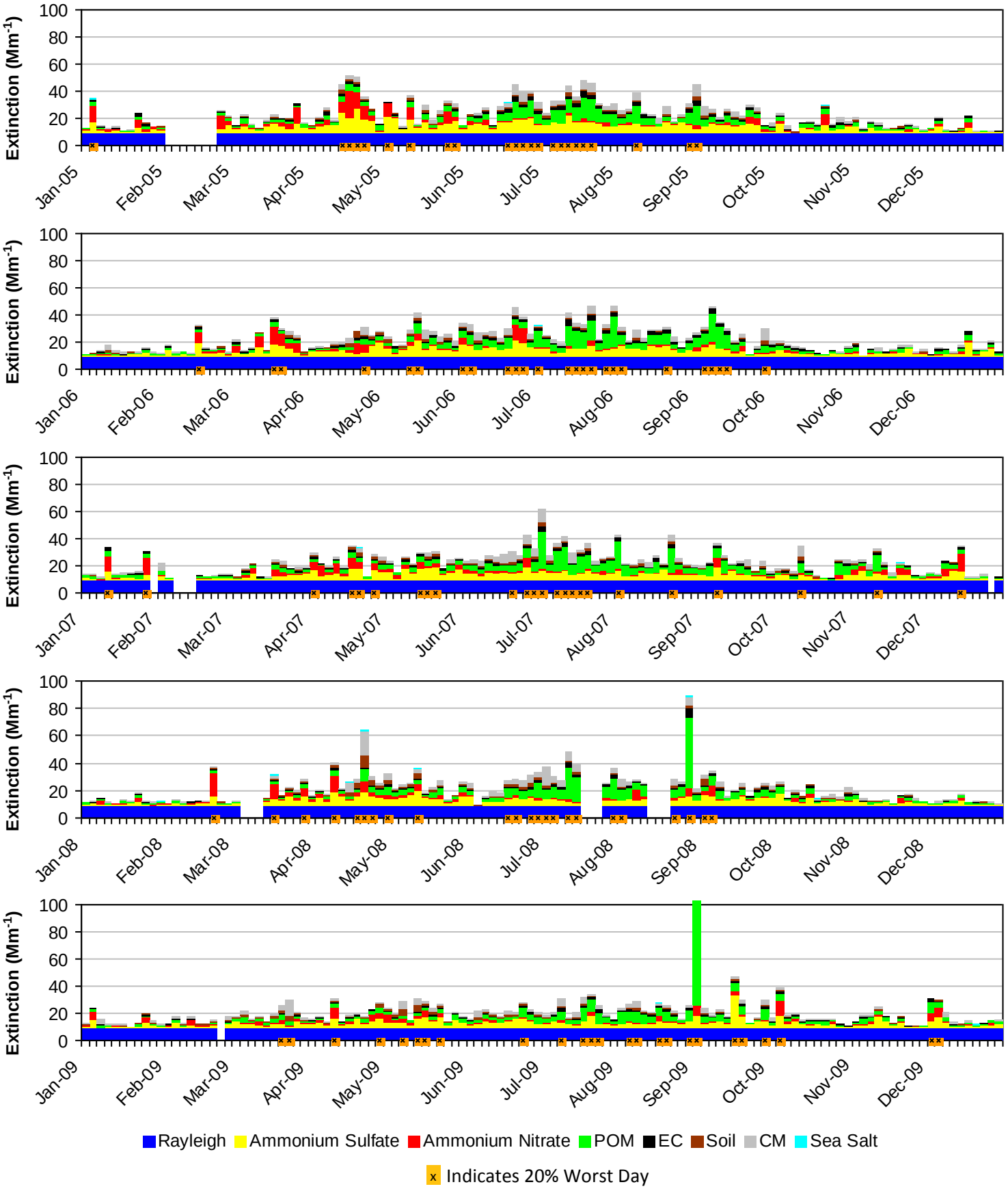


Figure D.4-8
Rocky Mountain NP, CO (ROMO1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



D.5. WEMINUCHE WA, BLACK CANYON OF THE GUNNISON WA, AND LA GARITA WA (WEMI1)

The following tables and figures are presented in this section for the Weminuche WA, Black Canyon of the Gunnison WA, and La Garita WA represented by the WEMI1 IMPROVE Monitor:

- **Table D.5-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure D.5-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure D.5-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure D.5-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure D.5-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure D.5-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure D.5-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure D.5-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

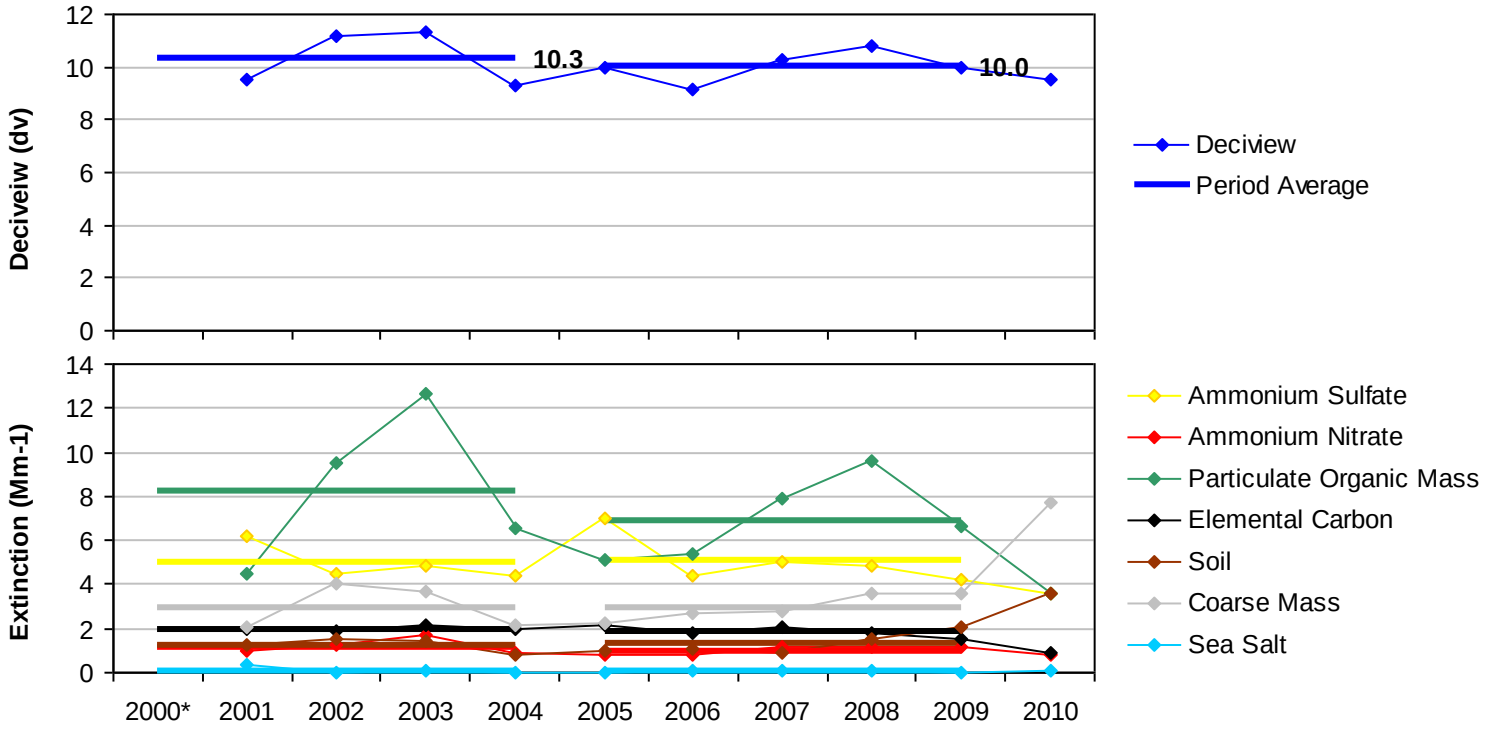
- **Figure D.5-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table D.5-1
Weminuche WA, Black Canyon of the Gunnison WA and La Garita WA, CO (WEMI1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period						2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	3.2	3.3	2.9	3.0	2.6	2.9	2.3	2.2	2.1	1.8	-0.2	0.0	3.1	2.4	-0.7	-23%
Worst 20% Days	---	9.5	11.2	11.3	9.3	10.0	9.2	10.3	10.8	10.0	9.5	0.0	0.5	10.3	10.0	-0.3	-3%
All Days	---	6.5	6.7	6.7	6.1	6.0	6.1	6.1	6.2	5.7	5.4	-0.1	0.0	6.5	6.0	-0.5	-8%
Total Extinction (Mm-1)																	
Best 20% Days	---	13.9	13.9	13.5	13.6	13.0	13.4	12.6	12.4	12.4	12.0	-0.2	0.0	13.7	12.8	-0.9	-7%
Worst 20% Days	---	26.2	31.7	35.6	25.9	27.2	25.1	28.9	31.5	28.3	29.2	0.1	0.5	29.9	28.2	-1.7	-6%
All Days	---	19.6	20.6	21.3	18.9	18.9	19.0	19.3	19.9	18.7	18.5	-0.1	0.2	20.1	19.2	-0.9	-5%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	1.7	1.6	1.2	1.4	1.4	1.7	1.2	1.1	1.4	1.2	-0.1	0.1	1.5	1.3	-0.2	-13%
Worst 20% Days	---	6.2	4.5	4.9	4.4	7.0	4.4	5.1	4.9	4.2	3.6	0.0	0.2	5.0	5.1	0.1	2%
All Days	---	3.9	3.0	2.9	3.0	3.7	3.2	3.0	3.1	2.9	2.6	0.0	0.3	3.2	3.2	0.0	0%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.3	0.4	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.0	0.1	0.3	0.2	-0.1	-33%
Worst 20% Days	---	1.0	1.3	1.7	0.9	0.8	0.8	1.1	1.2	1.2	0.8	0.0	0.5	1.2	1.0	-0.2	-17%
All Days	---	0.7	0.9	0.8	0.6	0.6	0.6	0.7	0.6	0.6	0.5	0.0	0.1	0.8	0.6	-0.2	-25%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	1.2	1.2	1.2	1.3	1.2	1.0	0.9	0.7	0.6	0.6	-0.1	0.0	1.2	0.9	-0.3	-25%
Worst 20% Days	---	4.5	9.5	12.7	6.6	5.1	5.4	7.9	9.6	6.6	3.6	0.2	0.3	8.3	6.9	-1.4	-17%
All Days	---	2.6	3.8	4.7	3.2	2.7	2.8	3.3	3.7	2.8	2.1	0.0	0.5	3.6	3.1	-0.5	-14%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.8	0.7	0.8	0.9	0.7	0.8	0.5	0.5	0.3	0.4	-0.1	0.0	0.8	0.5	-0.3	-38%
Worst 20% Days	---	2.0	1.9	2.2	2.0	2.1	1.8	2.0	1.8	1.5	0.9	0.0	0.1	2.0	1.8	-0.2	-10%
All Days	---	1.4	1.3	1.4	1.3	1.4	1.4	1.2	1.0	0.9	0.8	-0.1	0.0	1.4	1.2	-0.2	-14%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.0	0.2	0.2	0.2	0.0	0%
Worst 20% Days	---	1.2	1.5	1.4	0.8	0.9	1.1	0.9	1.5	2.1	3.6	0.0	0.4	1.3	1.3	0.0	0%
All Days	---	0.6	0.7	0.6	0.4	0.4	0.5	0.5	0.7	0.9	1.1	0.0	0.4	0.6	0.6	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.6	0.7	0.7	0.5	0.4	0.6	0.6	0.6	0.6	0.4	0.0	0.4	0.7	0.6	-0.1	-14%
Worst 20% Days	---	2.1	4.1	3.6	2.2	2.2	2.7	2.8	3.6	3.6	7.7	0.1	0.2	3.0	3.0	0.0	0%
All Days	---	1.3	1.9	1.8	1.3	1.2	1.5	1.5	1.7	1.6	2.4	0.0	0.5	1.6	1.5	-0.1	-6%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0%
Worst 20% Days	---	0.3	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.2	0.1	0.0	-0.1	-100%
All Days	---	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.5	0.1	0.0	-0.1	-100%

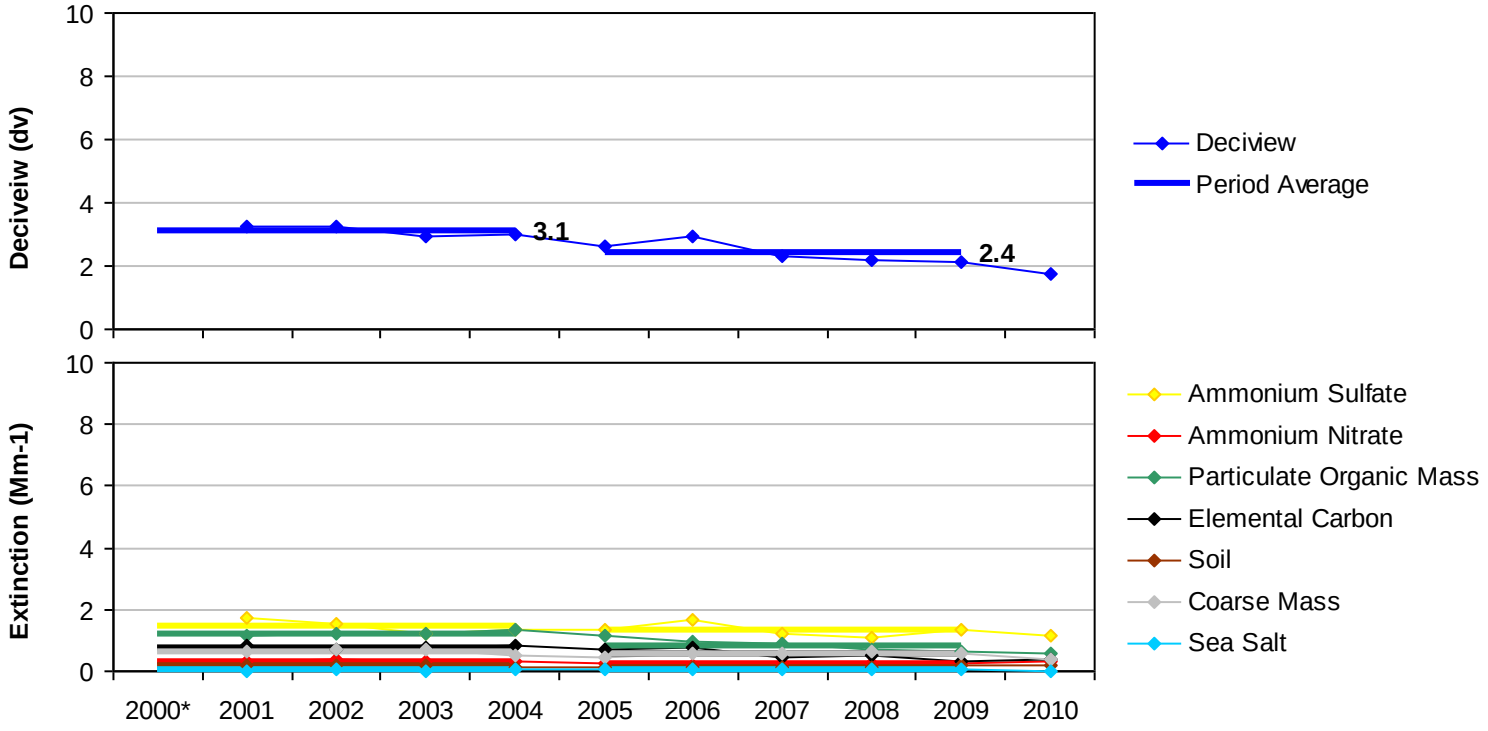
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure D.5-1
Weminuche WA, Black Canyon of the Gunnison WA and La Garita WA, CO (WEMI1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure D.5-2
Weminuche WA, Black Canyon of the Gunnison WA and La Garita WA, CO (WEMI1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

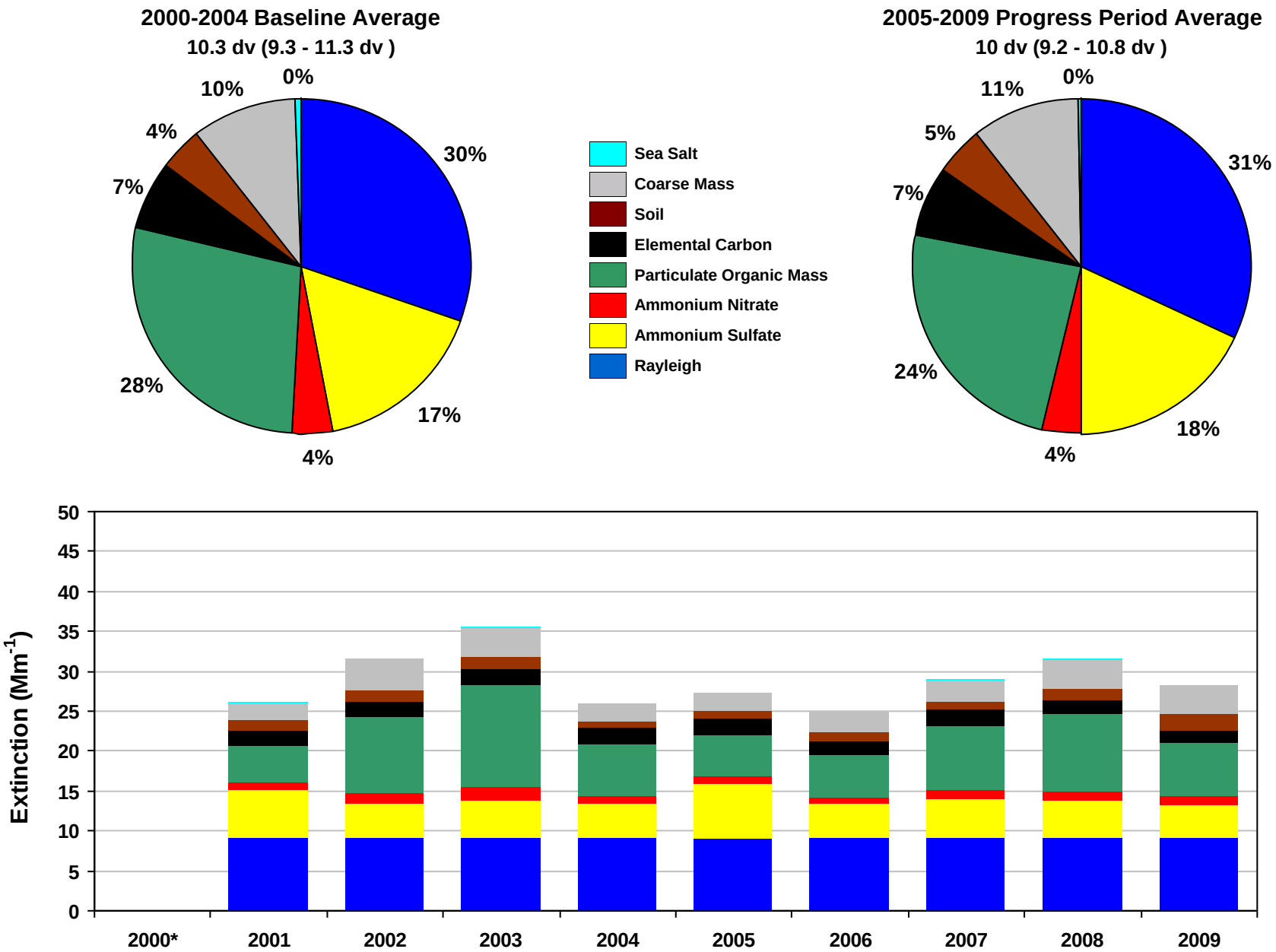


*Missing years did not meet RHR data completeness criteria.

Figure D.5-3

Weminuche WA, Black Canyon of the Gunnison WA and La Garita WA, CO (WEMI1 Site)

20% Most Impaired Visibility Days

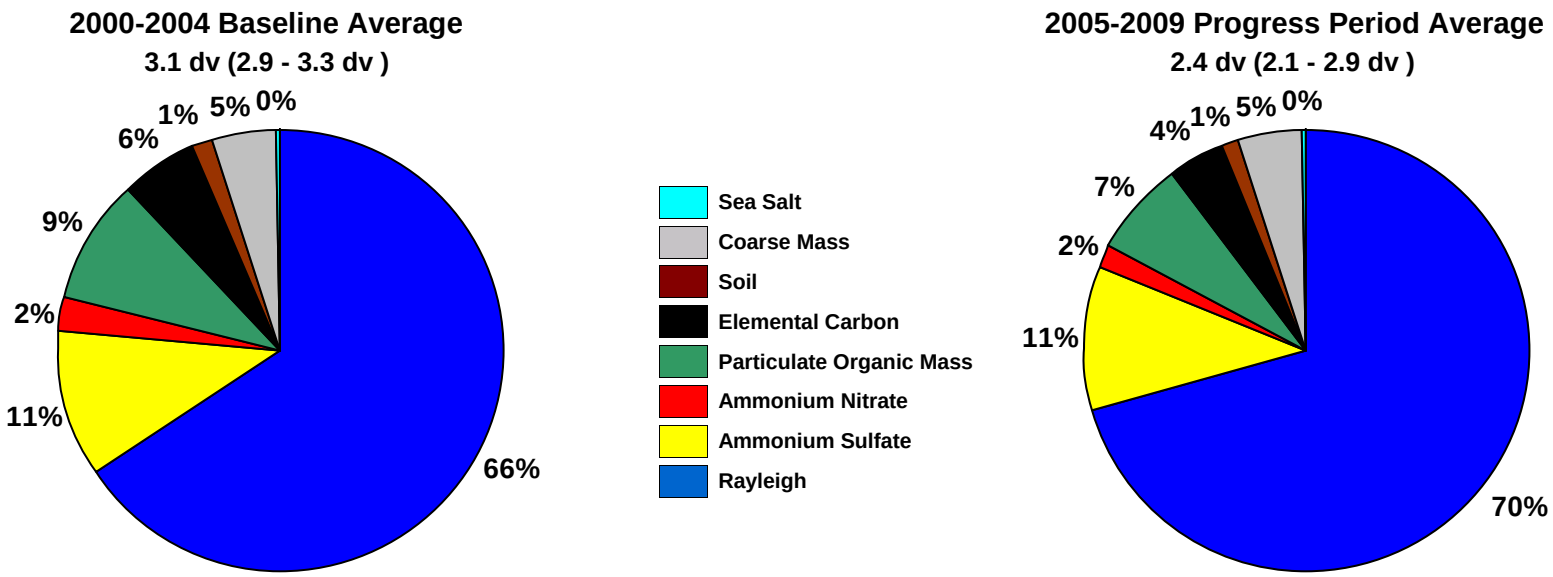


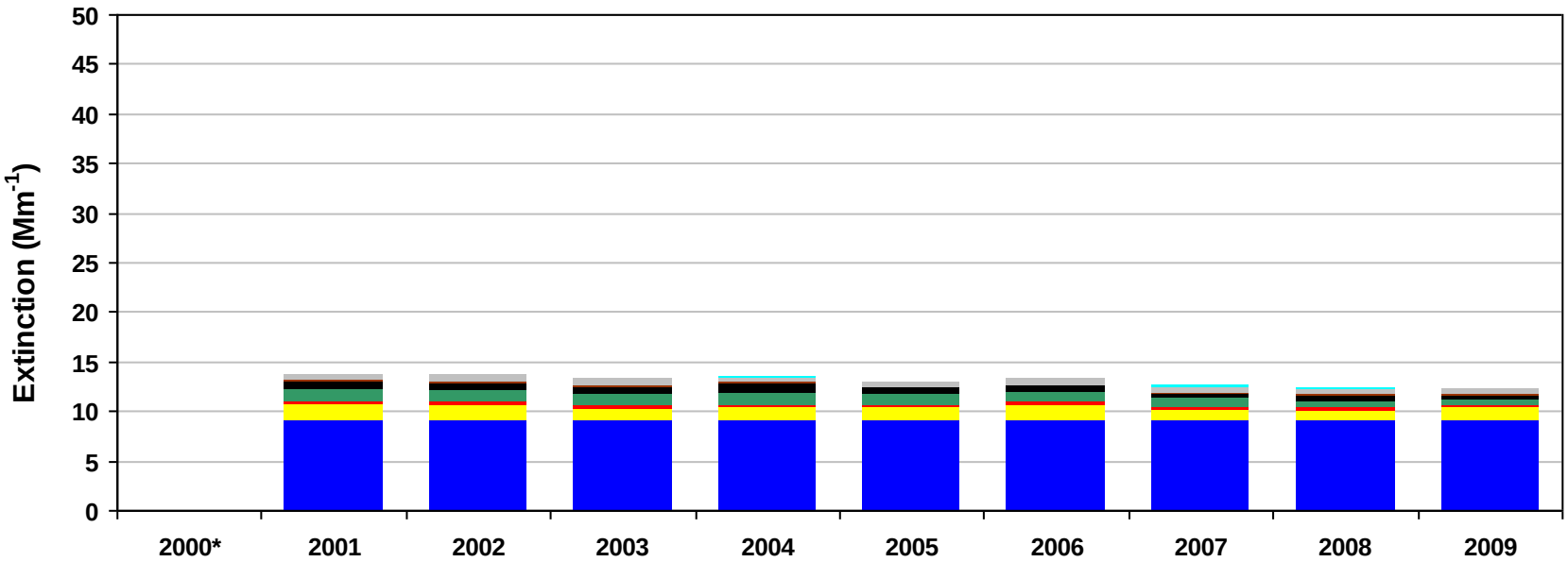
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure D.5-4

Weminuche WA, Black Canyon of the Gunnison WA and La Garita WA, CO (WEMI1 Site)

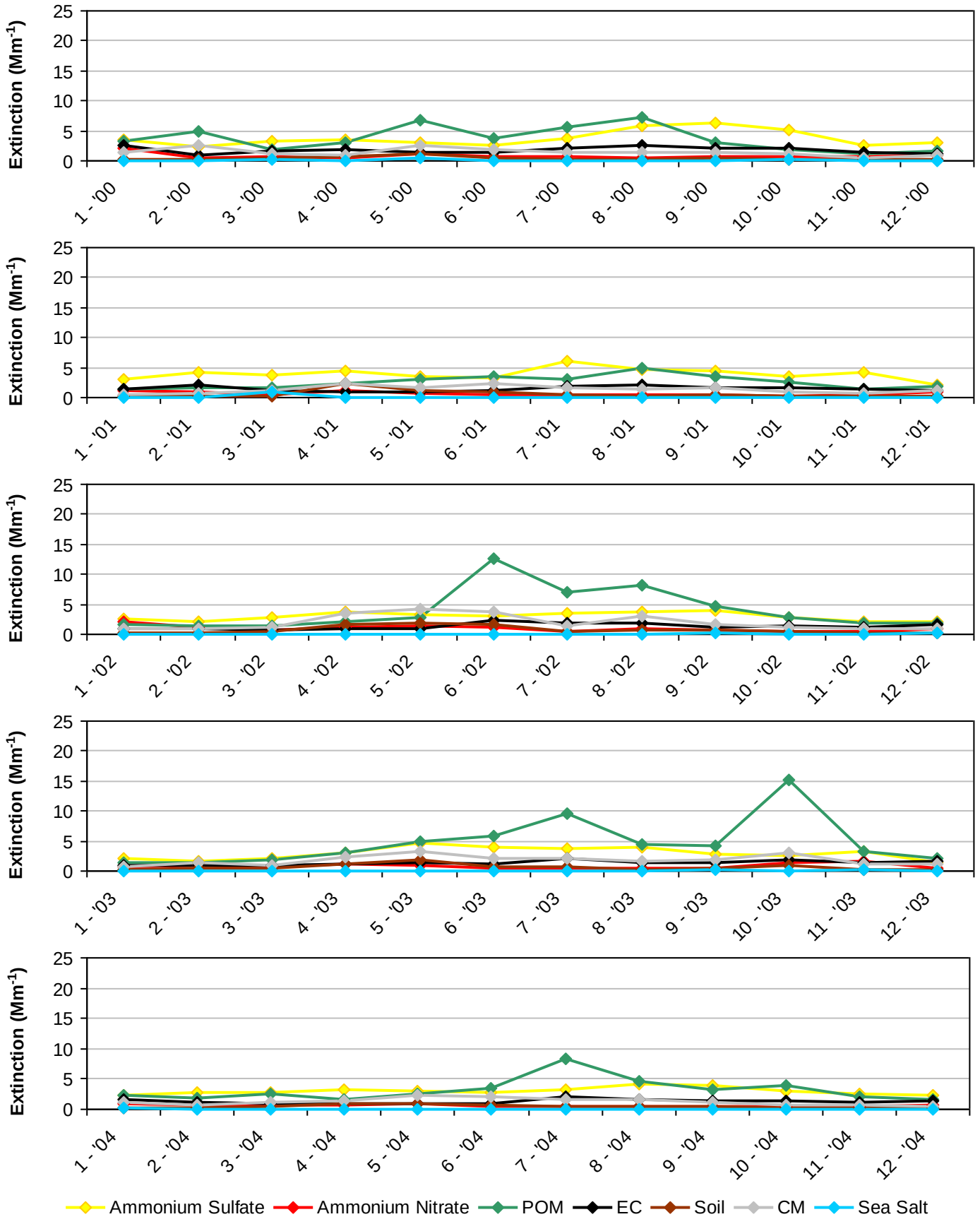
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure D.5-5
Weminuche WA, Black Canyon of the Gunnison WA and La Garita WA, CO (WEMI1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure D.5-6
Weminuche WA, Black Canyon of the Gunnison WA and La Garita WA, CO (WEMI1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

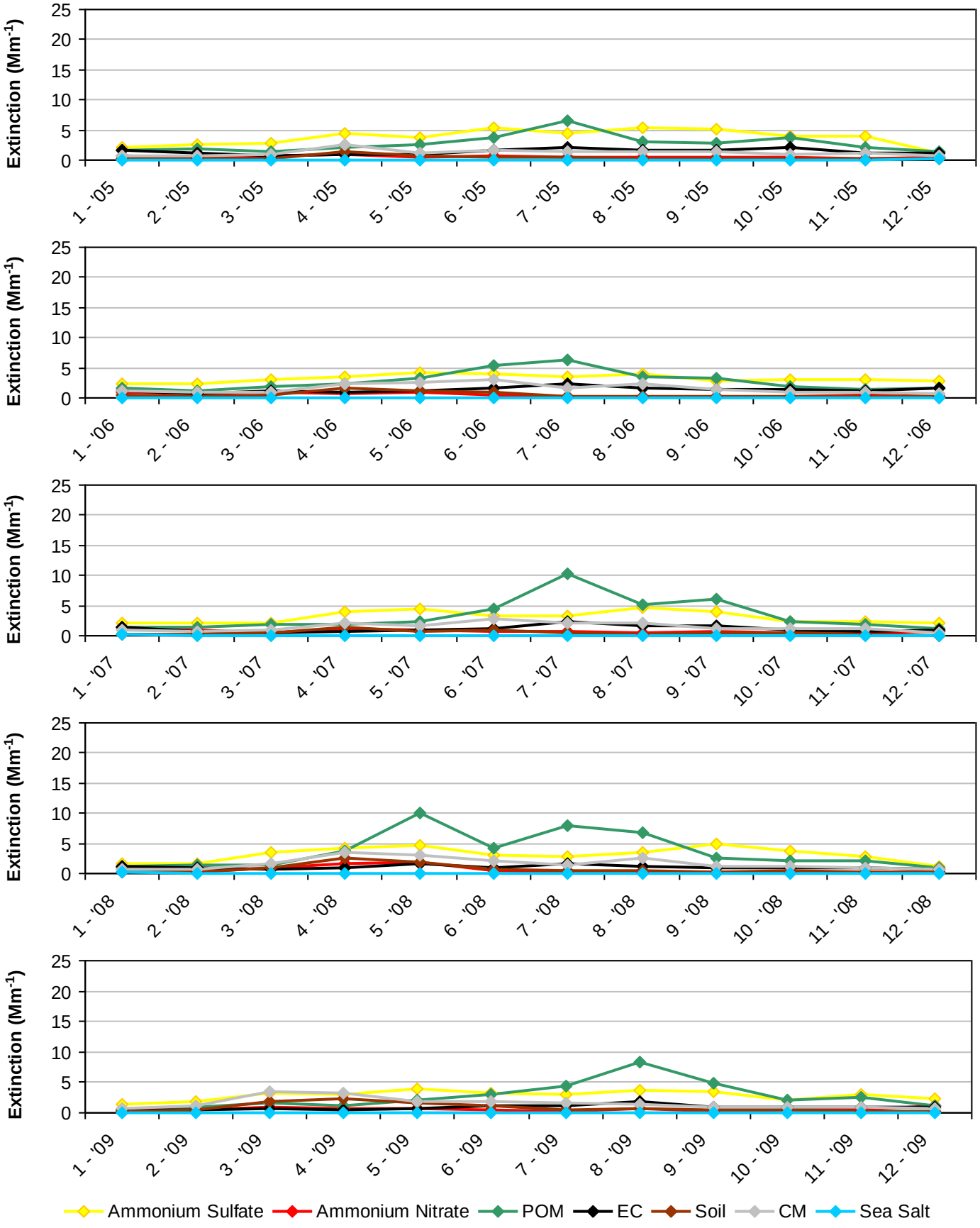
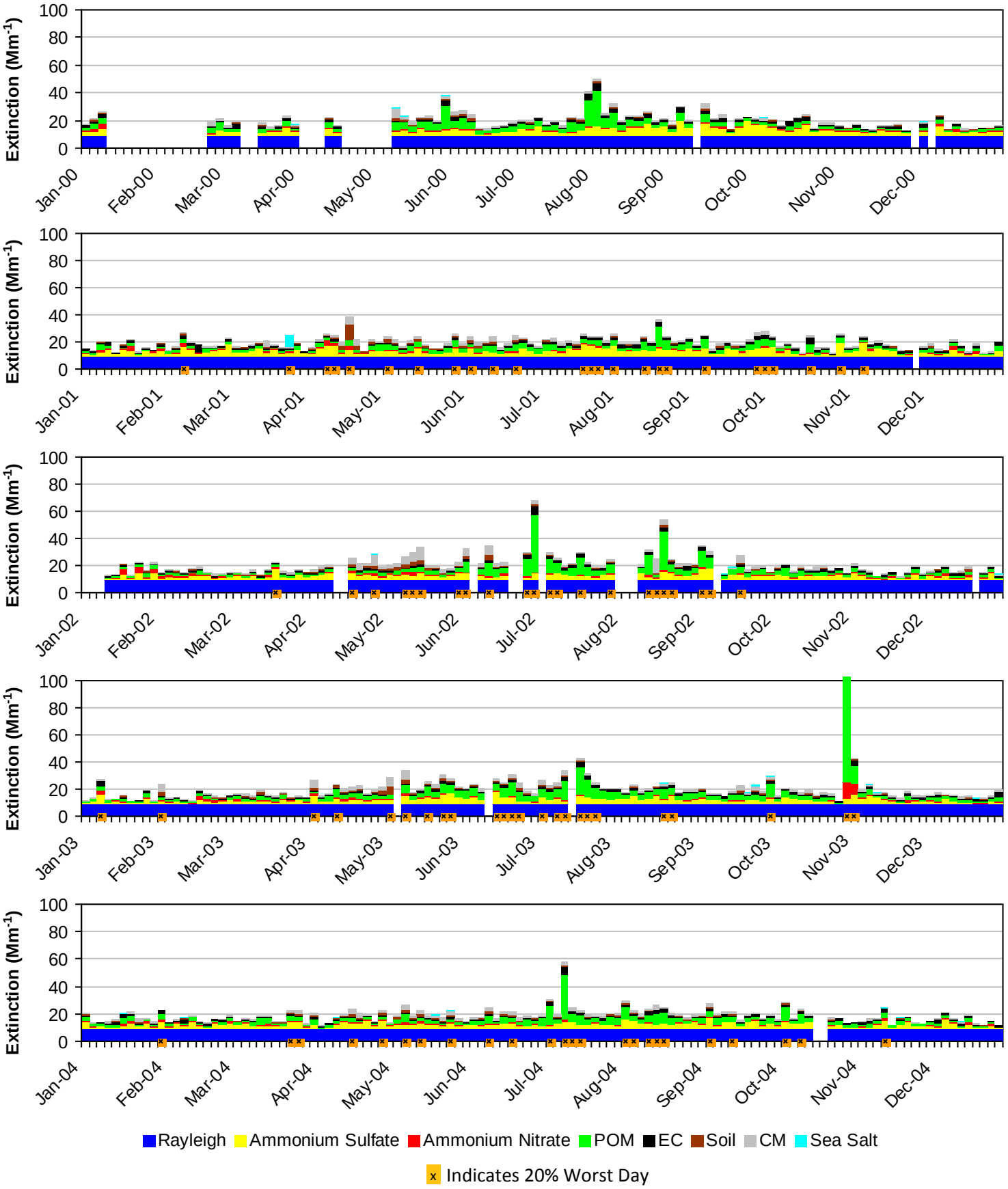
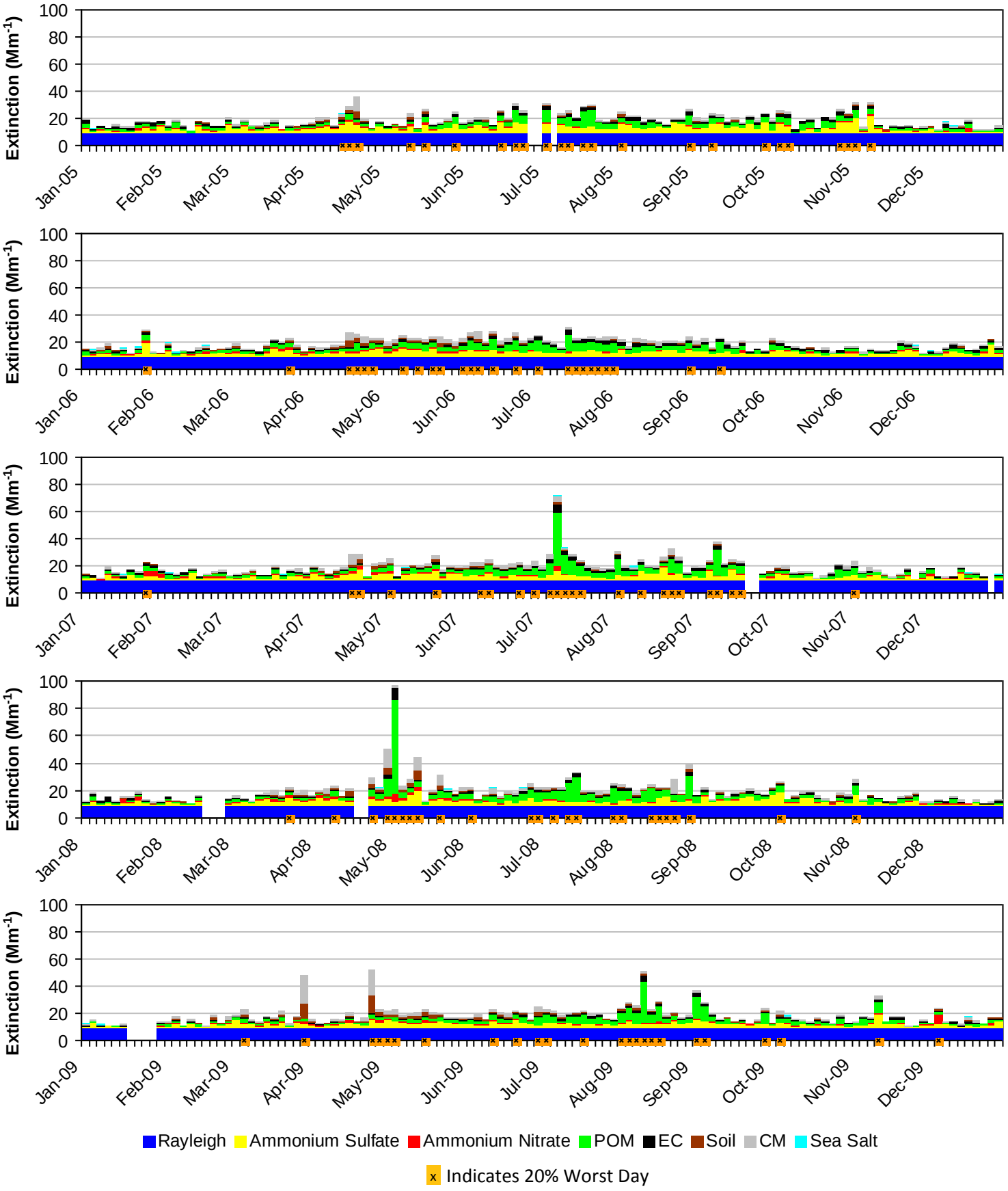


Figure D.5-7
Weminuche WA, Black Canyon of the Gunnison WA and La Garita WA, CO (WEMI1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure D.5-8
Weminuche WA, Black Canyon of the Gunnison WA and La Garita WA, CO (WEMI1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



D.6. EAGLES NEST WA, FLAT TOPS WA, MAROON BELLS-SNOWMASS WA, AND WEST ELK WA (WHRI1)

The following tables and figures are presented in this section for the Eagles Nest WA, Flat Tops WA, Maroon Bells-Snowmass WA, and West Elk WA represented by the WHRI1 IMPROVE Monitor:

- **Table D.6-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure D.6-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure D.6-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure D.6-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure D.6-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure D.6-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure D.6-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure D.6-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

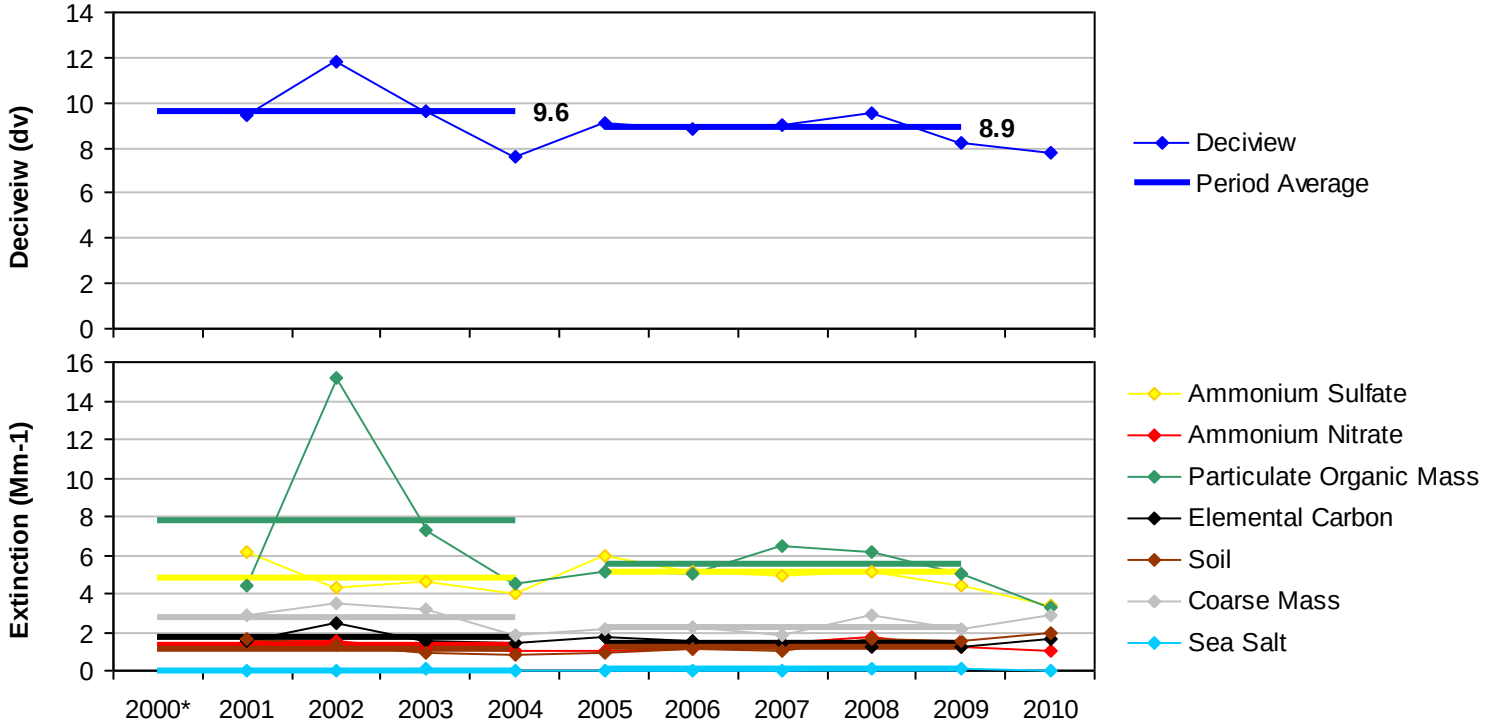
- **Figure D.6-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table D.6-1
Eagles Nest WA, Flat Tops WA, Maroon Bells-Snowmass WA and West Elk WA, CO (WHRI1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	1.1	0.6	0.6	0.6	-0.1	0.5	0.3	0.1	0.1	0.0	-0.1	0.0	0.7	0.2	-0.5	-71%
Worst 20% Days	---	9.4	11.8	9.6	7.6	9.1	8.8	9.0	9.6	8.3	7.8	-0.1	0.1	9.6	8.9	-0.7	-7%
All Days	---	5.0	5.6	4.7	4.1	4.1	4.6	4.5	4.5	4.1	3.7	-0.1	0.0	4.8	4.4	-0.4	-8%
Total Extinction (Mm-1)																	
Best 20% Days	---	11.2	10.7	10.6	10.6	10.0	10.6	10.4	10.1	10.2	10.0	-0.1	0.0	10.8	10.2	-0.6	-6%
Worst 20% Days	---	26.1	36.4	26.6	21.7	25.1	24.3	25.2	26.9	23.7	22.2	-0.3	0.2	27.7	25.0	-2.7	-10%
All Days	---	17.2	19.6	17.0	15.6	16.0	16.6	16.5	16.8	15.8	15.1	-0.1	0.1	17.4	16.3	-1.1	-6%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	1.3	0.9	1.0	1.1	0.9	1.3	0.9	1.0	1.0	0.9	0.0	0.5	1.1	1.0	-0.1	-9%
Worst 20% Days	---	6.1	4.3	4.6	4.0	6.0	5.1	4.9	5.1	4.4	3.4	0.0	0.4	4.8	5.1	0.3	6%
All Days	---	3.4	2.8	2.8	2.7	3.2	3.2	2.9	3.0	2.8	2.5	0.0	0.3	2.9	3.0	0.1	3%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.0	0.0	0.3	0.2	-0.1	-33%
Worst 20% Days	---	1.5	1.5	1.1	1.1	1.0	1.2	1.5	1.7	1.3	1.0	0.0	0.5	1.3	1.3	0.0	0%
All Days	---	0.8	1.0	0.8	0.8	0.7	0.7	0.9	0.9	0.7	0.7	0.0	0.2	0.8	0.8	0.0	0%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	0.7	0.7	0.5	0.5	0.3	0.4	0.4	0.3	0.1	0.2	-0.1	0.0	0.6	0.3	-0.3	-50%
Worst 20% Days	---	4.4	15.2	7.2	4.5	5.2	5.1	6.4	6.2	5.0	3.3	0.0	0.5	7.8	5.6	-2.2	-28%
All Days	---	2.1	4.7	2.7	2.0	1.9	2.1	2.4	2.3	1.8	1.4	-0.1	0.1	2.9	2.1	-0.8	-28%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.0	0.0	0.5	0.3	-0.2	-40%
Worst 20% Days	---	1.6	2.5	1.5	1.4	1.8	1.5	1.4	1.2	1.2	1.6	-0.1	0.0	1.8	1.4	-0.4	-22%
All Days	---	0.9	1.0	0.9	0.8	0.9	0.9	0.8	0.6	0.6	0.7	0.0	0.0	0.9	0.8	-0.1	-11%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.3	0.1	0.1	0.0	0%
Worst 20% Days	---	1.6	1.3	0.9	0.9	1.0	1.1	1.0	1.6	1.6	2.0	0.0	0.3	1.2	1.3	0.1	8%
All Days	---	0.6	0.6	0.5	0.4	0.4	0.6	0.5	0.7	0.7	0.8	0.0	0.3	0.5	0.6	0.1	20%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.3	0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.4	0.2	0.0	0.5	0.2	0.3	0.1	50%
Worst 20% Days	---	2.8	3.5	3.1	1.8	2.1	2.3	1.9	2.9	2.2	2.8	-0.1	0.2	2.8	2.3	-0.5	-18%
All Days	---	1.4	1.5	1.3	0.9	0.9	1.1	1.0	1.2	1.1	1.1	0.0	0.2	1.3	1.1	-0.2	-15%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0%
Worst 20% Days	---	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0%
All Days	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0%

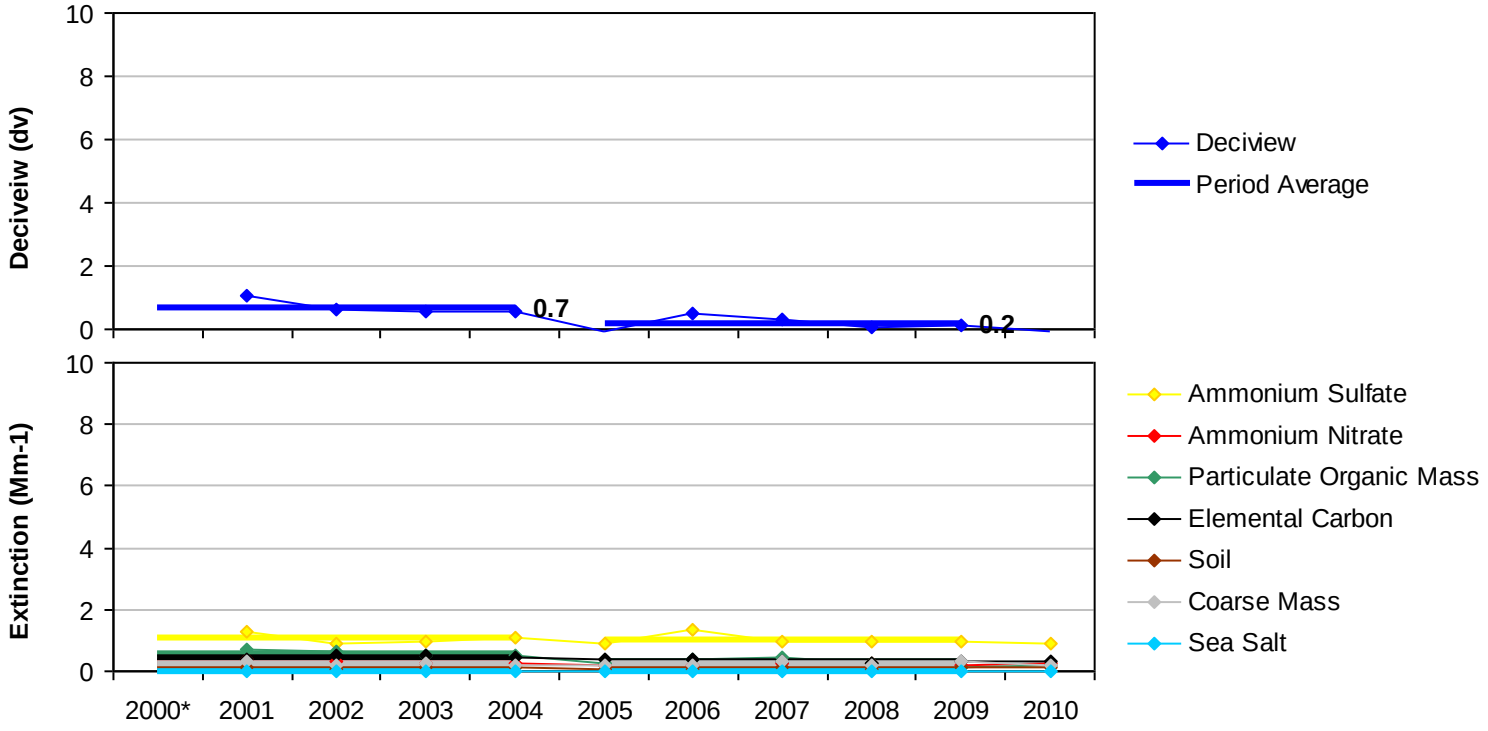
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure D.6-1
Eagles Nest WA, Flat Tops WA, Maroon Bells-Snowmass WA and West Elk WA, CO (WHRI1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure D.6-2
Eagles Nest WA, Flat Tops WA, Maroon Bells-Snowmass WA and West Elk WA, CO (WHRI1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

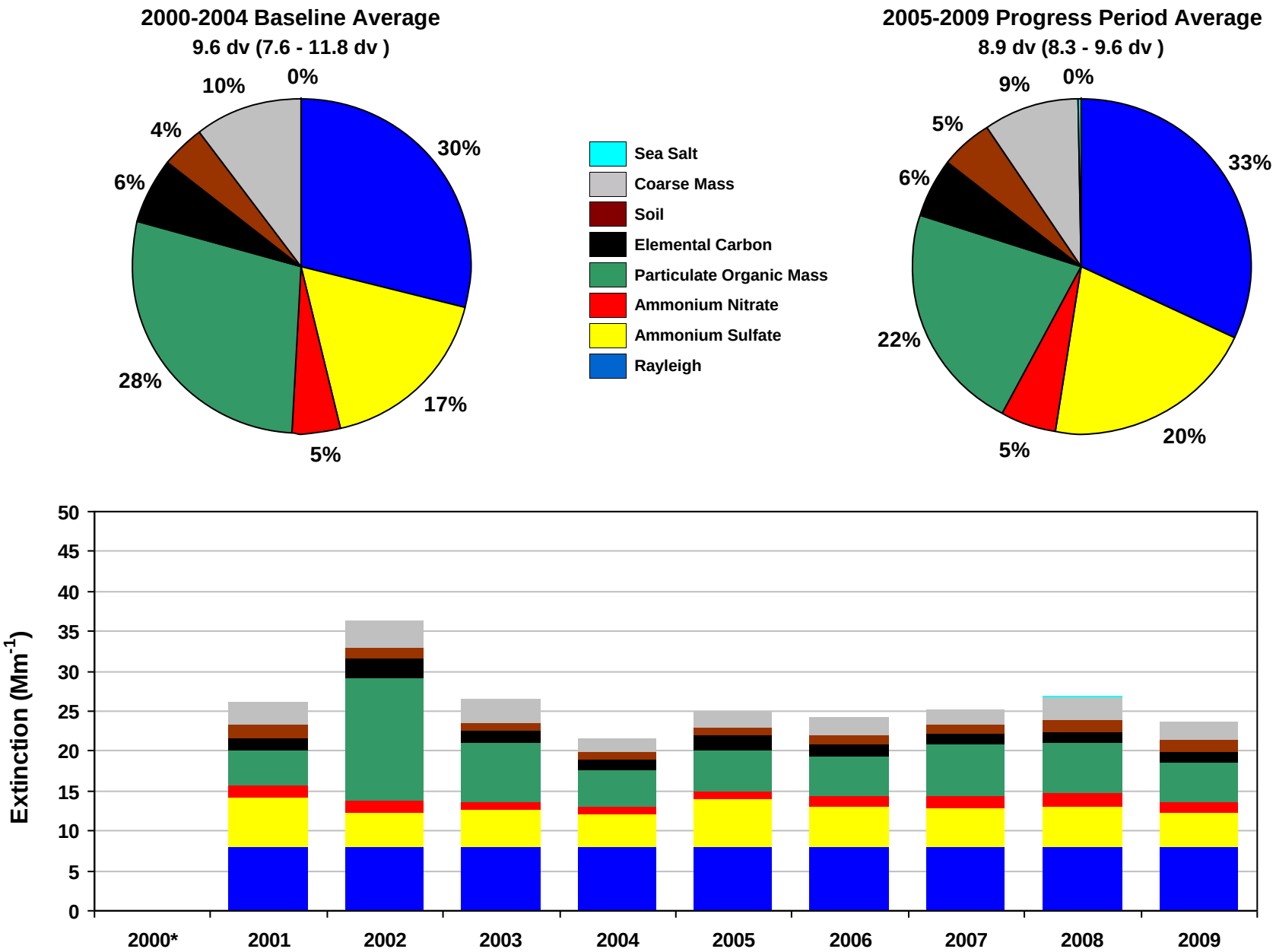


*Missing years did not meet RHR data completeness criteria.

Figure D.6-3

Eagles Nest WA, Flat Tops WA, Maroon Bells-Snowmass WA and West Elk WA, CO (WHRI1 Site)

20% Most Impaired Visibility Days

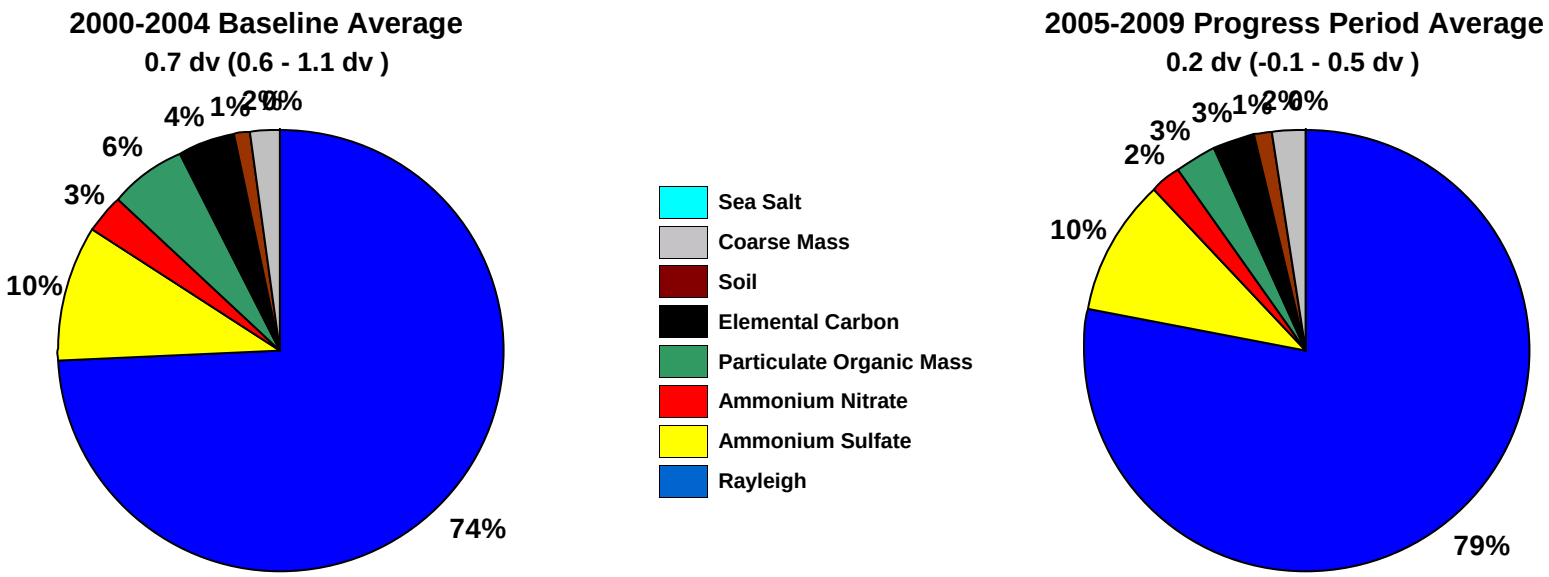


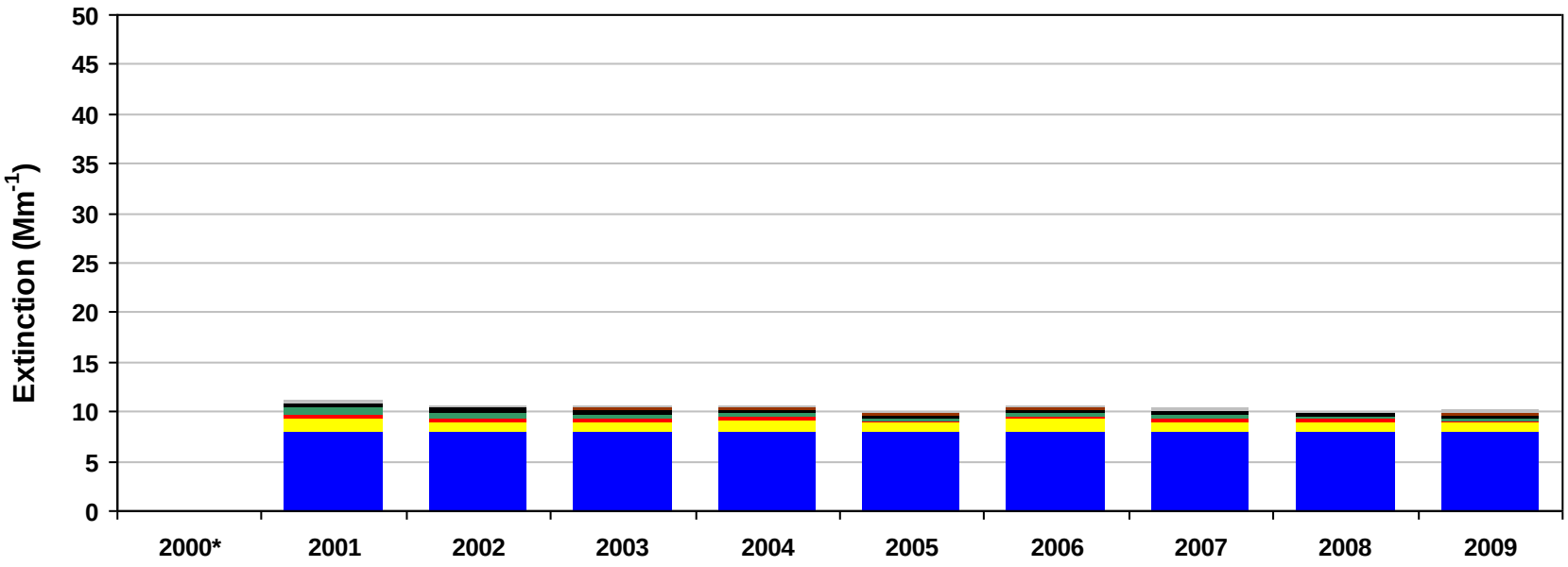
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure D.6-4

Eagles Nest WA, Flat Tops WA, Maroon Bells-Snowmass WA and West Elk WA, CO (WHRI1 Site)

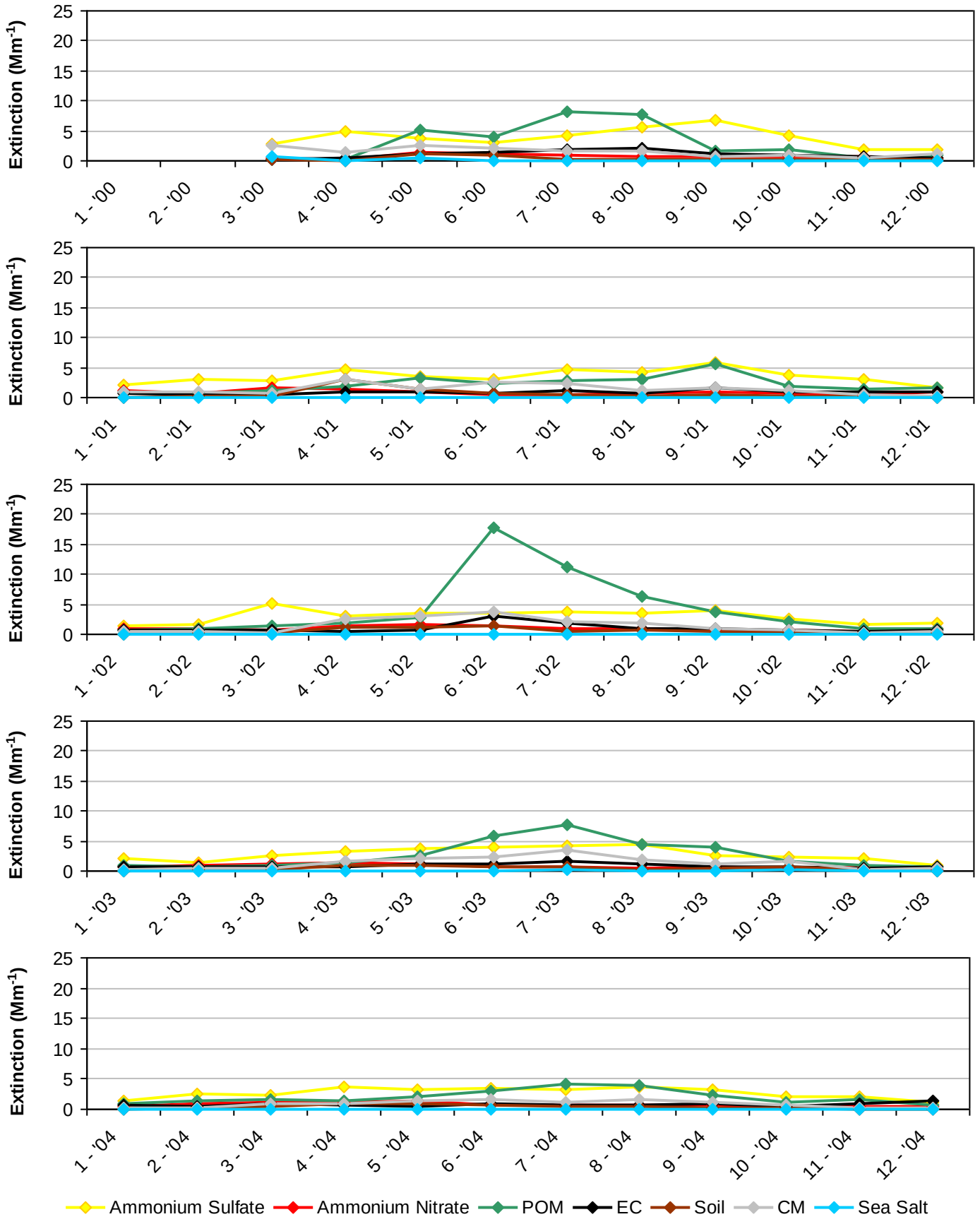
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure D.6-5
Eagles Nest WA, Flat Tops WA, Maroon Bells-Snowmass WA and West Elk WA, CO (WHRI1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure D.6-6
Eagles Nest WA, Flat Tops WA, Maroon Bells-Snowmass WA and West Elk WA, CO (WHRI1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

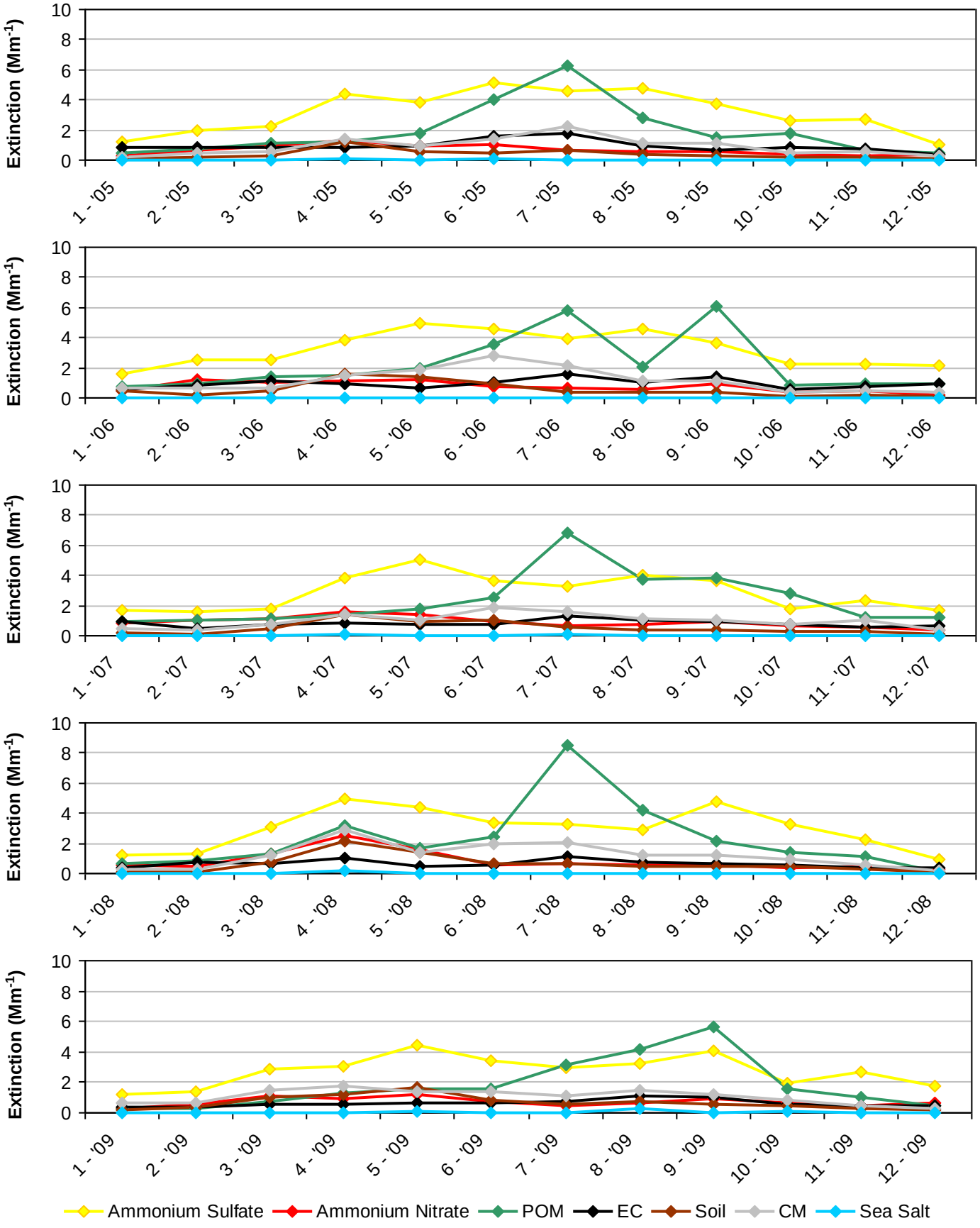
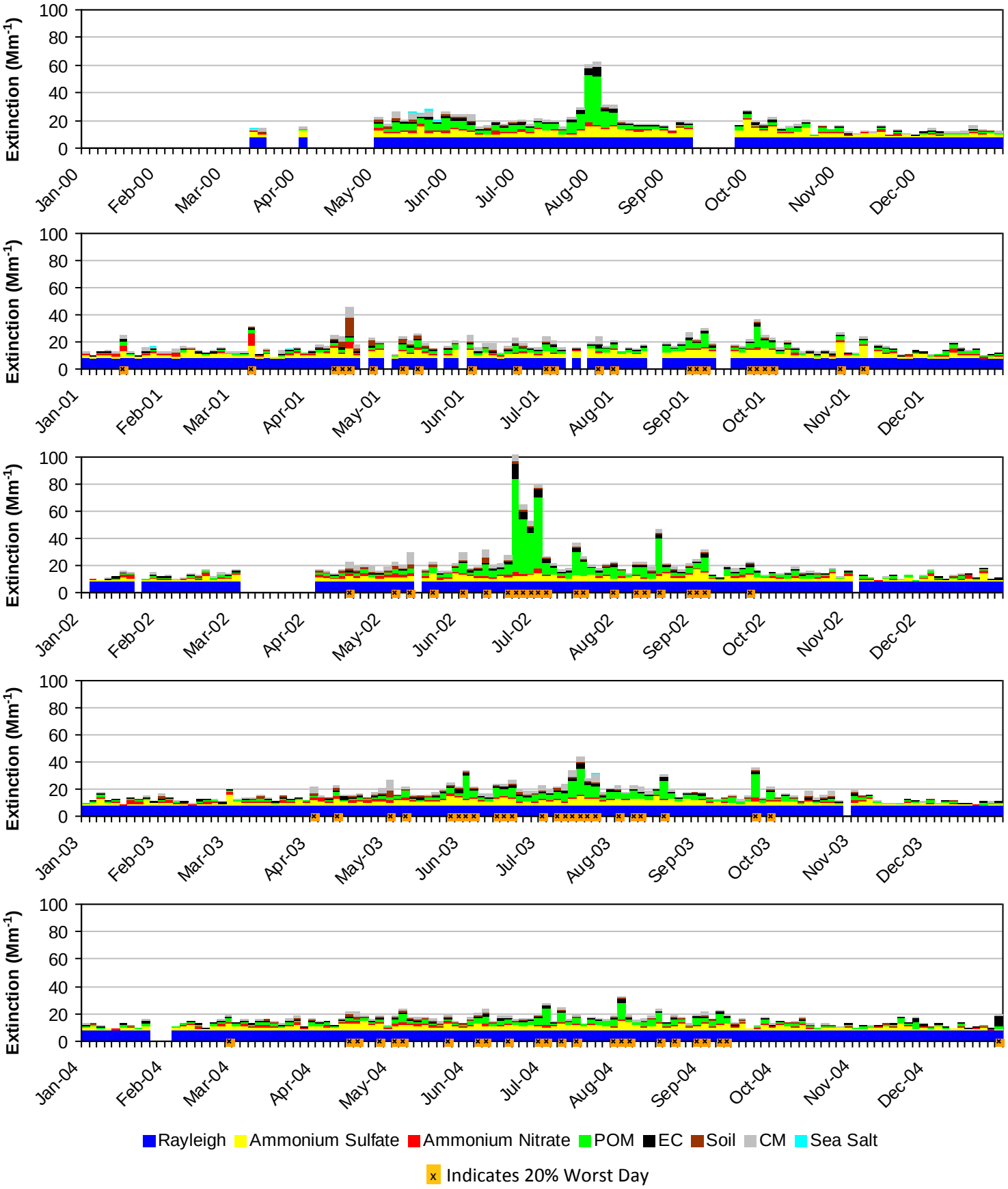
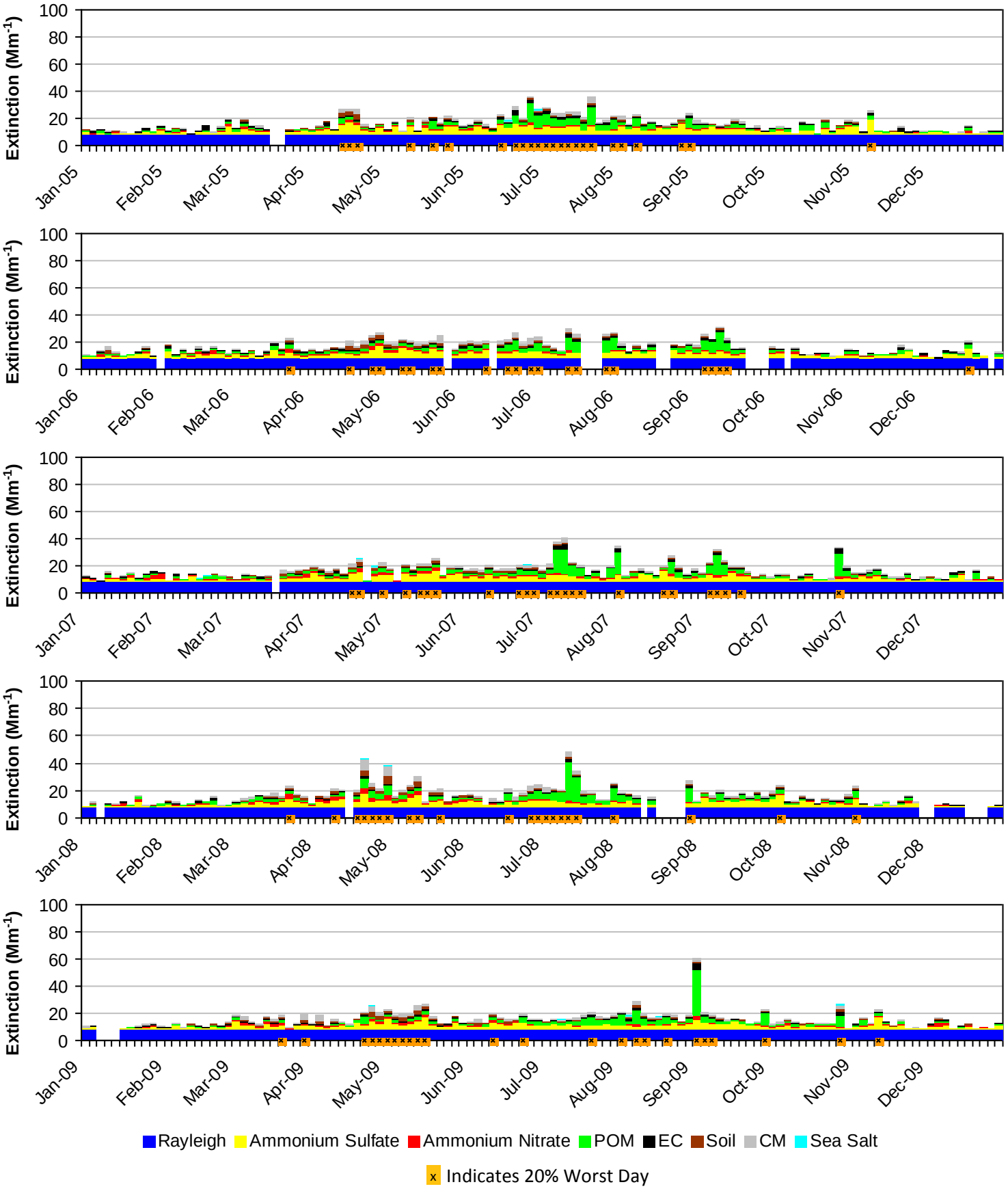


Figure D.6-7
Eagles Nest WA, Flat Tops WA, Maroon Bells-Snowmass WA and West Elk WA, CO (WHRI1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure D.6-8
Eagles Nest WA, Flat Tops WA, Maroon Bells-Snowmass WA and West Elk WA, CO (WHRI1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



APPENDIX E:

Hawaii Class I Area Monitoring Data Summary Tables and Charts

Includes the following subsections:

Subsection	IMPROVE Monitor	Class I Area(s) Represented
E.1	HACR1	Haleakala NP
E.2	HALE1	Haleakala NP
E.3	HAVO1	Hawaii Volcanoes NP

E.1. HALEAKALA NP (HACR1)

The following tables and figures are presented in this section for the Haleakala NP represented by the HACR1 IMPROVE Monitor:

- **Table E.1-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure E.1-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure E.1-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure E.1-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure E.1-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure E.1-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure E.1-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure E.1-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

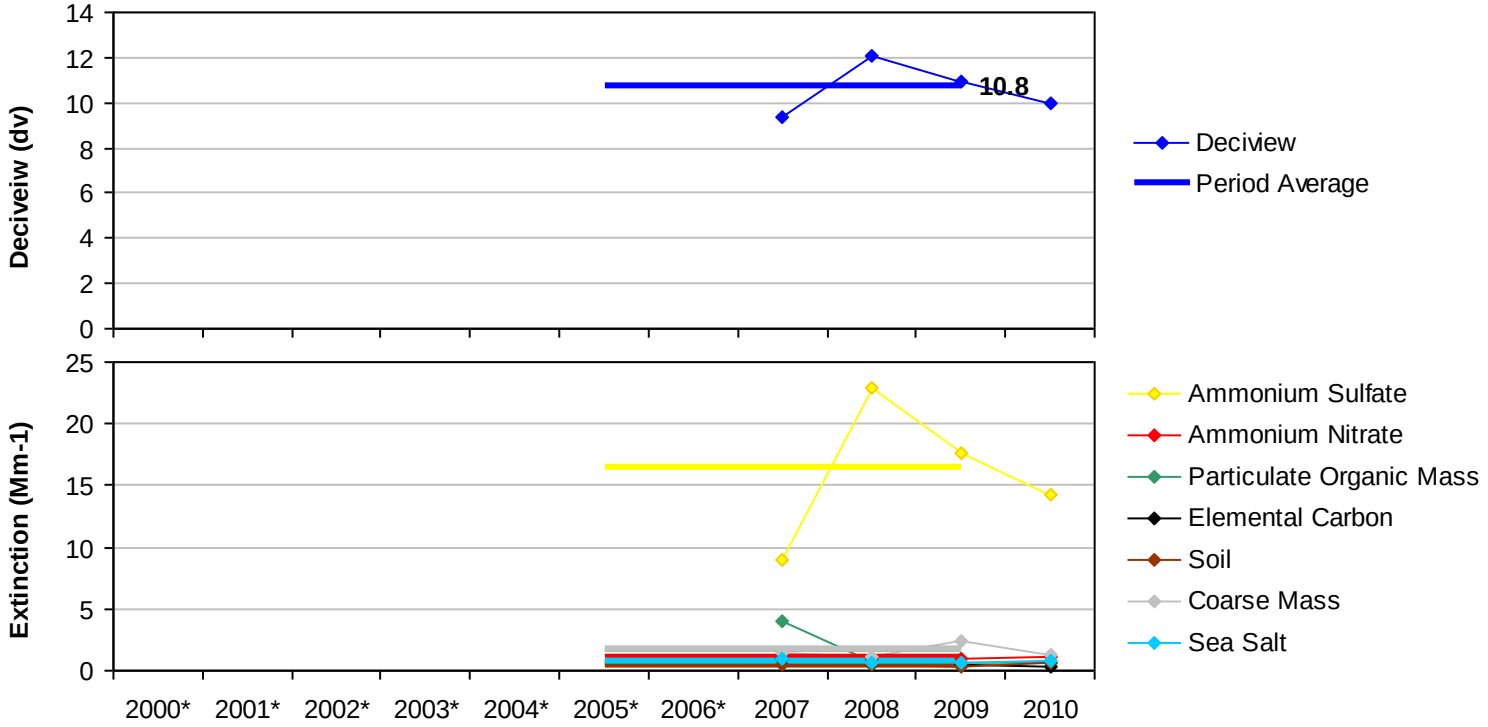
- **Figure E.1-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table E.1-1
Haleakala NP, HI (HACR1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	---	---	---	---	---	---	0.8	0.6	1.3	0.4	N/A	N/A	1.0	0.9	-0.1	-10%
Worst 20% Days	---	---	---	---	---	---	---	9.3	12.1	10.9	9.9	N/A	N/A	9.5	10.8	1.3	14%
All Days	---	---	---	---	---	---	---	4.4	5.3	5.2	4.5	N/A	N/A	4.6	5.0	0.4	9%
Total Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	---	---	---	10.9	10.6	11.4	10.4	N/A	N/A	11.1	11.0	-0.1	-1%
Worst 20% Days	---	---	---	---	---	---	---	27.3	36.3	32.3	28.1	N/A	N/A	27.7	32.0	4.3	16%
All Days	---	---	---	---	---	---	---	16.6	19.1	18.4	16.8	N/A	N/A	17.2	18.0	0.8	5%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	---	---	---	1.0	1.0	1.2	0.8	N/A	N/A	1.1	1.0	-0.1	-9%
Worst 20% Days	---	---	---	---	---	---	---	9.0	22.9	17.6	14.3	N/A	N/A	10.9	16.5	5.6	51%
All Days	---	---	---	---	---	---	---	3.7	7.3	6.2	5.1	N/A	N/A	4.5	5.7	1.2	27%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	---	---	---	0.2	0.1	0.2	0.1	N/A	N/A	0.2	0.1	-0.1	-50%
Worst 20% Days	---	---	---	---	---	---	---	1.3	1.0	1.0	1.1	N/A	N/A	1.4	1.1	-0.3	-21%
All Days	---	---	---	---	---	---	---	0.7	0.6	0.6	0.6	N/A	N/A	0.7	0.6	-0.1	-14%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	---	---	---	0.1	0.0	0.1	0.0	N/A	N/A	0.1	0.1	0.0	0%
Worst 20% Days	---	---	---	---	---	---	---	4.1	0.7	0.7	0.7	N/A	N/A	2.4	1.8	-0.6	-25%
All Days	---	---	---	---	---	---	---	1.2	0.4	0.3	0.3	N/A	N/A	0.8	0.6	-0.2	-25%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	---	---	---	0.0	0.0	0.1	0.0	N/A	N/A	0.1	0.0	-0.1	-100%
Worst 20% Days	---	---	---	---	---	---	---	0.9	0.5	0.5	0.4	N/A	N/A	0.8	0.6	-0.2	-25%
All Days	---	---	---	---	---	---	---	0.3	0.2	0.2	0.2	N/A	N/A	0.3	0.2	-0.1	-33%
Soil Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	---	---	---	0.0	0.1	0.1	0.1	N/A	N/A	0.1	0.1	0.0	0%
Worst 20% Days	---	---	---	---	---	---	---	0.5	0.4	0.4	0.7	N/A	N/A	0.4	0.4	0.0	0%
All Days	---	---	---	---	---	---	---	0.2	0.2	0.2	0.3	N/A	N/A	0.2	0.2	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	---	---	---	0.2	0.2	0.5	0.2	N/A	N/A	0.4	0.3	-0.1	-25%
Worst 20% Days	---	---	---	---	---	---	---	1.4	1.2	2.5	1.2	N/A	N/A	2.3	1.7	-0.6	-26%
All Days	---	---	---	---	---	---	---	0.8	0.7	1.3	0.8	N/A	N/A	1.2	0.9	-0.3	-25%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	---	---	---	0.3	0.3	0.3	0.2	N/A	N/A	0.2	0.3	0.1	50%
Worst 20% Days	---	---	---	---	---	---	---	1.0	0.6	0.6	0.7	N/A	N/A	0.5	0.7	0.2	40%
All Days	---	---	---	---	---	---	---	0.7	0.6	0.6	0.6	N/A	N/A	0.4	0.6	0.2	50%

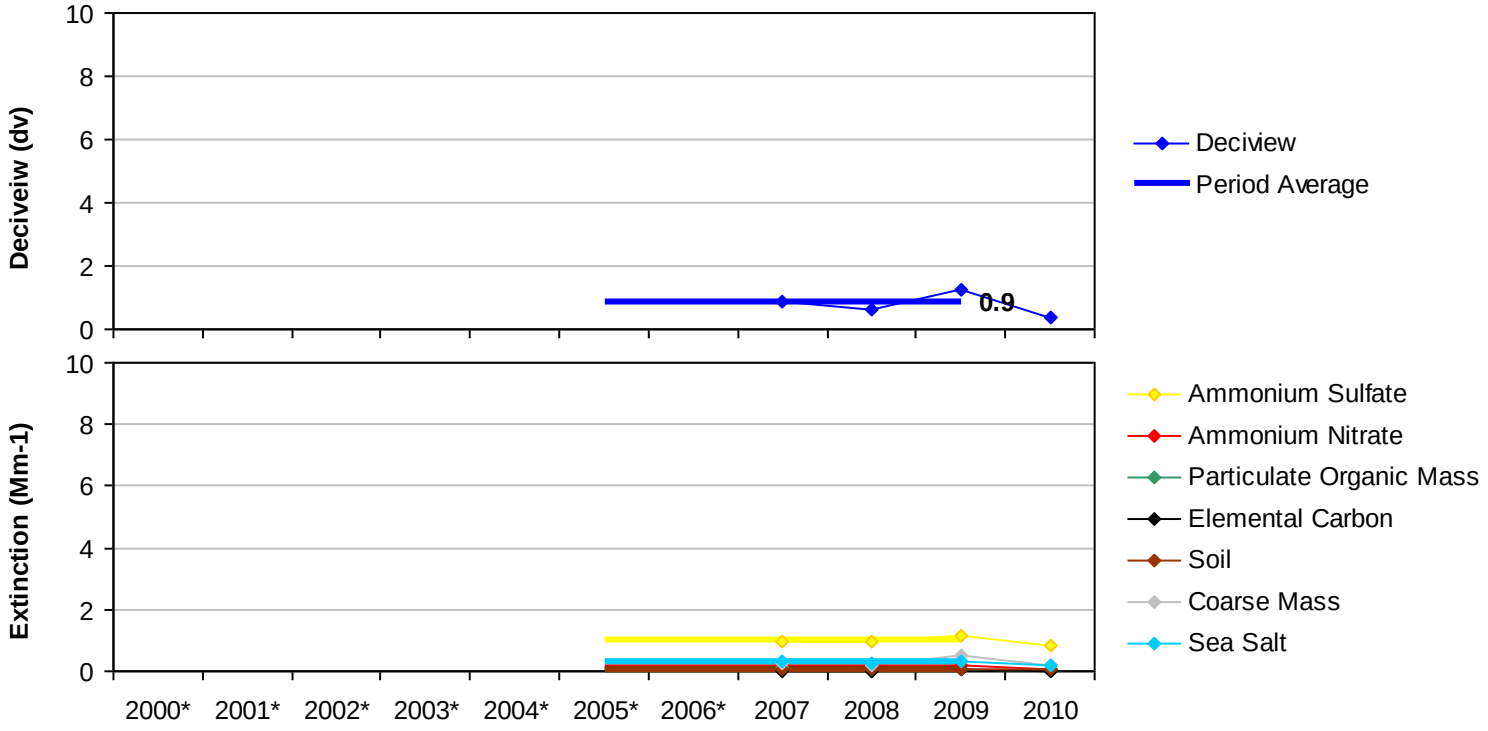
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure E.1-1
Haleakala NP, HI (HACR1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



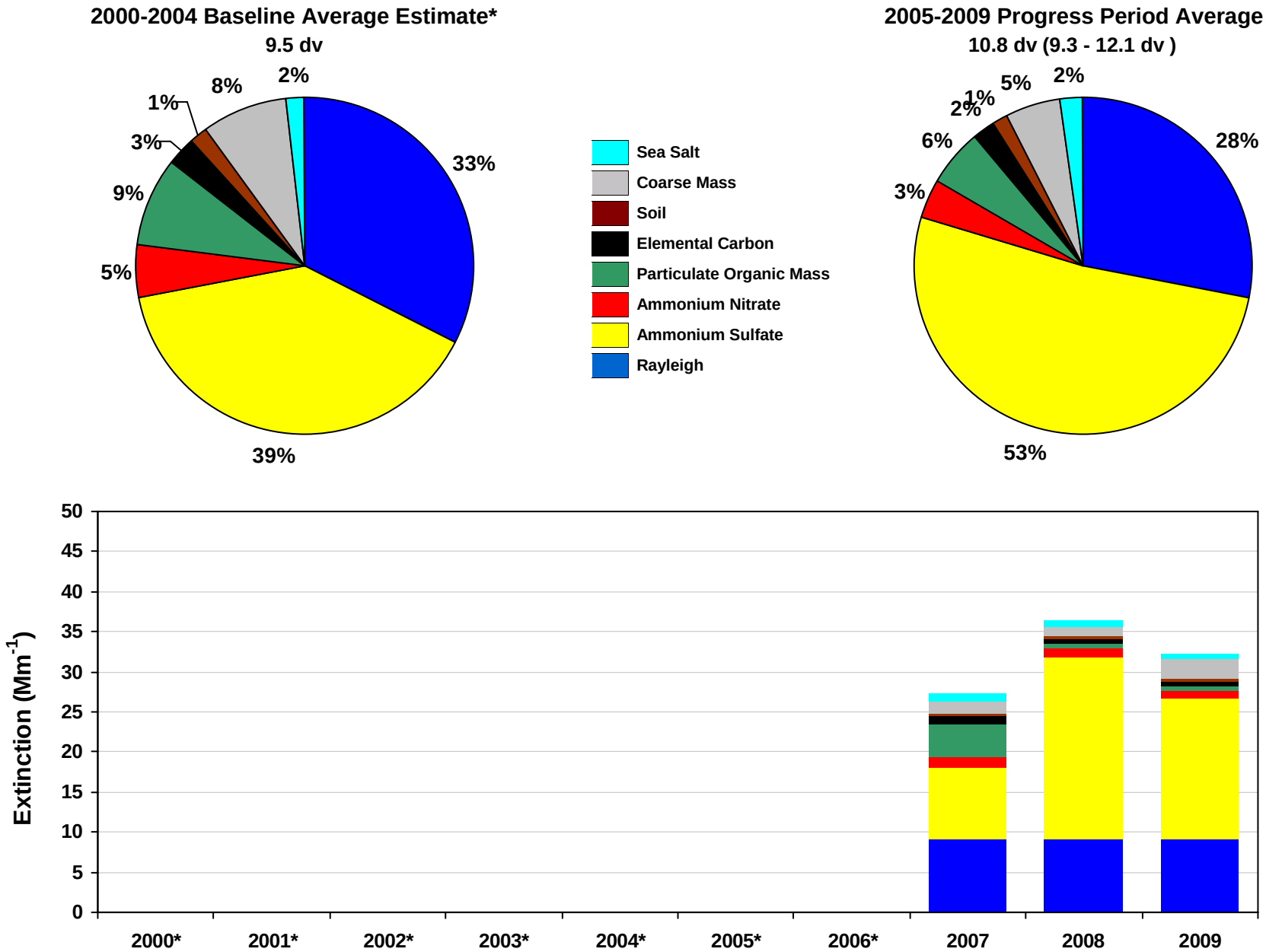
*Missing years did not meet RHR data completeness criteria.

Figure E.1-2
Haleakala NP, HI (HACR1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure E.1-3
Haleakala NP, HI (HACR1 Site)
20% Most Impaired Visibility Days

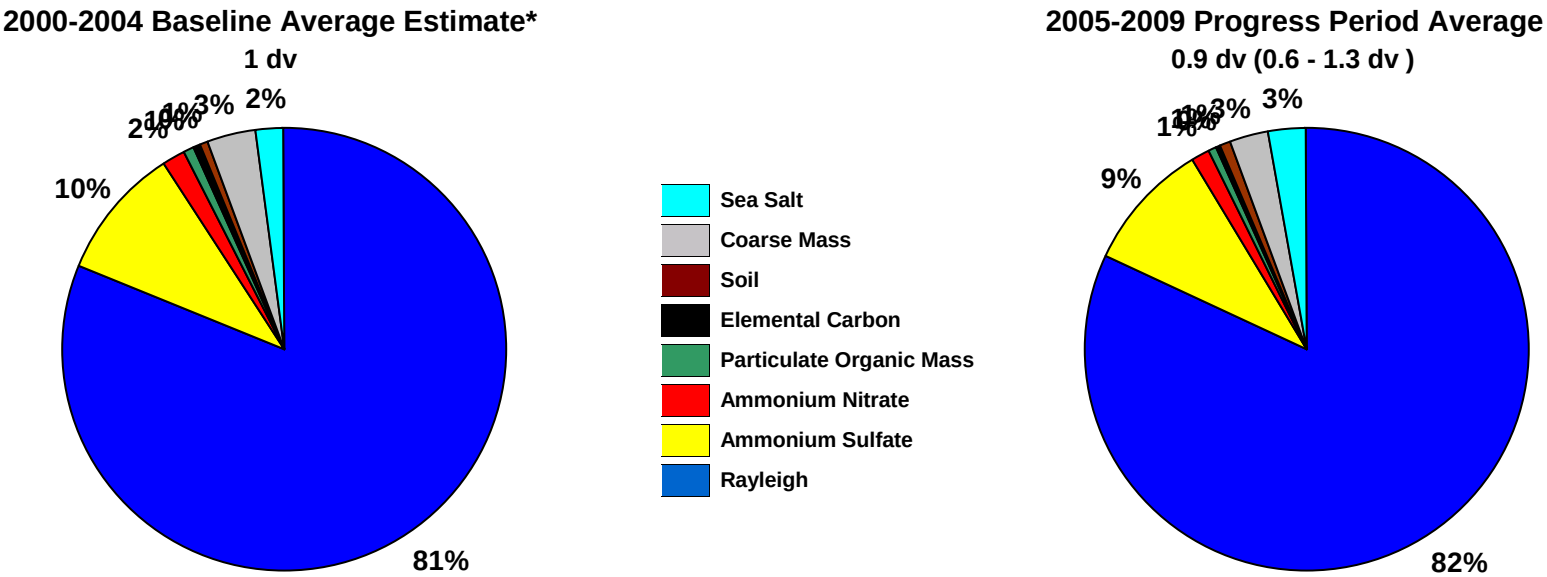


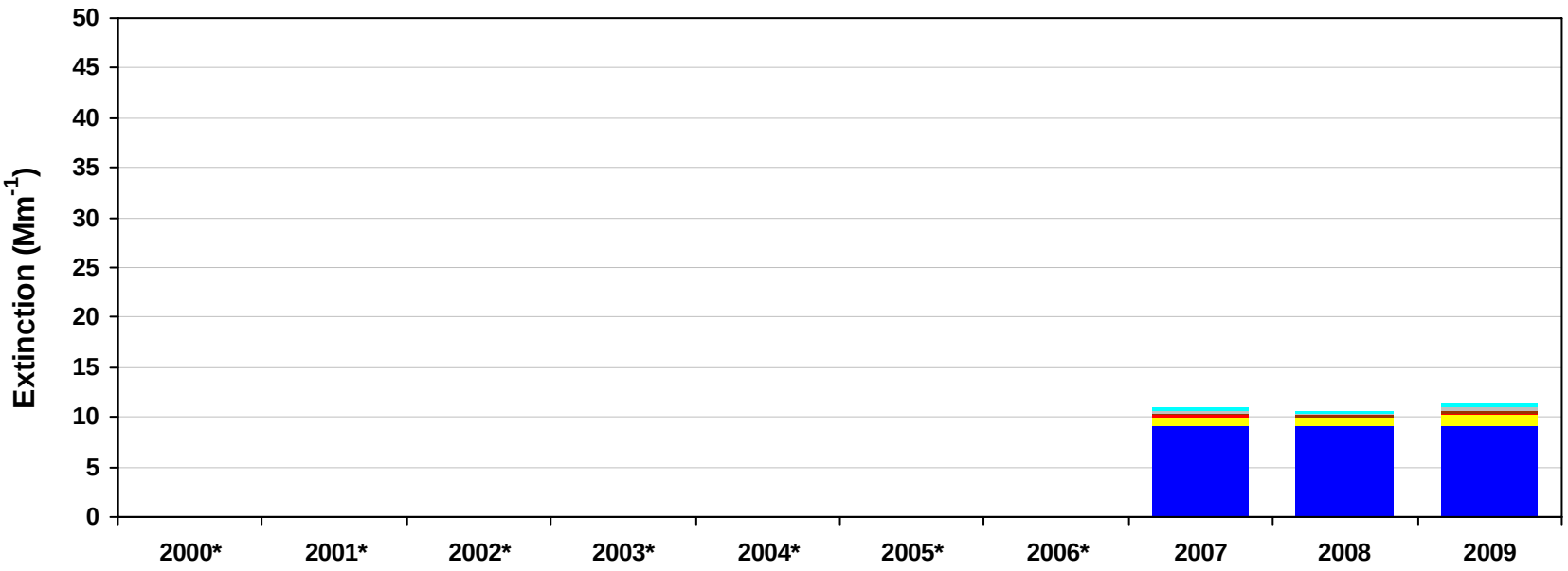
*Baseline years did not meet RHR data completeness criteria. The 5-year baseline average represents an approximation based on methods described in text.

Figure E.1-4

Haleakala NP, HI (HACR1 Site)

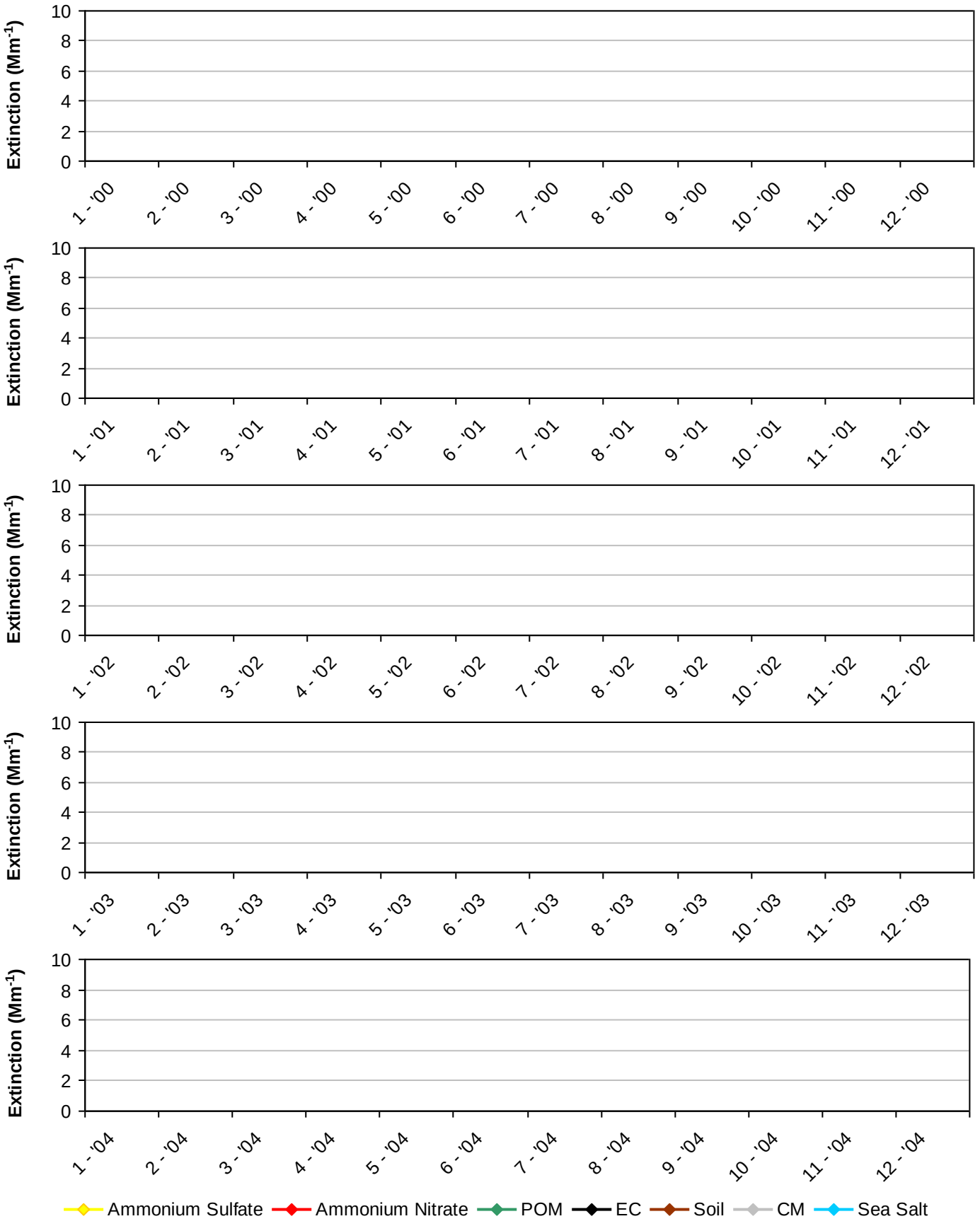
20% Least Impaired Visibility Days





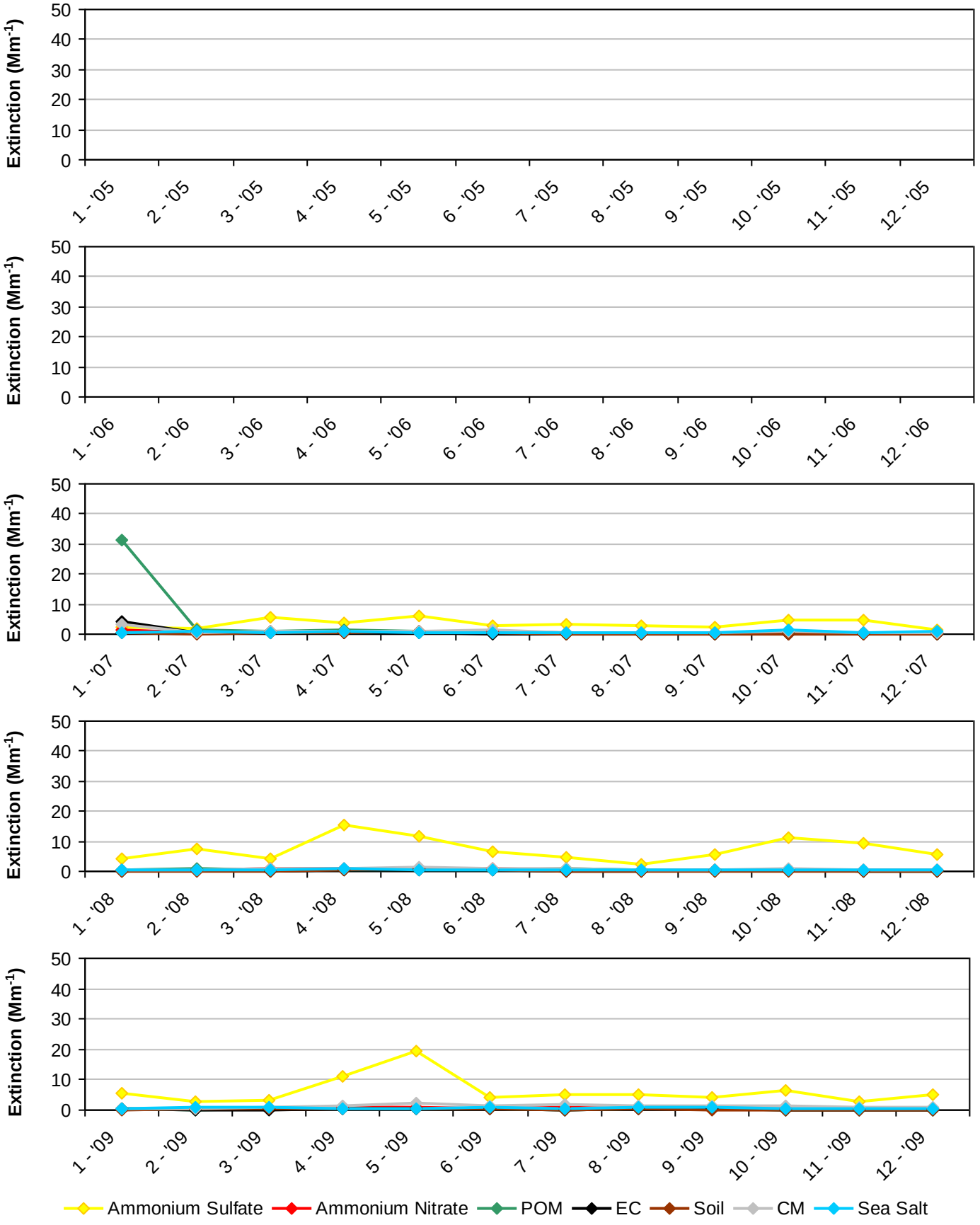
*Baseline years did not meet RHR data completeness criteria. The 5-year baseline average represents an approximation based on methods described in text.

Figure E.1-5
Haleakala NP, HI (HACR1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



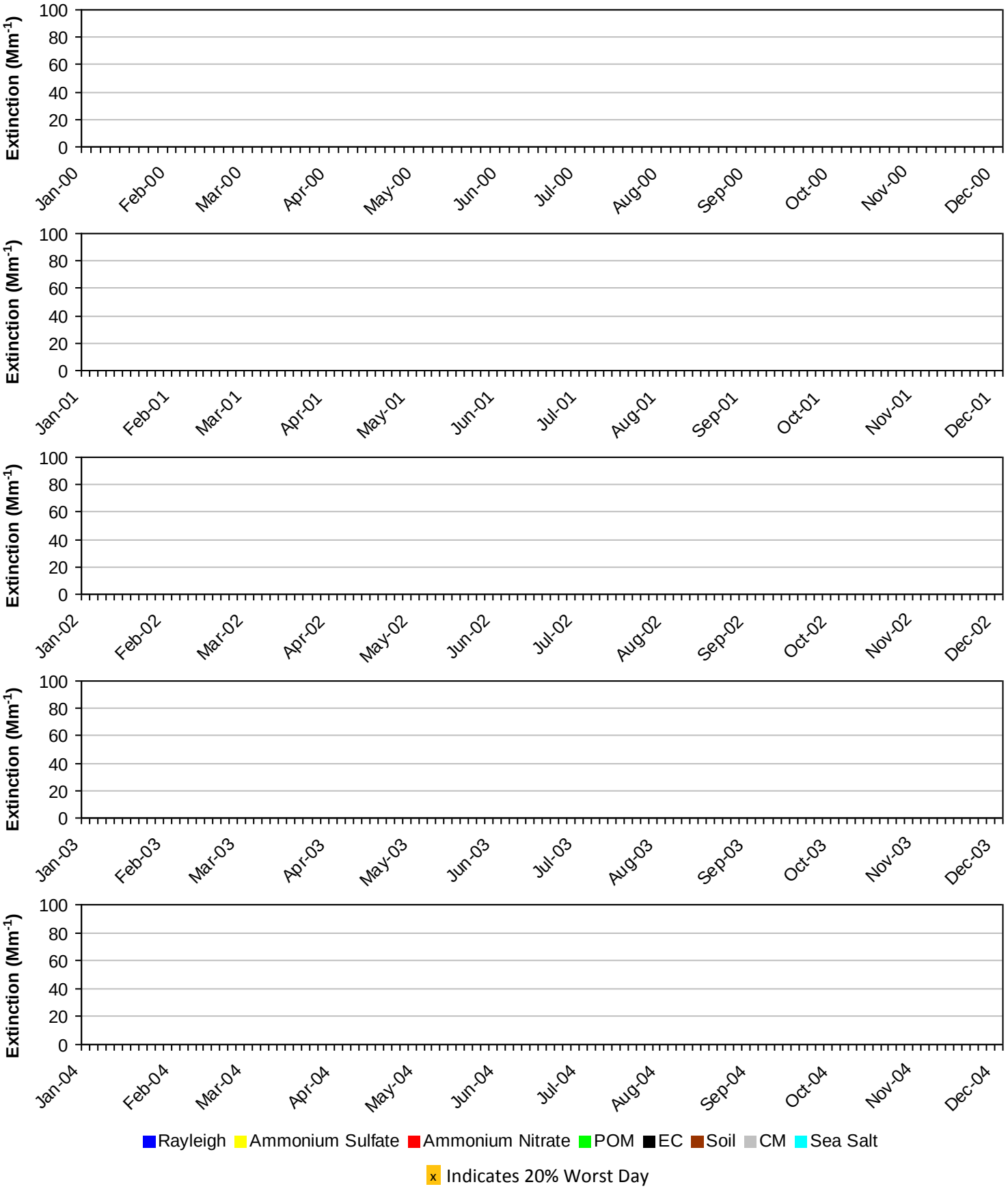
*Note that monthly averages for the years 2000, 2001, 2002, 2003 and 2004 are shown here, but these years did not meet RHR data completeness crite

Figure E.1-6
Haleakala NP, HI (HACR1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days



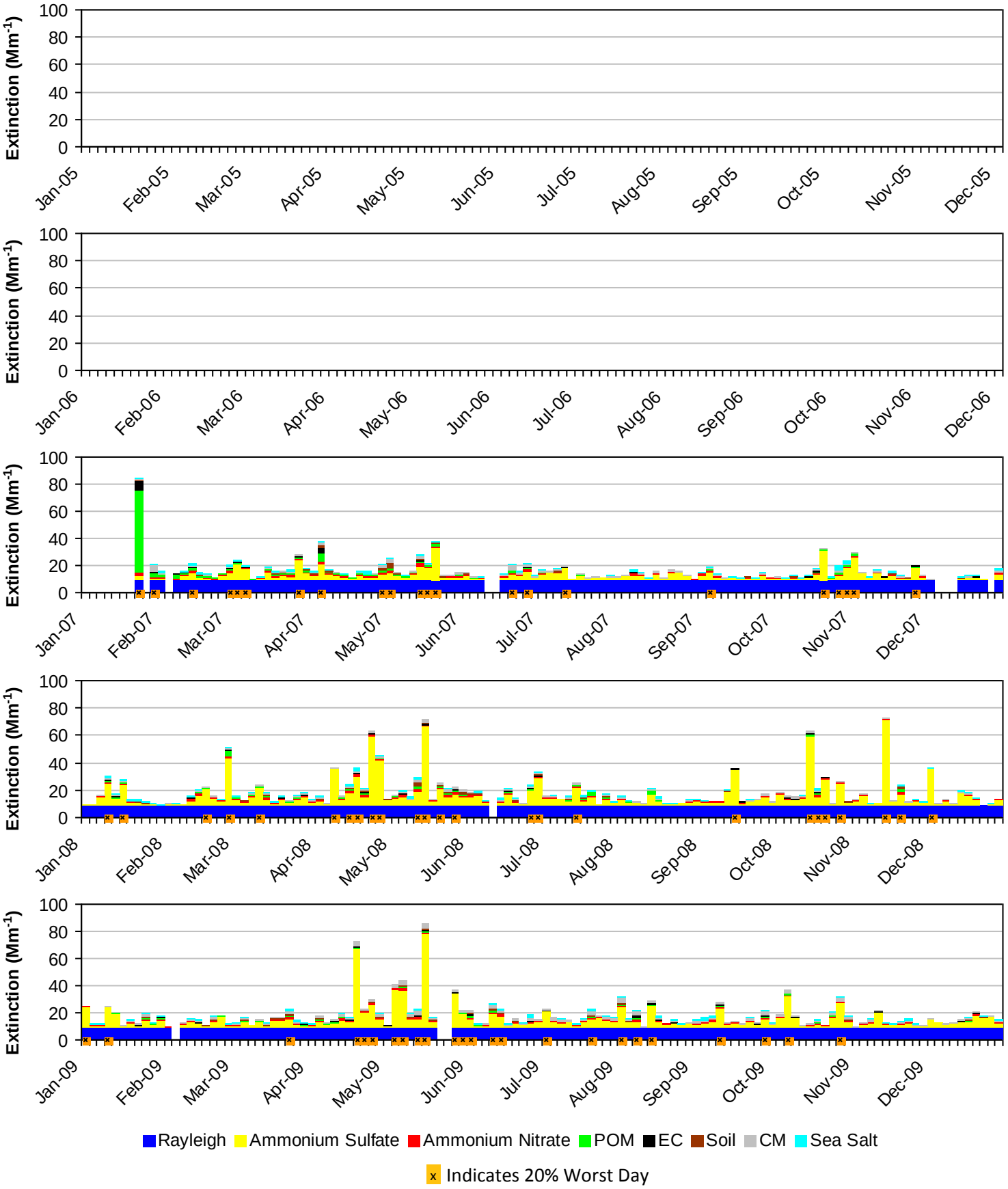
*Note that monthly averages for the years 2005 and 2006 are shown here, but these years did not meet RHR data completeness criteria.

Figure E.1-7
Haleakala NP, HI (HACR1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2000, 2001, 2002, 2003 and 2004 are shown here, but these years did not meet RHR data completeness criteria.

Figure E.1-8
Haleakala NP, HI (HACR1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2005 and 2006 are shown here, but these years did not meet RHR data completeness criteria.

E.2. HALEAKALA NP (HALE1)

The following tables and figures are presented in this section for the Haleakala NP represented by the HALE1 IMPROVE Monitor:

- **Table E.2-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure E.2-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure E.2-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure E.2-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure E.2-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure E.2-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure E.2-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure E.2-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

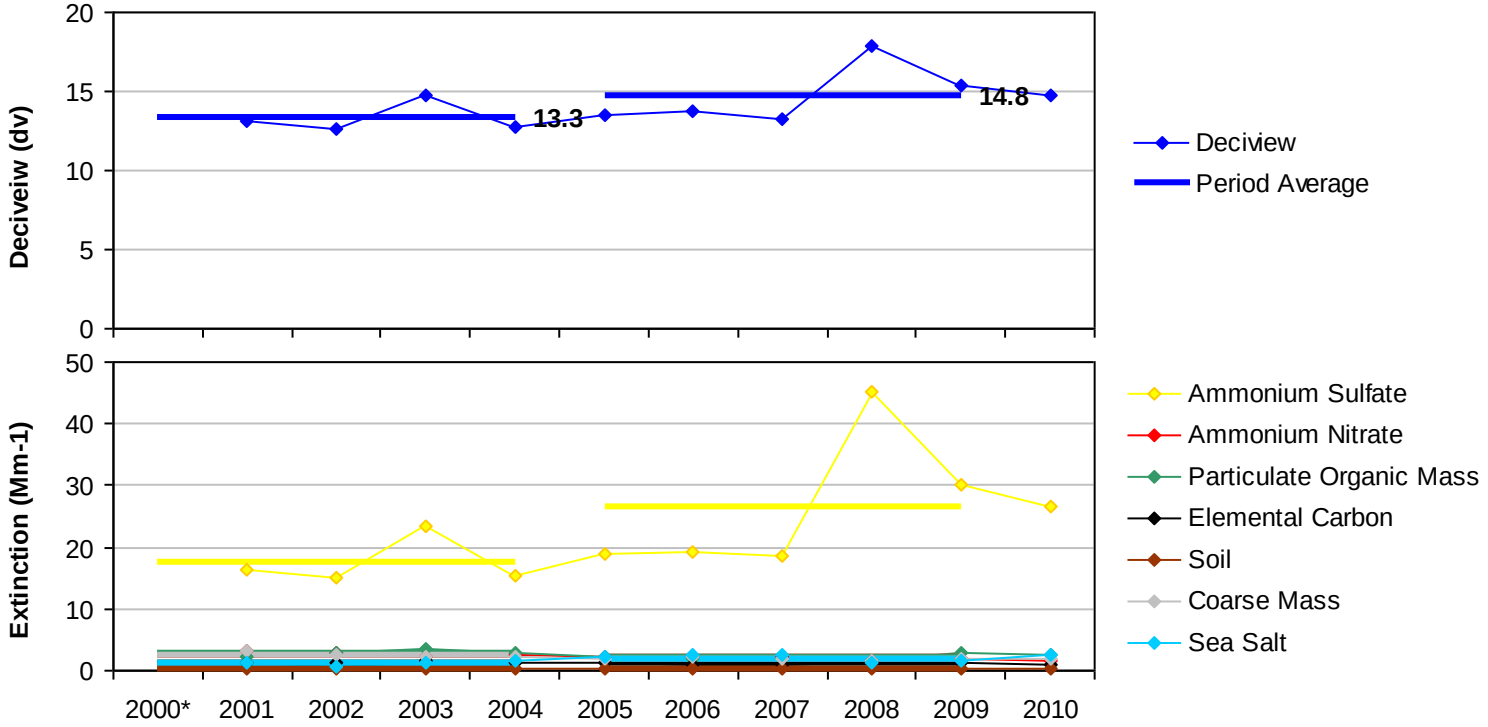
- **Figure E.2-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table E.2-1
Haleakala NP, HI (HALE1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	4.6	4.8	4.3	4.5	3.7	4.5	4.6	4.6	4.6	4.2	0.0	0.5	4.5	4.4	-0.1	-2%
Worst 20% Days	---	13.1	12.6	14.8	12.8	13.5	13.7	13.3	17.9	15.4	14.8	0.3	0.0	13.3	14.8	1.5	11%
All Days	---	8.5	8.7	9.1	8.6	8.5	8.8	8.5	9.9	9.3	8.6	0.1	0.2	8.7	9.0	0.3	3%
Total Extinction (Mm-1)																	
Best 20% Days	---	15.9	16.2	15.5	15.8	14.6	15.8	15.9	15.8	16.0	15.2	0.0	0.5	15.8	15.6	-0.2	-1%
Worst 20% Days	---	37.7	36.1	45.1	36.1	39.0	39.9	38.9	63.2	50.2	46.5	1.0	0.0	38.7	46.2	7.5	19%
All Days	---	24.7	25.0	26.9	24.6	24.9	25.6	24.8	30.9	28.1	26.0	0.3	0.1	25.3	26.8	1.5	6%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	2.3	2.4	2.1	2.0	1.7	2.3	2.2	2.2	2.1	1.8	0.0	0.3	2.2	2.1	-0.1	-5%
Worst 20% Days	---	16.2	15.2	23.5	15.3	18.8	19.4	18.6	45.3	30.3	26.8	1.2	0.0	17.5	26.5	9.0	51%
All Days	---	7.0	7.2	8.7	6.9	7.6	8.1	7.1	14.0	10.8	9.3	0.4	0.1	7.4	9.5	2.1	28%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.5	0.7	0.5	0.5	0.3	0.4	0.5	0.4	0.5	0.4	0.0	0.1	0.6	0.4	-0.2	-33%
Worst 20% Days	---	3.1	2.8	2.4	2.4	2.3	2.4	2.4	1.7	1.8	1.7	-0.1	0.0	2.7	2.1	-0.6	-22%
All Days	---	1.7	1.8	1.6	1.5	1.4	1.6	1.5	1.4	1.3	1.1	-0.1	0.0	1.6	1.4	-0.2	-13%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.7	0.7	0.9	0.6	0.4	0.6	0.5	0.5	0.4	0.0	0.3	0.7	0.5	-0.2	-29%
Worst 20% Days	---	2.2	3.0	3.6	2.8	2.3	2.0	2.0	1.7	3.0	2.5	-0.1	0.2	2.9	2.2	-0.7	-24%
All Days	---	1.4	1.8	2.0	1.9	1.4	1.4	1.3	1.2	1.4	1.2	0.0	0.0	1.8	1.3	-0.5	-28%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.0	0.0	0.2	0.2	0.0	0%
Worst 20% Days	---	1.2	1.3	1.7	1.3	1.3	1.0	1.0	1.1	1.3	1.0	0.0	0.3	1.4	1.2	-0.2	-14%
All Days	---	0.7	0.8	0.9	0.8	0.6	0.7	0.6	0.6	0.6	0.5	0.0	0.1	0.8	0.6	-0.2	-25%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.4	0.1	0.1	0.0	0%
Worst 20% Days	---	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.0	0.1	0.3	0.4	0.1	33%
All Days	---	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.5	0.2	0.2	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	1.2	1.1	1.0	0.9	0.8	0.8	0.9	0.9	1.0	0.9	0.0	0.1	1.0	0.9	-0.1	-10%
Worst 20% Days	---	3.2	2.7	2.4	2.2	1.9	2.3	2.0	1.6	1.9	1.9	-0.2	0.0	2.6	1.9	-0.7	-27%
All Days	---	2.2	2.0	1.9	1.6	1.5	1.6	1.6	1.5	1.6	1.5	-0.1	0.0	1.9	1.6	-0.3	-16%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	1.1	1.0	0.9	1.3	1.1	1.4	1.6	1.7	1.7	1.5	0.1	0.0	1.1	1.5	0.4	36%
Worst 20% Days	---	1.4	0.7	1.3	1.7	2.1	2.5	2.5	1.3	1.5	2.4	0.1	0.1	1.3	2.0	0.7	54%
All Days	---	1.4	1.1	1.6	1.7	2.3	2.1	2.5	1.9	2.1	2.2	0.1	0.0	1.4	2.2	0.8	57%

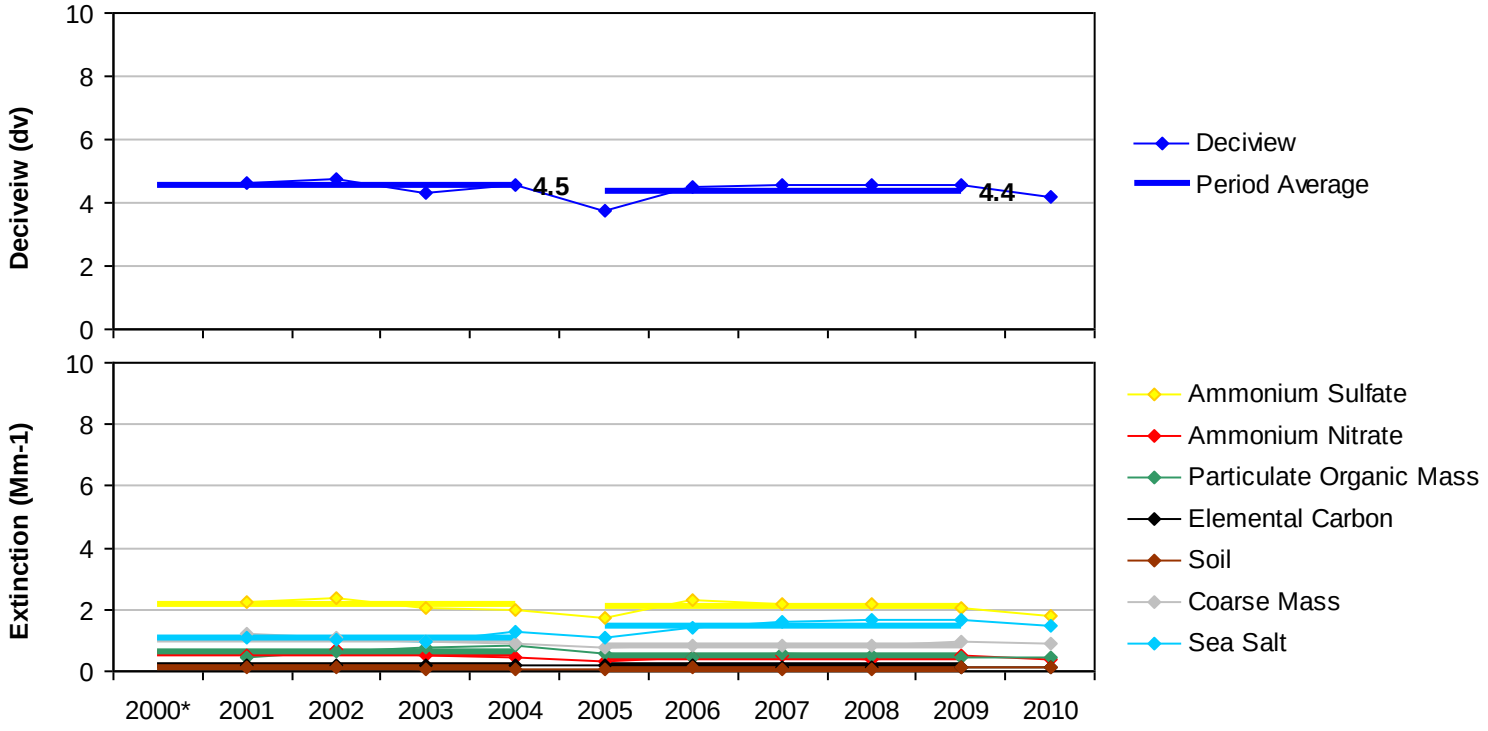
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure E.2-1
Haleakala NP, HI (HALE1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



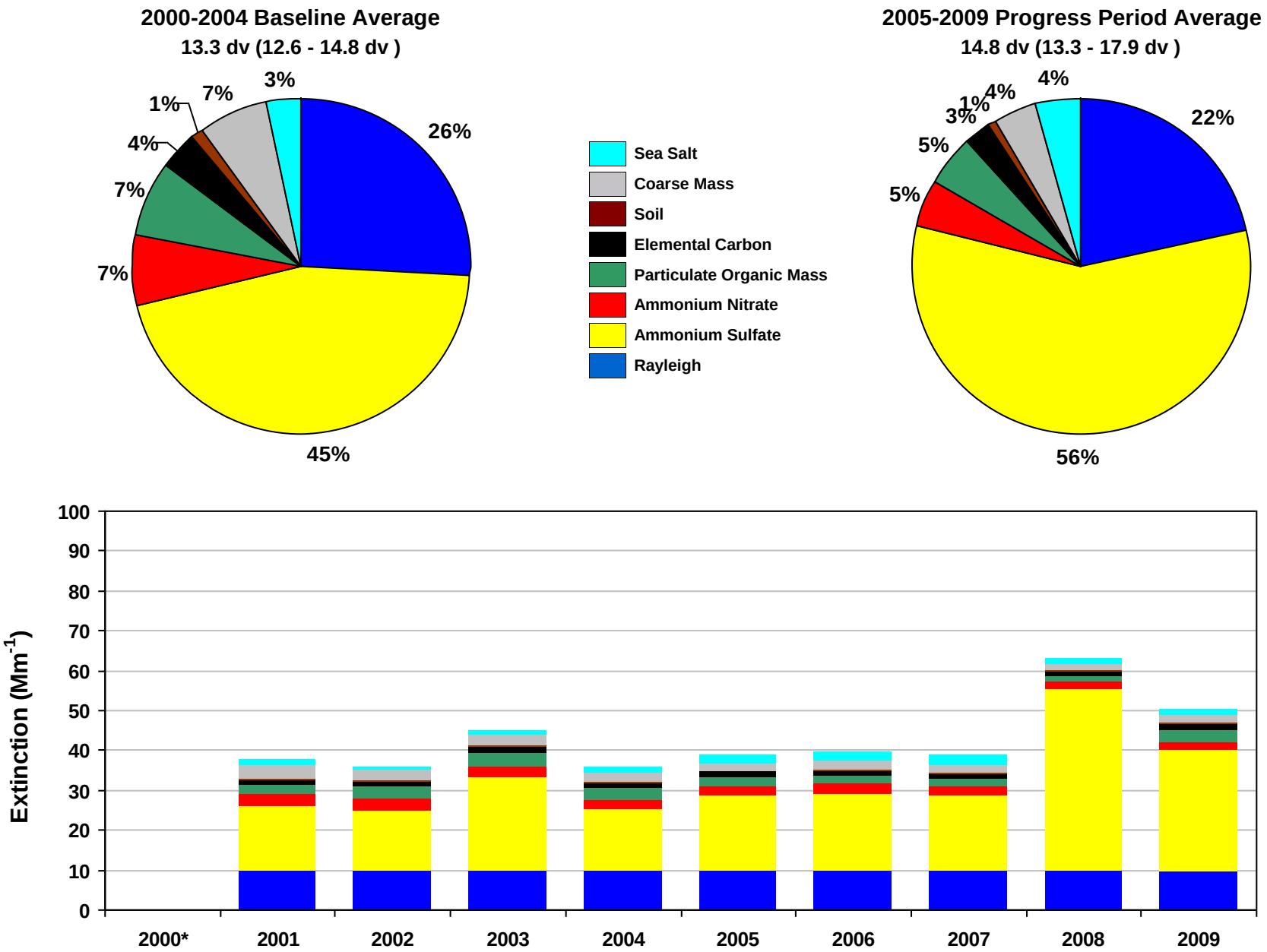
*Missing years did not meet RHR data completeness criteria.

Figure E.2-2
Haleakala NP, HI (HALE1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



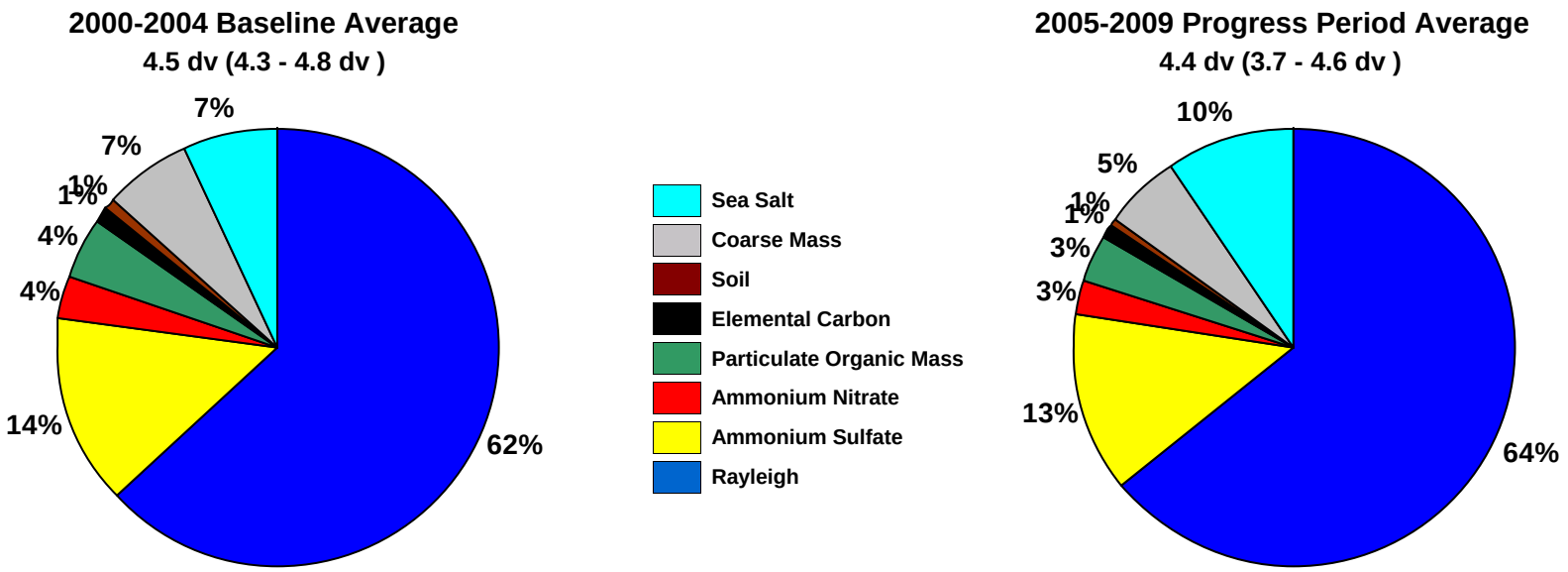
*Missing years did not meet RHR data completeness criteria.

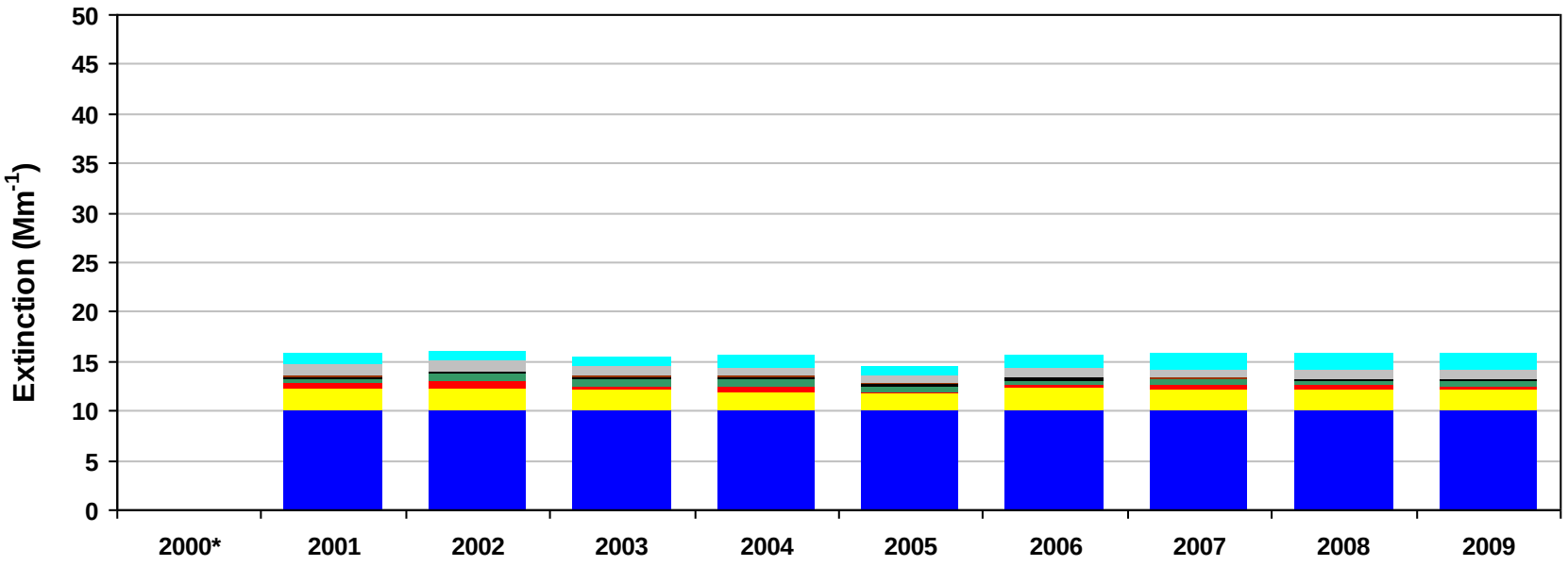
Figure E.2-3
Haleakala NP, HI (HALE1 Site)
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

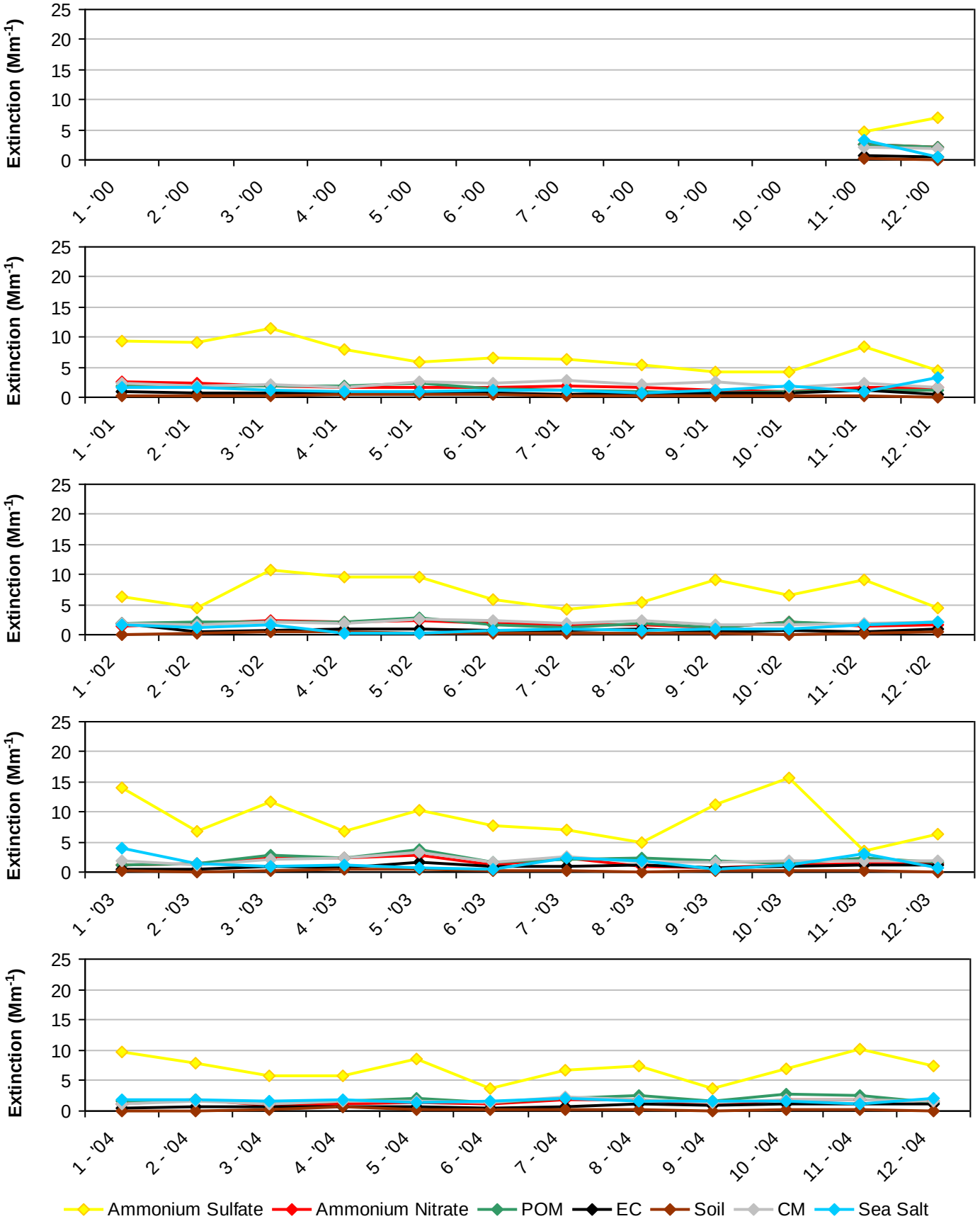
Figure E.2-4
Haleakala NP, HI (HALE1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure E.2-5
Haleakala NP, HI (HALE1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure E.2-6
Haleakala NP, HI (HALE1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

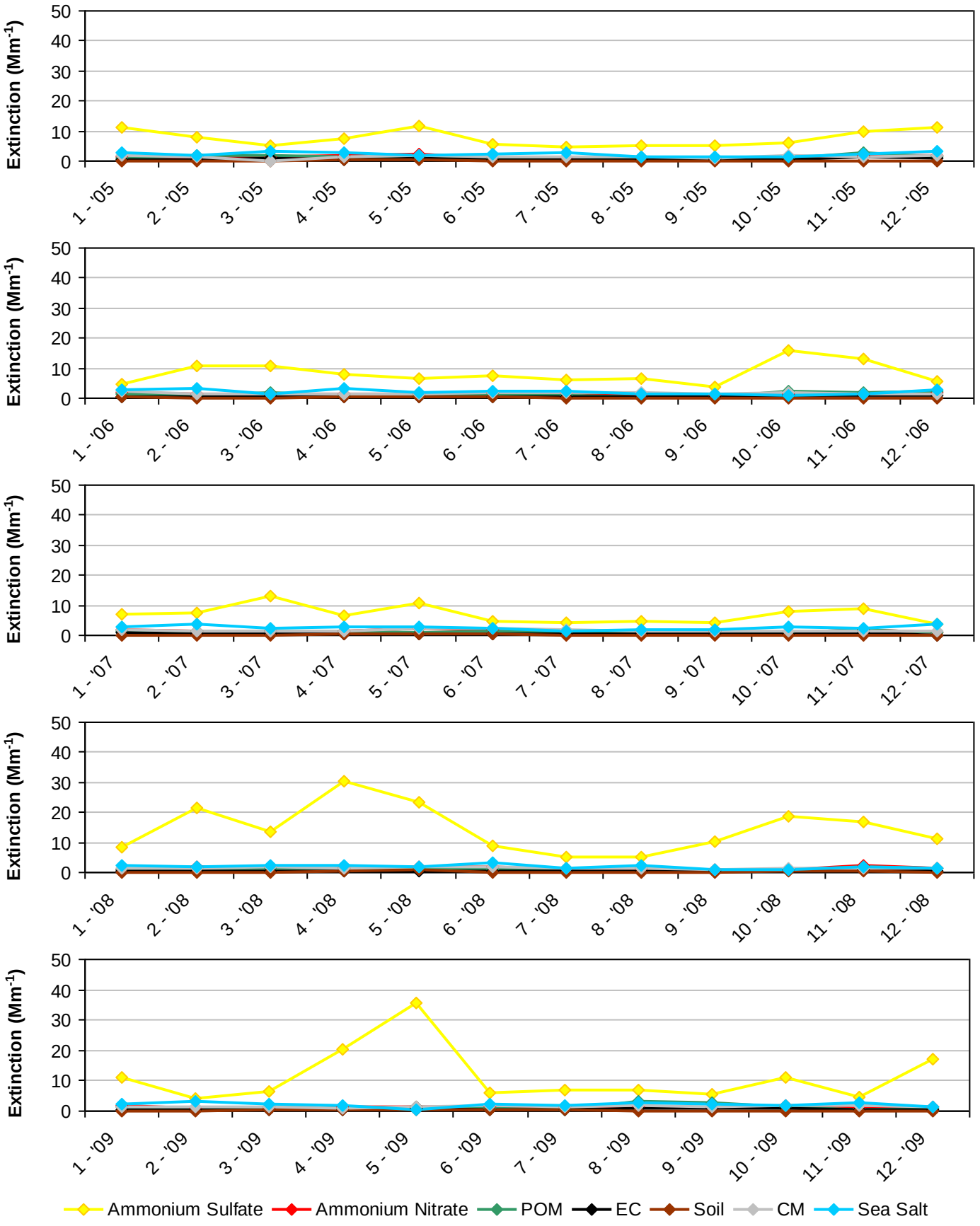
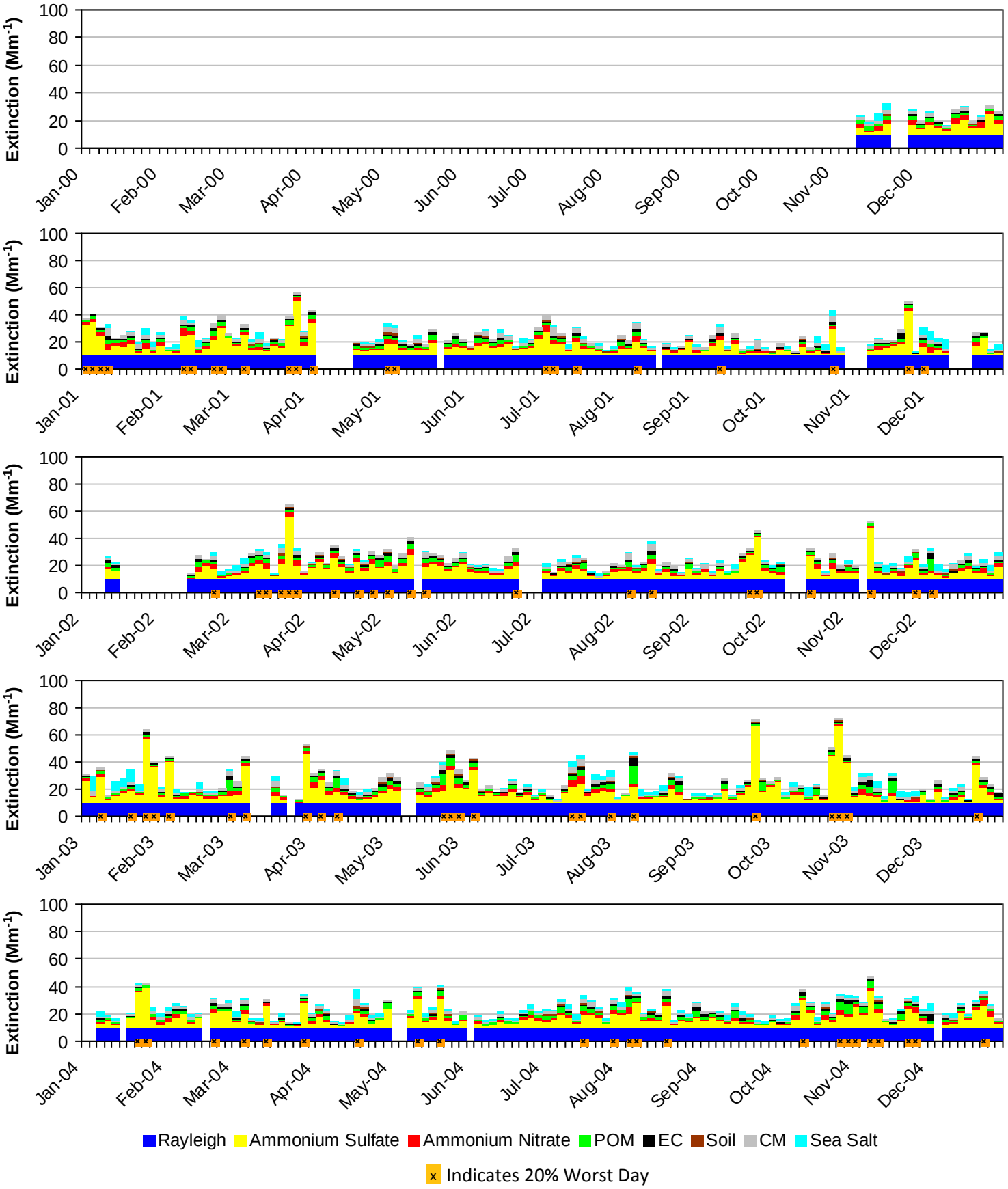
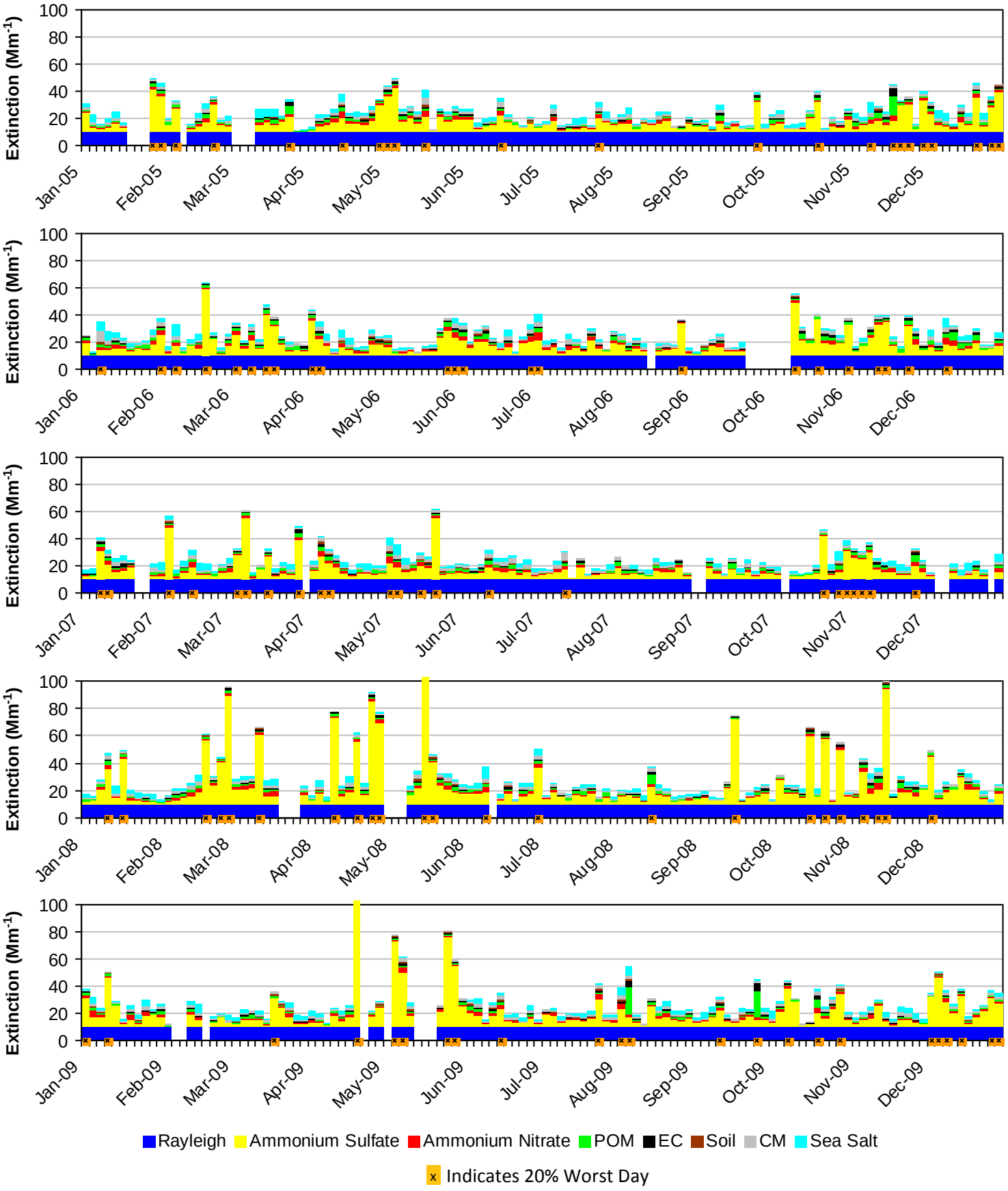


Figure E.2-7
Haleakala NP, HI (HALE1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure E.2-8
Haleakala NP, HI (HALE1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



E.3. HAWAII VOLCANOES NP (HAVO1)

The following tables and figures are presented in this section for the Hawaii Volcanoes NP represented by the HAVO1 IMPROVE Monitor:

- **Table E.3-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure E.3-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure E.3-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure E.3-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure E.3-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure E.3-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure E.3-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure E.3-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

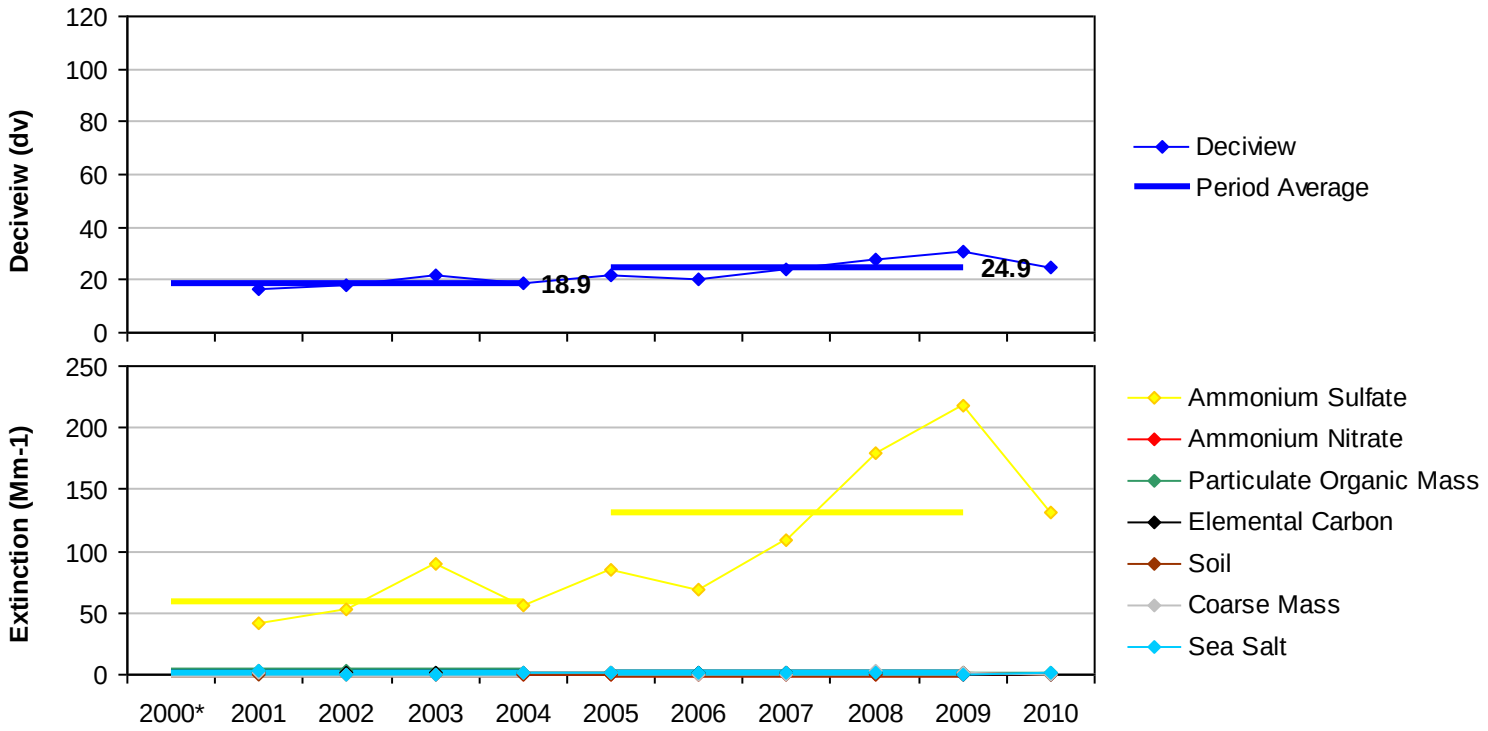
- **Figure E.3-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table E.3-1
Hawaii Volcanoes NP, HI (HAVO1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	4.1	3.9	4.2	4.0	3.5	3.2	4.0	4.1	3.9	3.5	0.0	0.2	4.1	3.8	-0.3	-7%
Worst 20% Days	---	16.4	18.0	22.0	19.0	22.1	20.6	23.8	27.5	30.5	24.4	1.6	0.0	18.9	24.9	6.0	32%
All Days	---	8.8	9.2	10.6	9.7	10.2	10.0	10.3	11.5	13.2	10.5	0.4	0.0	9.6	11.1	1.5	16%
Total Extinction (Mm-1)																	
Best 20% Days	---	15.2	14.9	15.3	15.0	14.3	13.9	15.1	15.1	14.9	14.2	0.0	0.3	15.1	14.6	-0.5	-3%
Worst 20% Days	---	60.9	69.7	103.7	71.6	100.8	83.5	124.1	197.5	232.9	145.3	19.1	0.0	76.5	147.7	71.2	93%
All Days	---	28.6	30.5	39.3	31.8	37.7	34.5	41.4	57.4	69.4	46.4	3.9	0.0	32.5	48.1	15.6	48%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	1.9	1.7	2.9	2.1	2.1	1.8	2.2	2.3	2.7	2.0	0.1	0.1	2.2	2.2	0.0	0%
Worst 20% Days	---	41.4	53.0	89.3	56.2	85.2	69.2	108.6	179.5	218.1	131.2	18.9	0.0	60.0	132.1	72.1	>100%
All Days	---	12.0	14.6	24.3	15.8	22.6	20.0	26.1	41.8	55.1	31.8	3.9	0.0	16.7	33.1	16.4	98%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.3	0.2	0.4	0.3	0.2	0.2	0.4	0.3	0.3	0.3	0.0	0.4	0.3	0.3	0.0	0%
Worst 20% Days	---	1.1	1.0	0.8	0.6	0.6	0.3	0.7	0.7	0.5	0.4	-0.1	0.0	0.9	0.6	-0.3	-33%
All Days	---	0.9	0.9	0.8	0.8	0.7	0.6	0.8	0.7	0.5	0.6	0.0	0.0	0.8	0.7	-0.1	-13%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	1.7	1.9	0.3	0.5	0.1	0.1	0.2	0.1	0.1	0.0	-0.1	0.0	1.1	0.1	-1.0	-91%
Worst 20% Days	---	3.6	3.9	1.3	1.2	1.4	1.0	1.5	1.7	0.9	0.8	-0.1	0.1	2.5	1.3	-1.2	-48%
All Days	---	2.4	2.7	0.8	0.9	0.6	0.5	0.7	0.6	0.4	0.3	-0.1	0.0	1.7	0.6	-1.1	-65%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.1	-0.1	-50%
Worst 20% Days	---	0.9	0.9	1.2	1.0	0.9	0.8	0.9	0.9	0.6	0.6	0.0	0.1	1.0	0.8	-0.2	-20%
All Days	---	0.4	0.4	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.2	0.0	0.0	0.4	0.3	-0.1	-25%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.0	-0.1	-100%
Worst 20% Days	---	0.2	0.2	0.4	0.3	0.3	0.2	0.3	0.7	1.2	0.8	0.1	0.0	0.3	0.5	0.2	67%
All Days	---	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.4	0.3	0.0	0.2	0.2	0.2	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.2	0.5	0.5	0.4	0.3	0.5	0.4	0.3	0.5	0.0	0.5	0.4	0.4	0.0	0%
Worst 20% Days	---	1.1	0.4	0.7	0.9	1.0	0.4	0.8	2.5	0.8	0.7	0.0	0.3	0.8	1.1	0.3	38%
All Days	---	0.8	0.6	1.1	0.9	0.9	0.6	0.9	1.3	0.7	0.9	0.0	0.5	0.9	0.9	0.0	0%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.7	0.7	1.0	1.3	1.4	1.4	1.7	1.8	1.4	1.3	0.1	0.0	0.9	1.6	0.7	78%
Worst 20% Days	---	2.7	0.4	0.1	1.4	1.5	1.5	1.2	1.5	0.8	0.8	0.0	0.4	1.2	1.3	0.1	8%
All Days	---	1.9	1.2	1.6	2.7	2.4	2.3	2.5	2.4	2.0	2.3	0.1	0.2	1.8	2.3	0.5	28%

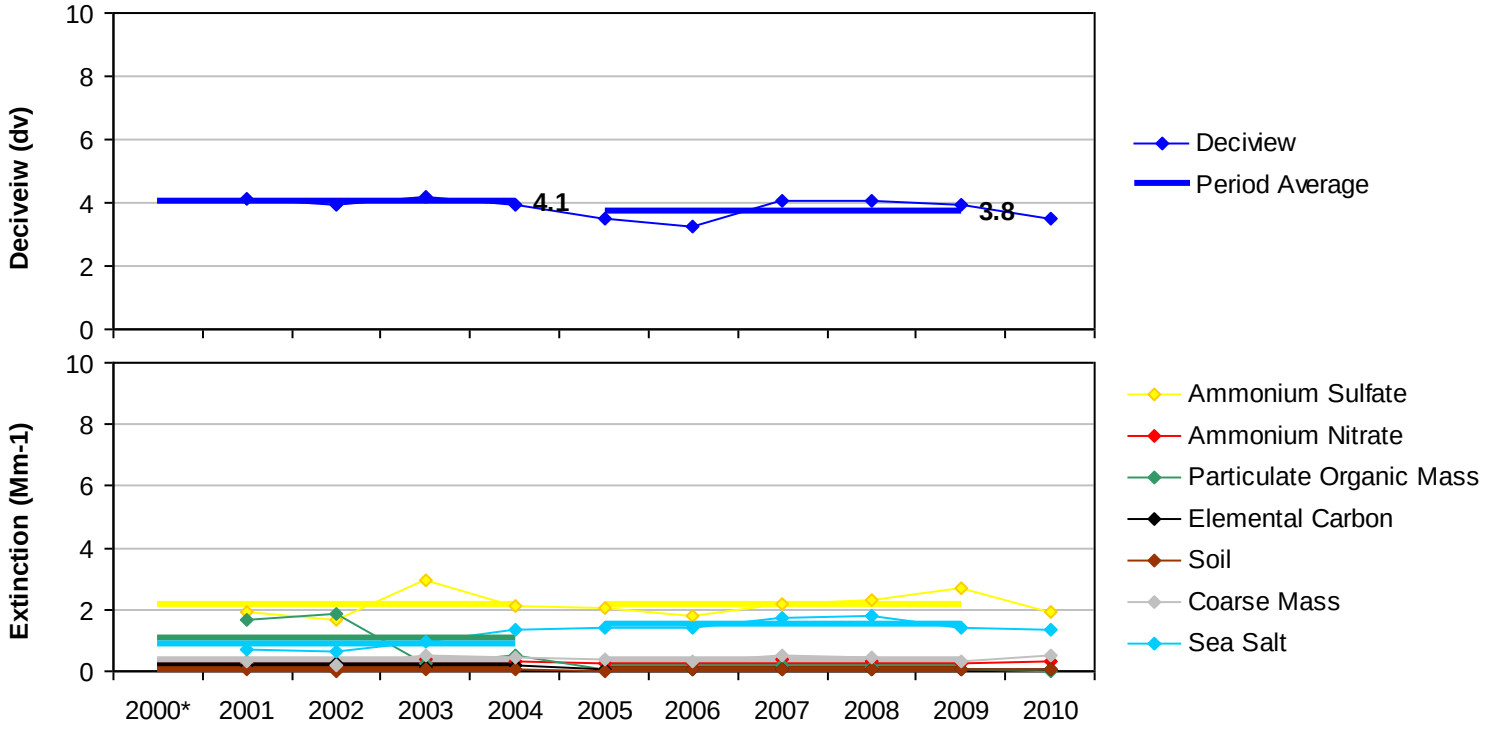
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure E.3-1
Hawaii Volcanoes NP, HI (HAVO1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure E.3-2
Hawaii Volcanoes NP, HI (HAVO1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

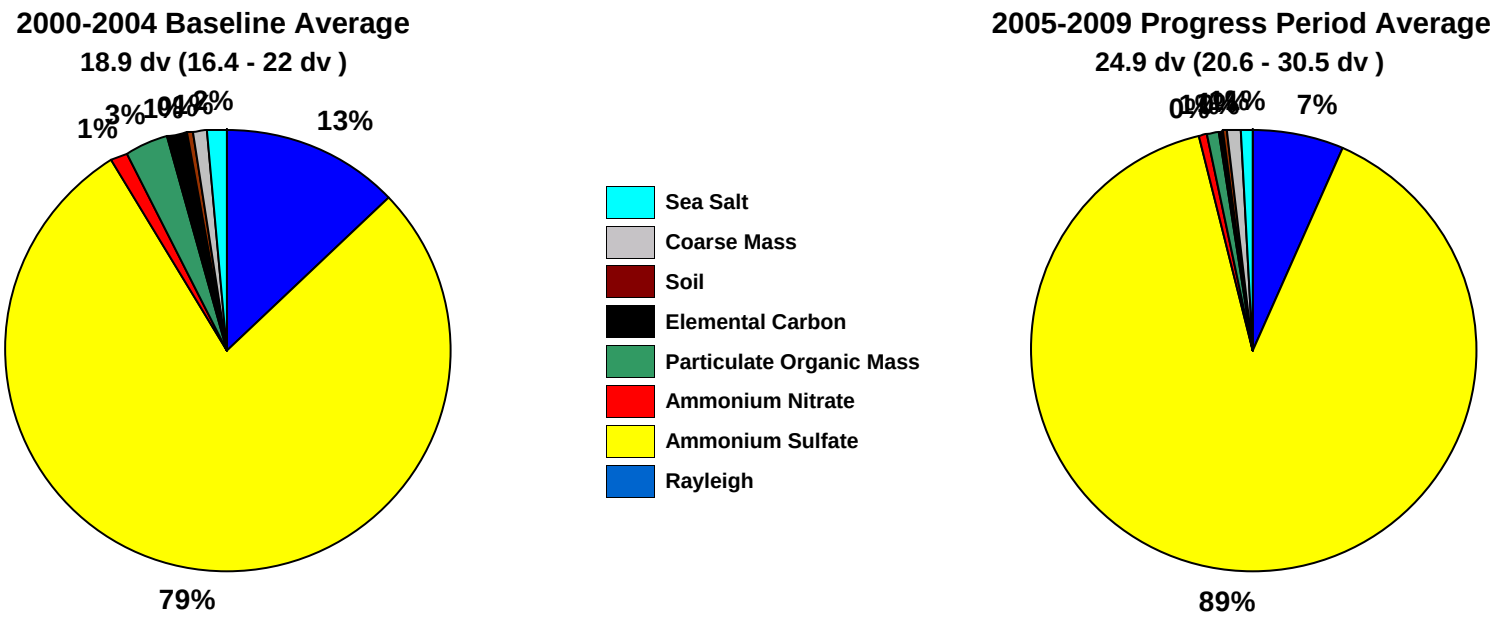


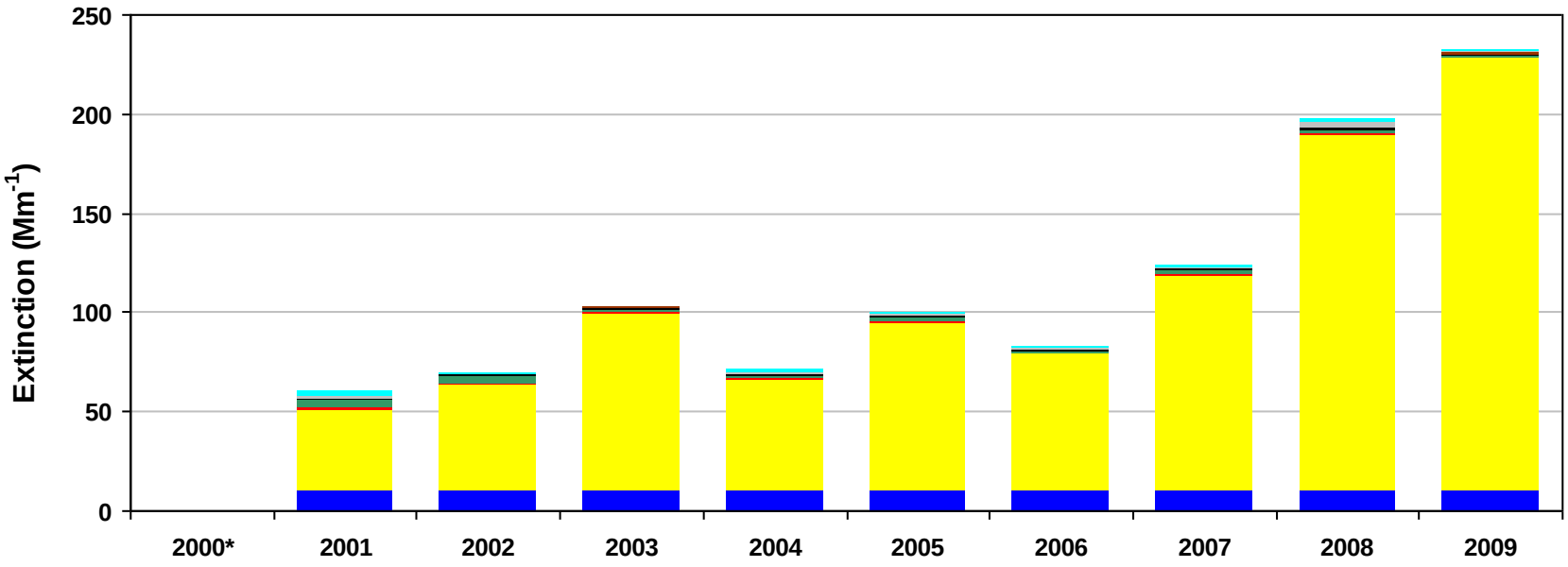
*Missing years did not meet RHR data completeness criteria.

Figure E.3-3

Hawaii Volcanoes NP, HI (HAVO1 Site)

20% Most Impaired Visibility Days



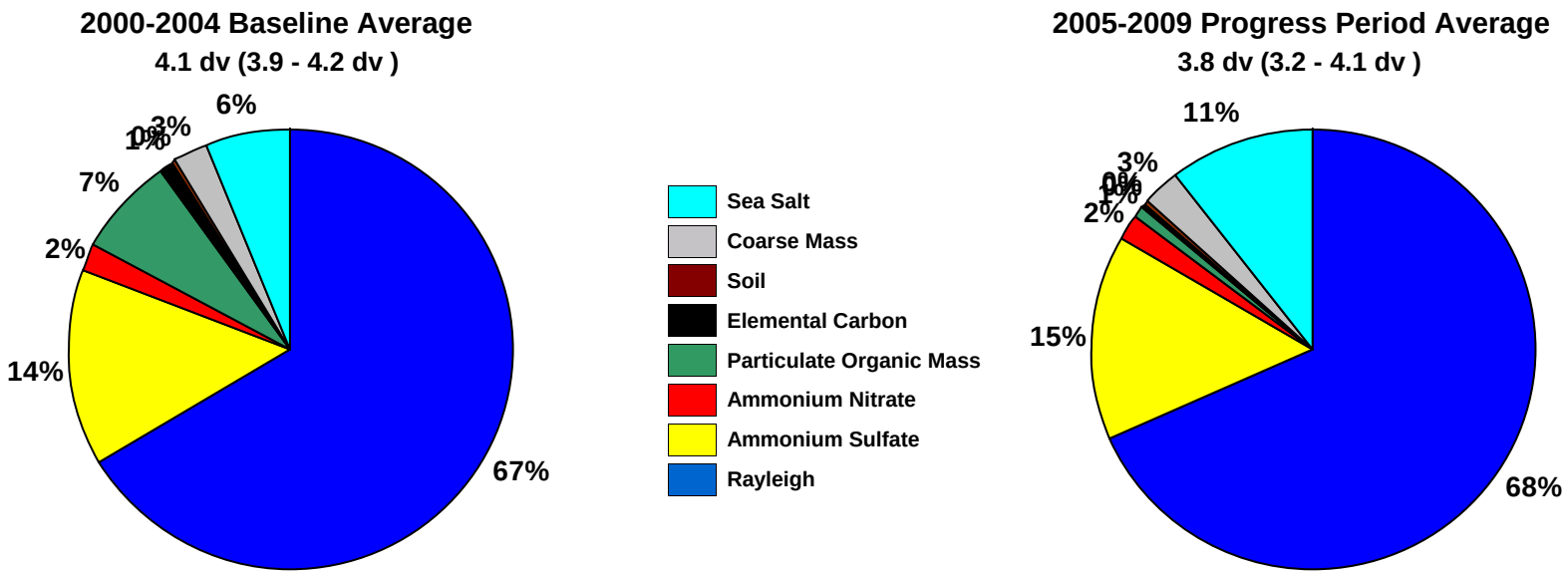


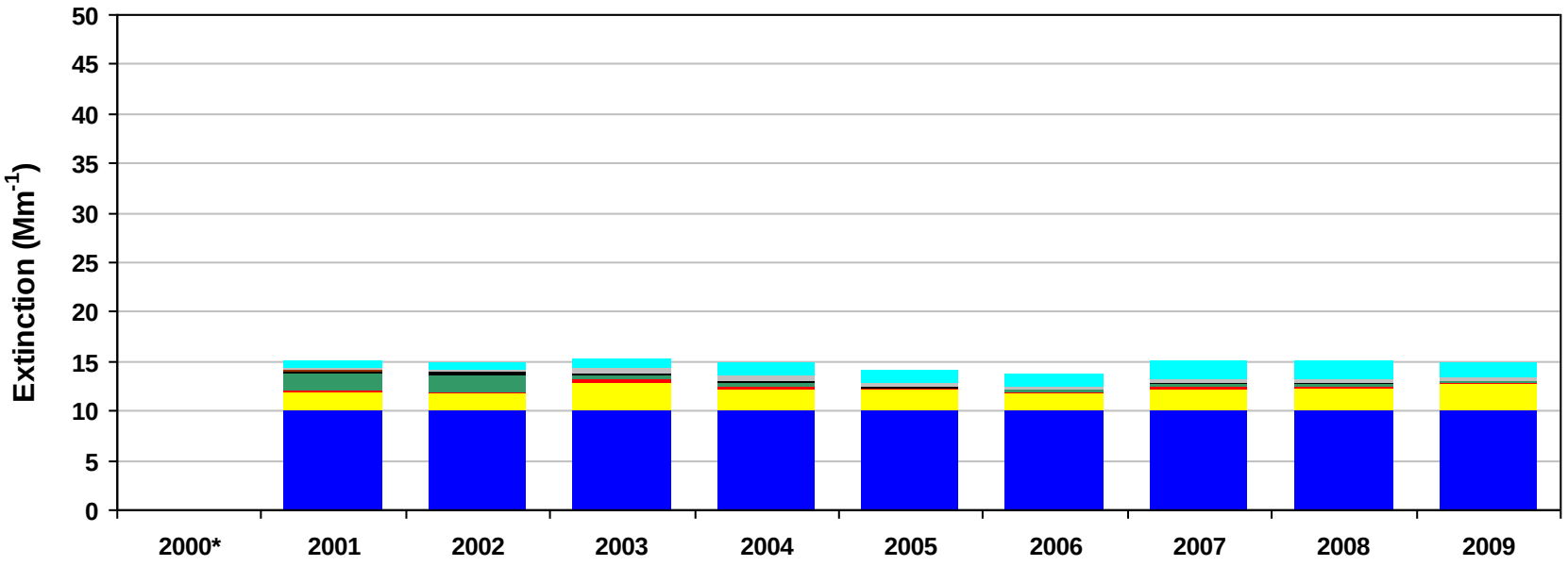
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure E.3-4

Hawaii Volcanoes NP, HI (HAVO1 Site)

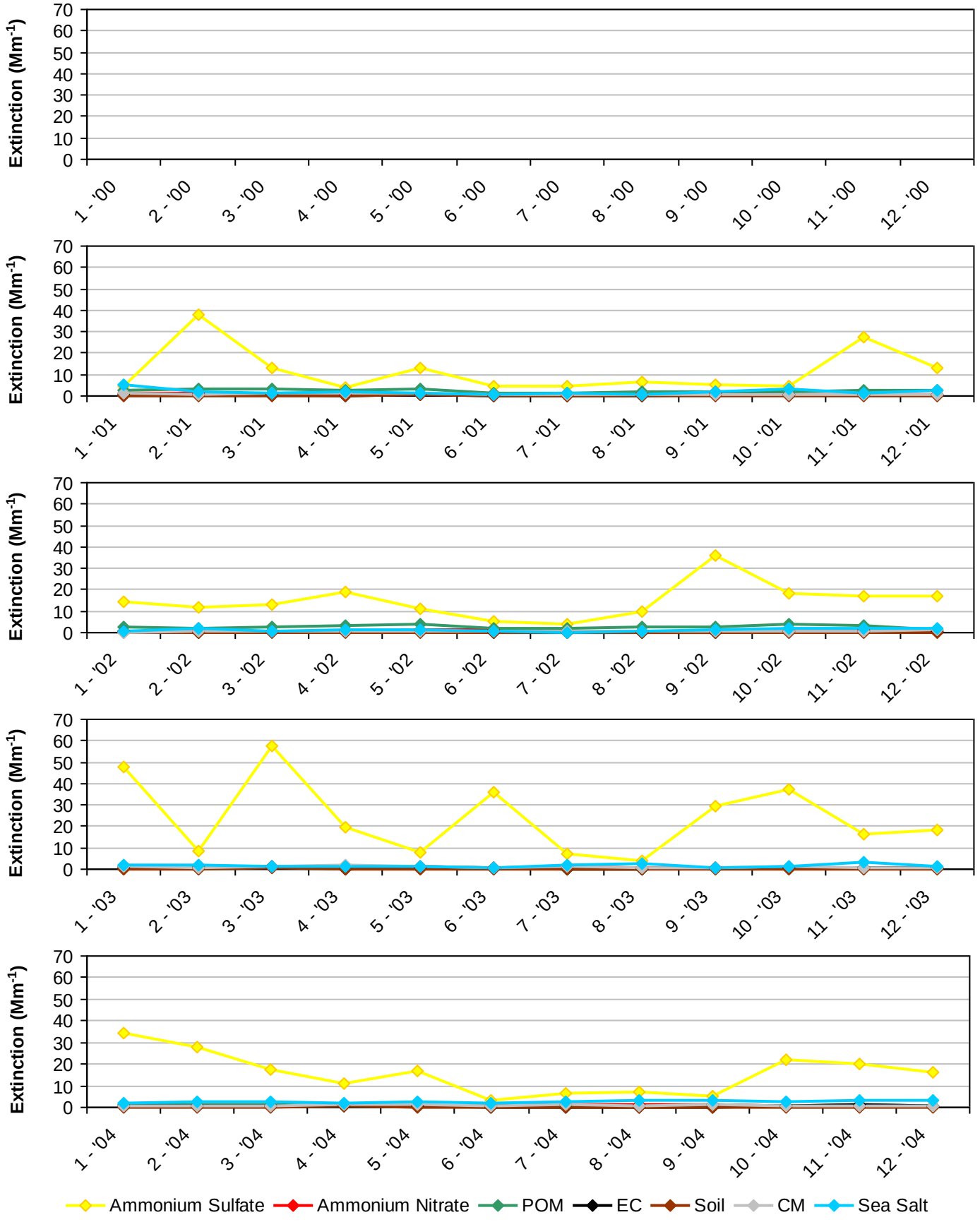
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure E.3-5
Hawaii Volcanoes NP, HI (HAVO1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure E.3-6
Hawaii Volcanoes NP, HI (HAVO1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

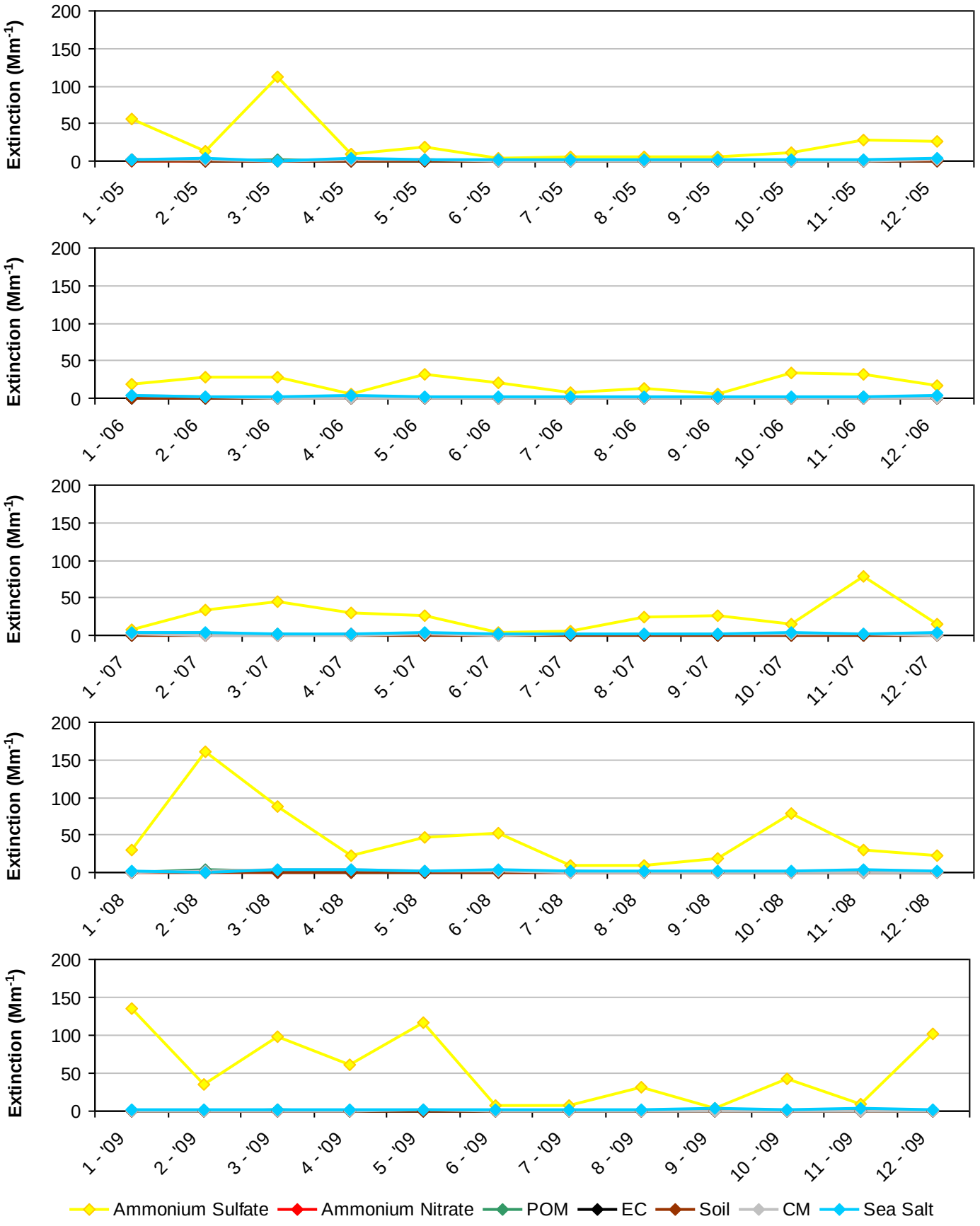
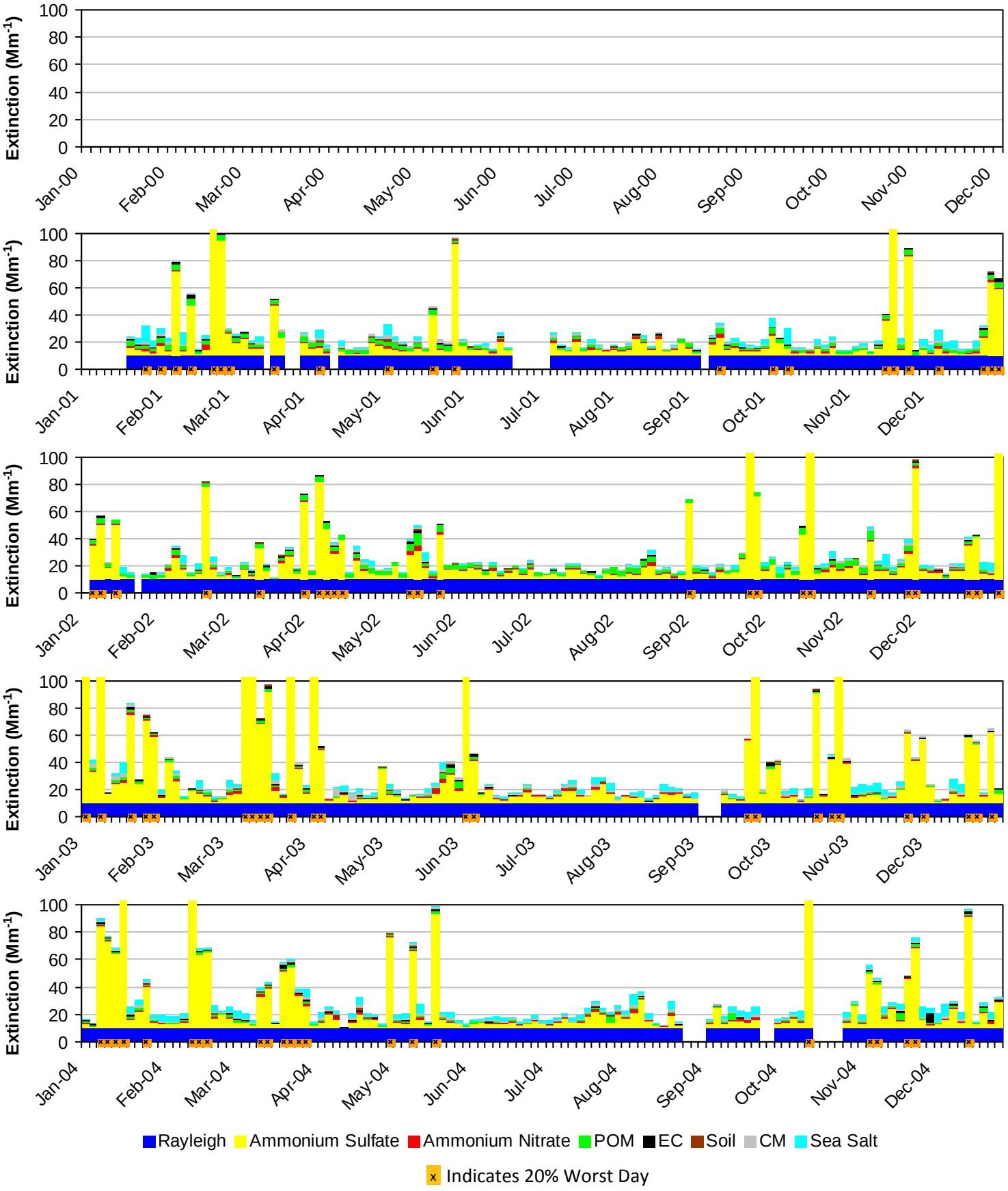
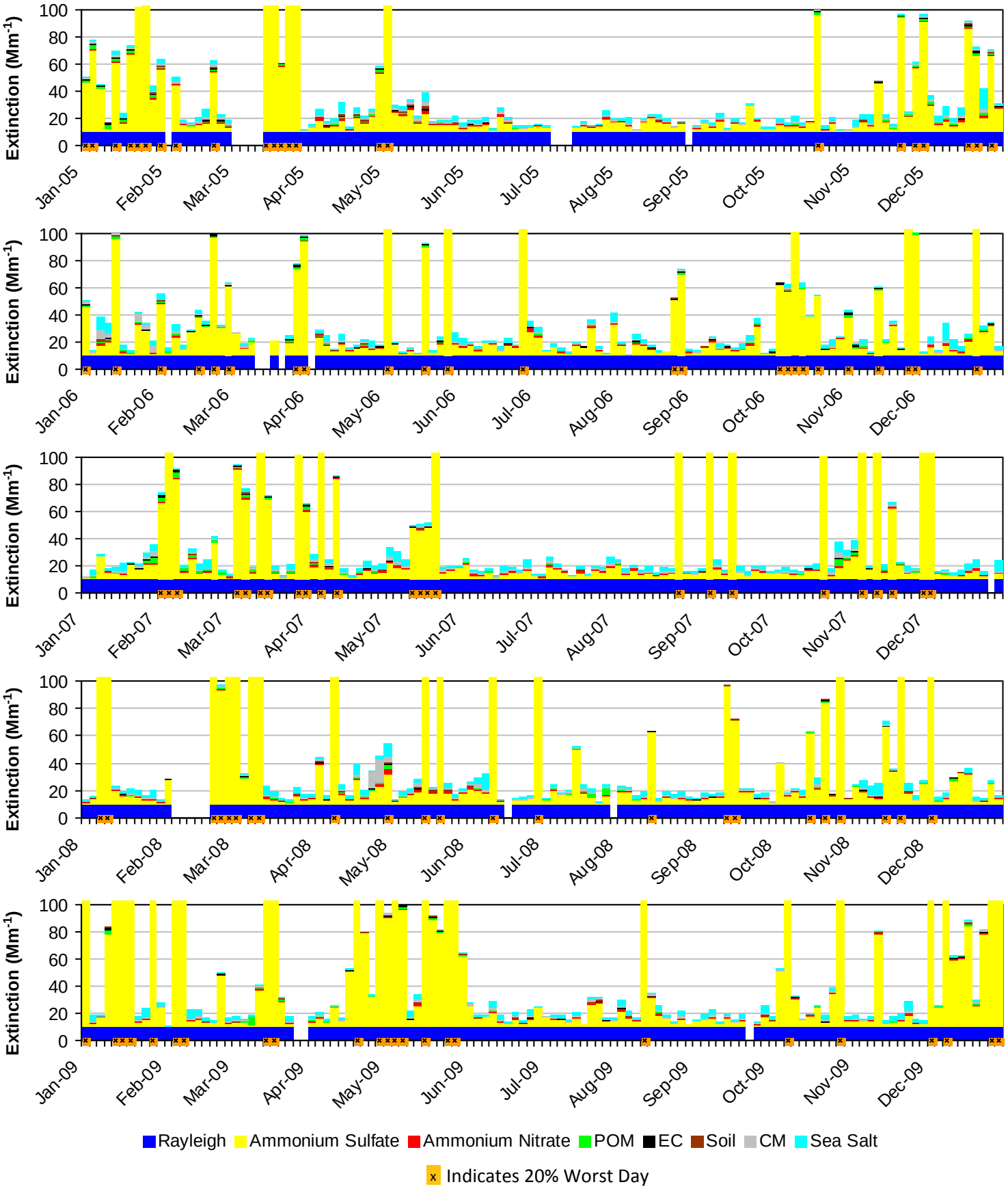


Figure E.3-7
Hawaii Volcanoes NP, HI (HAVO1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure E.3-8
Hawaii Volcanoes NP, HI (HAVO1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



APPENDIX F:

Idaho Class I Area Monitoring Data Summary Tables and Charts

Includes the following subsections:

Subsection	IMPROVE Monitor	Class I Area(s) Represented
F.1	CRMO1	Craters of the Moon NM
F.2	HECA1	Hells Canyon WA (Monitor located in OR)
F.3	SAWT1	Sawtooth WA
F.4	SULA1	Anaconda-Pintlar WA and Selway-Bitterroot WA (Monitor located in MT)
F.5	YELL2	Yellowstone NP, Grand Teton NP, Red Rock Lakes WA, and Teton WA (Monitor located in WY)

F.1. CRATERS OF THE MOON NM (CRMO1)

The following tables and figures are presented in this section for the Craters of the Moon NM represented by the CRMO1 IMPROVE Monitor:

- **Table F.1-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure F.1-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure F.1-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure F.1-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure F.1-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure F.1-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure F.1-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure F.1-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

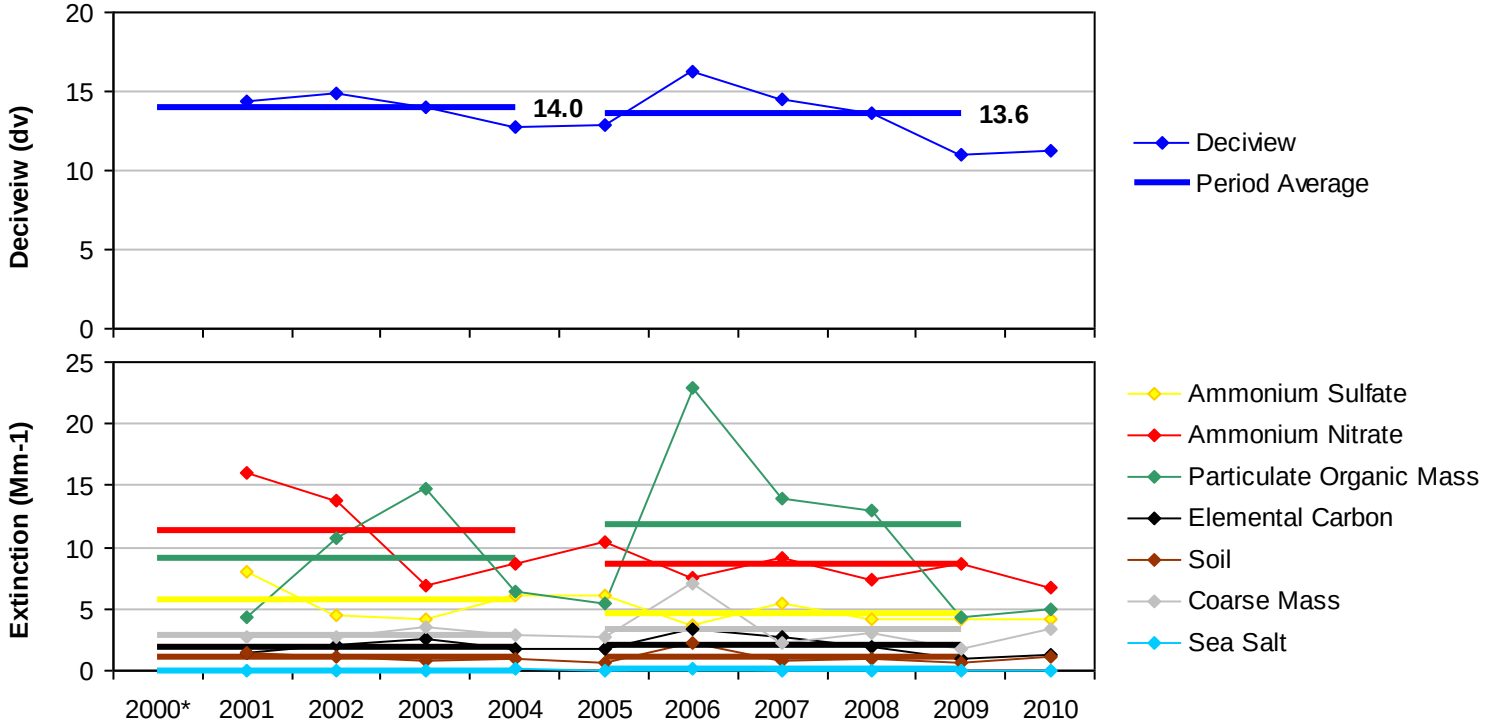
- **Figure F.1-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table F.1-1
Craters of the Moon NM, ID (CRMO1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	4.8	4.9	3.3	4.3	3.9	3.6	3.5	3.2	3.0	2.7	-0.2	0.0	4.3	3.4	-0.9	-21%
Worst 20% Days	---	14.3	14.9	14.0	12.8	12.8	16.2	14.5	13.6	11.0	11.3	-0.3	0.2	14.0	13.6	-0.4	-3%
All Days	---	8.6	9.3	8.1	8.2	8.1	9.3	8.2	7.9	6.9	6.8	-0.2	0.1	8.6	8.1	-0.5	-6%
Total Extinction (Mm-1)																	
Best 20% Days	---	16.2	16.3	13.9	15.4	14.8	14.3	14.3	13.8	13.5	13.2	-0.3	0.0	15.5	14.1	-1.4	-9%
Worst 20% Days	---	43.8	44.8	42.8	36.8	37.1	57.0	44.5	40.3	30.5	31.6	-1.0	0.2	42.0	41.9	-0.1	0%
All Days	---	25.4	27.1	24.7	23.9	23.7	29.2	25.0	23.8	20.7	20.7	-0.5	0.1	25.3	24.5	-0.8	-3%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	1.9	1.8	1.0	1.4	2.0	1.6	1.4	1.3	1.3	1.2	-0.1	0.1	1.5	1.5	0.0	0%
Worst 20% Days	---	8.0	4.5	4.2	6.1	6.1	3.6	5.5	4.2	4.1	4.2	-0.2	0.0	5.7	4.7	-1.0	-18%
All Days	---	3.9	3.2	2.6	3.6	3.8	3.4	3.2	3.2	2.9	2.7	-0.1	0.1	3.3	3.3	0.0	0%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	1.2	1.3	0.9	1.5	0.9	0.8	0.8	1.1	0.6	0.6	-0.1	0.0	1.2	0.8	-0.4	-33%
Worst 20% Days	---	16.0	13.8	6.9	8.6	10.3	7.6	9.2	7.3	8.6	6.7	-0.7	0.1	11.3	8.6	-2.7	-24%
All Days	---	5.0	5.0	2.8	3.5	3.5	3.7	3.4	3.1	2.9	2.4	-0.2	0.0	4.1	3.3	-0.8	-20%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	1.5	1.4	0.9	1.4	0.9	0.7	0.8	0.7	0.7	0.6	-0.1	0.0	1.3	0.8	-0.5	-39%
Worst 20% Days	---	4.3	10.7	14.8	6.5	5.4	22.9	13.9	13.0	4.3	4.9	0.1	0.5	9.1	11.9	2.8	31%
All Days	---	3.1	5.0	5.6	3.6	3.2	6.8	4.8	4.4	2.6	2.4	-0.1	0.4	4.3	4.3	0.0	0%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.5	0.4	0.2	0.4	0.3	0.4	0.3	0.2	0.2	0.2	0.0	0.0	0.4	0.3	-0.1	-25%
Worst 20% Days	---	1.4	2.1	2.5	1.7	1.8	3.3	2.7	1.9	1.0	1.3	0.0	0.5	1.9	2.1	0.2	11%
All Days	---	1.0	1.1	1.2	1.0	1.0	1.3	1.1	0.8	0.6	0.7	0.0	0.3	1.0	1.0	0.0	0%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.3	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.0	0.2	0.2	0.2	0.0	0%
Worst 20% Days	---	1.4	1.1	0.9	0.9	0.6	2.2	0.8	0.9	0.7	1.1	0.0	0.1	1.0	1.1	0.1	10%
All Days	---	0.7	0.7	0.5	0.5	0.4	1.0	0.6	0.6	0.5	0.6	0.0	0.3	0.6	0.6	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.9	1.1	0.7	0.5	0.5	0.5	0.6	0.4	0.5	0.4	0.0	0.0	0.8	0.5	-0.3	-38%
Worst 20% Days	---	2.8	2.7	3.5	2.9	2.8	7.1	2.3	3.0	1.8	3.3	-0.1	0.4	2.9	3.4	0.5	17%
All Days	---	1.8	2.1	2.1	1.6	1.8	2.9	1.8	1.7	1.3	1.9	-0.1	0.1	1.9	1.9	0.0	0%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0%
Worst 20% Days	---	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.2	0.0	0.1	0.1	0%
All Days	---	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.5	0.0	0.1	0.1	0%

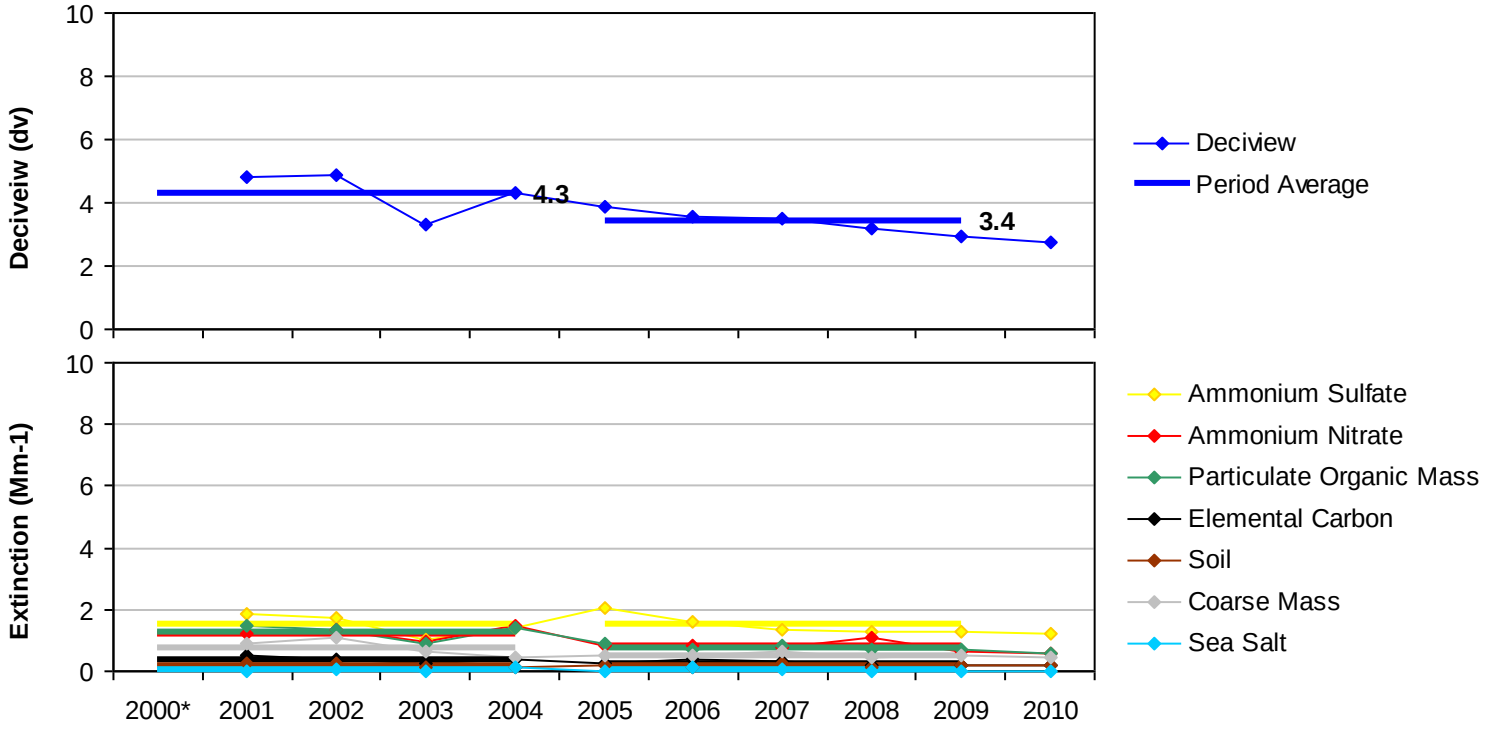
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure F.1-1
Craters of the Moon NM, ID (CRMO1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



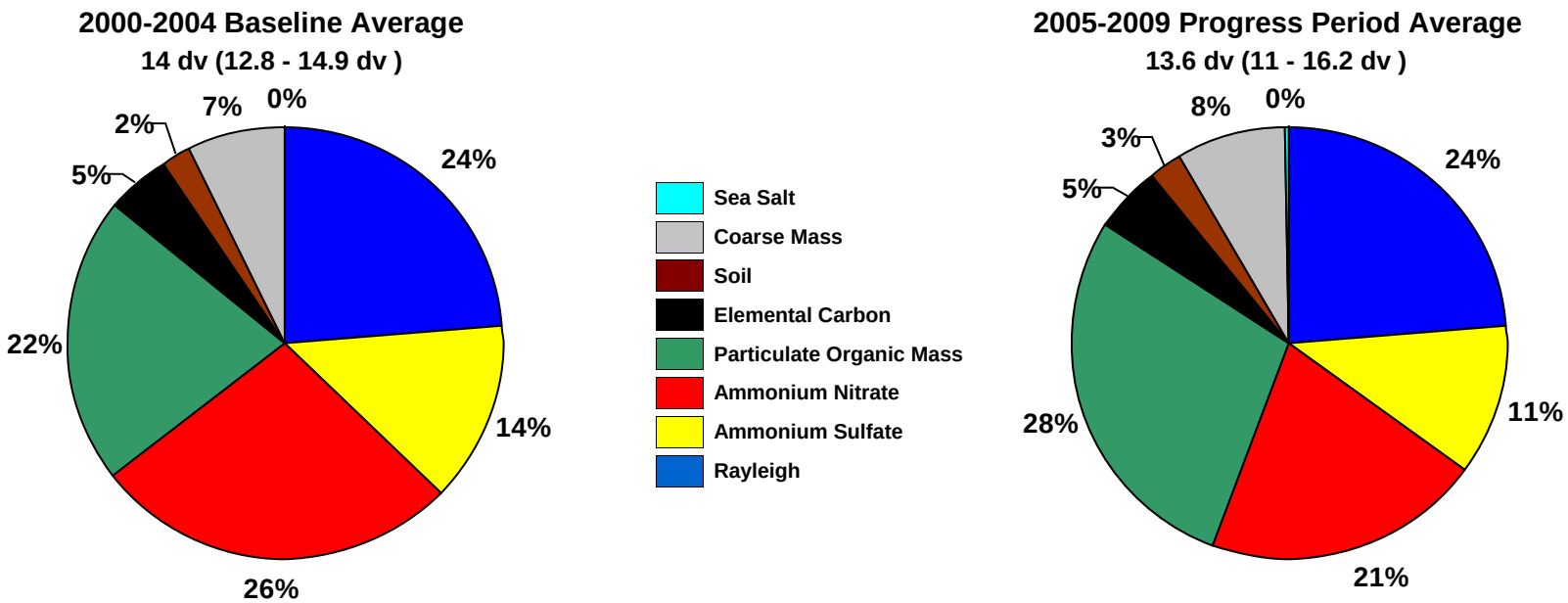
*Missing years did not meet RHR data completeness criteria.

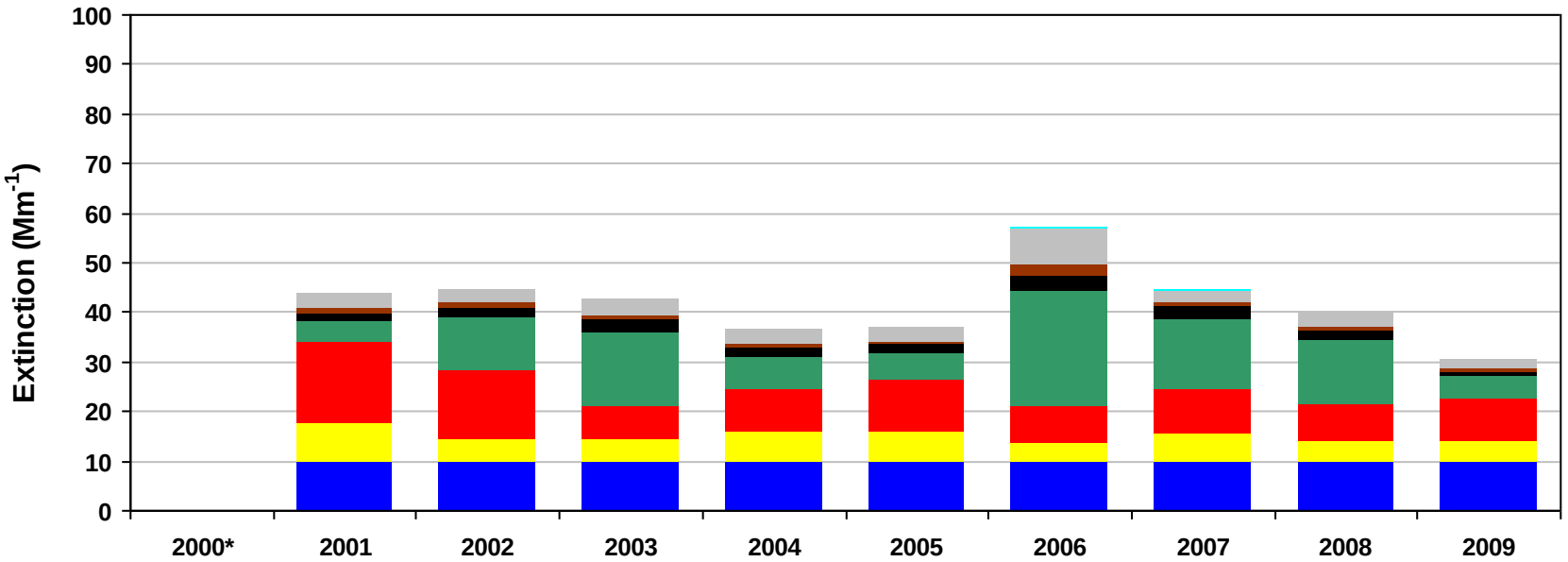
Figure F.1-2
Craters of the Moon NM, ID (CRMO1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

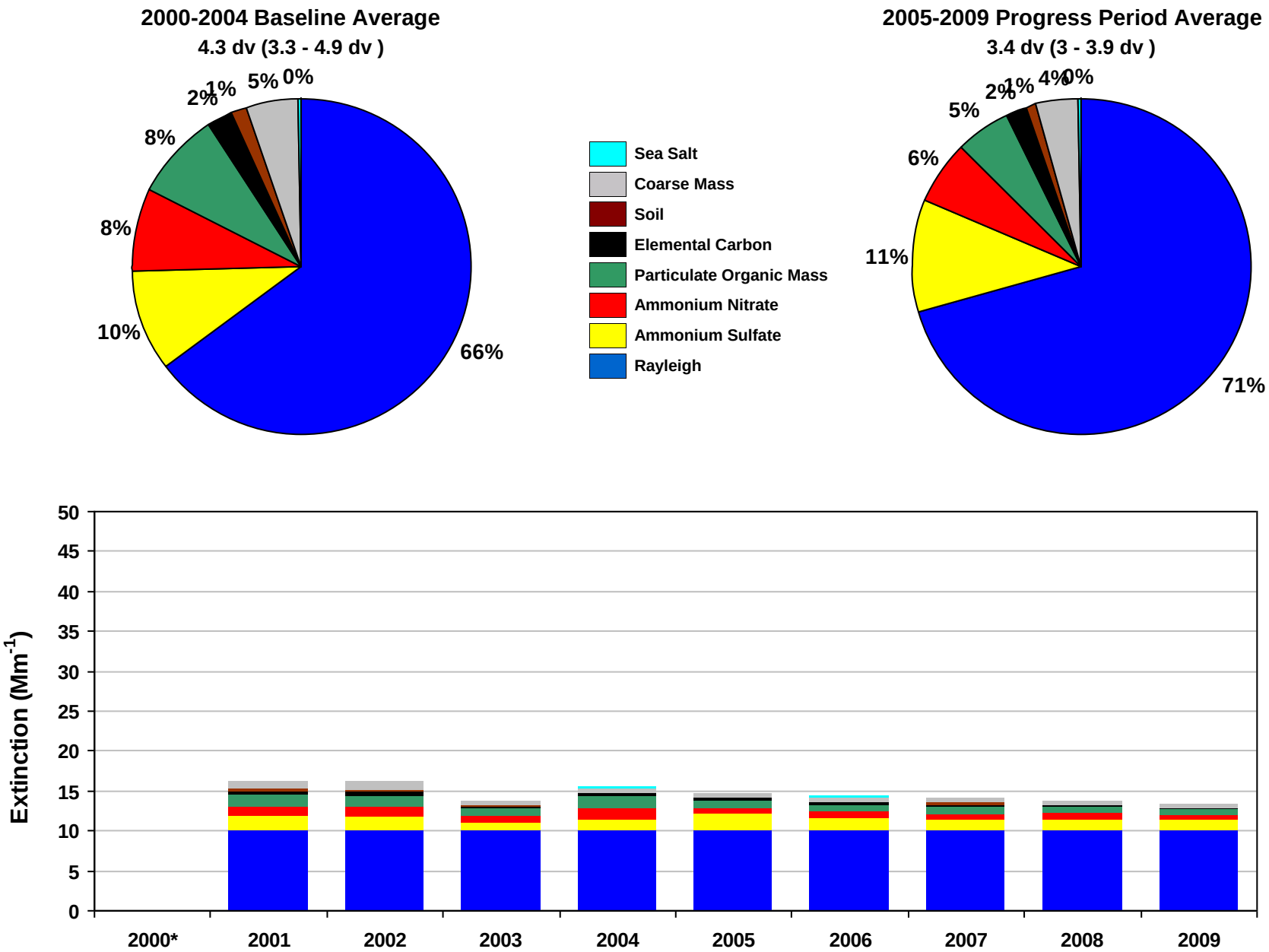
Figure F.1-3
Craters of the Moon NM, ID (CRMO1 Site)
20% Most Impaired Visibility Days





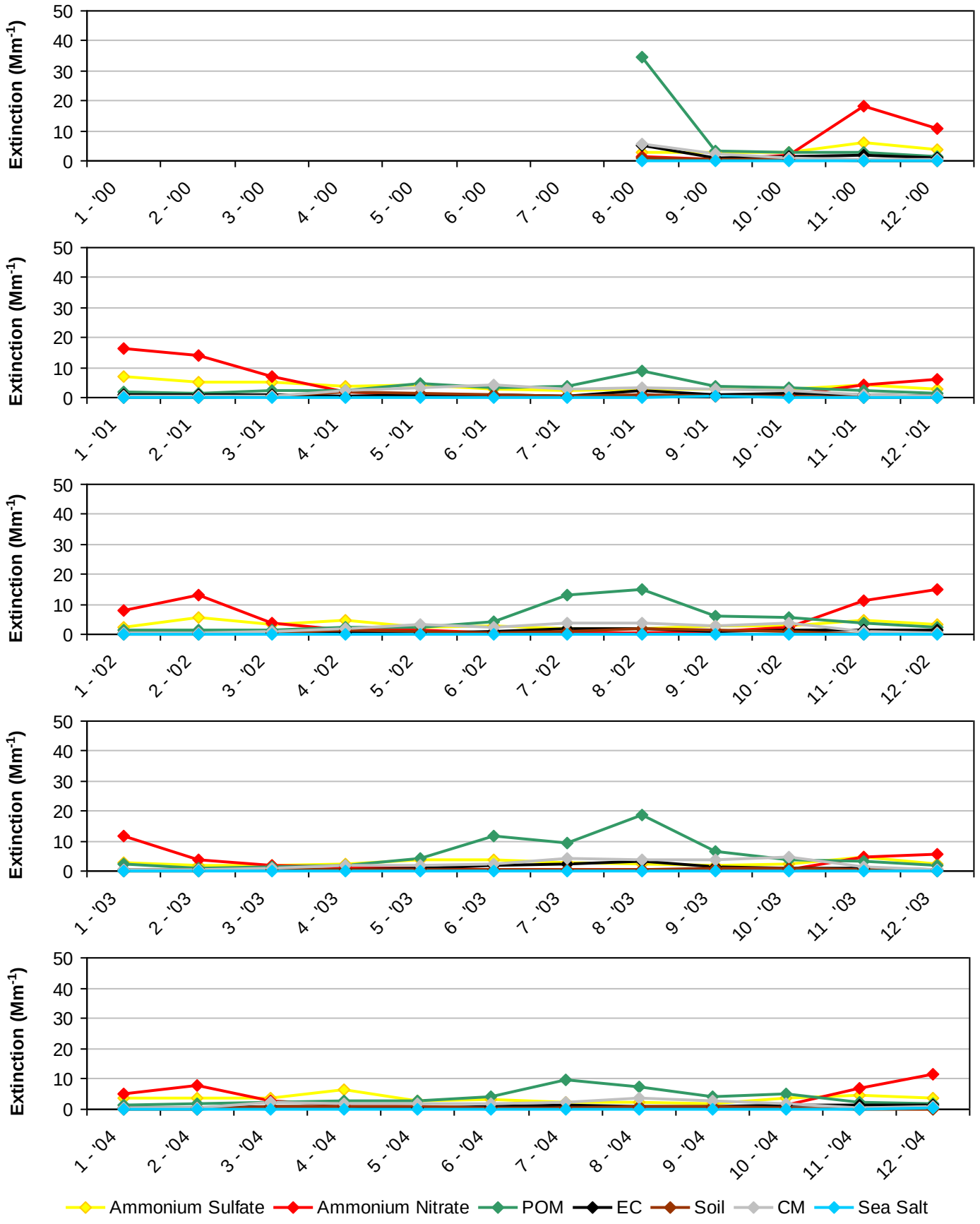
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure F.1-4
Craters of the Moon NM, ID (CRMO1 Site)
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure F.1-5
Craters of the Moon NM, ID (CRMO1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure F.1-6
Craters of the Moon NM, ID (CRMO1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

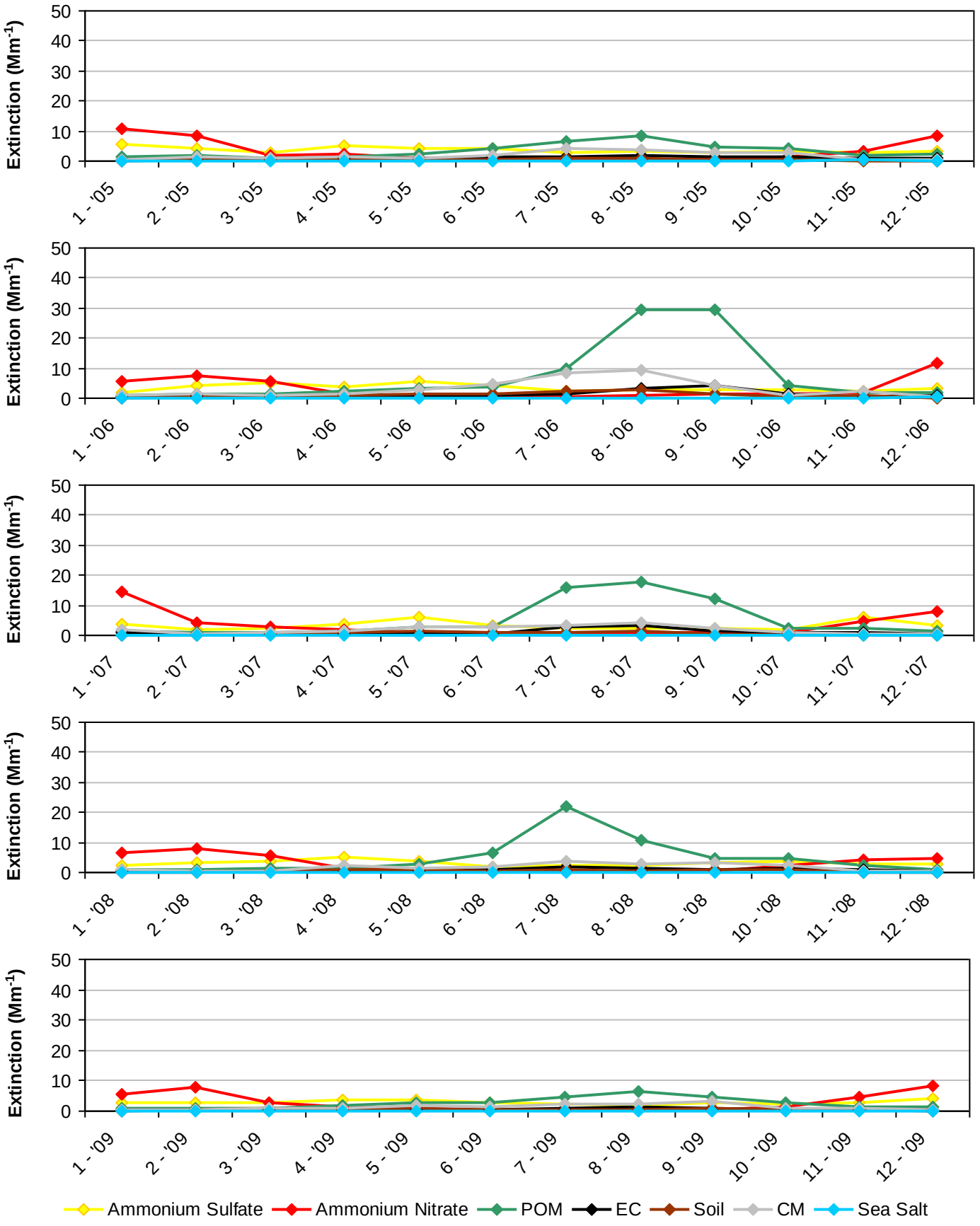
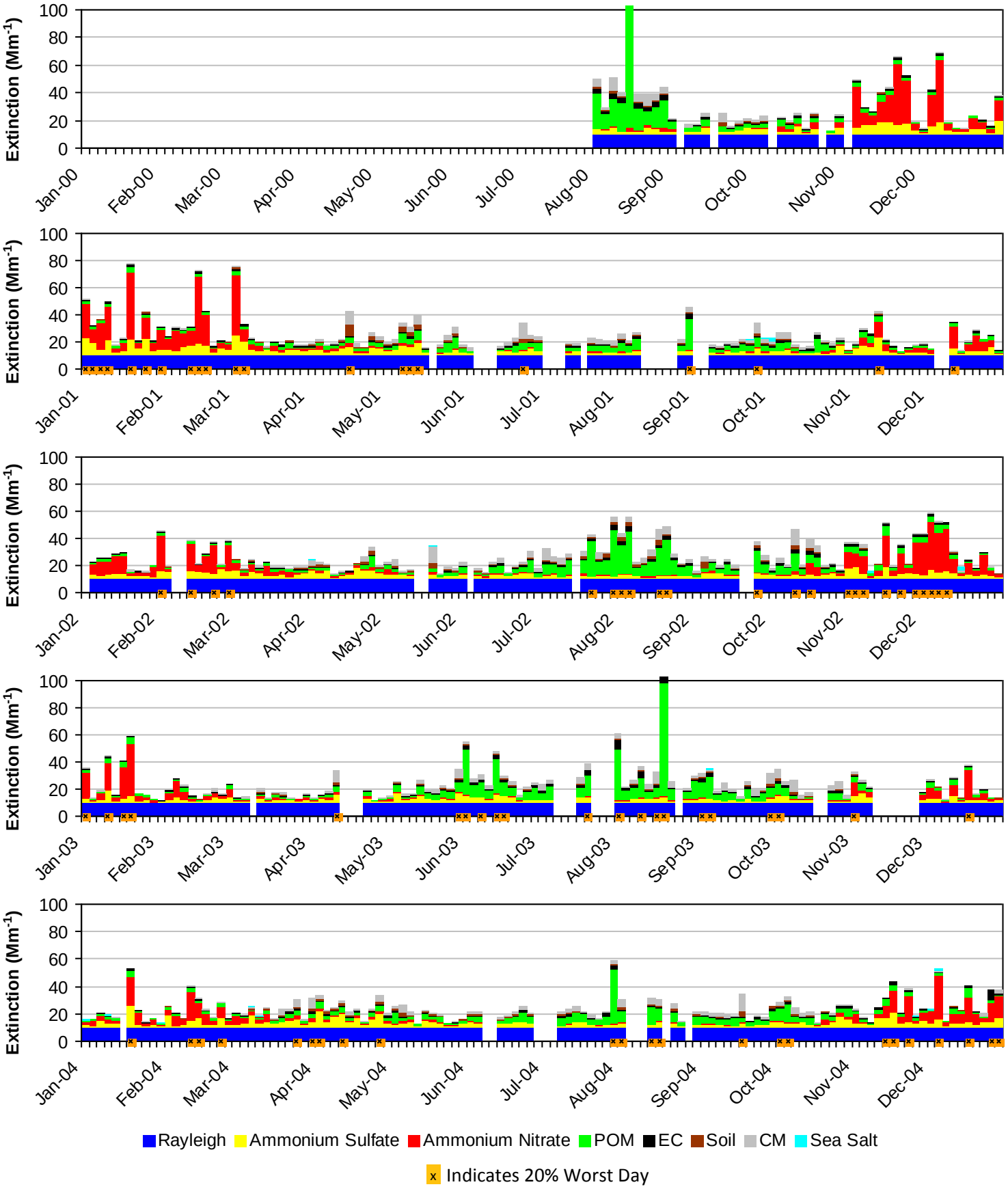
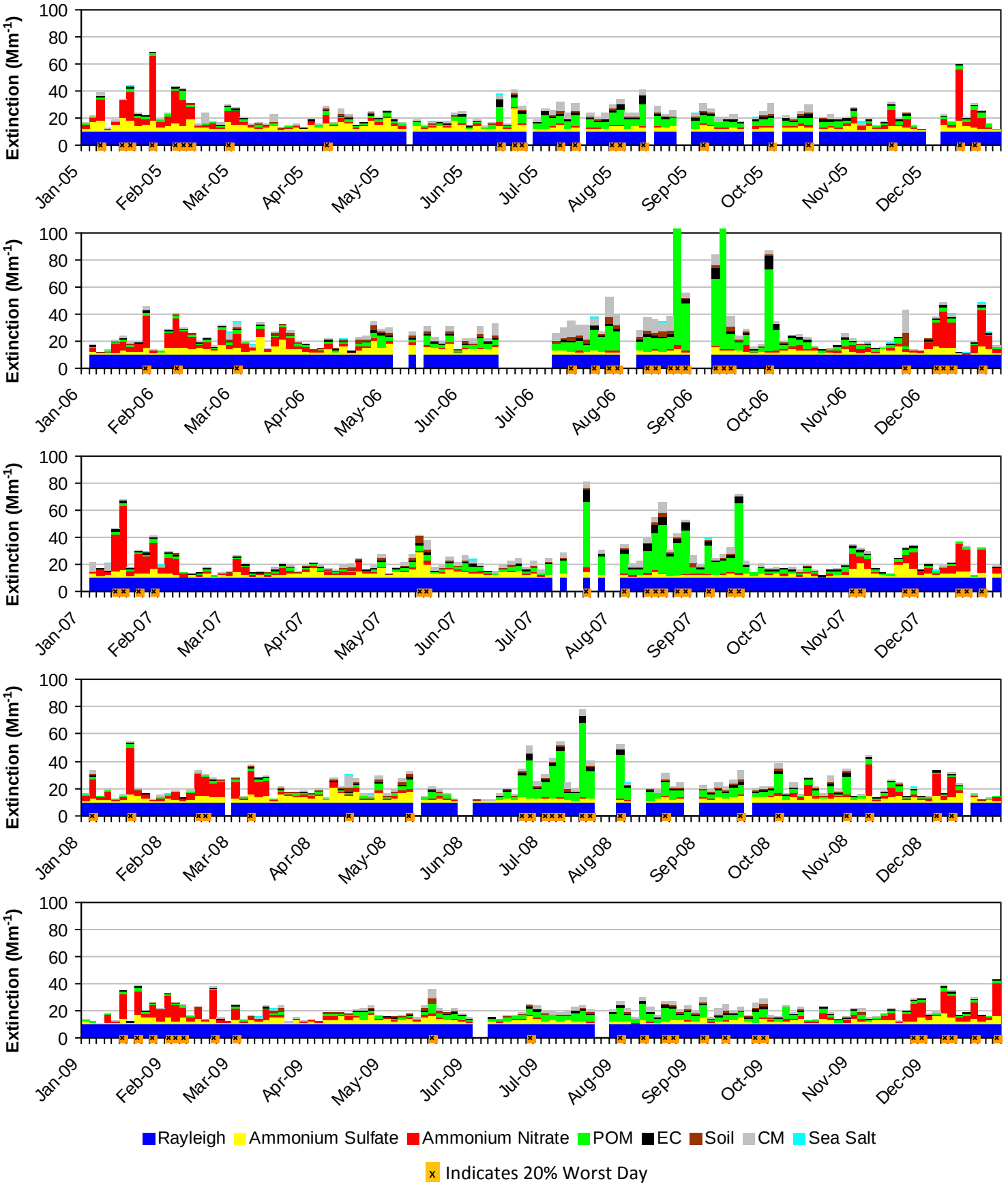


Figure F.1-7
Craters of the Moon NM, ID (CRMO1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure F.1-8
Craters of the Moon NM, ID (CRMO1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



F.2. HELLS CANYON WA (HECA1)

The following tables and figures are presented in this section for the Hells Canyon WA represented by the HECA1 IMPROVE Monitor:

- **Table F.2-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure F.2-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure F.2-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure F.2-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure F.2-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure F.2-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure F.2-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure F.2-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

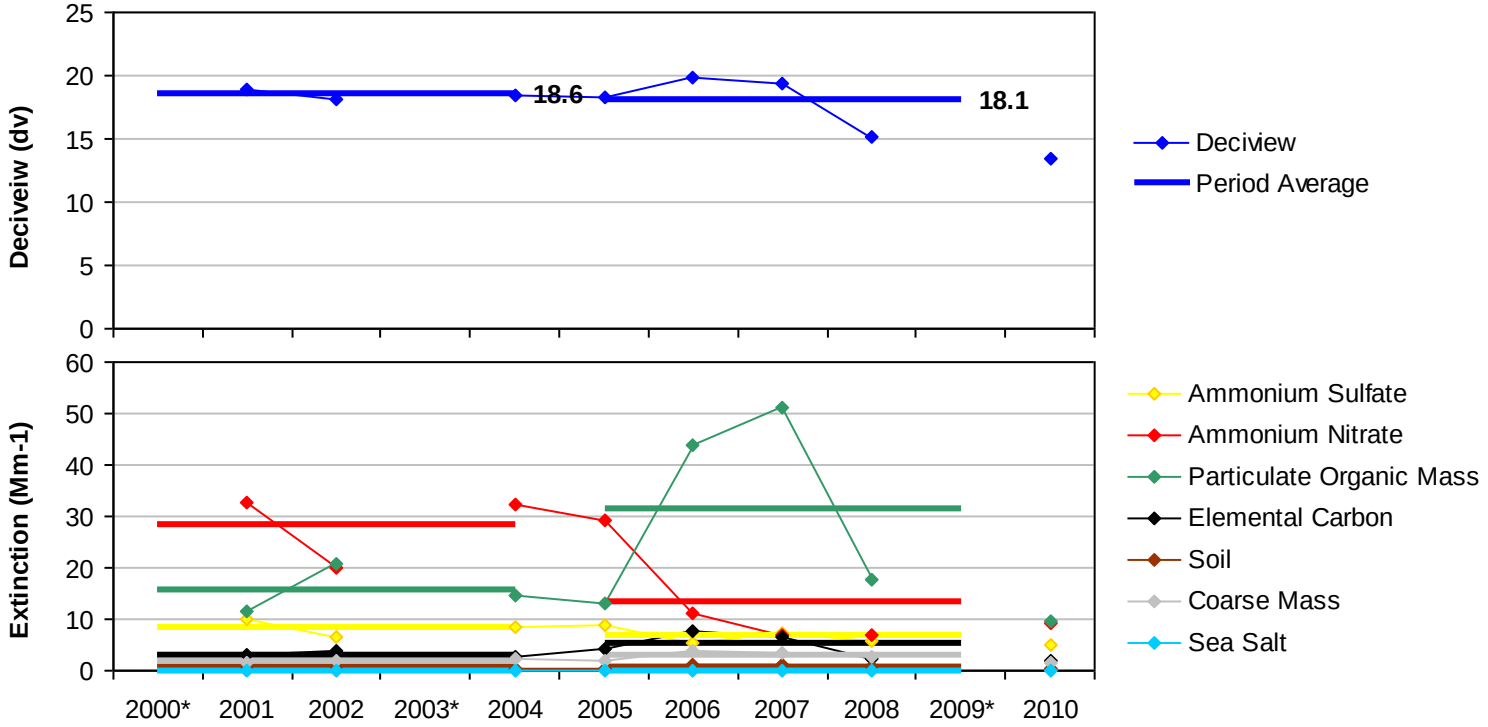
- **Figure F.2-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table F.2-1
Hells Canyon WA, OR (HECA1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	5.5	5.8	---	5.2	4.7	4.7	5.2	4.6	---	4.0	-0.1	0.1	5.5	4.8	-0.7	-13%
Worst 20% Days	---	19.0	18.2	---	18.5	18.3	19.8	19.4	15.1	---	13.5	-0.1	0.5	18.6	18.1	-0.5	-3%
All Days	---	10.9	11.0	---	10.7	10.0	10.8	10.8	9.4	---	8.5	-0.1	0.1	10.9	10.3	-0.6	-6%
Total Extinction (Mm-1)																	
Best 20% Days	---	17.4	18.0	---	16.9	16.1	16.1	17.0	15.9	---	15.0	-0.2	0.0	17.4	16.3	-1.1	-6%
Worst 20% Days	---	70.2	64.8	---	72.5	68.7	84.1	87.5	47.2	---	39.1	1.3	0.4	69.1	71.9	2.8	4%
All Days	---	34.3	33.9	---	34.6	32.0	36.7	37.4	27.7	---	24.8	0.1	0.5	34.2	33.4	-0.8	-2%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	2.2	1.9	---	1.7	2.0	1.7	2.2	1.8	---	1.3	0.0	0.4	1.9	1.9	0.0	0%
Worst 20% Days	---	9.9	6.6	---	8.6	8.8	5.4	7.3	5.7	---	5.2	-0.4	0.1	8.4	6.8	-1.6	-19%
All Days	---	4.9	3.8	---	4.5	4.5	3.8	4.4	3.9	---	3.5	-0.1	0.3	4.4	4.2	-0.2	-5%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	1.0	0.8	---	0.5	0.5	0.7	0.6	0.7	---	0.3	0.0	0.2	0.8	0.6	-0.2	-25%
Worst 20% Days	---	32.9	20.0	---	32.5	29.1	11.2	6.8	6.9	---	9.3	-3.7	0.0	28.5	13.5	-15.0	-53%
All Days	---	8.3	5.7	---	8.2	6.7	3.5	3.0	2.7	---	2.8	-0.8	0.0	7.4	4.0	-3.4	-46%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	1.6	2.3	---	2.1	1.4	1.5	1.7	1.4	---	1.1	-0.1	0.1	2.0	1.5	-0.5	-25%
Worst 20% Days	---	11.4	20.7	---	14.7	13.1	43.9	51.0	17.8	---	9.7	1.6	0.1	15.6	31.4	15.8	>100%
All Days	---	6.0	8.9	---	7.1	5.8	13.0	14.1	6.7	---	4.5	0.4	0.3	7.4	9.9	2.5	34%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.6	0.7	---	0.5	0.5	0.4	0.5	0.3	---	0.3	0.0	0.1	0.6	0.4	-0.2	-33%
Worst 20% Days	---	2.9	3.7	---	2.5	4.3	7.6	6.6	2.5	---	1.9	0.3	0.4	3.1	5.3	2.2	71%
All Days	---	1.5	1.8	---	1.4	1.9	2.5	2.3	1.2	---	1.0	0.1	0.4	1.6	2.0	0.4	25%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.3	---	0.2	0.1	0.2	0.2	0.2	---	0.2	0.0	0.1	0.3	0.2	-0.1	-33%
Worst 20% Days	---	0.7	0.7	---	0.6	0.4	1.1	1.2	0.7	---	0.5	0.1	0.3	0.7	0.8	0.1	14%
All Days	---	0.7	0.7	---	0.5	0.4	0.7	0.5	0.5	---	0.4	0.0	0.4	0.6	0.5	-0.1	-17%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.7	0.9	---	0.8	0.5	0.4	0.6	0.5	---	0.7	-0.1	0.1	0.8	0.5	-0.3	-38%
Worst 20% Days	---	1.4	2.0	---	2.5	1.8	3.8	3.6	2.6	---	1.5	0.3	0.1	1.9	2.9	1.0	53%
All Days	---	1.8	2.0	---	1.8	1.6	2.0	1.9	1.7	---	1.6	0.0	0.3	1.9	1.8	-0.1	-5%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.0	---	0.1	0.1	0.2	0.1	0.1	---	0.0	0.0	0.3	0.1	0.1	0.0	0%
Worst 20% Days	---	0.0	0.0	---	0.1	0.2	0.2	0.1	0.0	---	0.0	0.0	0.2	0.0	0.1	0.1	0%
All Days	---	0.0	0.1	---	0.1	0.1	0.1	0.1	0.1	---	0.0	0.0	0.5	0.1	0.1	0.0	0%

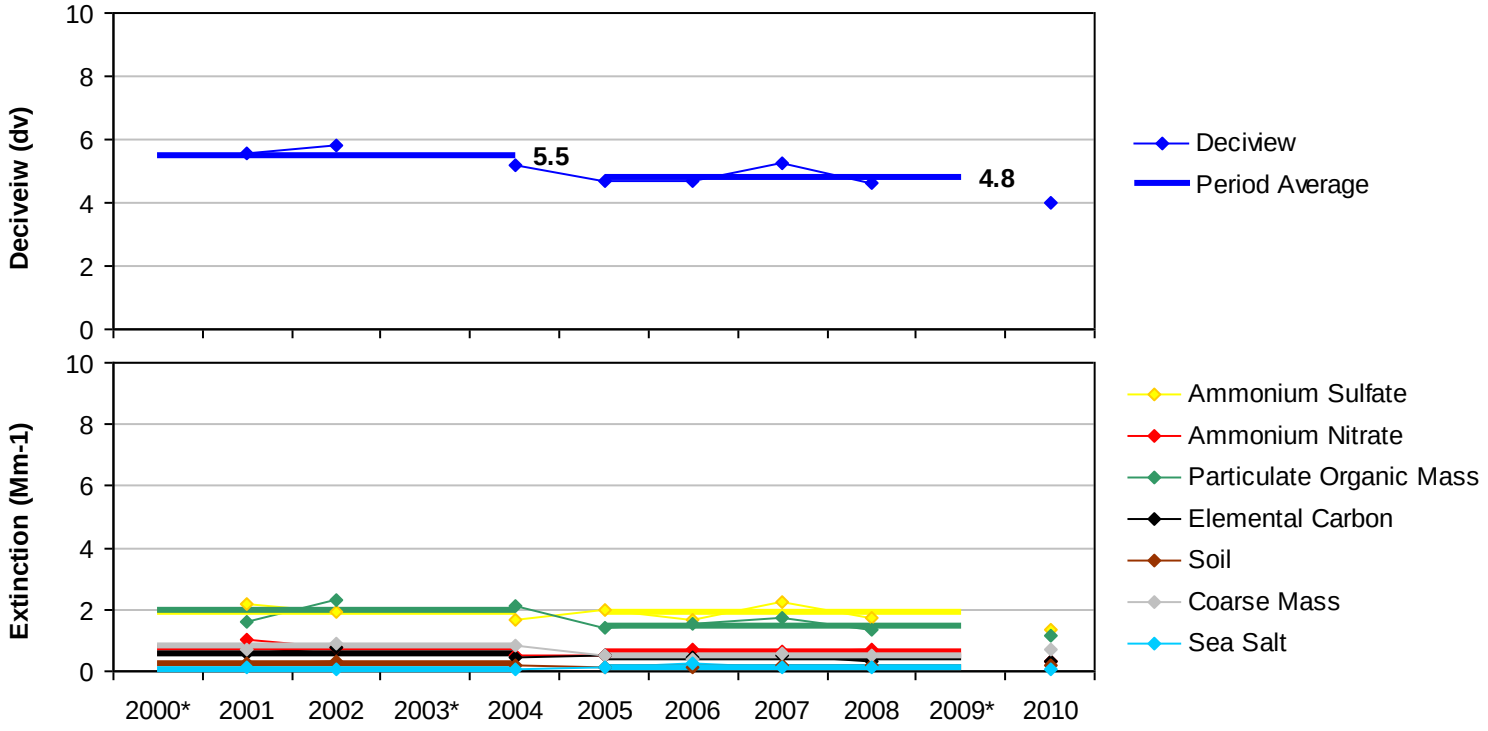
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure F.2-1
Hells Canyon WA, OR (HECA1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



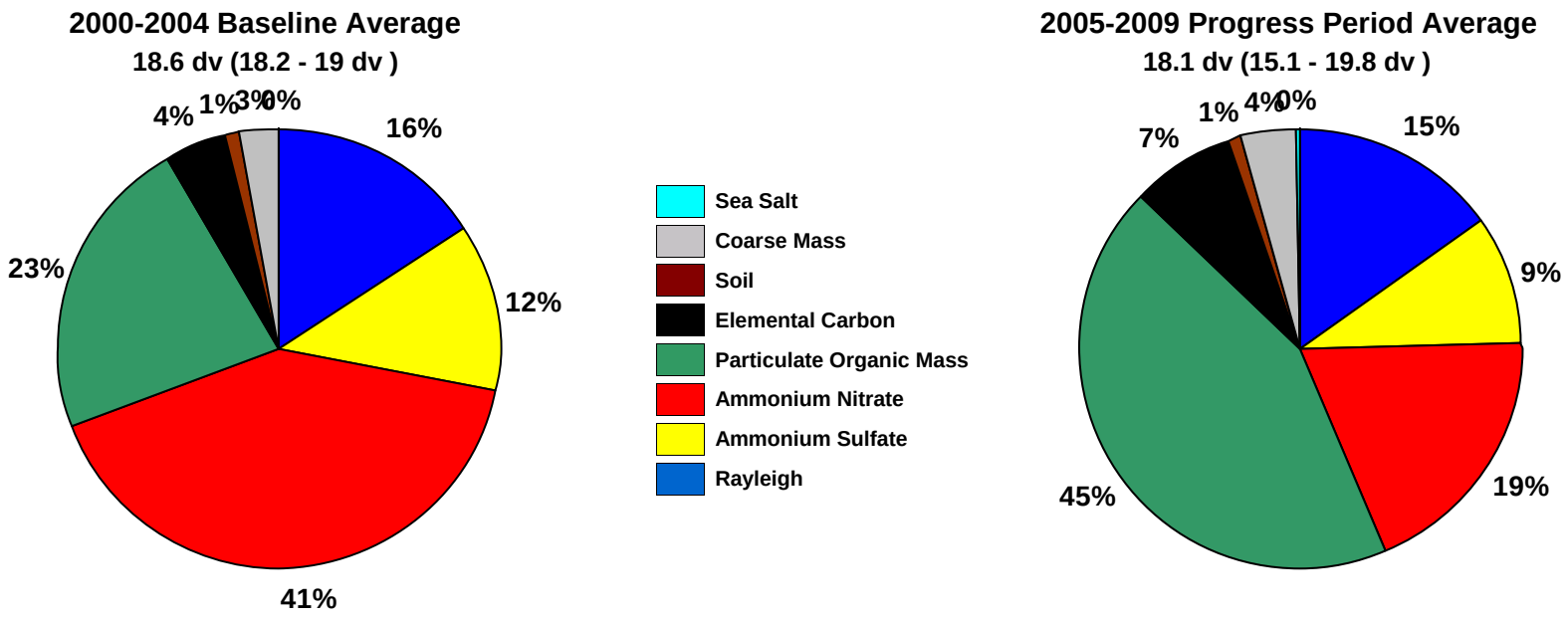
*Missing years did not meet RHR data completeness criteria.

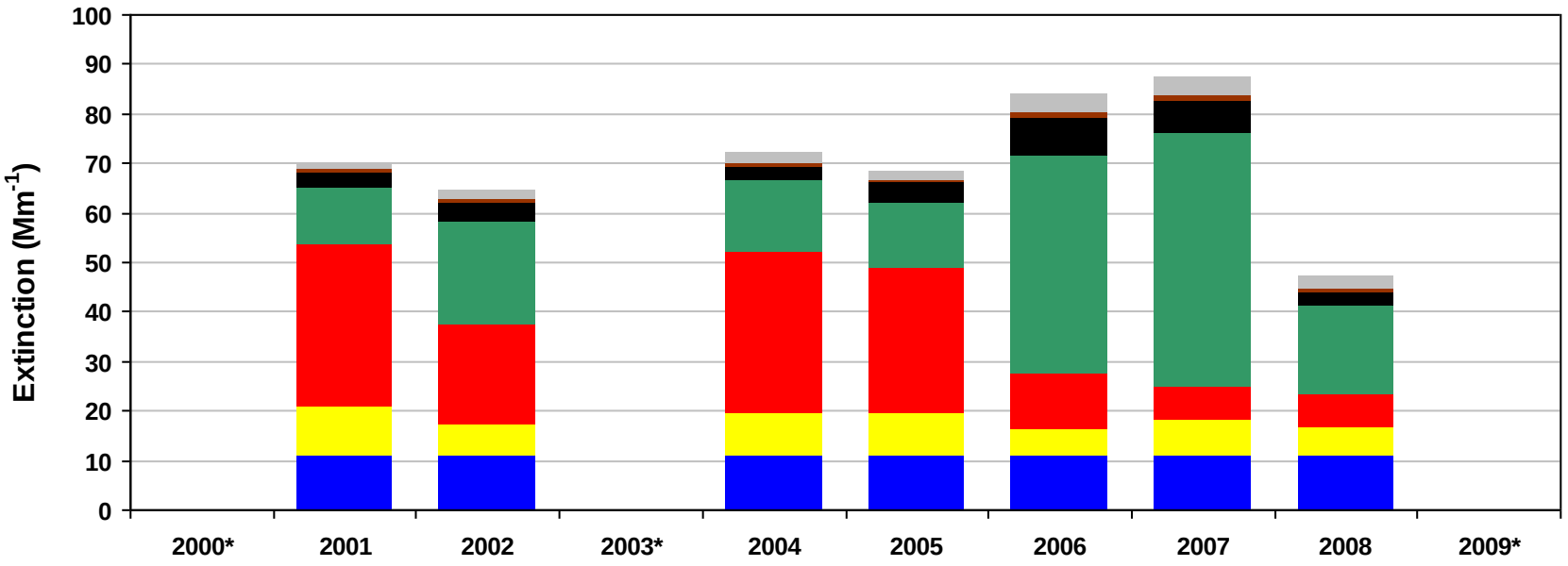
Figure F.2-2
Hells Canyon WA, OR (HECA1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

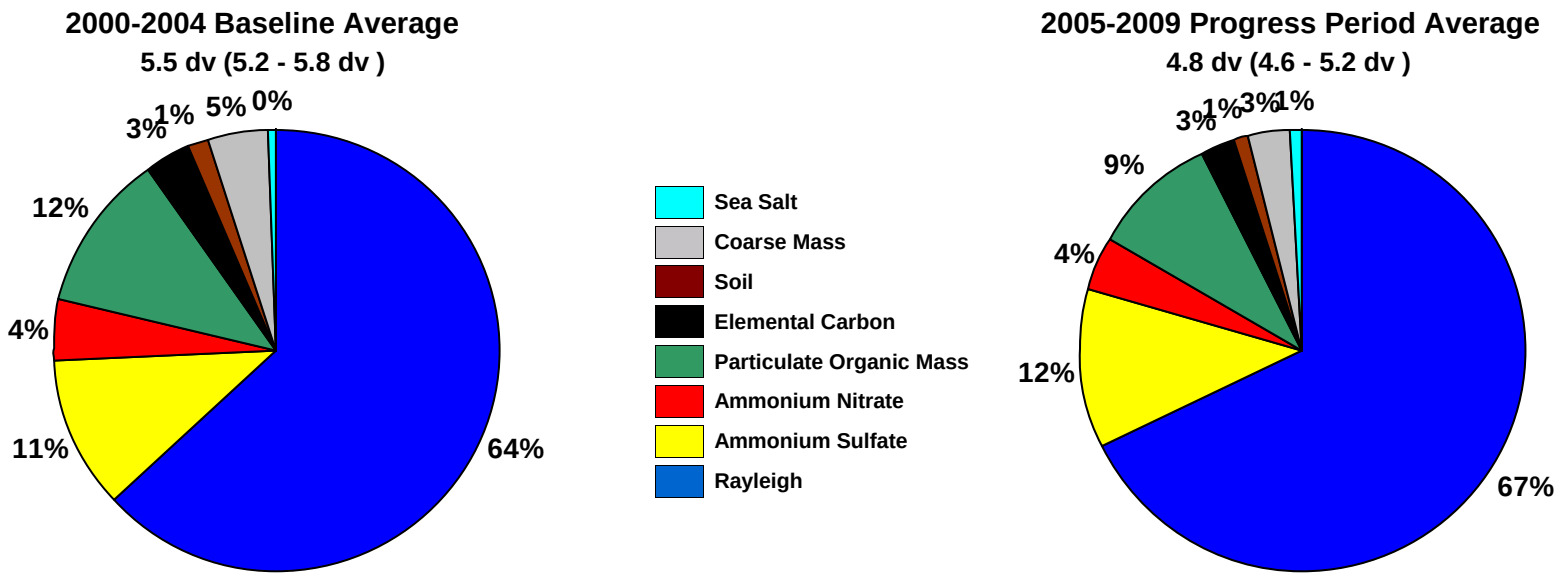
Figure F.2-3
Hells Canyon WA, OR (HECA1 Site)
20% Most Impaired Visibility Days

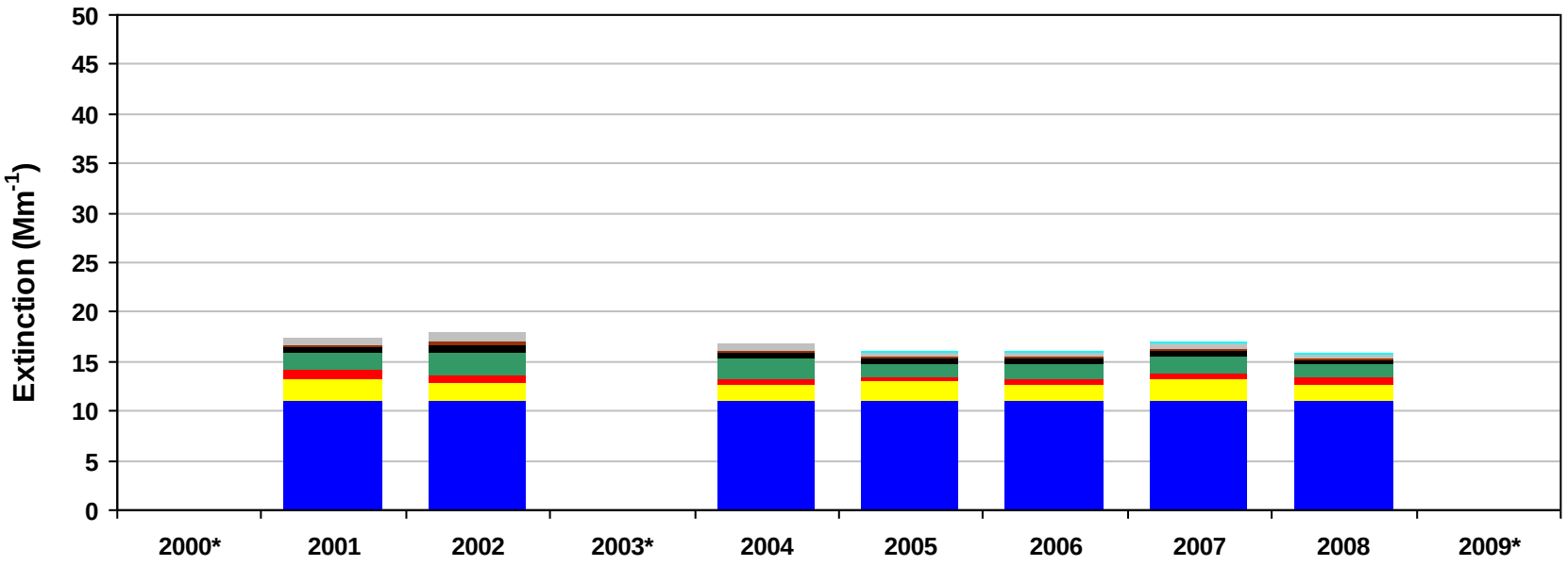




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

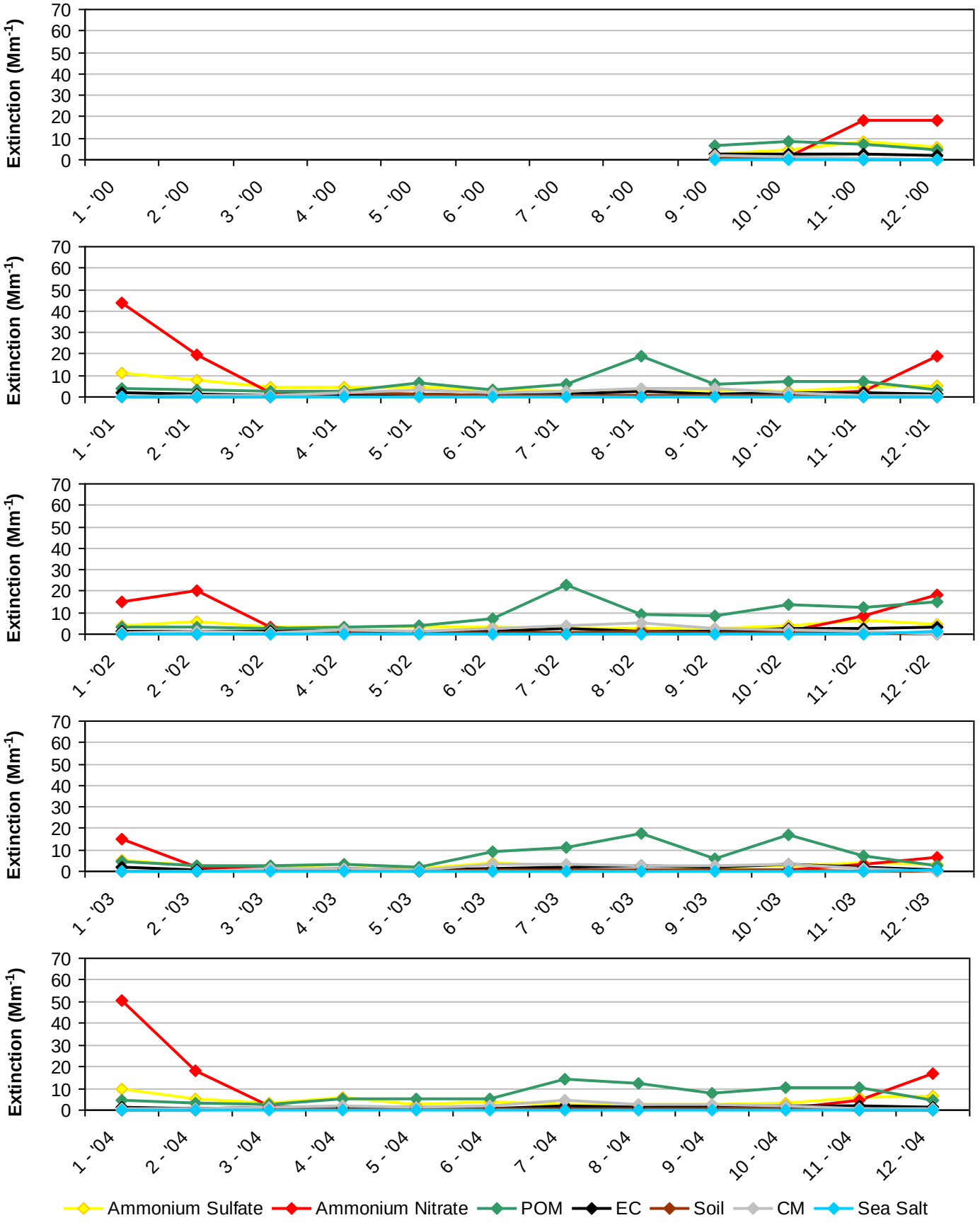
Figure F.2-4
Hells Canyon WA, OR (HECA1 Site)
20% Least Impaired Visibility Days





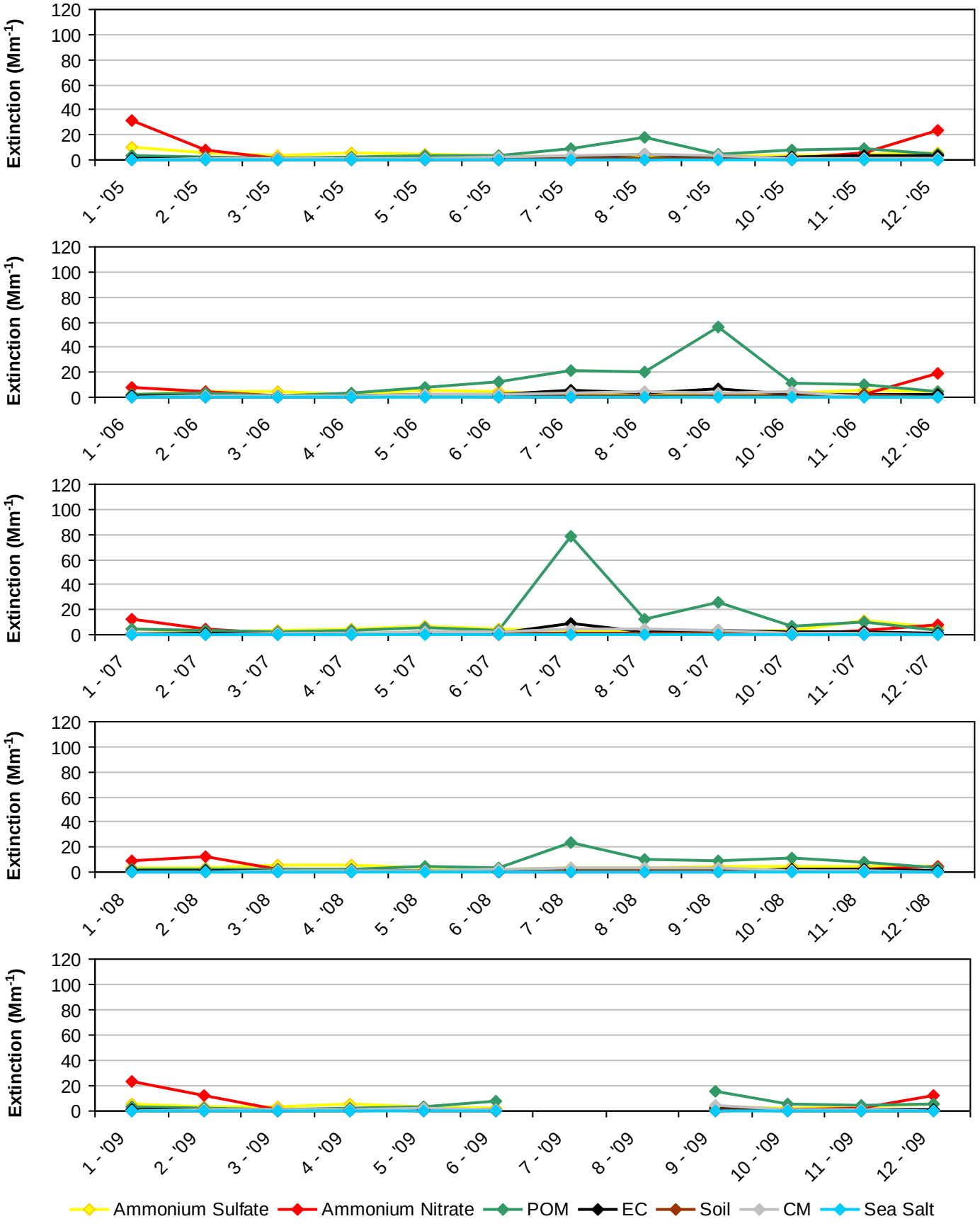
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure F.2-5
Hells Canyon WA, OR (HECA1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



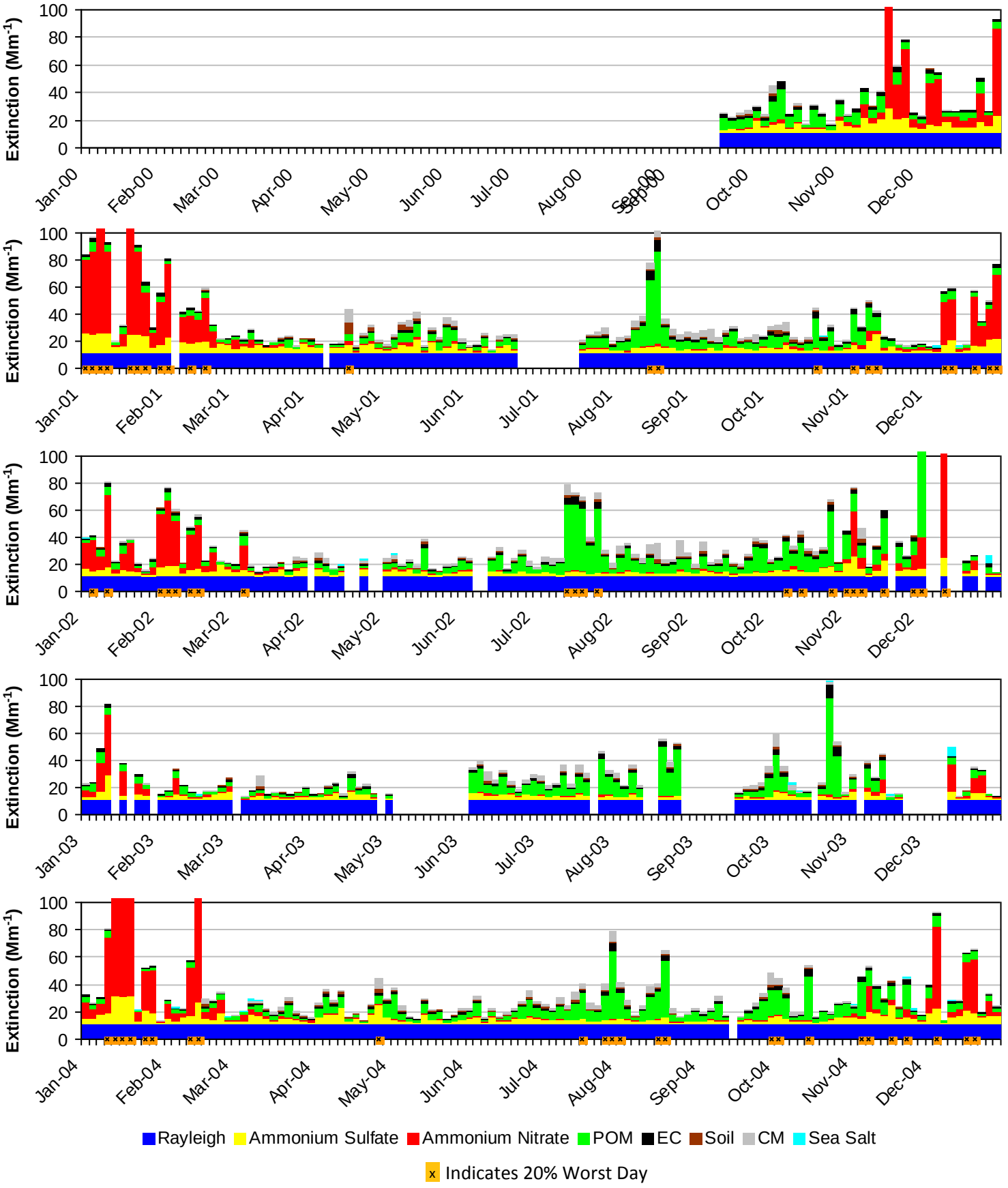
*Note that monthly averages for the years 2000 and 2003 are shown here, but these years did not meet RHR data completeness criteria.

Figure F.2-6
Hells Canyon WA, OR (HECA1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days



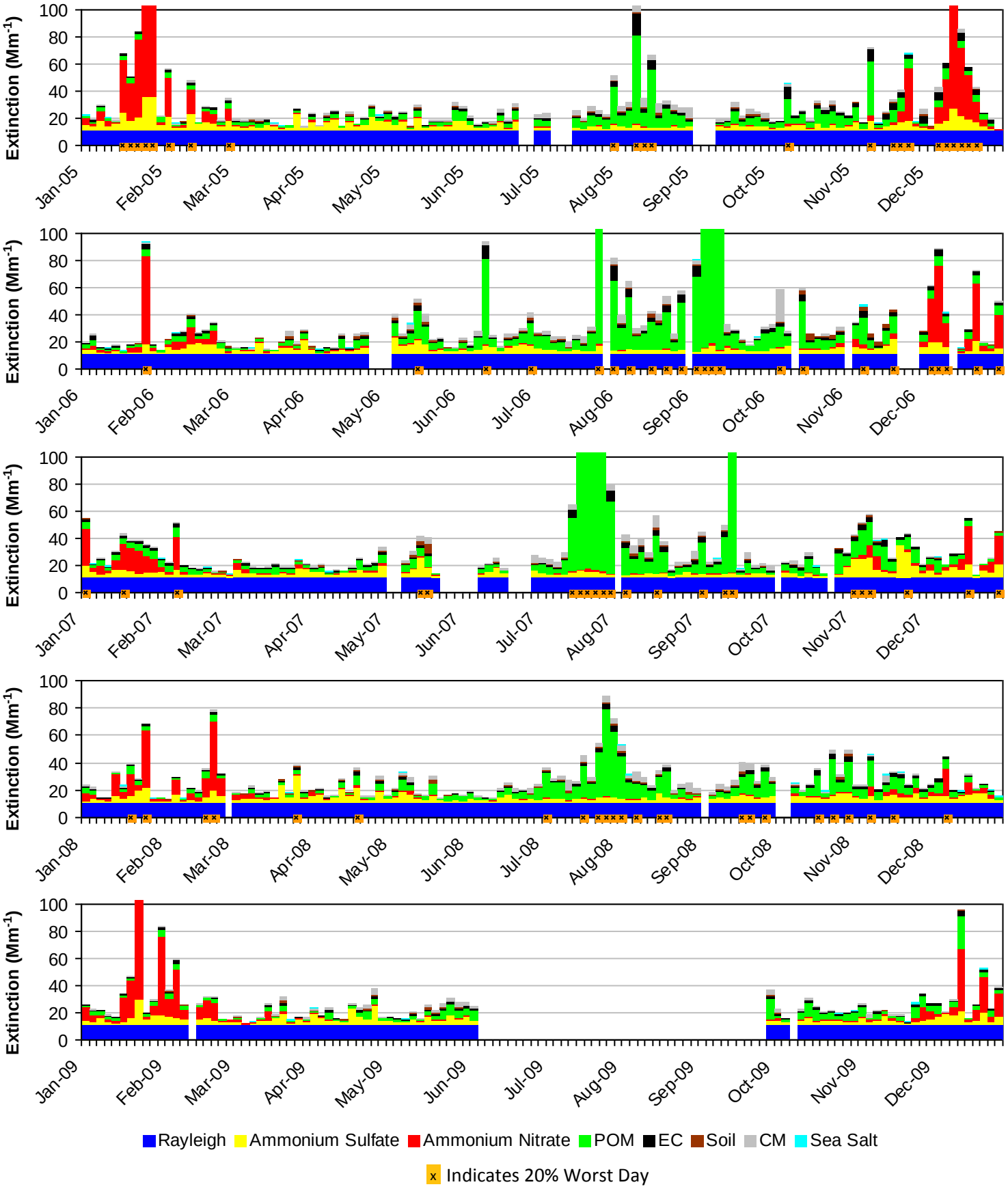
*Note that monthly averages for the year 2009 are shown here, but this year did not meet RHR data completeness criteria.

Figure F.2-7
Hells Canyon WA, OR (HECA1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2000 and 2003 are shown here, but these years did not meet RHR data completeness criteria.

Figure F.2-8
Hells Canyon WA, OR (HECA1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2009 are shown here, but this year did not meet RHR data completeness criteria.

F.3. SAWTOOTH WA (SAWT1)

The following tables and figures are presented in this section for the Sawtooth WA represented by the SAWT1 IMPROVE Monitor:

- **Table F.3-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure F.3-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure F.3-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure F.3-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure F.3-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure F.3-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure F.3-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure F.3-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

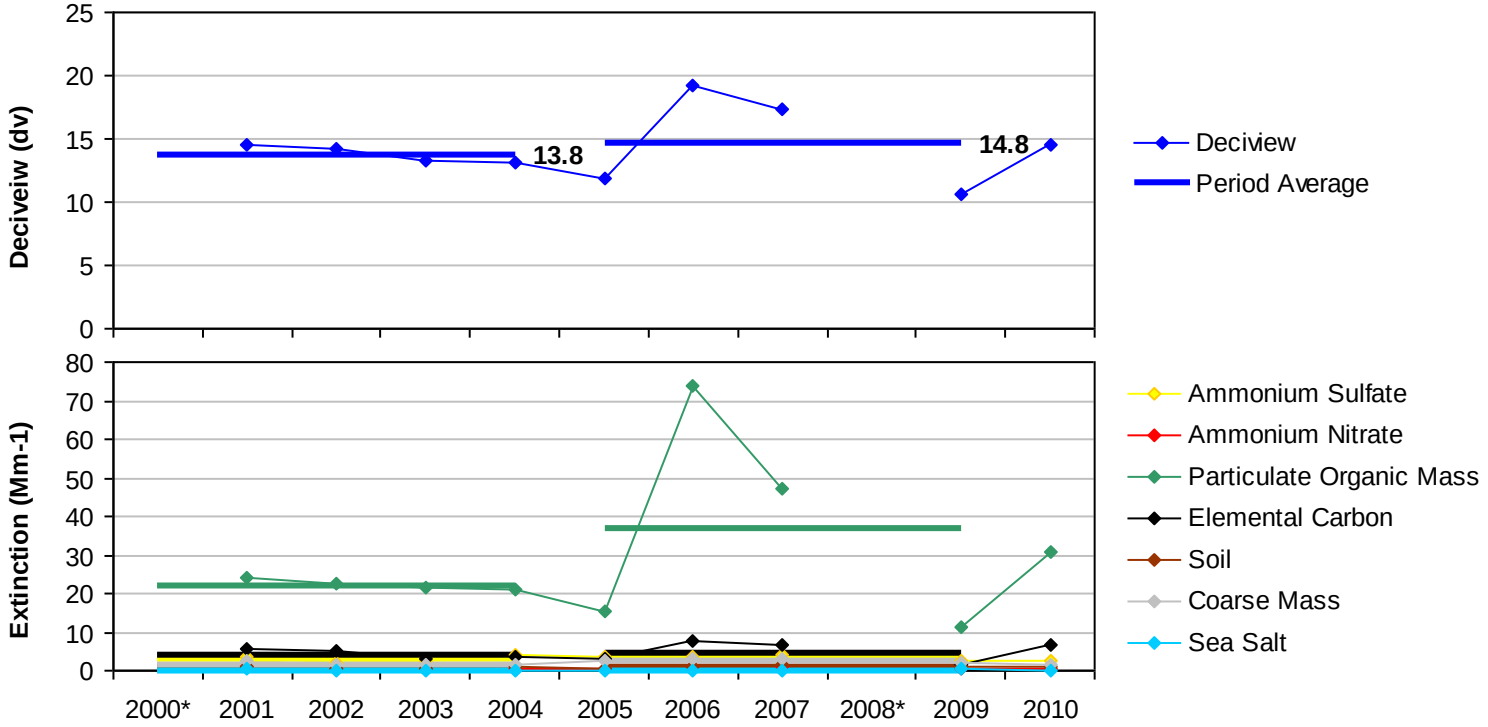
- **Figure F.3-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table F.3-1
Sawtooth WA, ID (SAWT1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	4.9	3.8	3.2	4.1	3.5	4.0	3.8	---	3.8	4.0	-0.1	0.4	4.0	3.8	-0.2	-5%
Worst 20% Days	---	14.5	14.2	13.3	13.1	11.9	19.2	17.4	---	10.6	14.5	-0.4	0.2	13.8	14.8	1.0	7%
All Days	---	8.7	8.1	7.5	7.8	7.4	9.6	8.4	---	6.7	7.9	-0.2	0.2	8.0	8.0	0.0	0%
Total Extinction (Mm-1)																	
Best 20% Days	---	16.3	14.6	13.8	15.1	14.3	15.0	14.7	---	14.6	14.9	-0.1	0.4	15.0	14.7	-0.3	-2%
Worst 20% Days	---	47.5	42.5	39.8	41.3	36.0	100.6	72.9	---	29.3	52.8	-1.8	0.3	42.8	59.7	16.9	40%
All Days	---	26.3	24.4	23.0	23.9	22.4	37.2	29.8	---	20.1	25.6	-0.5	0.3	24.4	27.4	3.0	12%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	1.7	1.1	0.8	1.1	1.2	1.4	1.3	---	1.2	1.0	0.0	0.3	1.2	1.3	0.1	8%
Worst 20% Days	---	3.5	2.1	2.6	4.0	3.8	3.8	4.1	---	2.5	2.7	0.1	0.3	3.1	3.5	0.4	13%
All Days	---	2.8	2.1	1.9	2.6	2.6	3.1	2.7	---	2.2	2.1	0.0	0.4	2.3	2.6	0.3	13%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.3	0.2	0.3	0.2	0.3	0.2	---	0.2	0.2	0.0	0.0	0.3	0.2	-0.1	-33%
Worst 20% Days	---	0.8	0.6	0.5	0.6	0.6	1.0	0.9	---	0.4	0.6	0.0	0.5	0.6	0.7	0.1	17%
All Days	---	0.5	0.5	0.4	0.4	0.4	0.6	0.5	---	0.3	0.4	0.0	0.2	0.5	0.5	0.0	0%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	2.8	2.1	1.9	2.6	1.9	2.1	2.3	---	2.2	2.8	0.0	0.4	2.4	2.1	-0.3	-13%
Worst 20% Days	---	23.9	22.5	21.6	20.9	15.3	73.8	47.0	---	11.3	30.7	-1.0	0.2	22.2	36.9	14.7	66%
All Days	---	8.9	8.3	8.2	8.0	6.4	18.8	12.8	---	5.2	9.9	-0.3	0.2	8.3	10.8	2.5	30%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.9	0.6	0.5	0.6	0.5	0.7	0.5	---	0.4	0.5	0.0	0.1	0.6	0.5	-0.1	-17%
Worst 20% Days	---	5.6	4.9	2.8	3.4	3.2	7.9	6.6	---	1.7	6.6	-0.3	0.4	4.2	4.9	0.7	17%
All Days	---	2.2	2.0	1.5	1.6	1.7	2.8	2.1	---	1.0	2.0	-0.1	0.4	1.8	1.9	0.1	6%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.2	0.1	0.2	0.1	0.1	0.1	---	0.2	0.1	0.0	0.4	0.1	0.1	0.0	0%
Worst 20% Days	---	1.1	0.8	0.5	0.8	0.7	1.1	1.4	---	0.8	0.9	0.0	0.2	0.8	1.0	0.2	25%
All Days	---	0.5	0.5	0.3	0.4	0.3	0.6	0.6	---	0.4	0.4	0.0	0.5	0.4	0.5	0.1	25%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.3	0.3	0.3	0.3	0.3	0.4	0.2	---	0.3	0.3	0.0	0.6	0.3	0.3	0.0	0%
Worst 20% Days	---	2.3	1.6	1.6	1.5	2.4	2.9	2.8	---	2.0	1.3	0.1	0.2	1.7	2.5	0.8	47%
All Days	---	1.3	1.0	0.8	0.9	1.0	1.2	1.1	---	0.8	0.8	0.0	0.4	1.0	1.0	0.0	0%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.0	0.0	0.0	0.0	0.0	0.1	0.0	---	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0%
Worst 20% Days	---	0.3	0.0	0.2	0.0	0.0	0.0	0.0	---	0.6	0.0	0.0	0.3	0.1	0.2	0.1	100%
All Days	---	0.1	0.0	0.0	0.0	0.0	0.1	0.0	---	0.1	0.0	0.0	0.4	0.0	0.1	0.1	0%

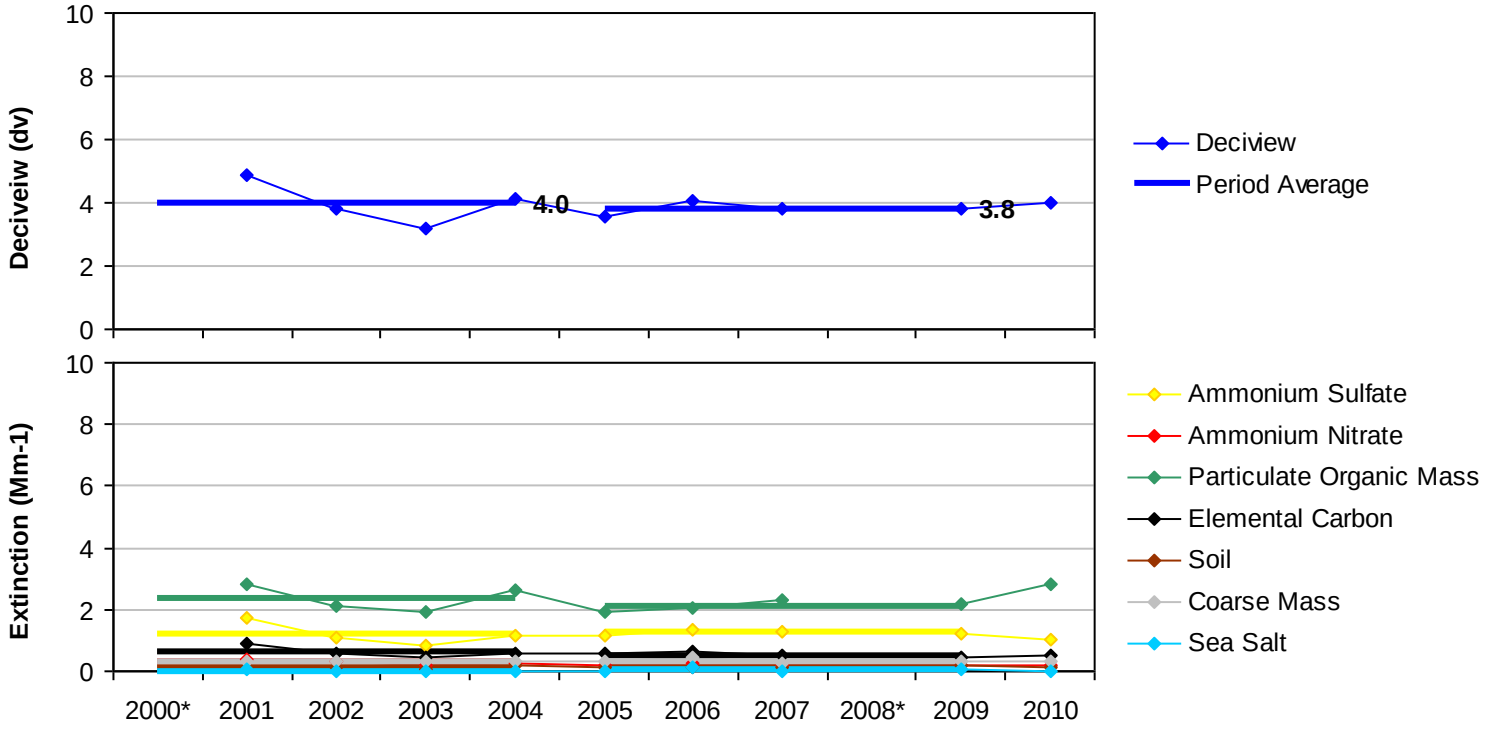
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure F.3-1
Sawtooth WA, ID (SAWT1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



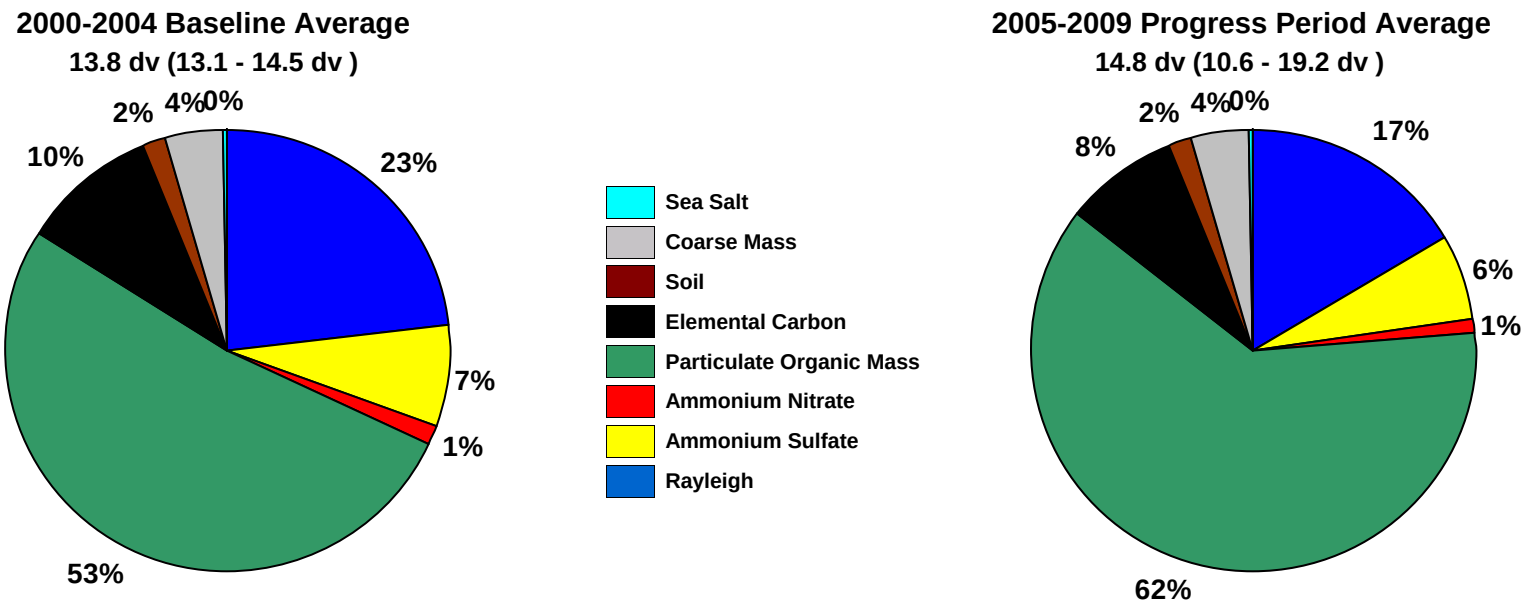
*Missing years did not meet RHR data completeness criteria.

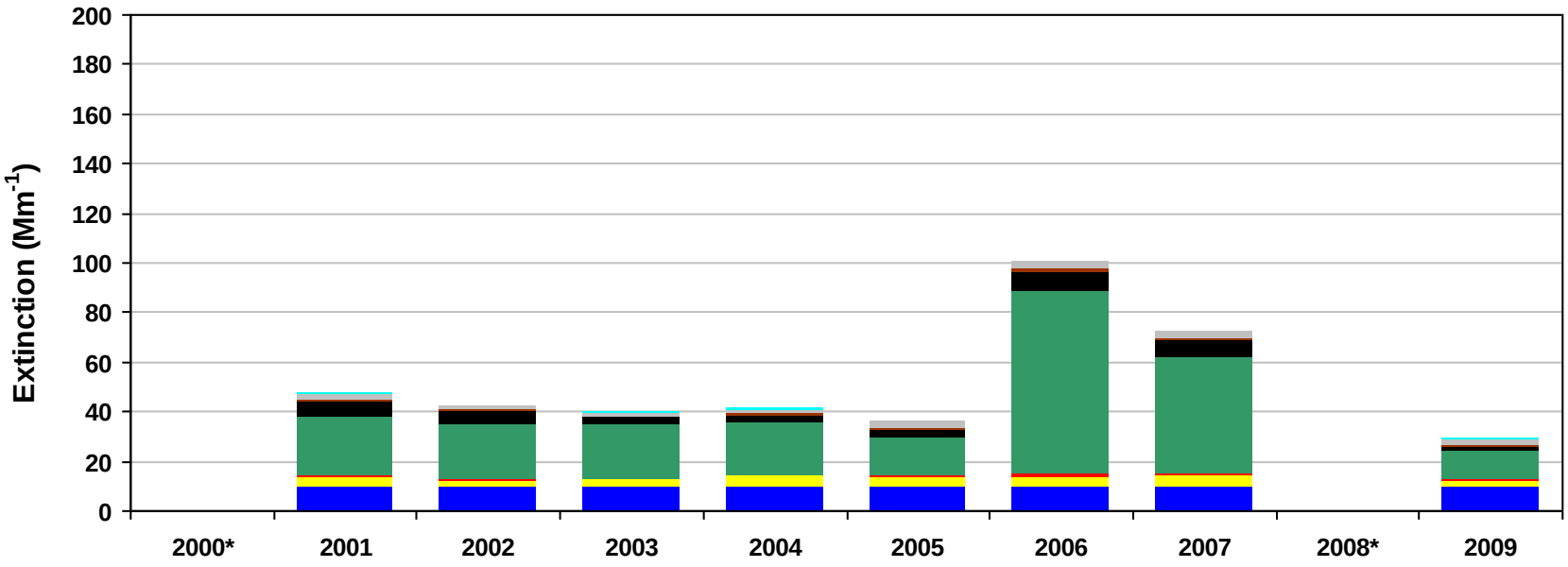
Figure F.3-2
Sawtooth WA, ID (SAWT1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

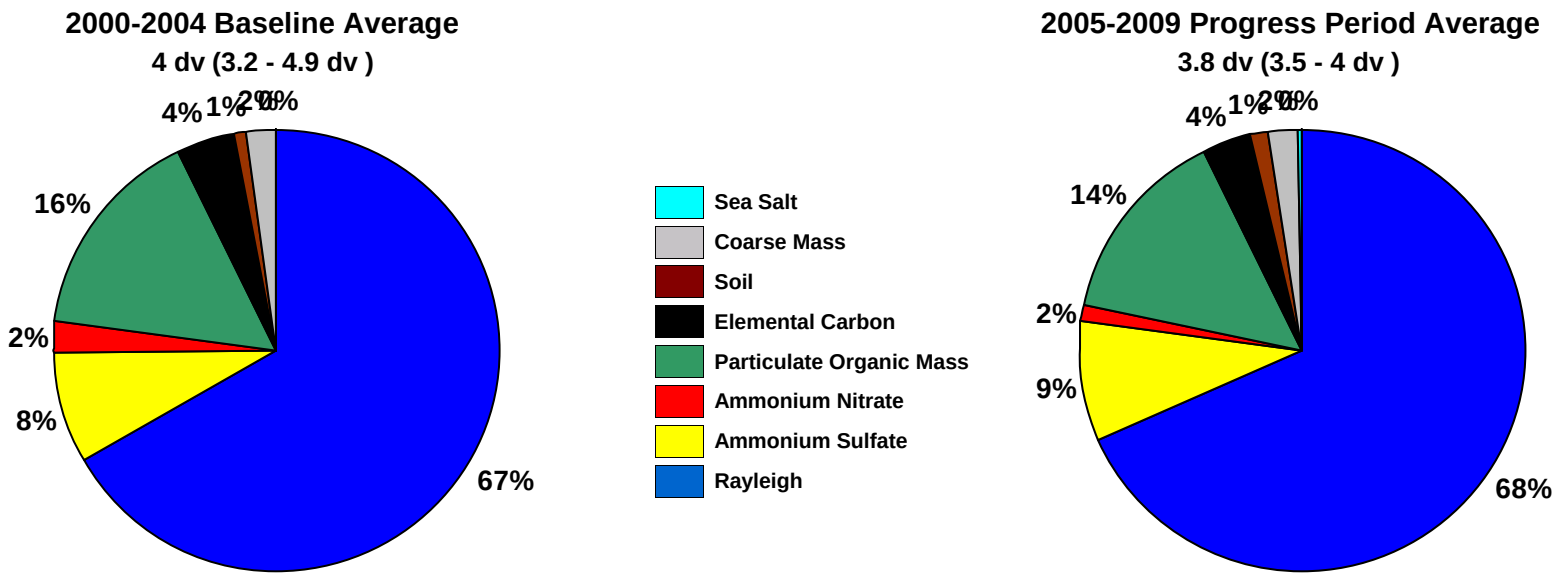
Figure F.3-3
Sawtooth WA, ID (SAWT1 Site)
20% Most Impaired Visibility Days

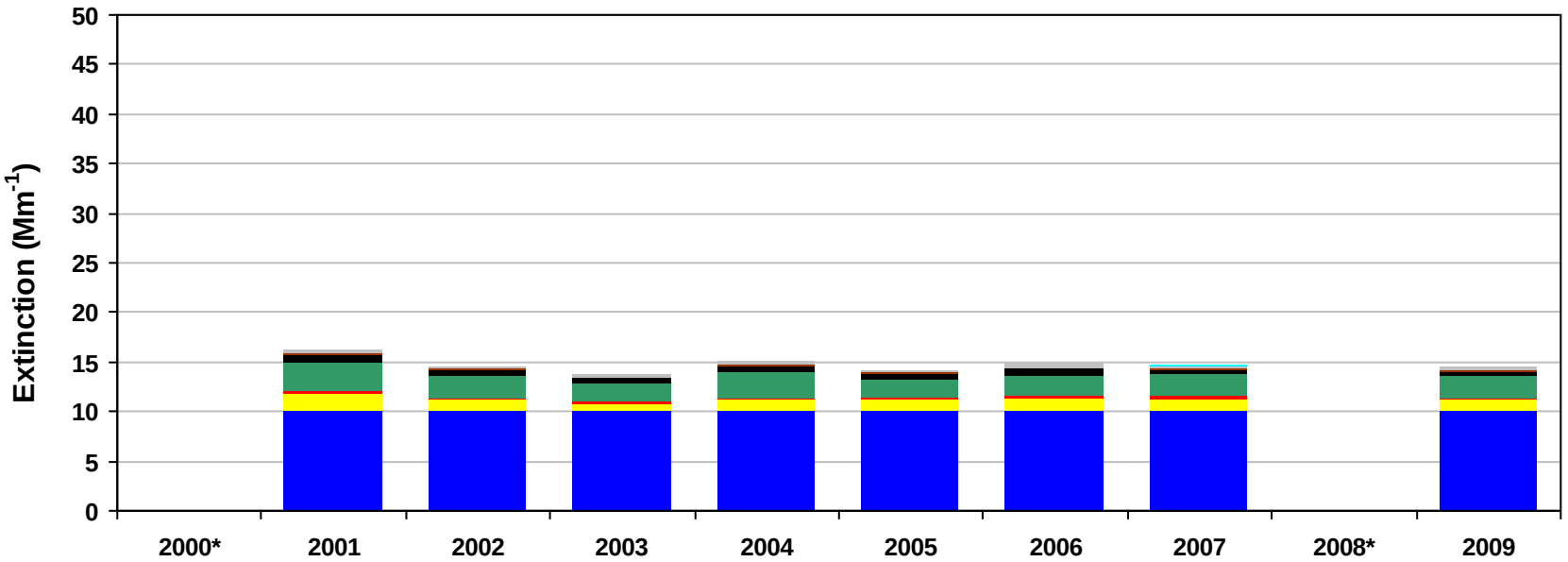




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

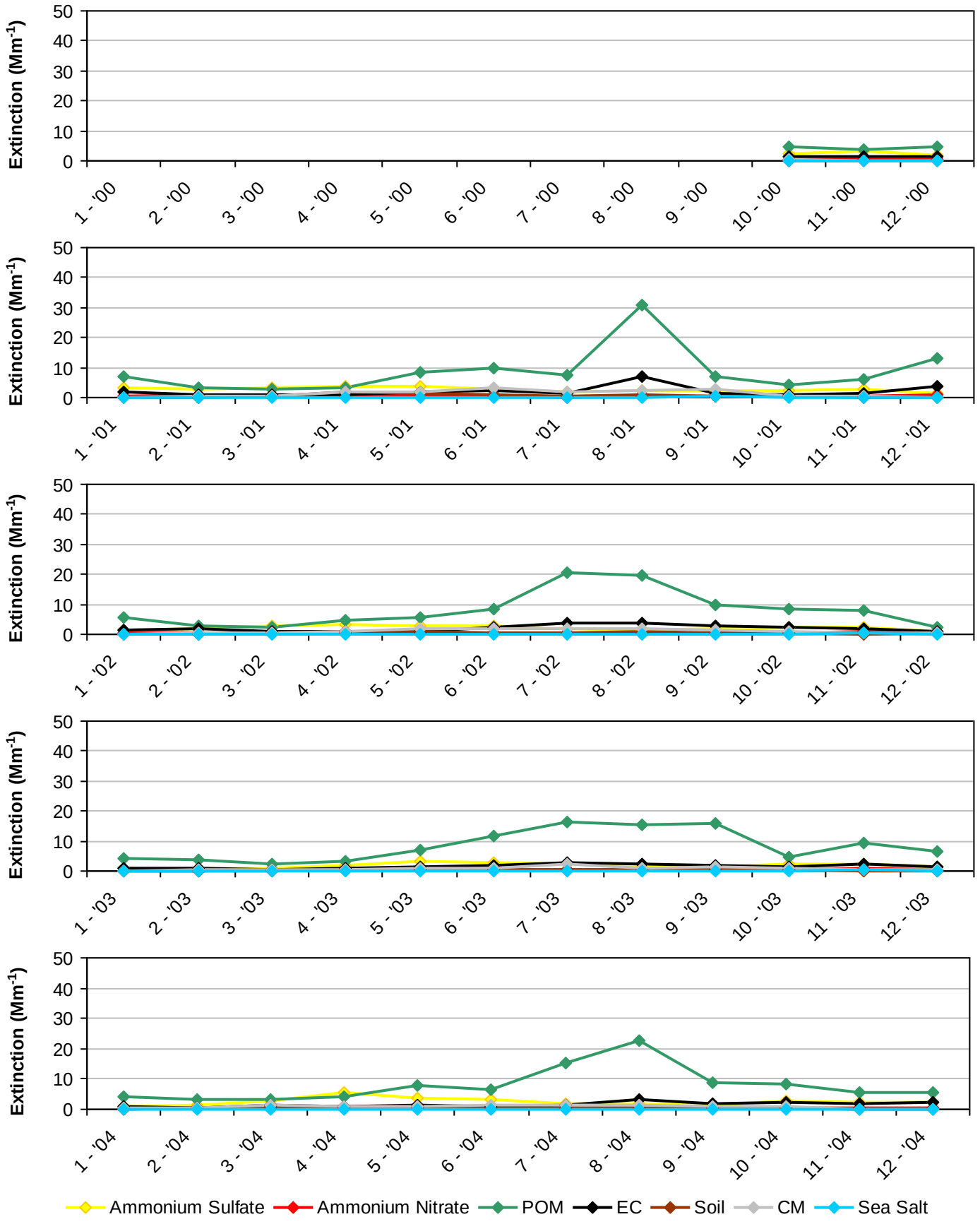
Figure F.3-4
Sawtooth WA, ID (SAWT1 Site)
20% Least Impaired Visibility Days





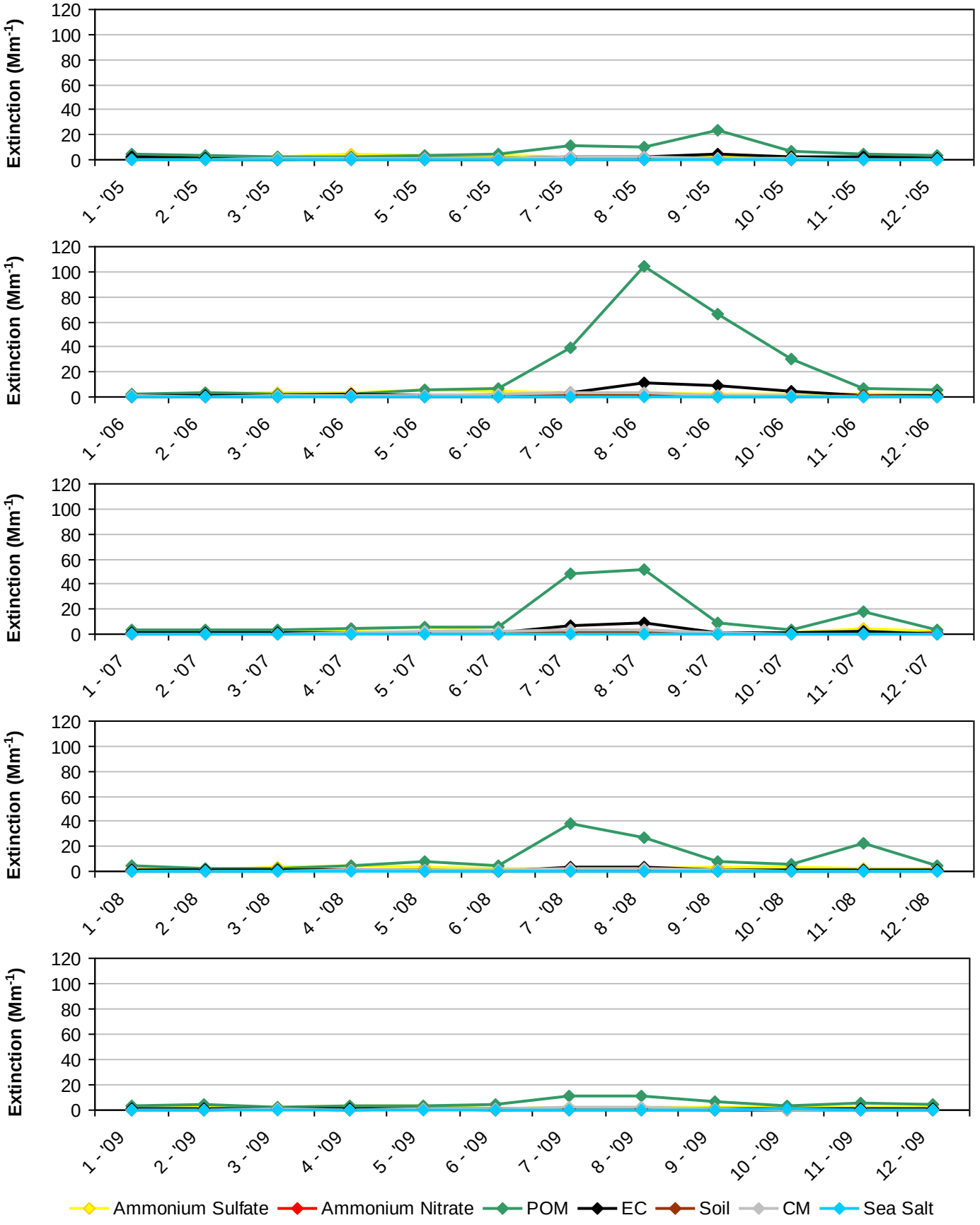
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure F.3-5
Sawtooth WA, ID (SAWT1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



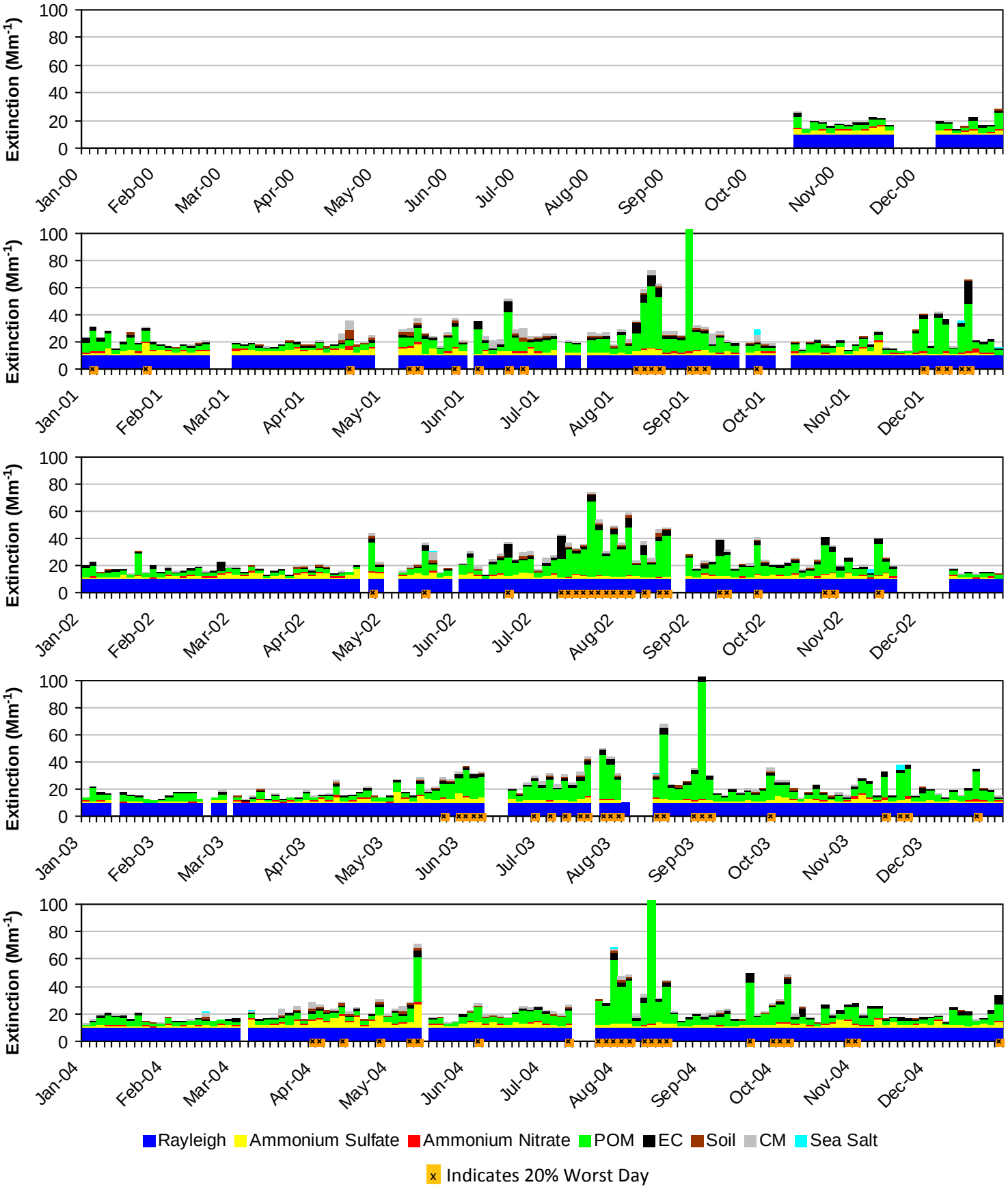
*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure F.3-6
Sawtooth WA, ID (SAWT1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days



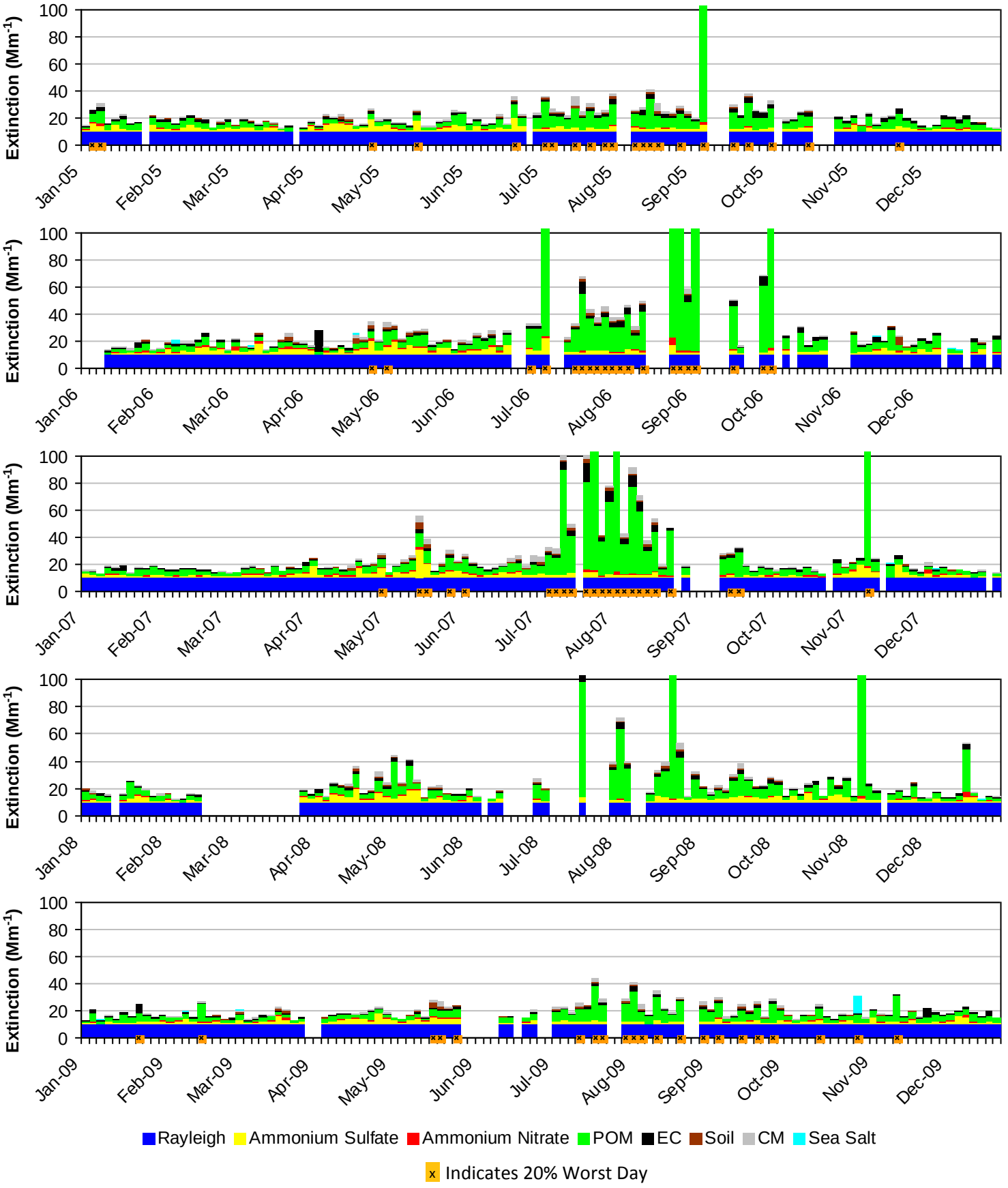
*Note that monthly averages for the year 2008 are shown here, but this year did not meet RHR data completeness criteria.

Figure F.3-7
Sawtooth WA, ID (SAWT1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure F.3-8
Sawtooth WA, ID (SAWT1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2008 are shown here, but this year did not meet RHR data completeness criteria.

F.4. ANACONDA-PINTLAR WA AND SELWAY-BITTERROOT WA (SULA1)

The following tables and figures are presented in this section for the Anaconda-Pintlar WA and Selway-Bitterroot WA represented by the SULA1 IMPROVE Monitor:

- **Table F.4-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure F.4-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure F.4-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure F.4-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure F.4-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure F.4-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure F.4-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure F.4-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

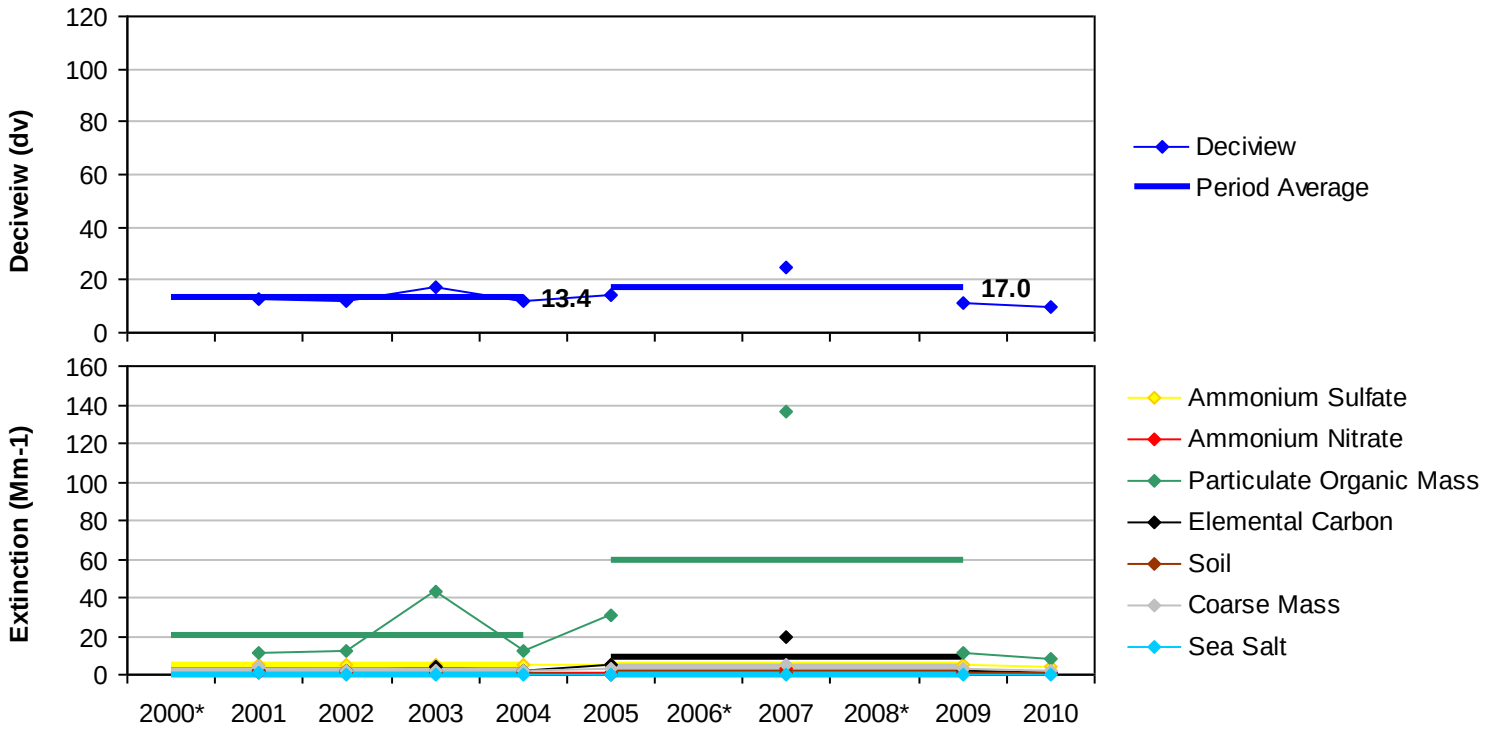
- **Figure F.4-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table F.4-1
Anaconda-Pintlar WA and Selway-Bitterroot WA, MT (SULA1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	3.1	2.7	1.8	2.7	2.5	---	2.5	---	2.3	1.7	-0.1	0.1	2.6	2.5	-0.1	-4%
Worst 20% Days	---	12.6	12.1	16.9	12.0	14.6	---	24.9	---	11.6	9.6	-0.1	0.5	13.4	17.0	3.6	27%
All Days	---	7.5	7.2	7.5	6.8	7.0	---	9.6	---	6.2	5.3	-0.1	0.3	7.2	7.6	0.4	6%
Total Extinction (Mm-1)																	
Best 20% Days	---	13.6	13.2	12.0	13.2	12.9	---	12.9	---	12.6	11.9	-0.1	0.1	13.0	12.8	-0.2	-2%
Worst 20% Days	---	35.7	34.2	66.3	33.8	55.4	---	178.9	---	32.6	27.4	-0.2	0.5	42.5	88.9	46.4	>100%
All Days	---	22.5	21.8	27.1	21.0	24.9	---	51.3	---	19.9	18.0	-0.2	0.5	23.1	32.0	8.9	39%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	1.3	1.1	0.7	1.2	1.4	---	1.3	---	1.2	0.9	0.0	0.5	1.1	1.3	0.2	18%
Worst 20% Days	---	4.8	4.6	4.8	5.1	5.2	---	3.8	---	5.1	4.3	0.0	0.3	4.8	4.7	-0.1	-2%
All Days	---	3.4	3.1	2.7	3.2	3.2	---	3.0	---	3.0	2.7	0.0	0.3	3.1	3.1	0.0	0%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.4	0.2	0.4	0.3	---	0.3	---	0.2	0.1	0.0	0.1	0.3	0.3	0.0	0%
Worst 20% Days	---	1.3	1.6	1.6	1.4	1.4	---	2.7	---	1.0	0.8	0.0	0.4	1.5	1.7	0.2	13%
All Days	---	1.1	1.1	0.8	0.9	0.8	---	1.1	---	0.6	0.6	0.0	0.2	1.0	0.9	-0.1	-10%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	1.0	1.0	0.8	1.0	0.6	---	0.7	---	0.6	0.5	-0.1	0.0	0.9	0.6	-0.3	-33%
Worst 20% Days	---	11.5	12.6	43.3	12.7	30.6	---	136.5	---	11.3	7.8	1.1	0.3	20.0	59.5	39.5	>100%
All Days	---	4.7	5.0	11.1	4.7	7.9	---	30.1	---	3.9	2.8	0.3	0.5	6.4	14.0	7.6	>100%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.3	0.3	0.2	0.3	0.2	---	0.2	---	0.1	0.1	0.0	0.1	0.3	0.2	-0.1	-33%
Worst 20% Days	---	2.0	2.1	4.3	1.7	4.9	---	19.8	---	1.7	1.3	0.3	0.4	2.5	8.8	6.3	>100%
All Days	---	1.0	1.1	1.4	0.9	1.5	---	4.6	---	0.7	0.6	0.1	0.4	1.1	2.3	1.2	>100%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.1	0.0	0.1	0.1	---	0.1	---	0.1	0.1	0.0	0.5	0.1	0.1	0.0	0%
Worst 20% Days	---	1.6	0.9	0.6	0.7	0.5	---	0.7	---	0.6	1.0	0.0	0.1	0.9	0.6	-0.3	-33%
All Days	---	0.6	0.5	0.3	0.3	0.3	---	0.3	---	0.3	0.4	0.0	0.2	0.4	0.3	-0.1	-25%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.3	0.2	0.1	0.2	0.3	---	0.4	---	0.4	0.2	0.0	0.1	0.2	0.3	0.1	50%
Worst 20% Days	---	3.7	2.4	1.7	2.1	2.8	---	5.2	---	2.8	2.2	0.1	0.3	2.5	3.6	1.1	44%
All Days	---	1.4	1.1	0.8	1.0	1.2	---	2.0	---	1.2	0.9	0.0	0.3	1.1	1.4	0.3	27%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.0	0.0	0.0	0.0	---	0.1	---	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0%
Worst 20% Days	---	1.0	0.0	0.0	0.0	0.0	---	0.1	---	0.0	0.0	0.0	0.3	0.3	0.0	-0.3	-100%
All Days	---	0.2	0.0	0.0	0.0	0.0	---	0.1	---	0.0	0.0	0.0	0.5	0.1	0.0	-0.1	-100%

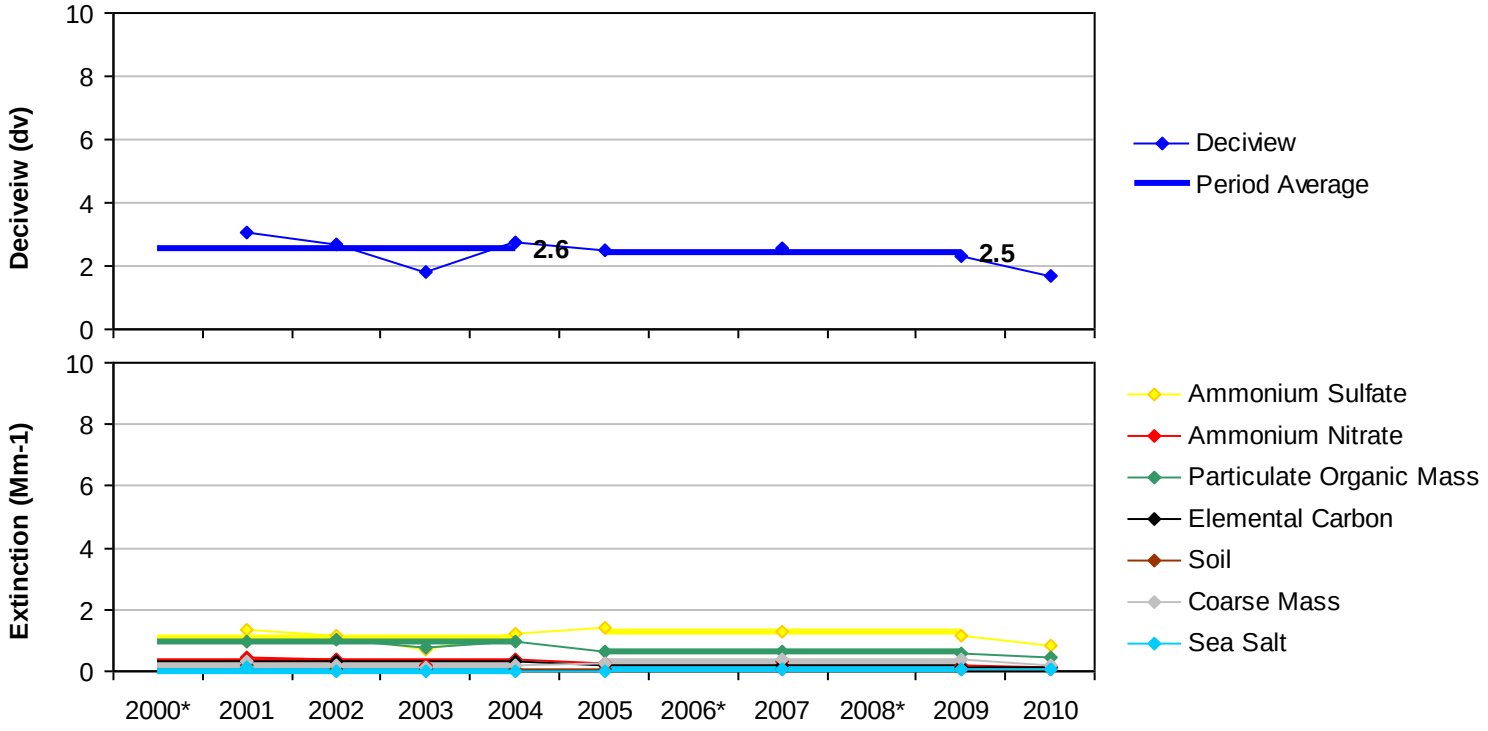
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure F.4-1
Anaconda-Pintlar WA and Selway-Bitterroot WA, MT (SULA1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure G.6-2
Anaconda-Pintlar WA and Selway-Bitterroot WA, MT (SULA1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

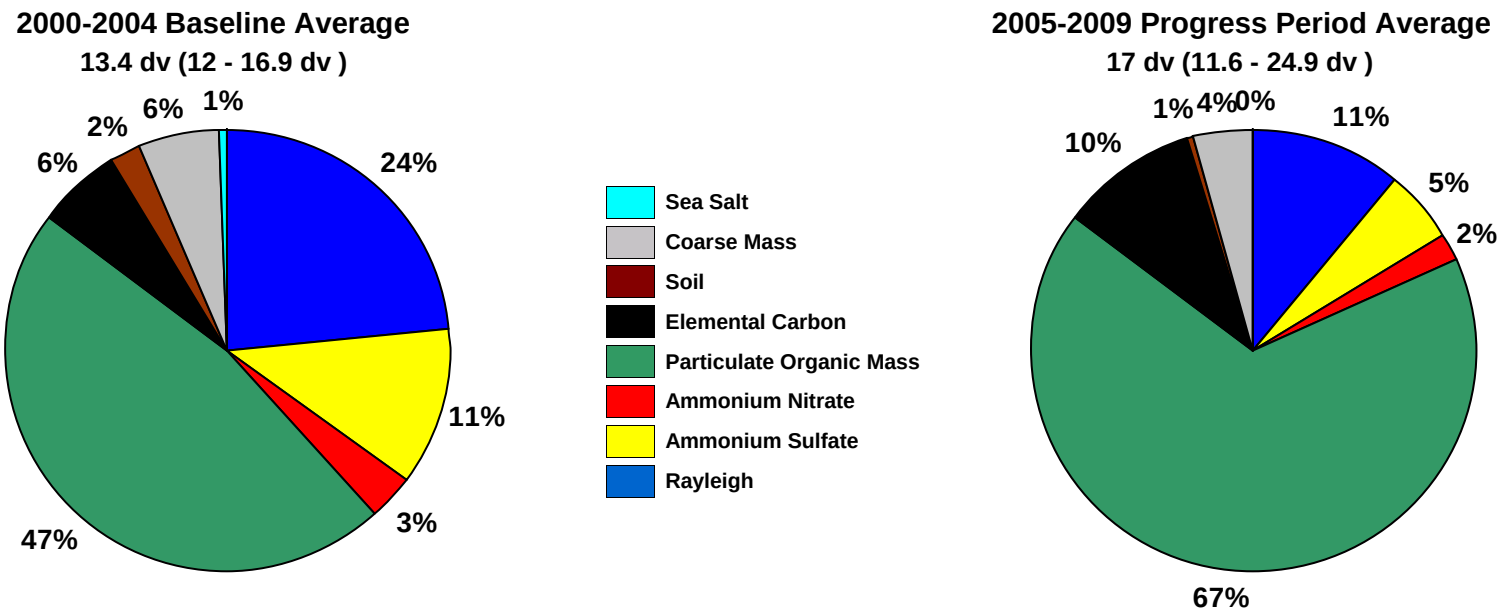


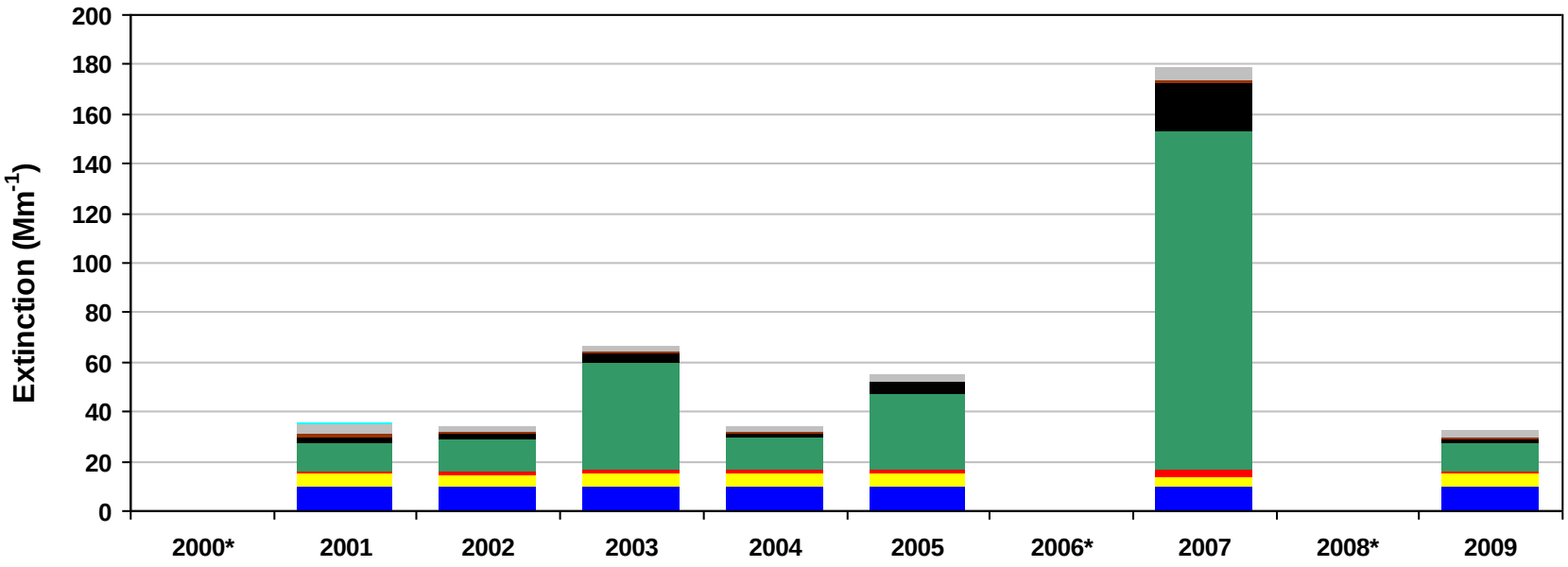
*Missing years did not meet RHR data completeness criteria.

Figure F.4-3

Anaconda-Pintlar WA and Selway-Bitterroot WA, MT (SULA1 Site)

20% Most Impaired Visibility Days



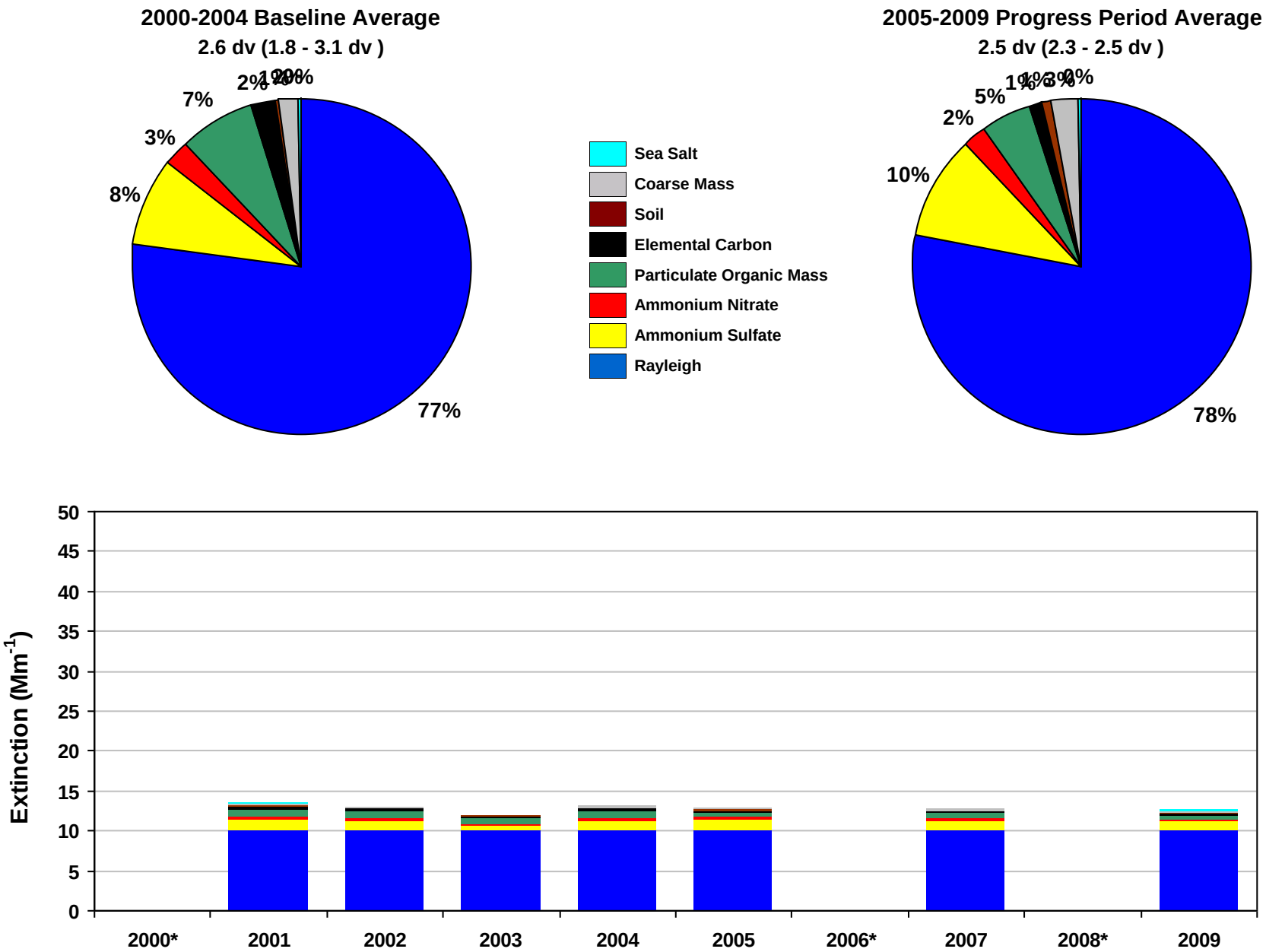


*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure F.4-4

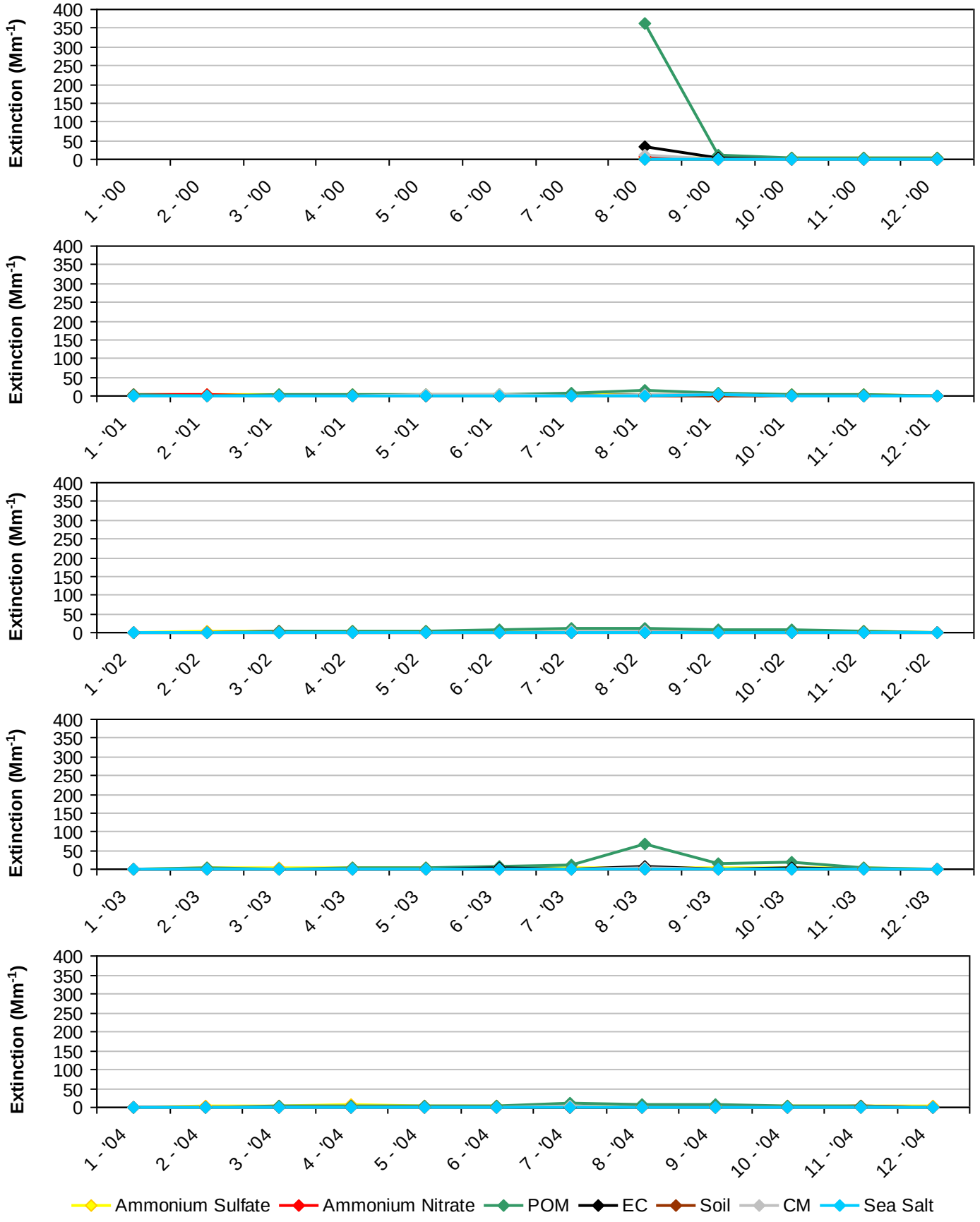
Anaconda-Pintlar WA and Selway-Bitterroot WA, MT (SULA1 Site)

20% Least Impaired Visibility Days



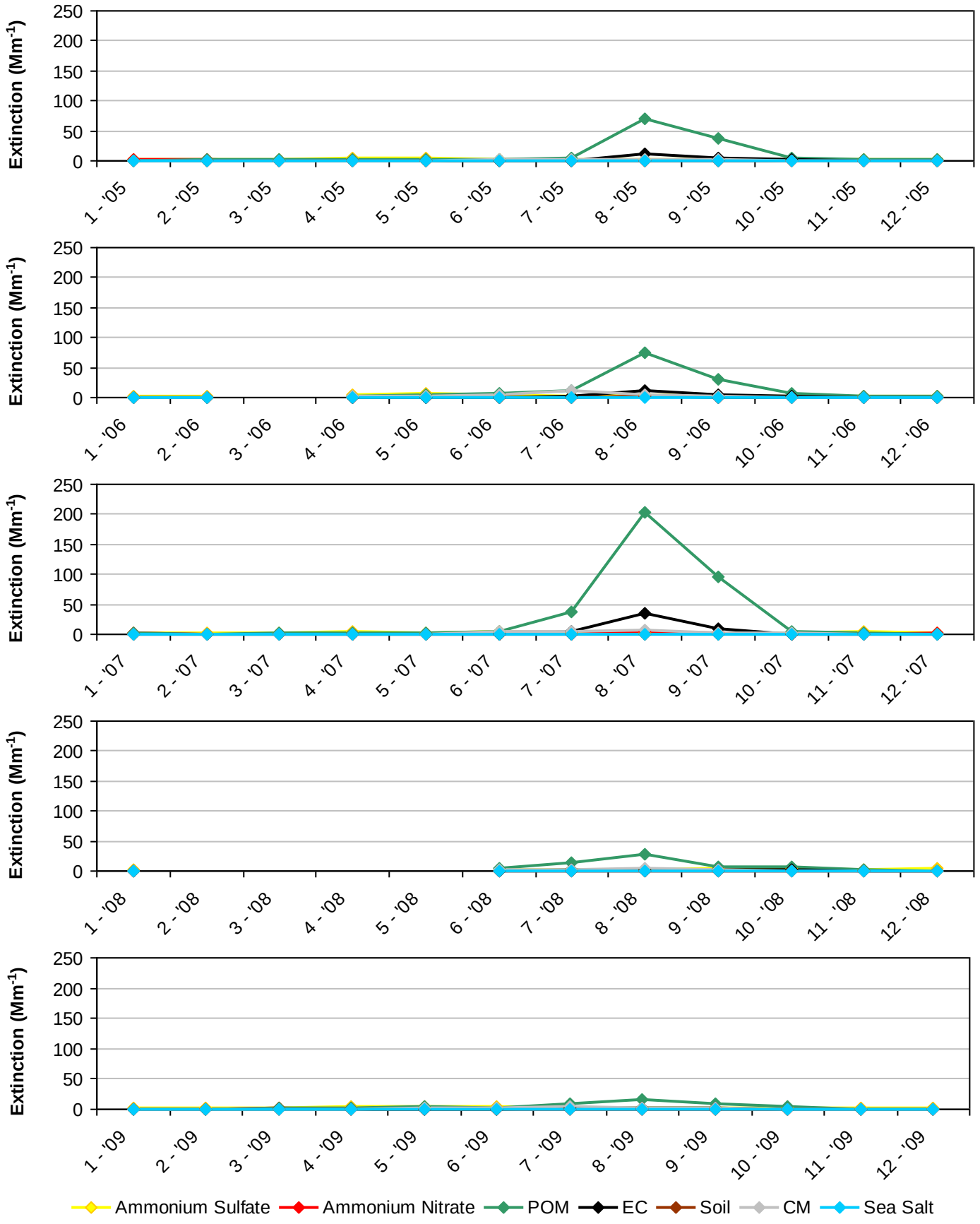
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure F.4-5
Anaconda-Pintlar WA and Selway-Bitterroot WA, MT (SULA1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



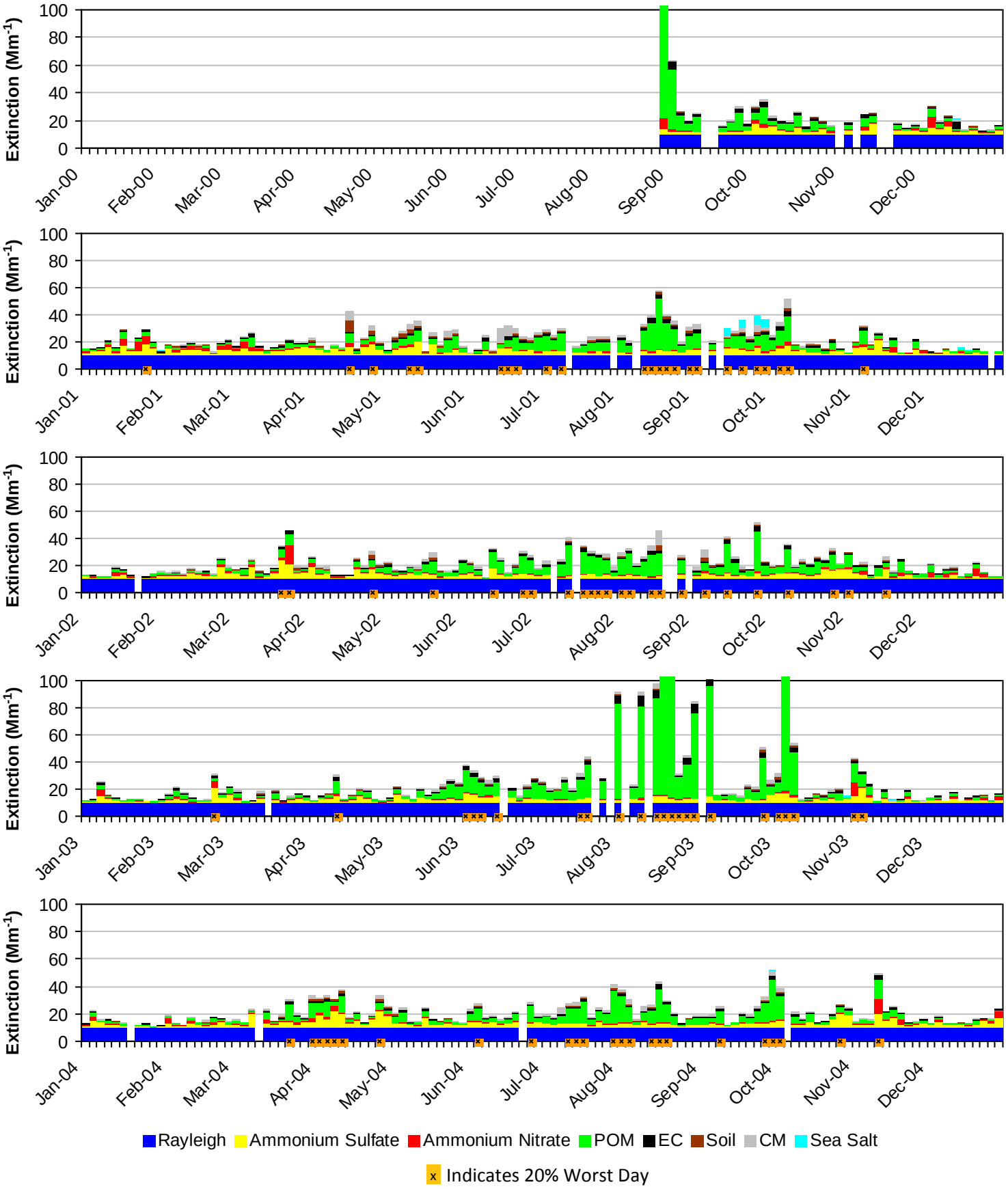
*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure F.4-6
Anaconda-Pintlar WA and Selway-Bitterroot WA, MT (SULA1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days



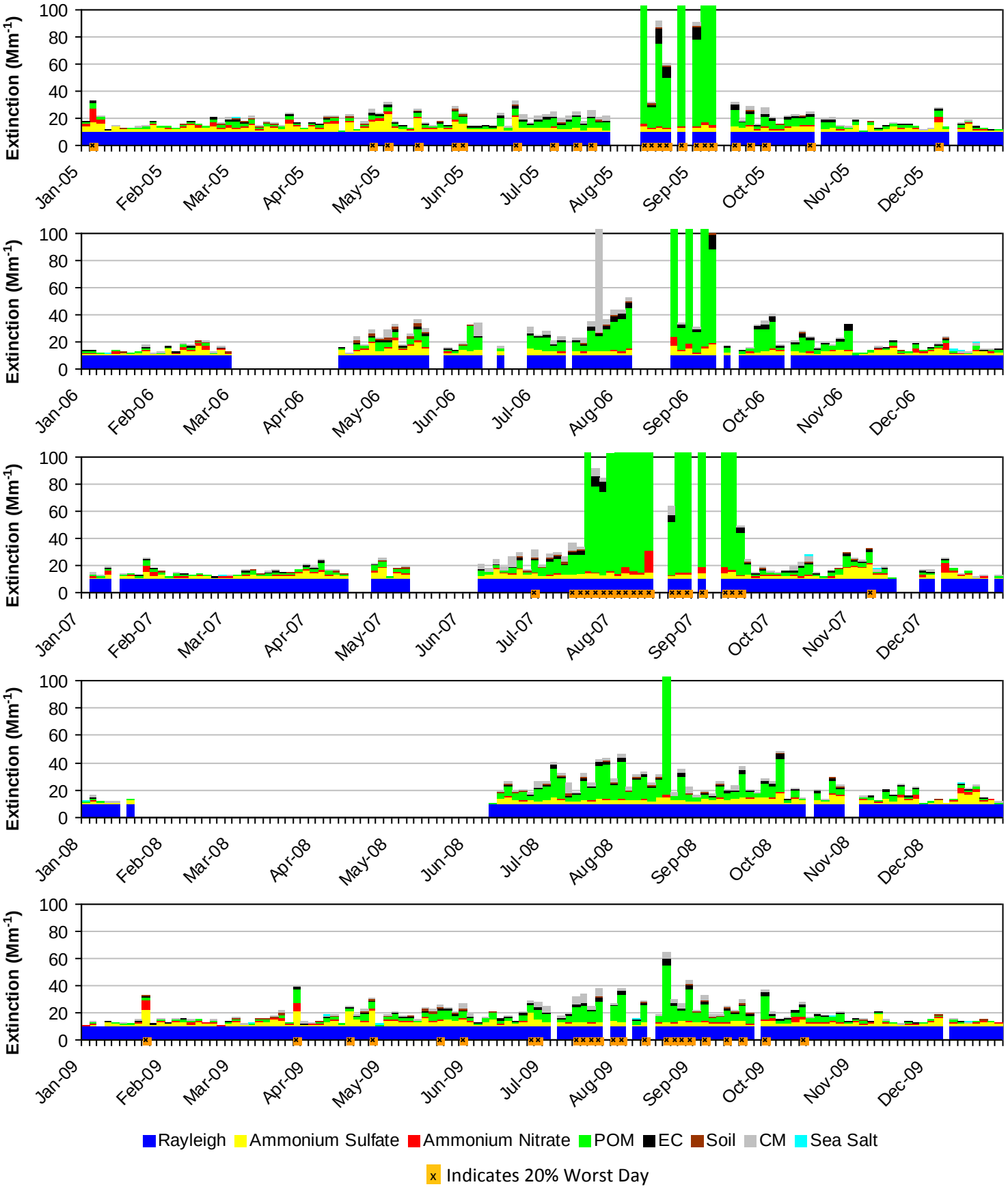
*Note that monthly averages for the years 2006 and 2008 are shown here, but these years did not meet RHR data completeness criteria.

Figure F.4-7
Anaconda-Pintlar WA and Selway-Bitterroot WA, MT (SULA1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure F.4-8
Anaconda-Pintlar WA and Selway-Bitterroot WA, MT (SULA1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2006 and 2008 are shown here, but these years did not meet RHR data completeness criteria.

F.5. YELLOWSTONE NP, GRAND TETON NP, RED ROCK LAKES WA, AND TETON WA (YELL2)

The following tables and figures are presented in this section for the Yellowstone NP, Grand Teton NP, Red Rock Lakes WA, and Teton WA represented by the YELL2 IMPROVE Monitor:

- **Table F.5-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure F.5-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure F.5-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure F.5-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure F.5-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure F.5-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure F.5-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure F.5-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure F.5-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table F.5-1
Yellowstone NP, WY (YELL2 Site)
Annual Averages, Period Averages and Trends

Group	Baseline Period					Progress Period						2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	2.8	3.0	2.6	1.9	2.6	2.1	2.3	2.2	1.8	1.9	0.9	-0.1	0.0	2.6	2.0	-0.6	-23%
Worst 20% Days	12.9	12.6	11.4	11.2	10.8	9.6	11.8	12.6	14.0	9.6	9.9	-0.2	0.2	11.8	11.5	-0.3	-3%
All Days	7.1	7.1	6.8	6.1	6.5	5.8	6.6	6.8	6.7	5.4	4.8	-0.1	0.1	6.7	6.3	-0.4	-6%
Total Extinction (Mm-1)																	
Best 20% Days	13.3	13.6	13.0	12.2	13.0	12.3	12.6	12.5	12.0	12.2	10.9	-0.1	0.0	13.0	12.3	-0.7	-5%
Worst 20% Days	40.9	38.9	31.8	31.4	29.8	26.3	36.2	36.3	47.6	34.1	27.4	-0.5	0.4	34.5	36.1	1.6	5%
All Days	22.5	22.2	20.7	19.7	20.0	18.5	21.3	21.4	23.1	19.4	17.1	-0.2	0.3	21.0	20.7	-0.3	-1%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	1.7	1.9	1.3	1.1	1.3	1.5	1.6	1.2	1.1	1.4	1.0	0.0	0.2	1.5	1.4	-0.1	-7%
Worst 20% Days	4.2	4.7	3.8	4.1	4.6	4.8	5.1	4.3	5.0	3.5	3.4	0.1	0.3	4.3	4.6	0.3	7%
All Days	3.1	3.6	3.0	2.5	3.1	3.3	3.5	3.1	3.1	2.7	2.4	0.0	0.5	3.1	3.2	0.1	3%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.9	0.8	0.8	0.5	0.6	0.3	0.4	0.7	0.6	0.6	0.2	0.0	0.1	0.7	0.5	-0.2	-29%
Worst 20% Days	2.0	2.4	1.6	1.4	1.5	1.6	0.9	2.4	1.7	1.6	1.2	0.0	0.3	1.8	1.6	-0.2	-11%
All Days	1.5	1.5	1.6	1.2	1.3	1.1	1.1	1.7	1.3	1.1	0.8	0.0	0.2	1.4	1.2	-0.2	-14%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.1	1.2	1.1	0.9	1.3	1.1	0.8	1.0	0.8	0.5	0.3	-0.1	0.0	1.1	0.8	-0.3	-27%
Worst 20% Days	18.4	16.1	11.2	12.8	8.9	6.7	15.1	14.7	25.6	15.2	6.8	0.0	0.5	13.5	15.5	2.0	15%
All Days	6.0	5.3	4.4	4.7	4.0	3.1	5.1	4.8	7.2	4.4	2.4	-0.1	0.3	4.9	4.9	0.0	0%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.2	0.4	0.3	0.2	0.5	0.3	0.4	0.3	0.1	0.2	0.1	0.0	0.2	0.3	0.3	0.0	0%
Worst 20% Days	3.7	2.6	1.9	2.3	1.9	1.8	2.3	2.4	2.6	1.7	1.6	0.0	0.2	2.5	2.2	-0.3	-12%
All Days	1.3	1.1	1.0	1.0	1.0	0.9	1.1	1.0	0.9	0.7	0.6	0.0	0.0	1.1	0.9	-0.2	-18%
Soil Extinction (Mm-1)																	
Best 20% Days	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0%
Worst 20% Days	0.8	1.4	1.2	0.4	0.9	0.6	1.1	0.8	1.0	0.6	1.3	0.0	0.3	1.0	0.8	-0.2	-20%
All Days	0.4	0.6	0.5	0.3	0.4	0.3	0.4	0.5	0.4	0.3	0.5	0.0	0.4	0.4	0.4	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	0.3	0.2	0.3	0.2	0.3	0.1	0.2	0.2	0.3	0.3	0.1	0.0	0.5	0.2	0.2	0.0	0%
Worst 20% Days	2.8	2.7	3.1	1.3	2.9	1.8	2.6	2.6	2.6	2.3	4.2	0.0	0.1	2.6	2.4	-0.2	-8%
All Days	1.2	1.2	1.3	0.9	1.1	0.8	1.1	1.4	1.0	1.2	1.4	0.0	0.3	1.1	1.1	0.0	0%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0%
Worst 20% Days	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0%
All Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure F.5-1
Yellowstone NP, WY (YELL2 Site)
Annual and Period Averages Averages
20% Most Impaired Visibility Days

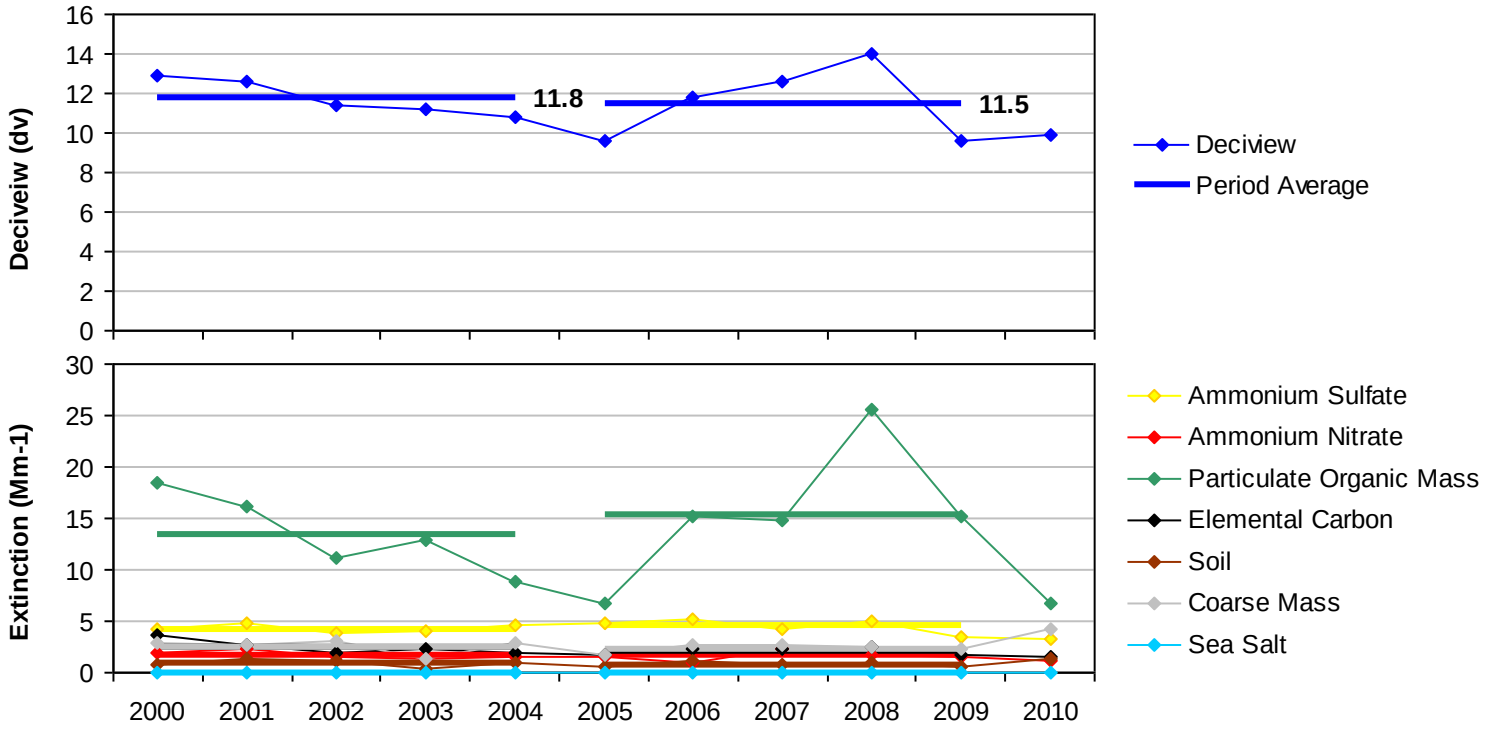


Figure F.5-2
Yellowstone NP, WY (YELL2 Site)
Annual and Period Averages
20% Least Impaired Visibility Days

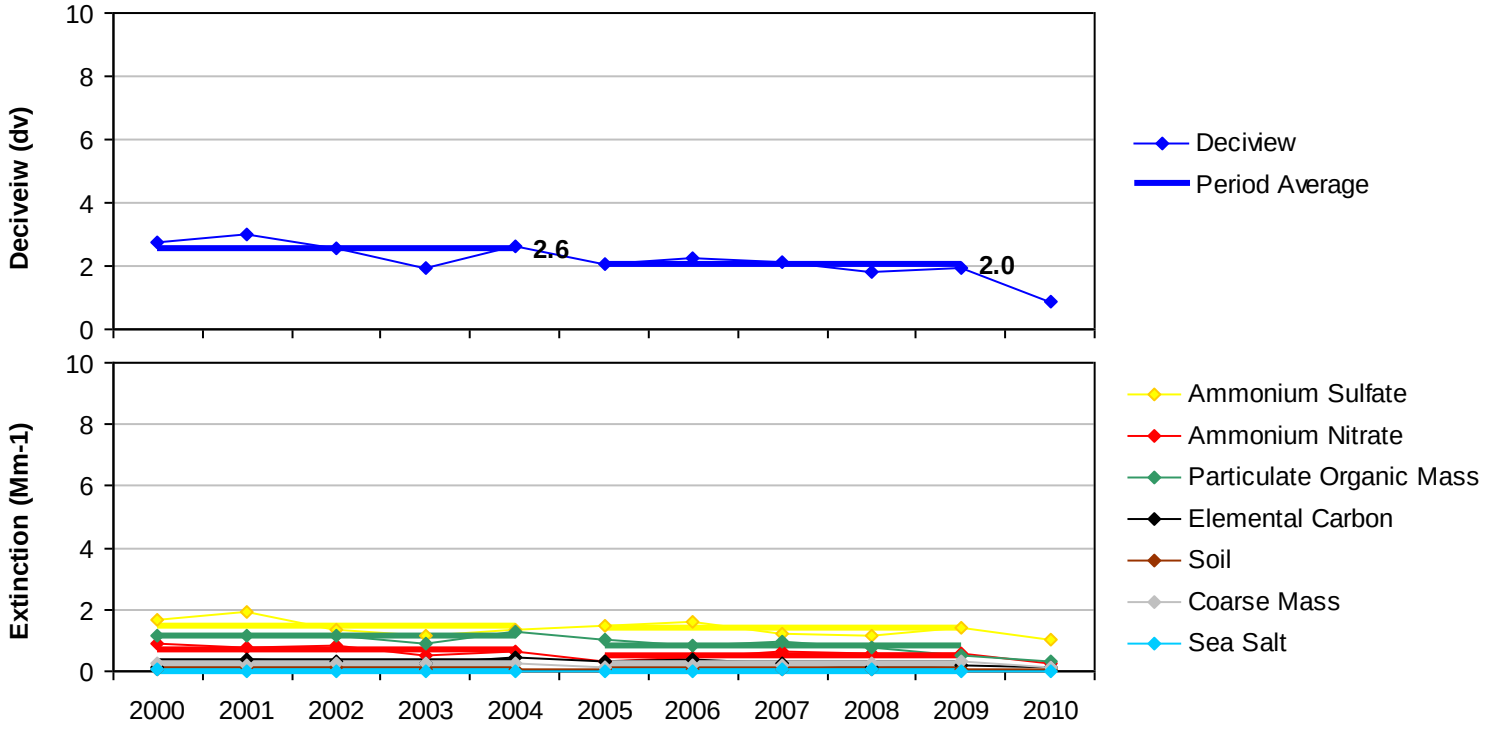
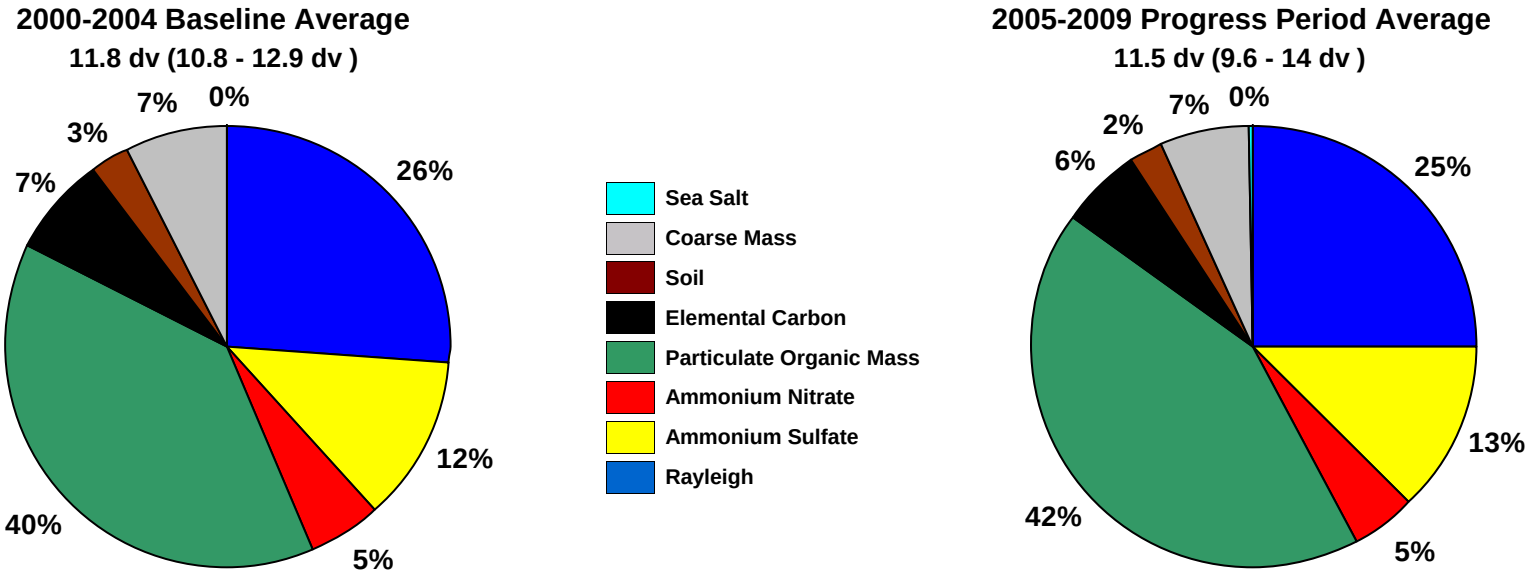
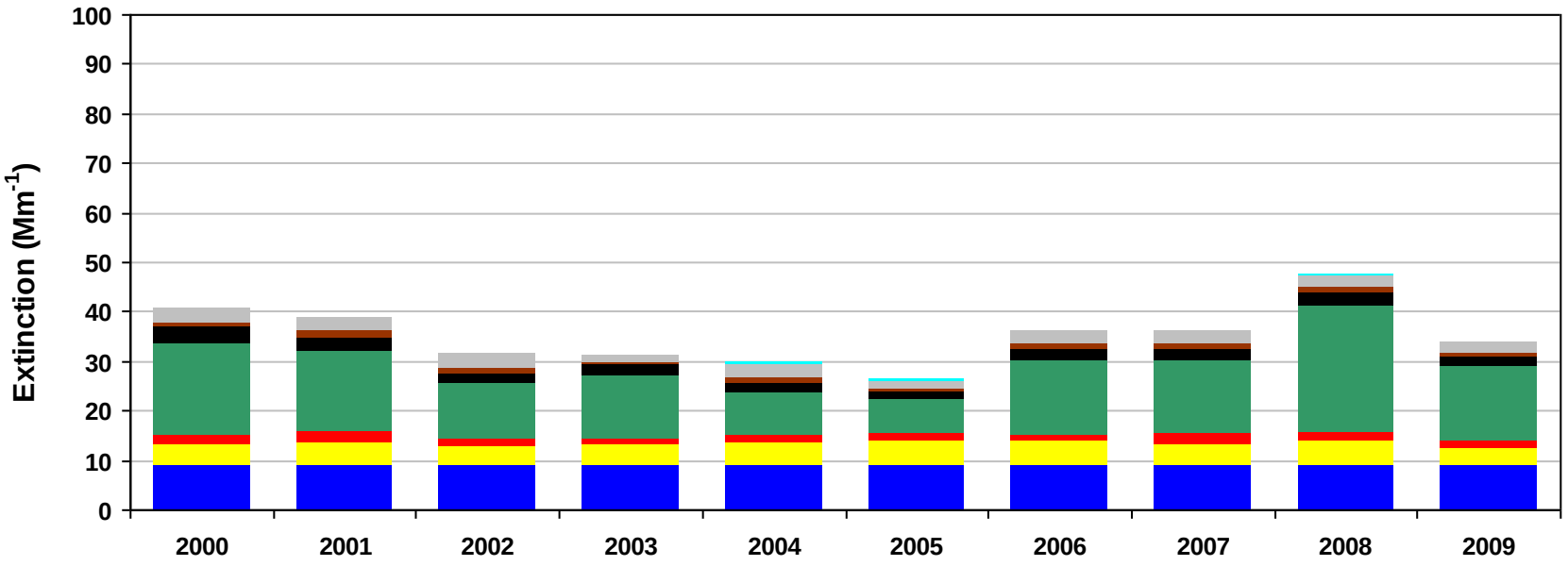


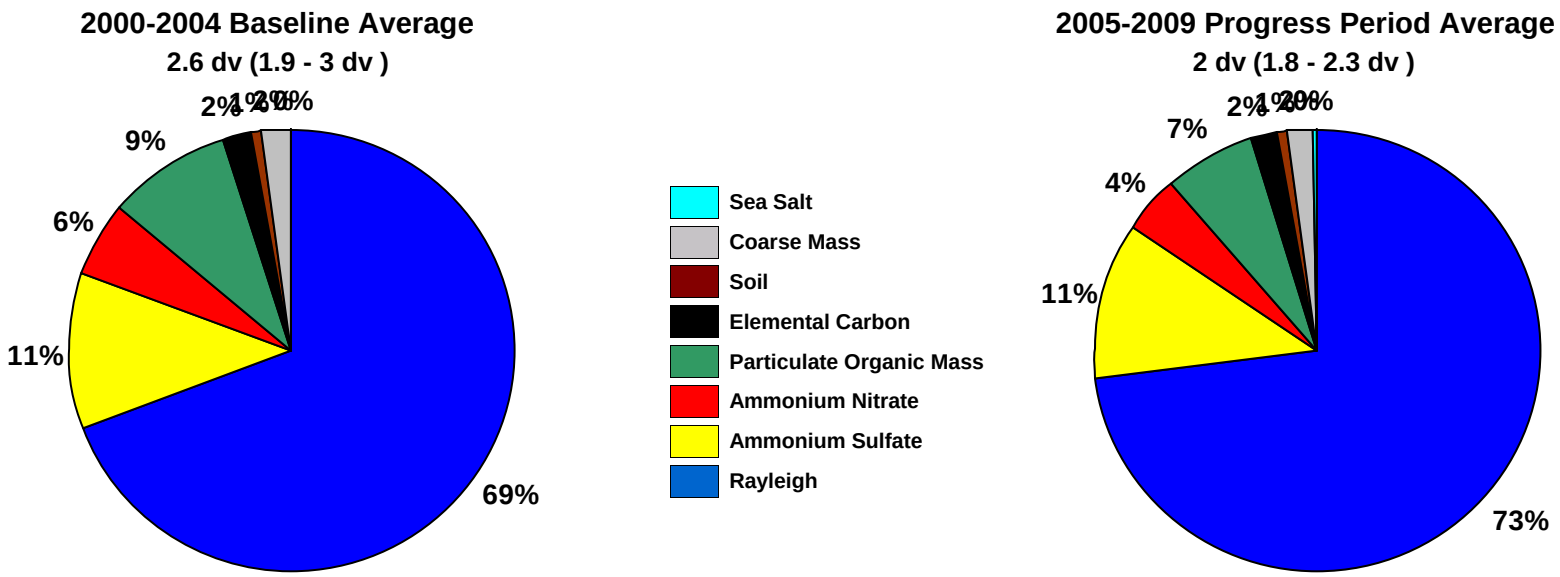
Figure F.5-3
Yellowstone NP, WY (YELL2 Site)
20% Most Impaired Visibility Days

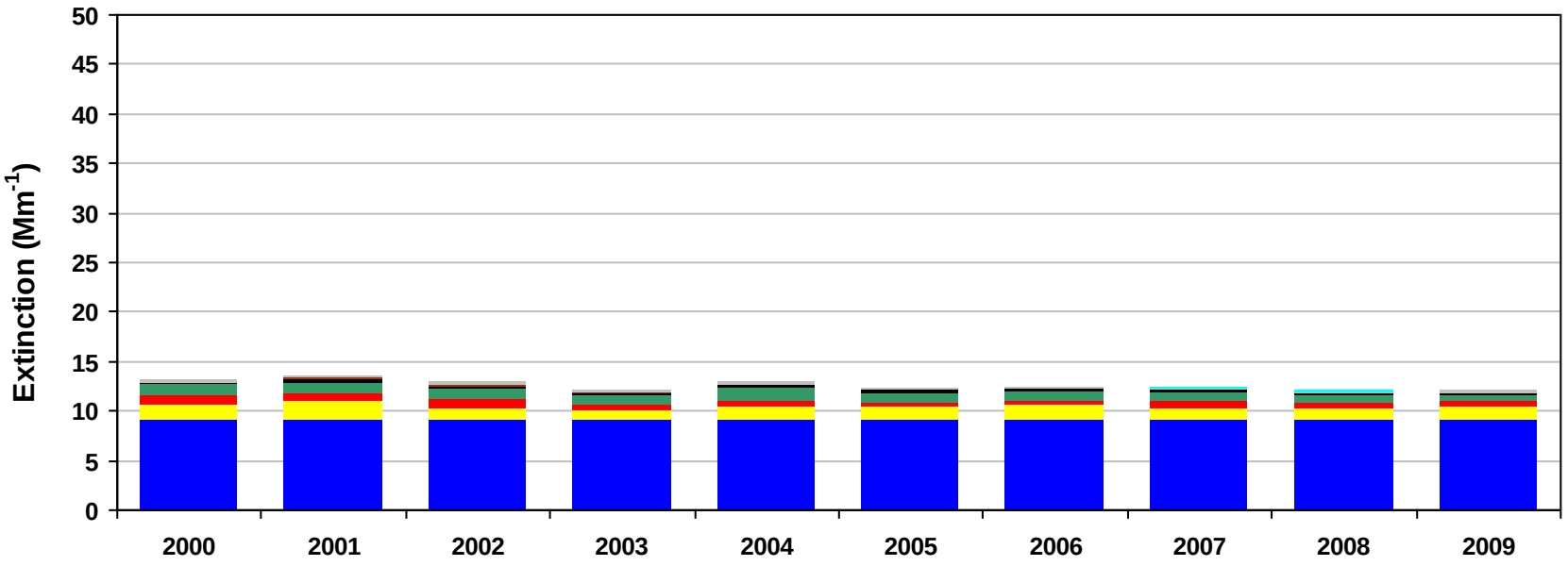




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure F.5-4
Yellowstone NP, WY (YELL2 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure F.5-5
Yellowstone NP, WY (YELL2 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

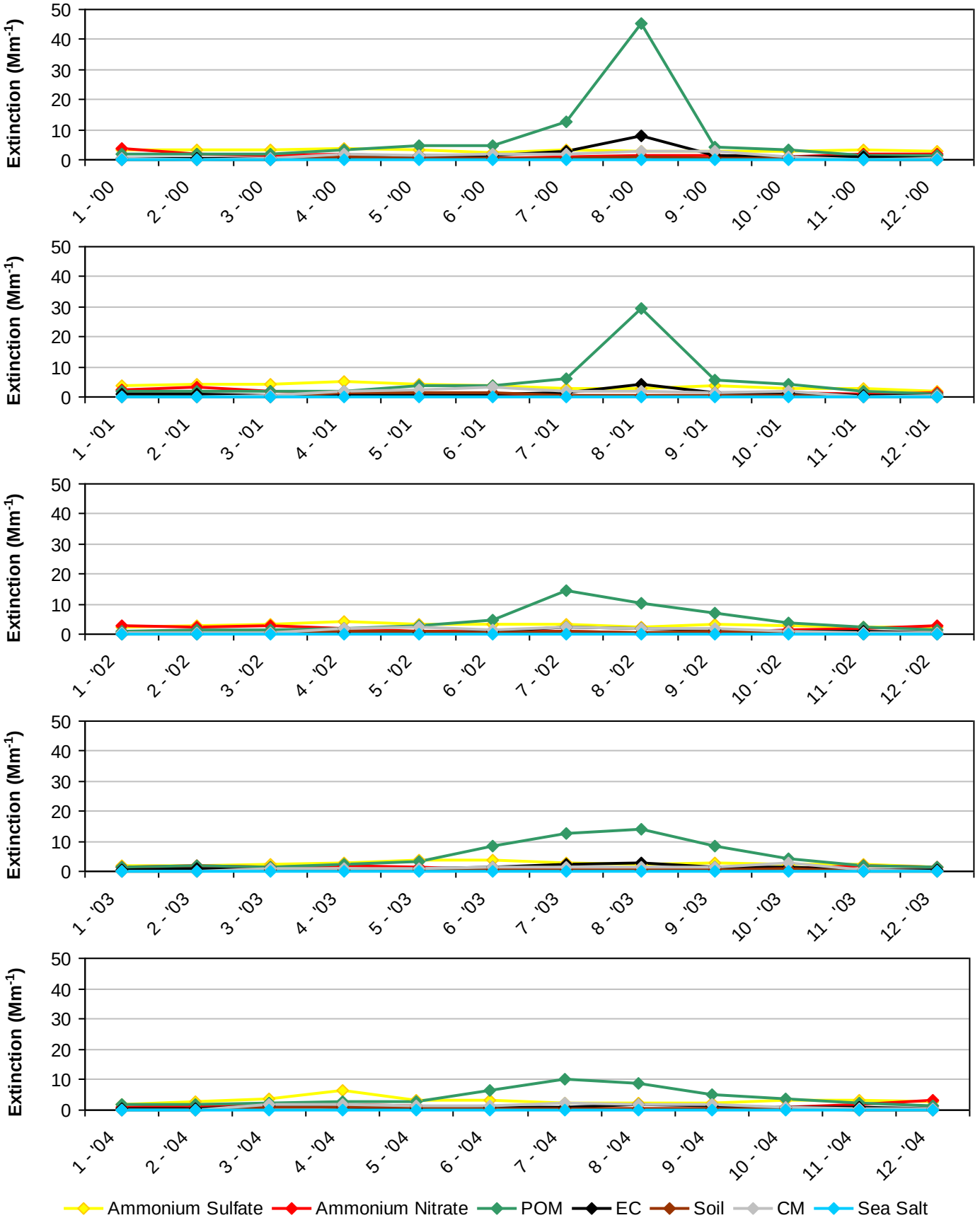


Figure F.5-6
Yellowstone NP, WY (YELL2 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

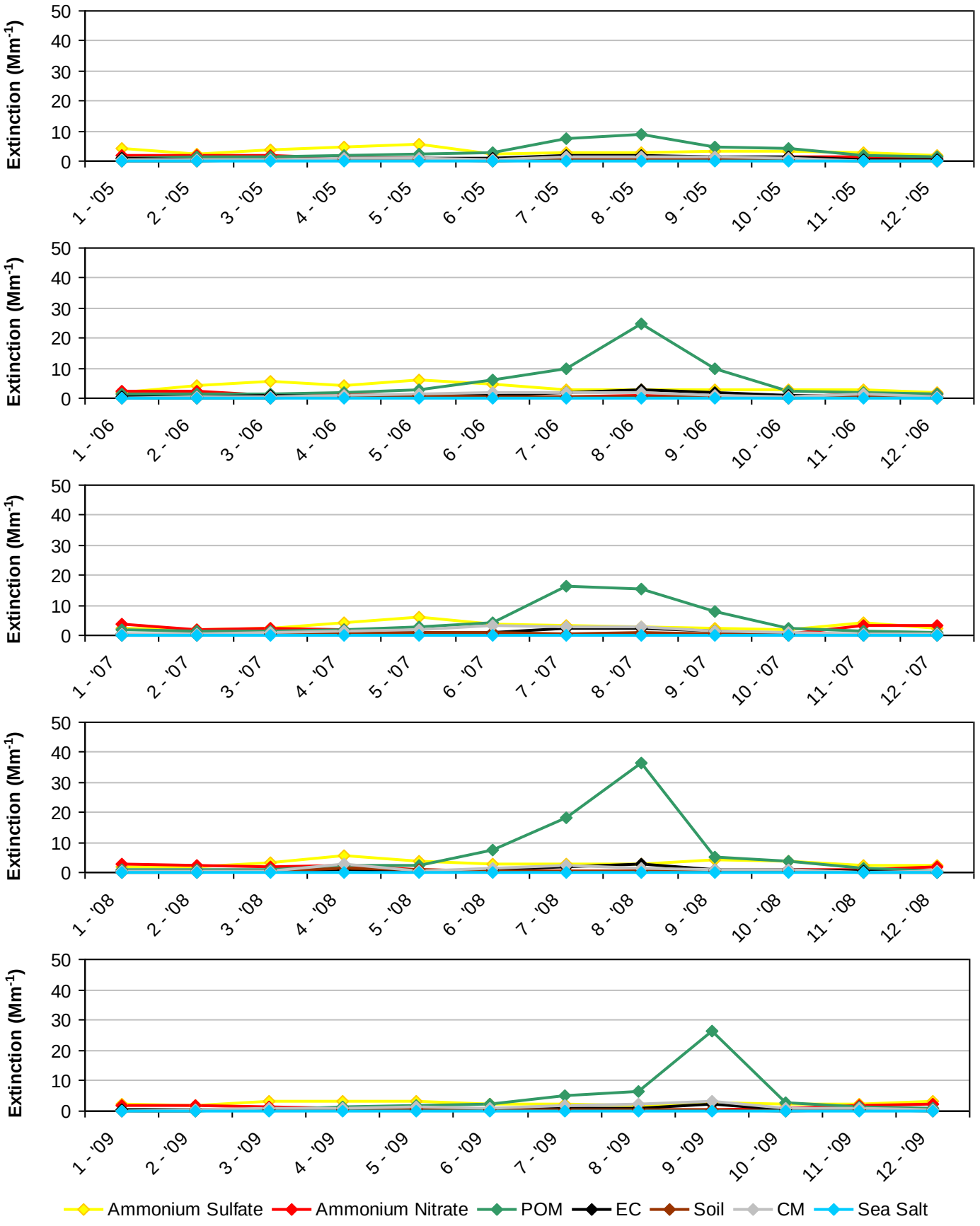


Figure F.5-7
Yellowstone NP, WY (YELL2 Site)
2000-2004 Progress Period Extinction, All Sampled Days

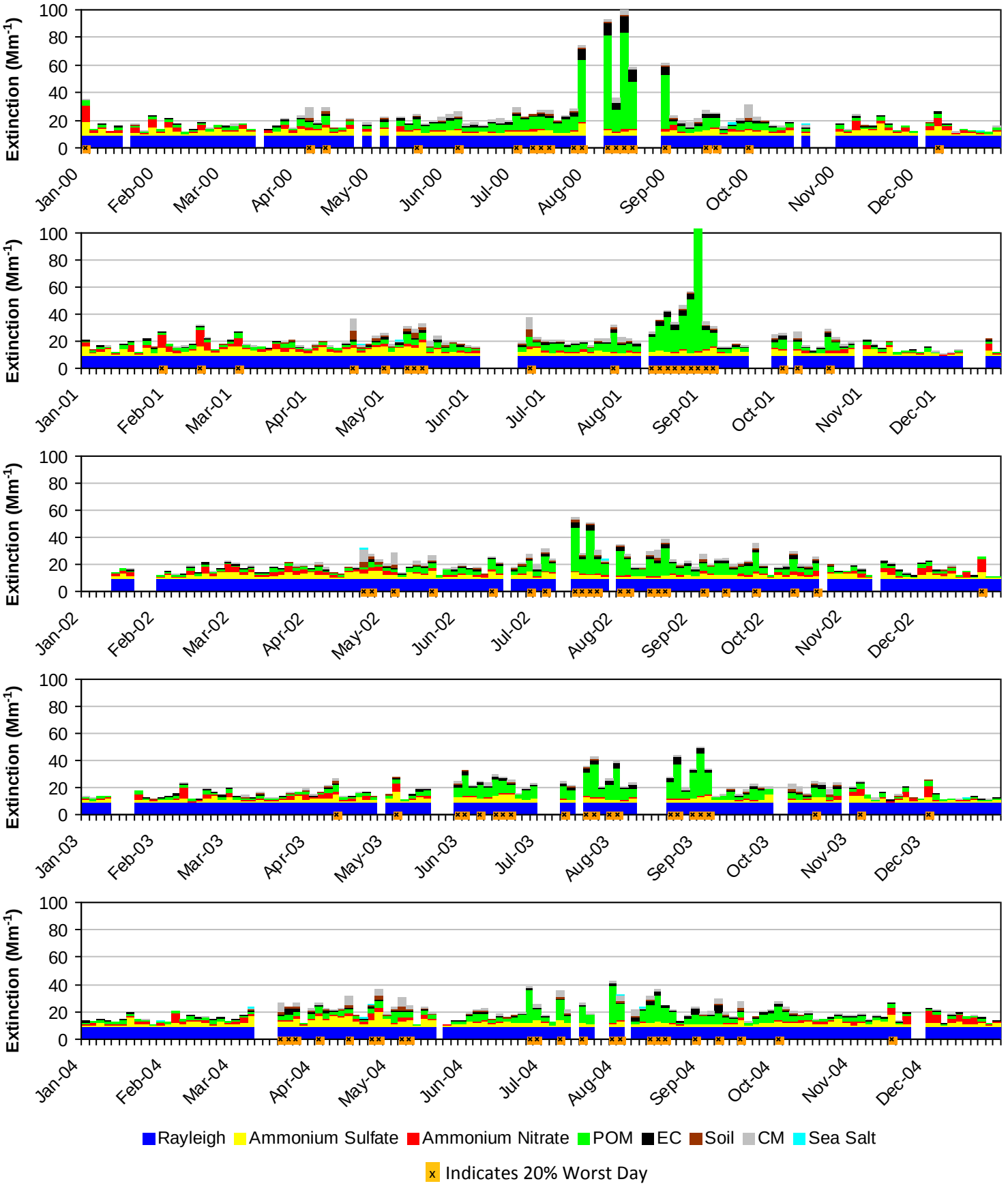
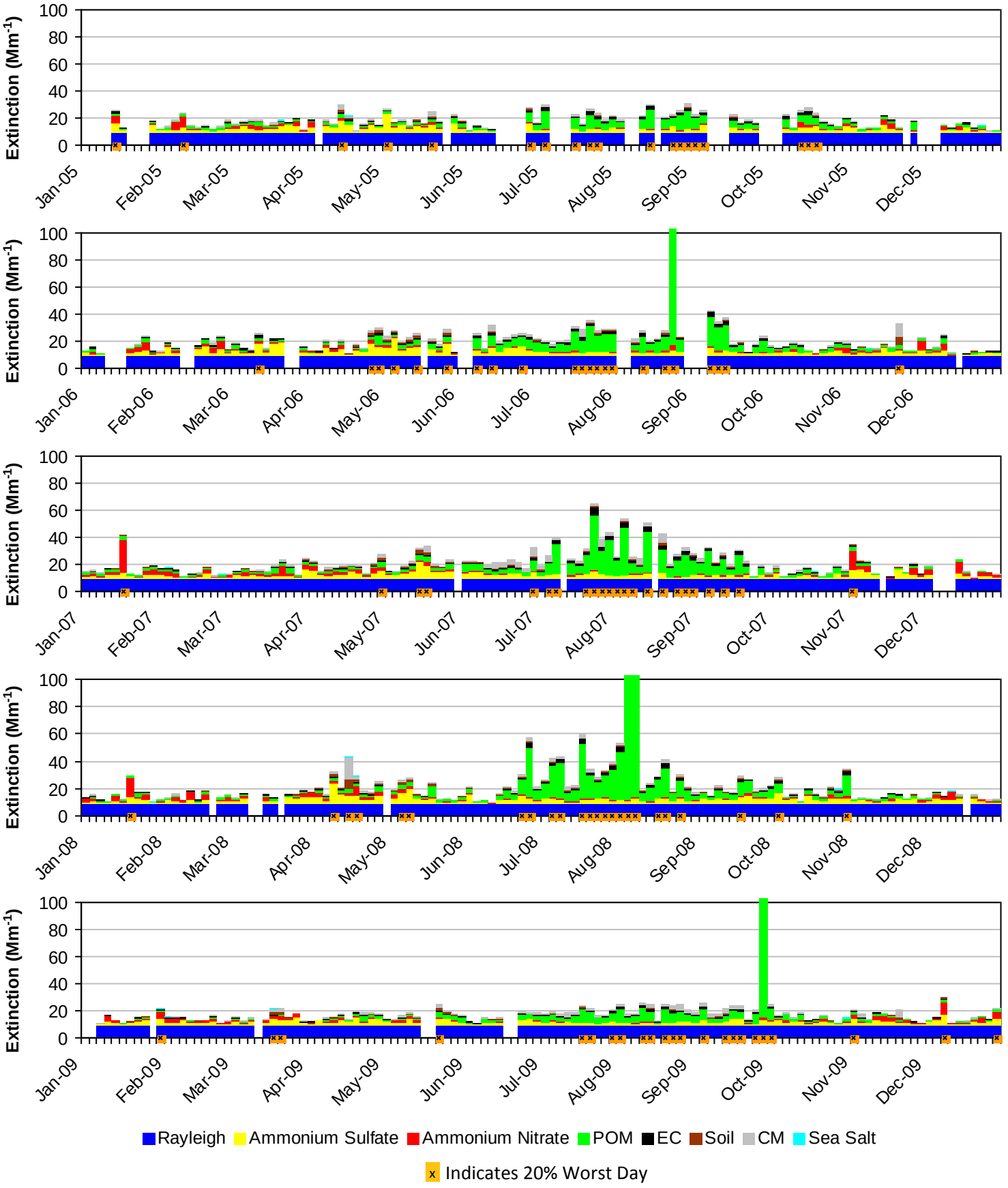


Figure F.5-8
Yellowstone NP, WY (YELL2 Site)
2005-2009 Progress Period Extinction, All Sampled Days



APPENDIX G:

Montana Class I Area Monitoring Data Summary Tables and Charts

Includes the following subsections:

Subsection	IMPROVE Monitor	Class I Area(s) Represented
G.1	CABI1	Cabinet Mountains WA
G.2	GAMO1	Gates of the Mountain WA
G.3	GLAC1	Glacier NP
G.4	MELA1	Medicine Lake WA
G.5	MONT1	Bob Marshall WA, Mission Mountain WA, and Scapegoat WA
G.6	SULA1	Anaconda-Pintlar WA and Selway-Bitterroot WA
G.7	ULBE1	U L Bend WA
G.8	YELL2	Yellowstone NP

G.1. CABINET MOUNTAINS WA (CABI1)

The following tables and figures are presented in this section for the Cabinet Mountains WA represented by the CABI1 IMPROVE Monitor:

- **Table G.1-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure G.1-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure G.1-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure G.1-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure G.1-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure G.1-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure G.1-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure G.1-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

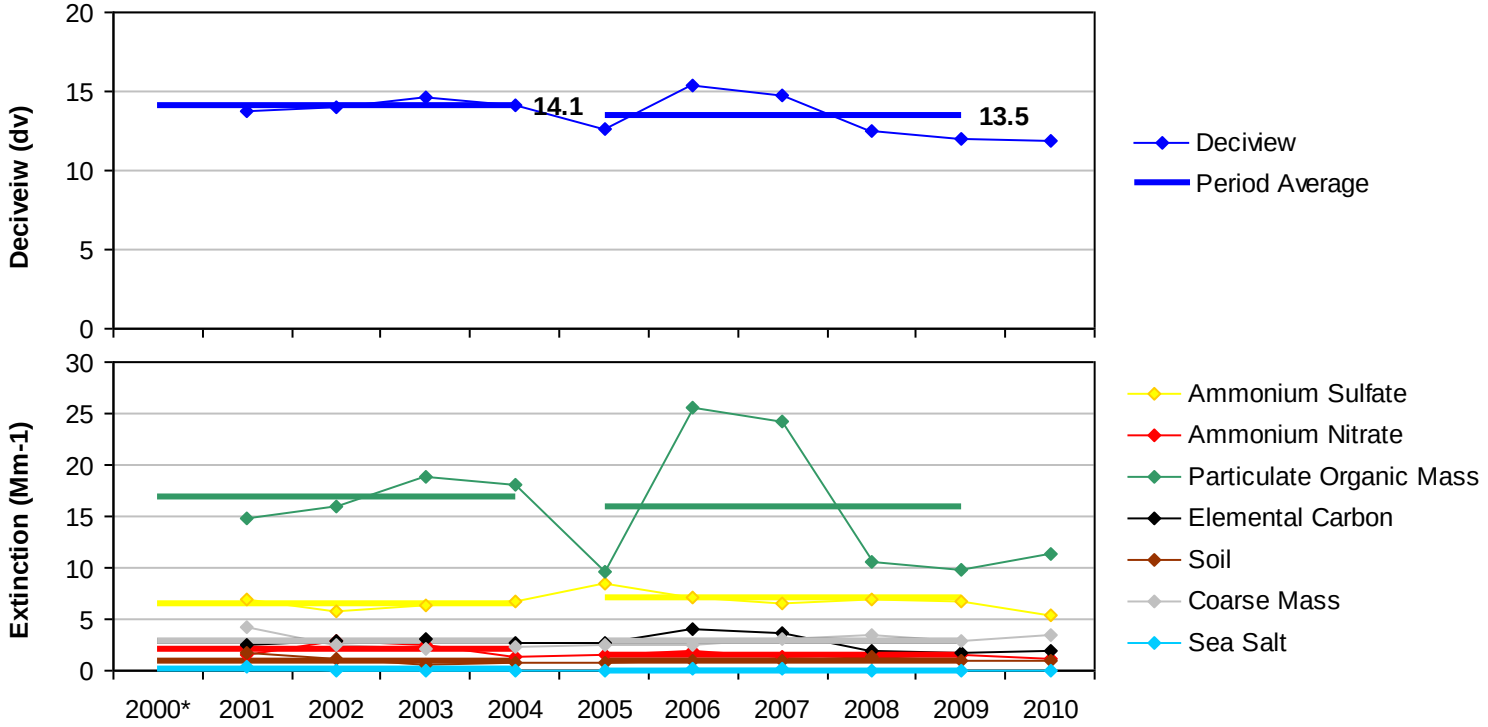
- **Figure G.1-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table G.1-1
Cabinet Mountains WA, MT (CABI1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	4.3	3.7	3.3	3.2	4.0	2.4	3.6	3.2	2.7	1.9	-0.1	0.0	3.6	3.2	-0.4	-11%
Worst 20% Days	---	13.7	13.9	14.6	14.2	12.6	15.4	14.8	12.5	12.0	11.9	-0.2	0.3	14.1	13.5	-0.6	-4%
All Days	---	8.5	8.8	8.6	8.1	8.4	8.4	8.5	7.6	7.4	6.6	-0.1	0.0	8.5	8.1	-0.4	-5%
Total Extinction (Mm-1)																	
Best 20% Days	---	15.4	14.6	14.0	13.9	15.1	12.8	14.3	13.8	13.2	12.2	-0.2	0.0	14.5	13.8	-0.7	-5%
Worst 20% Days	---	42.0	41.2	43.5	41.9	35.6	52.3	49.7	35.7	33.8	34.2	-0.9	0.2	42.2	41.4	-0.8	-2%
All Days	---	25.2	25.8	25.6	24.4	24.3	26.8	26.4	22.6	22.1	20.8	-0.4	0.1	25.3	24.5	-0.8	-3%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	2.2	2.0	1.5	1.5	2.5	1.2	1.7	1.5	1.6	1.0	-0.1	0.2	1.8	1.7	-0.1	-6%
Worst 20% Days	---	7.0	5.9	6.3	6.7	8.4	7.0	6.5	6.9	6.8	5.5	0.0	0.3	6.5	7.1	0.6	9%
All Days	---	4.6	4.3	3.9	4.2	5.2	4.1	4.1	4.1	4.2	3.4	0.0	0.1	4.2	4.3	0.1	2%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.8	0.7	0.8	0.7	0.6	0.4	0.6	0.7	0.5	0.3	0.0	0.1	0.8	0.6	-0.2	-25%
Worst 20% Days	---	1.4	2.8	2.5	1.3	1.5	2.0	1.4	1.4	1.6	1.1	0.0	0.4	2.0	1.6	-0.4	-20%
All Days	---	1.4	1.5	1.5	1.2	1.2	1.2	1.2	1.3	1.3	0.9	0.0	0.1	1.4	1.2	-0.2	-14%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	1.3	1.0	0.9	0.9	0.9	0.5	1.2	0.9	0.5	0.5	-0.1	0.0	1.0	0.8	-0.2	-20%
Worst 20% Days	---	14.8	16.0	18.9	18.1	9.6	25.5	24.2	10.6	9.8	11.4	-0.6	0.5	16.9	15.9	-1.0	-6%
All Days	---	5.6	6.4	7.2	6.1	4.6	7.8	7.6	4.2	4.0	4.0	-0.2	0.2	6.3	5.6	-0.7	-11%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.0	0.0	0.3	0.3	0.0	0%
Worst 20% Days	---	2.5	3.0	3.0	2.7	2.7	4.1	3.7	2.0	1.7	1.9	-0.1	0.3	2.8	2.8	0.0	0%
All Days	---	1.2	1.4	1.5	1.2	1.4	1.5	1.5	0.9	0.8	0.8	0.0	0.4	1.3	1.2	-0.1	-8%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.4	0.1	0.1	0.0	0%
Worst 20% Days	---	1.7	1.1	0.6	0.7	0.8	1.0	0.9	1.3	1.0	1.0	0.0	0.5	1.0	1.0	0.0	0%
All Days	---	0.6	0.6	0.3	0.3	0.4	0.5	0.4	0.5	0.5	0.4	0.0	0.5	0.5	0.5	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.4	0.2	0.3	0.4	0.2	0.3	0.2	0.2	0.1	0.0	0.0	0.3	0.3	0.0	0%
Worst 20% Days	---	4.3	2.5	2.2	2.3	2.5	2.5	3.0	3.5	2.8	3.4	0.1	0.1	2.8	2.9	0.1	4%
All Days	---	1.7	1.4	1.2	1.3	1.4	1.5	1.5	1.6	1.4	1.2	0.0	0.5	1.4	1.5	0.1	7%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.2	0.2	0.1	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.1	0.1	0.0	0%
Worst 20% Days	---	0.3	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.5	0.1	0.1	0.0	0%
All Days	---	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.5	0.1	0.1	0.0	0%

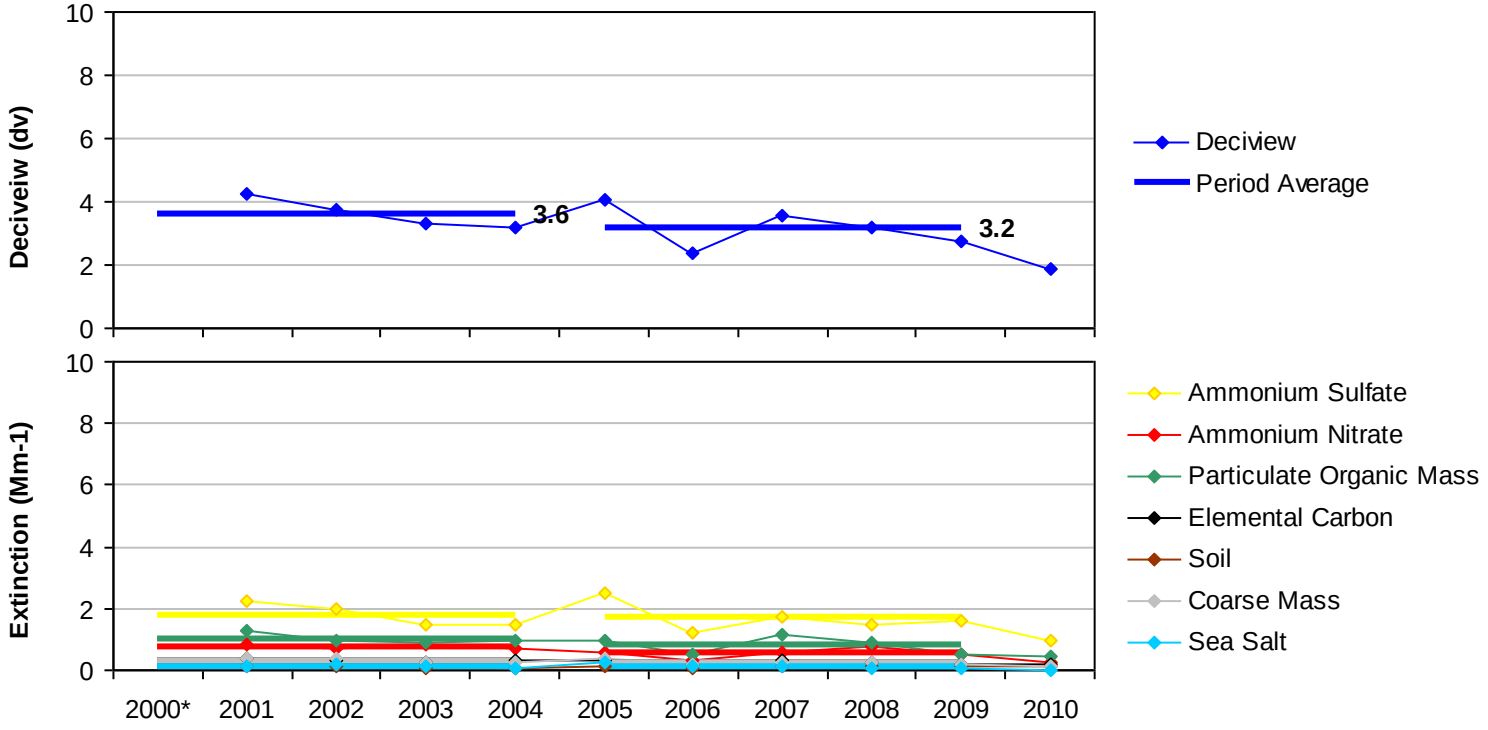
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure G.1-1
Cabinet Mountains WA, MT (CABI1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



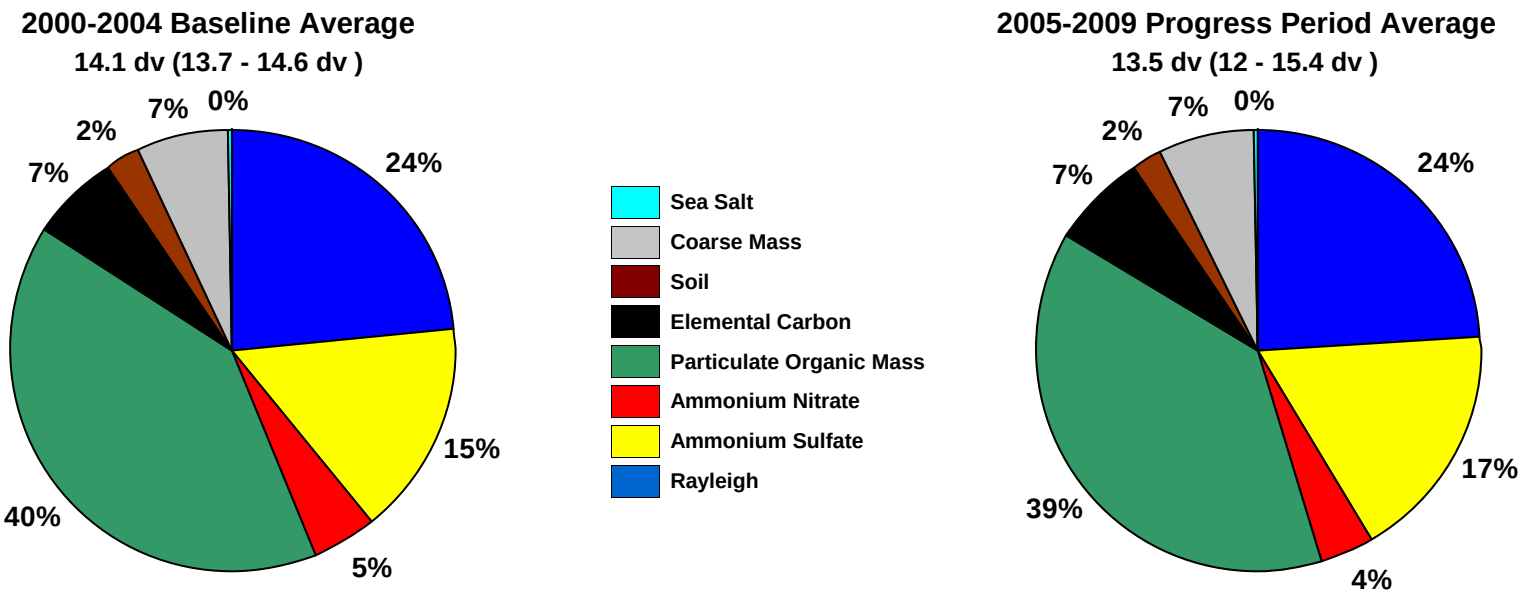
*Missing years did not meet RHR data completeness criteria.

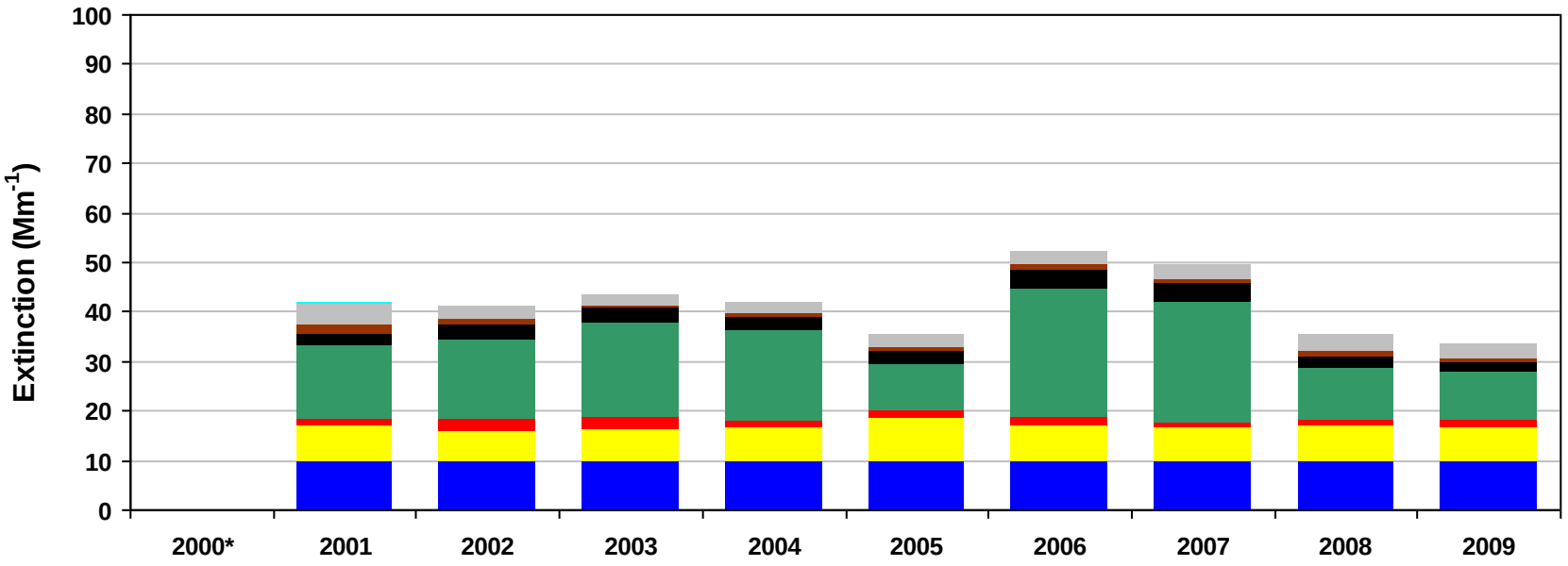
Figure G.1-2
Cabinet Mountains WA, MT (CABI1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

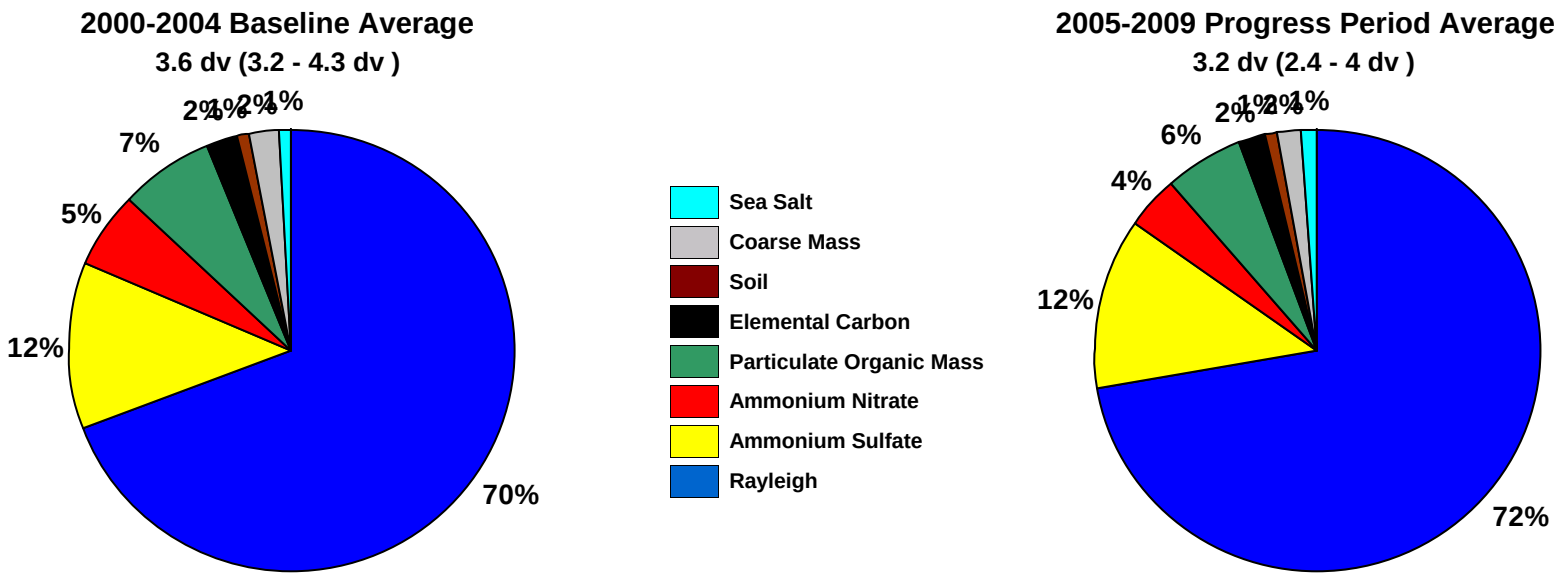
Figure G.1-3
Cabinet Mountains WA, MT (CABI1 Site)
20% Most Impaired Visibility Days

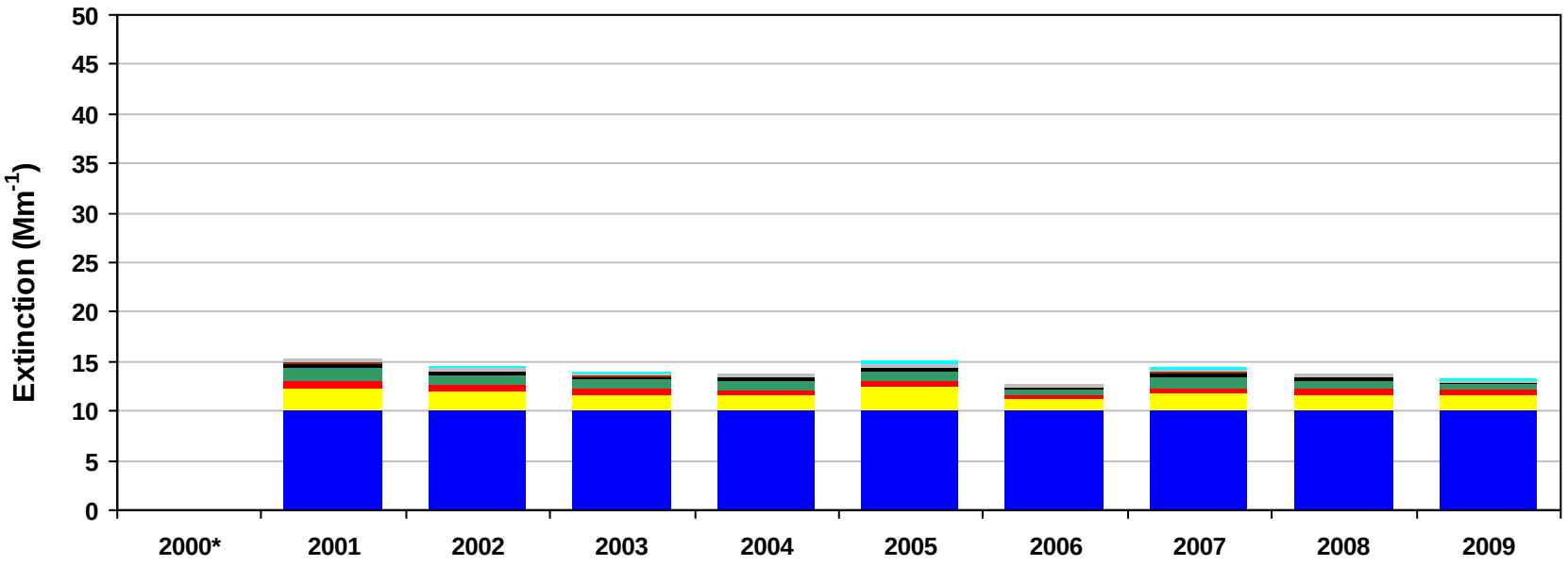




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

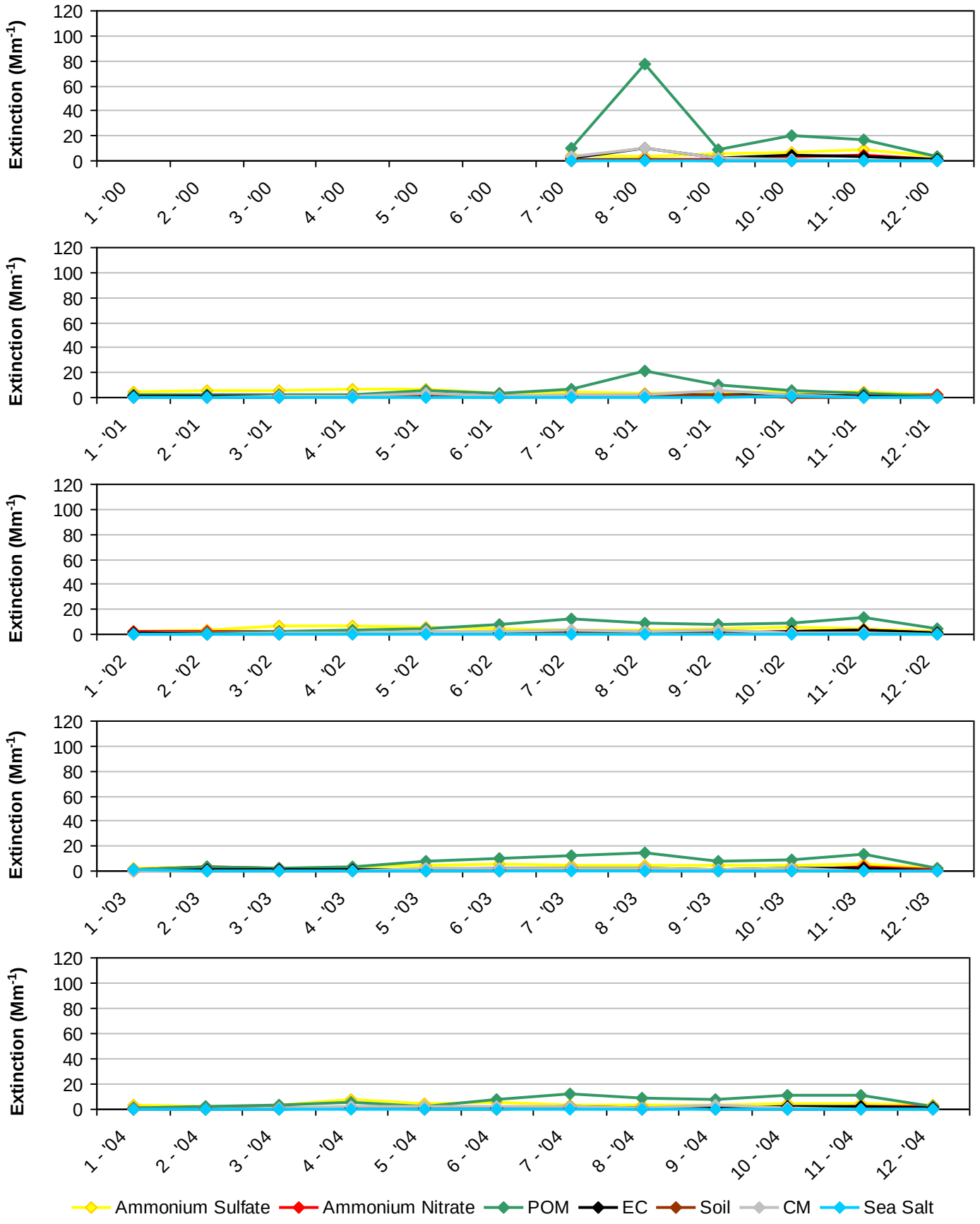
Figure G.1-4
Cabinet Mountains WA, MT (CABI1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure G.1-5
Cabinet Mountains WA, MT (CABI1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure G.1-6
Cabinet Mountains WA, MT (CABI1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

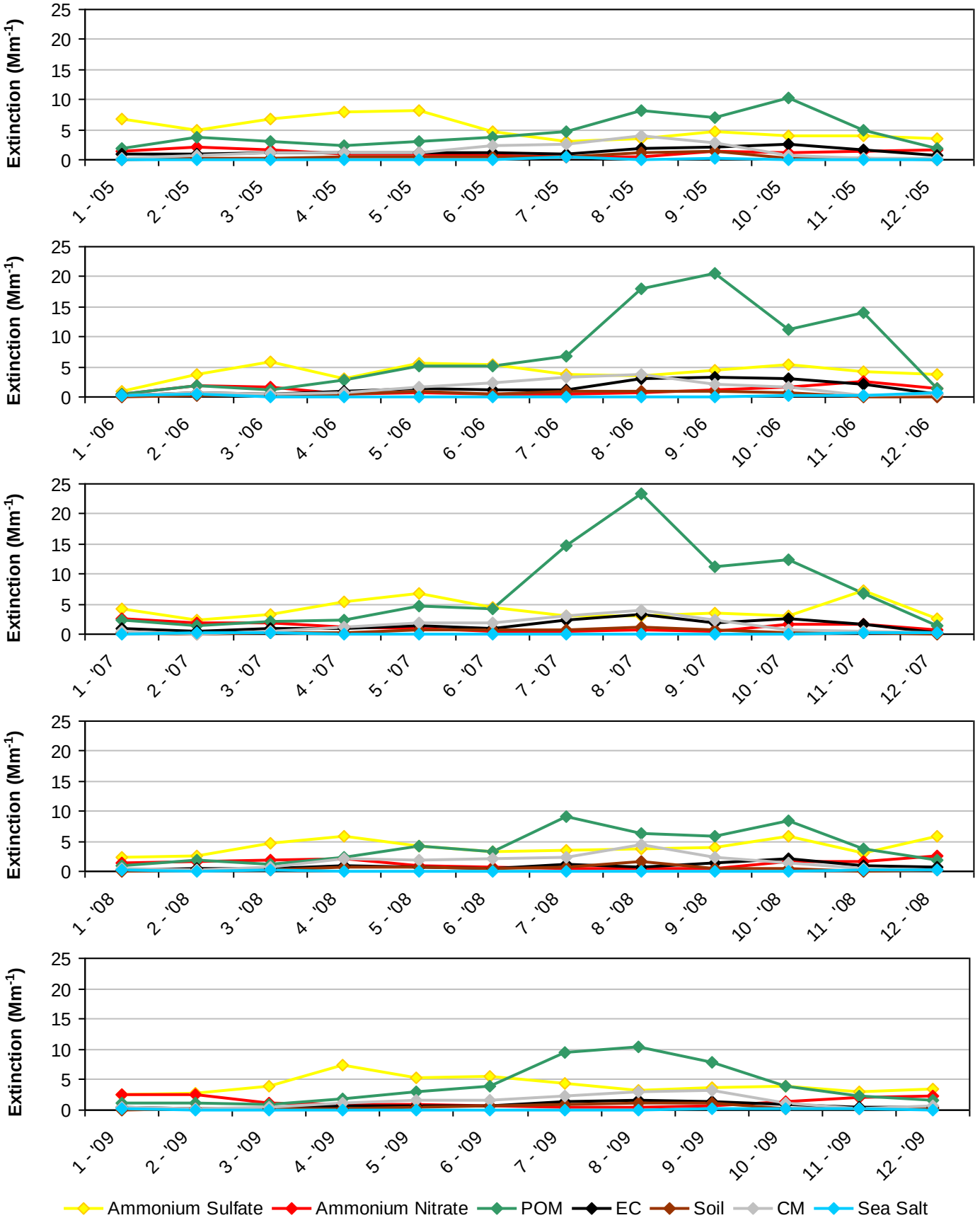
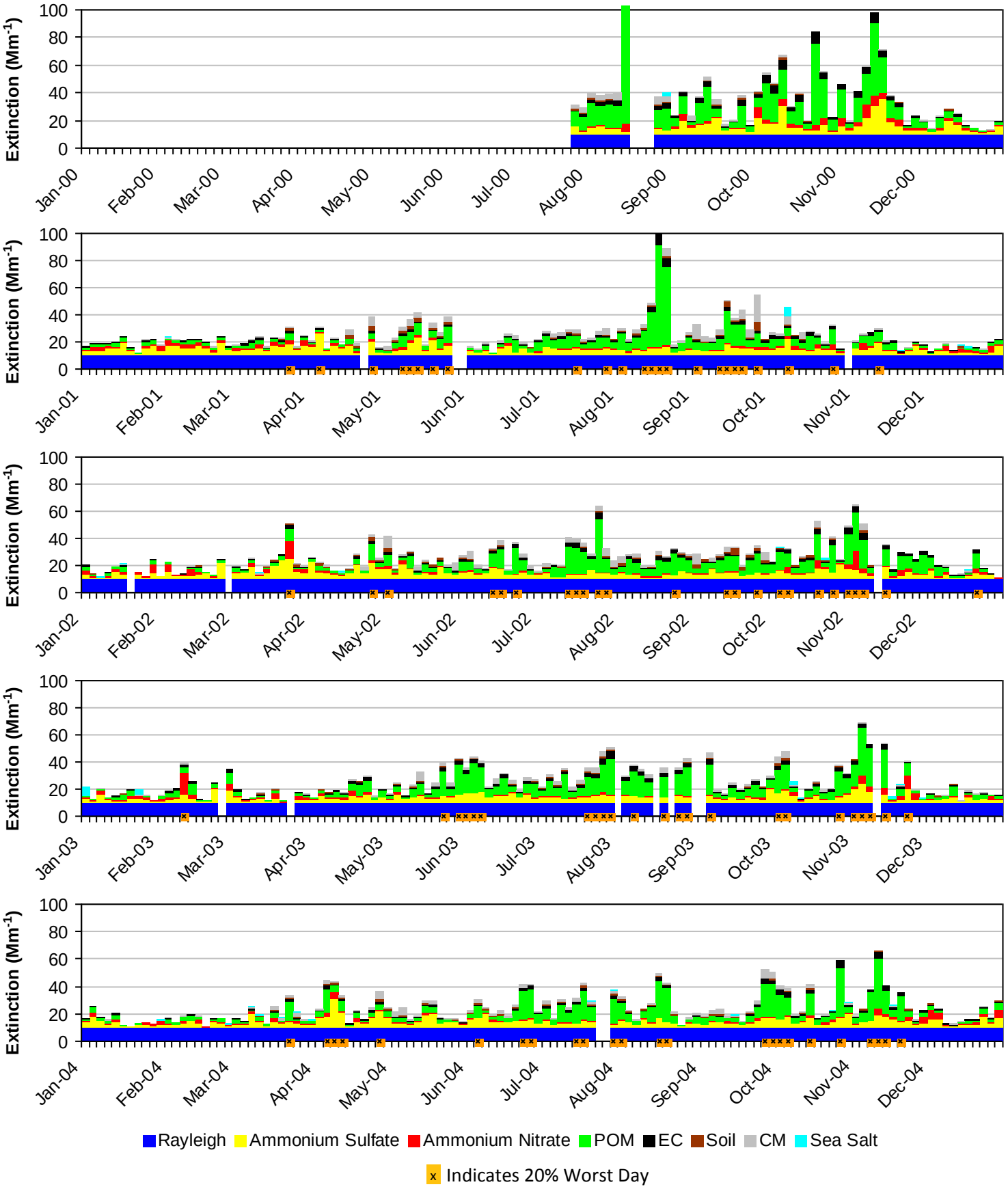
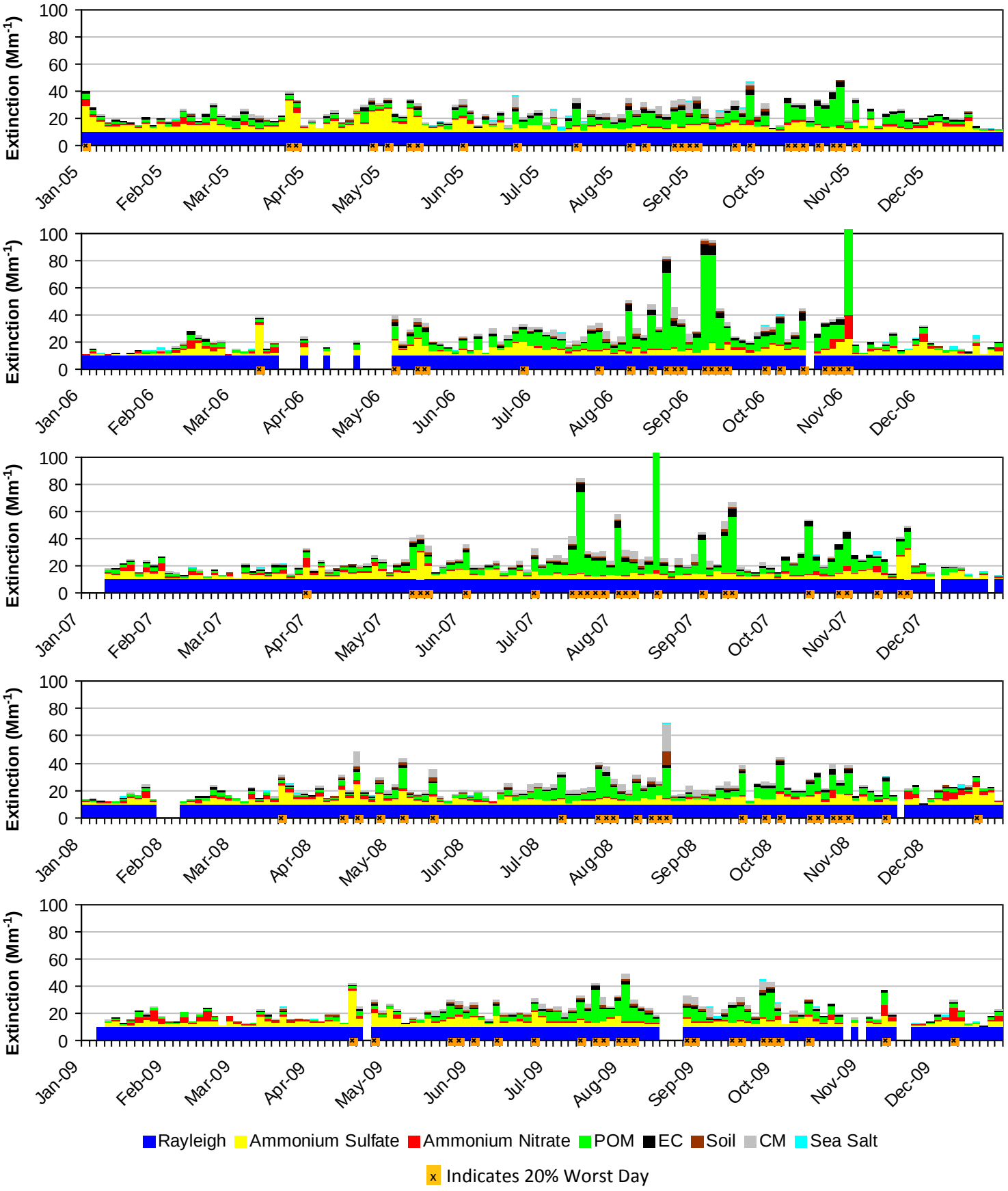


Figure G.1-7
Cabinet Mountains WA, MT (CABI1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure G.1-8
Cabinet Mountains WA, MT (CABI1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



G.2. GATES OF THE MOUNTAIN WA (GAMO1)

The following tables and figures are presented in this section for the Gates of the Mountain WA represented by the GAMO1 IMPROVE Monitor:

- **Table G.2-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure G.2-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure G.2-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure G.2-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure G.2-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure G.2-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure G.2-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure G.2-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

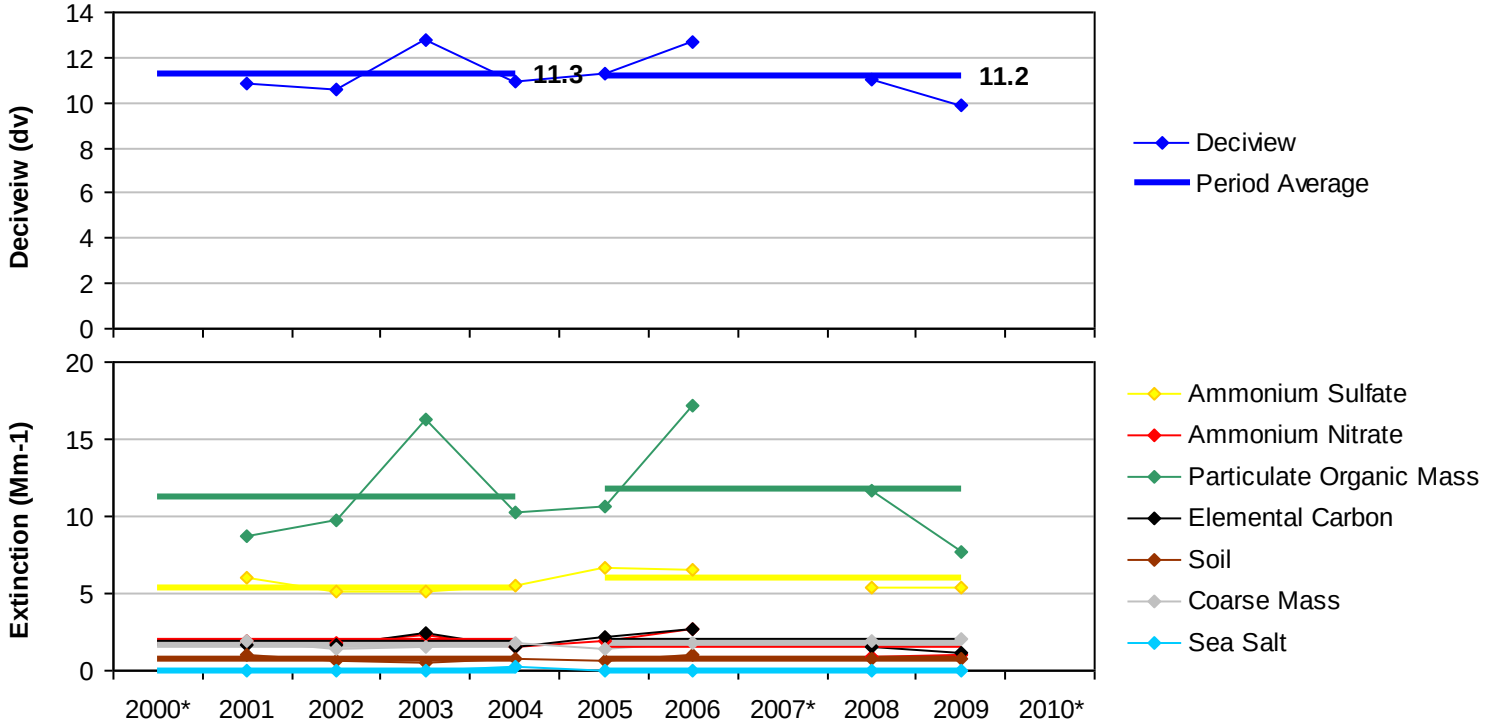
- **Figure G.2-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table G.2-1
Gates of the Mtn WA, MT (GAMO1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	1.8	2.2	0.9	1.9	1.1	0.9	---	0.8	0.8	---	-0.2	0.0	1.7	0.9	-0.8	-47%
Worst 20% Days	---	10.8	10.6	12.8	10.9	11.3	12.7	---	11.0	9.9	---	0.0	0.6	11.3	11.2	-0.1	-1%
All Days	---	5.9	6.2	5.7	5.7	5.7	5.8	---	5.4	5.1	---	-0.1	0.0	5.9	5.5	-0.4	-7%
Total Extinction (Mm-1)																	
Best 20% Days	---	12.0	12.6	10.9	12.1	11.2	11.0	---	10.9	10.9	---	-0.2	0.0	11.9	11.0	-0.9	-8%
Worst 20% Days	---	30.3	29.3	37.2	30.6	32.5	40.9	---	31.2	27.0	---	0.1	0.5	31.8	32.9	1.1	4%
All Days	---	19.2	19.6	19.7	18.7	19.2	20.7	---	18.5	17.6	---	-0.2	0.2	19.3	19.0	-0.3	-2%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	1.2	1.2	0.6	0.9	1.0	0.8	---	0.8	1.0	---	0.0	0.3	1.0	0.9	-0.1	-10%
Worst 20% Days	---	6.0	5.1	5.1	5.5	6.6	6.6	---	5.4	5.4	---	0.0	0.5	5.4	6.0	0.6	11%
All Days	---	3.4	3.3	2.6	2.9	3.3	3.4	---	3.1	3.1	---	0.0	0.4	3.1	3.2	0.1	3%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.5	0.6	0.3	0.5	0.3	0.3	---	0.3	0.2	---	0.0	0.0	0.5	0.3	-0.2	-40%
Worst 20% Days	---	1.9	1.8	2.3	1.5	2.0	2.7	---	0.8	1.0	---	-0.1	0.3	1.9	1.6	-0.3	-16%
All Days	---	1.3	1.2	1.1	1.0	0.9	1.1	---	0.7	0.7	---	-0.1	0.0	1.1	0.9	-0.2	-18%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	0.6	0.8	0.5	0.9	0.5	0.3	---	0.5	0.3	---	-0.1	0.0	0.7	0.4	-0.3	-43%
Worst 20% Days	---	8.7	9.8	16.2	10.3	10.7	17.2	---	11.7	7.7	---	0.3	0.3	11.3	11.8	0.5	4%
All Days	---	3.4	3.9	4.9	3.7	3.9	4.9	---	3.7	3.0	---	0.0	0.4	4.0	3.9	-0.1	-3%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.2	0.1	0.2	0.2	0.2	---	0.1	0.1	---	0.0	0.1	0.2	0.1	-0.1	-50%
Worst 20% Days	---	1.6	1.6	2.5	1.6	2.1	2.7	---	1.6	1.2	---	0.0	0.4	1.8	1.9	0.1	6%
All Days	---	0.7	0.8	0.9	0.8	0.9	1.0	---	0.6	0.5	---	0.0	0.5	0.8	0.7	-0.1	-13%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.1	0.1	0.1	0.1	0.1	---	0.1	0.1	---	0.0	0.3	0.1	0.1	0.0	0%
Worst 20% Days	---	1.1	0.6	0.5	0.8	0.6	1.0	---	0.8	0.7	---	0.0	0.6	0.7	0.8	0.1	14%
All Days	---	0.4	0.4	0.2	0.3	0.3	0.4	---	0.4	0.3	---	0.0	0.4	0.3	0.3	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.5	0.3	0.4	0.2	0.2	---	0.2	0.2	---	0.0	0.0	0.4	0.2	-0.2	-50%
Worst 20% Days	---	1.9	1.4	1.6	1.8	1.4	1.8	---	1.9	2.0	---	0.1	0.1	1.7	1.8	0.1	6%
All Days	---	0.9	0.9	1.0	0.9	0.8	0.9	---	1.0	0.9	---	0.0	0.3	0.9	0.9	0.0	0%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.0	0.1	0.0	0.0	0.0	0.1	---	0.0	0.0	---	0.0	0.5	0.0	0.0	0.0	0%
Worst 20% Days	---	0.0	0.0	0.0	0.2	0.0	0.0	---	0.0	0.0	---	0.0	0.5	0.1	0.0	-0.1	-100%
All Days	---	0.0	0.0	0.0	0.1	0.0	0.1	---	0.0	0.0	---	0.0	0.5	0.0	0.0	0.0	0%

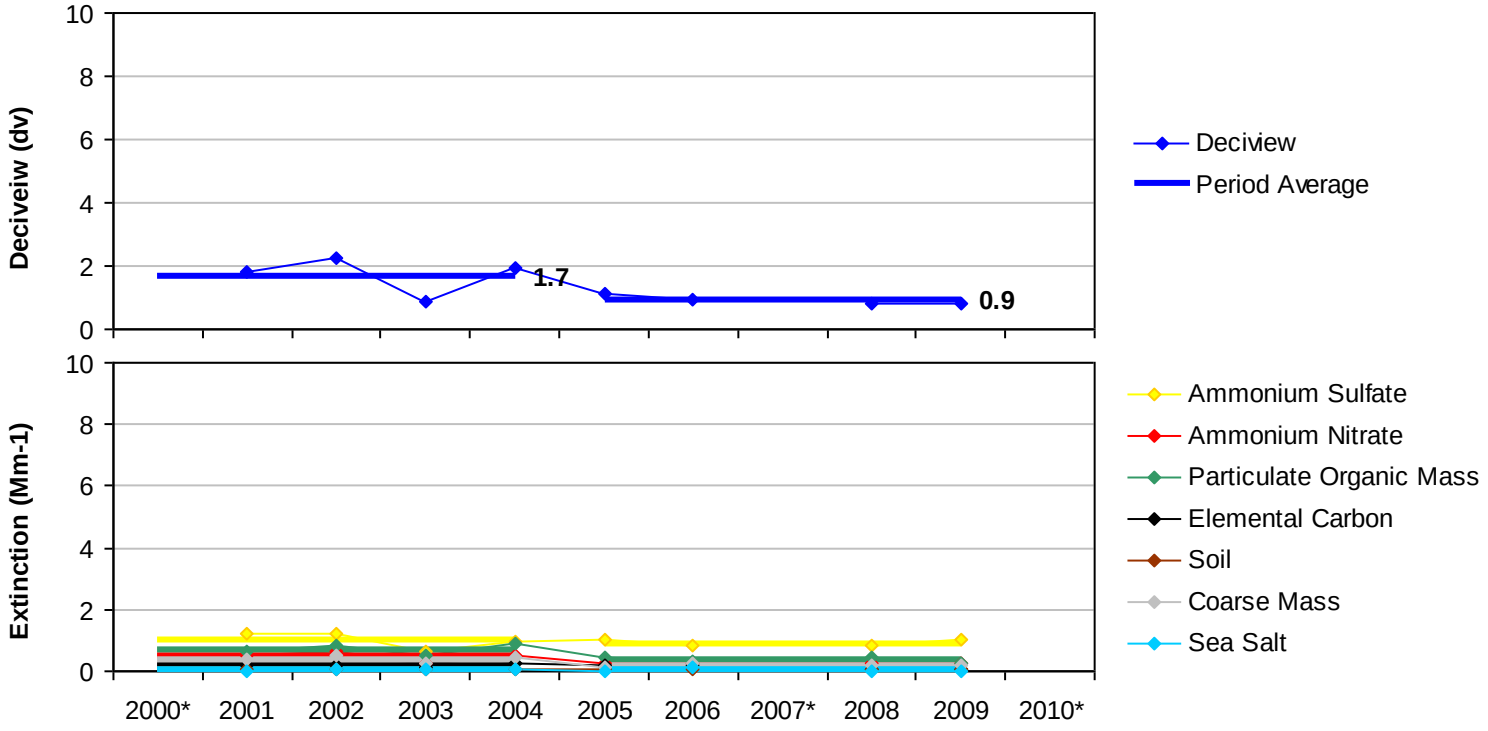
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure G.2-1
Gates of the Mtn WA, MT (GAMO1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



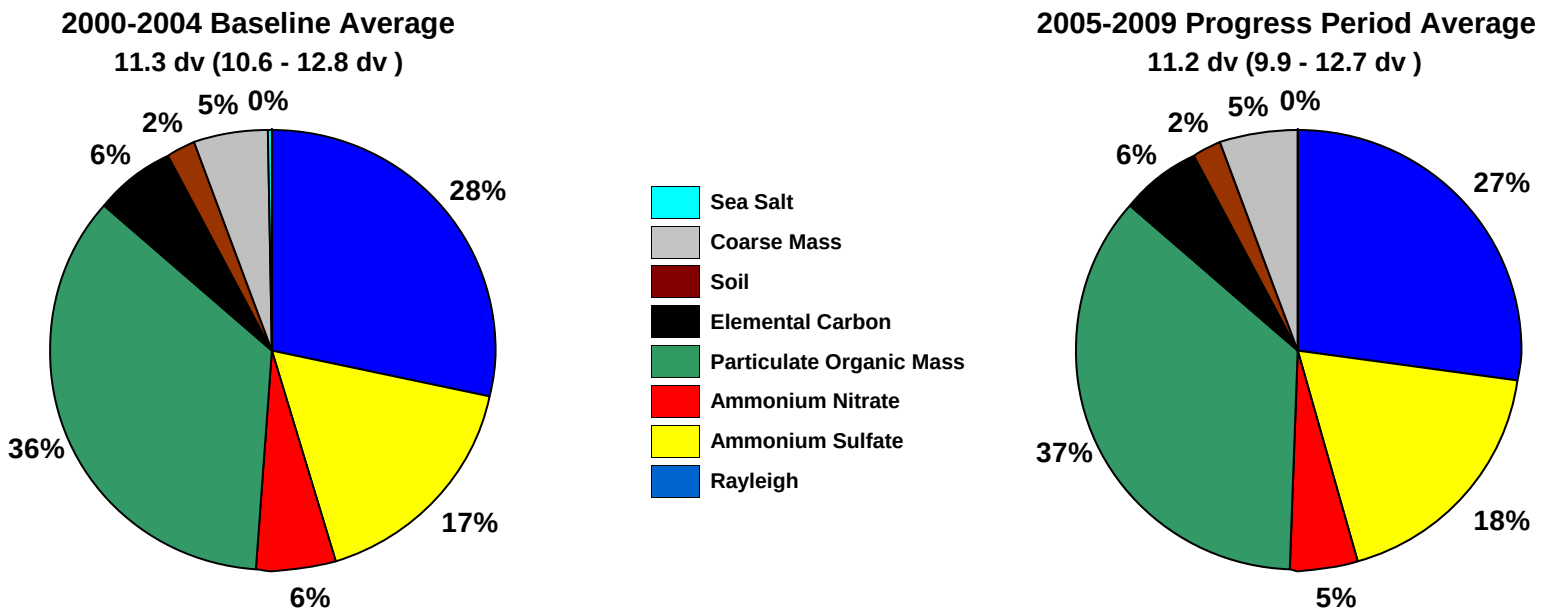
*Missing years did not meet RHR data completeness criteria.

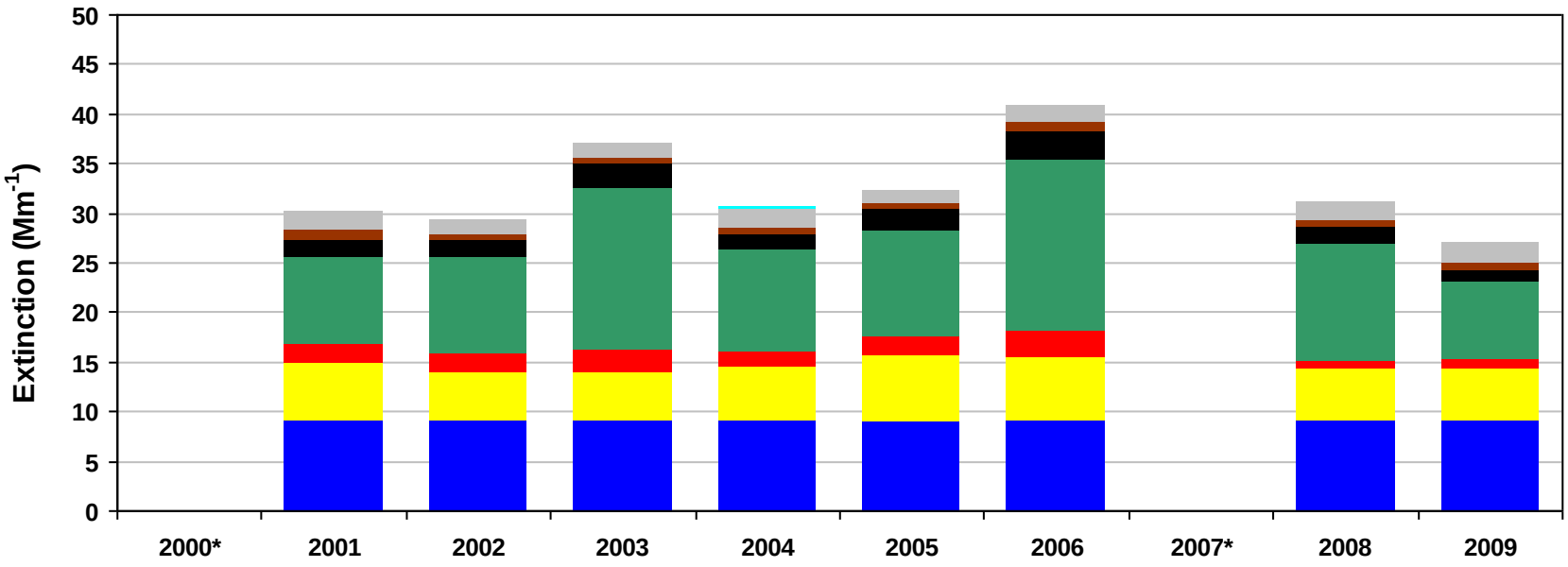
Figure G.2-2
Gates of the Mtn WA, MT (GAMO1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

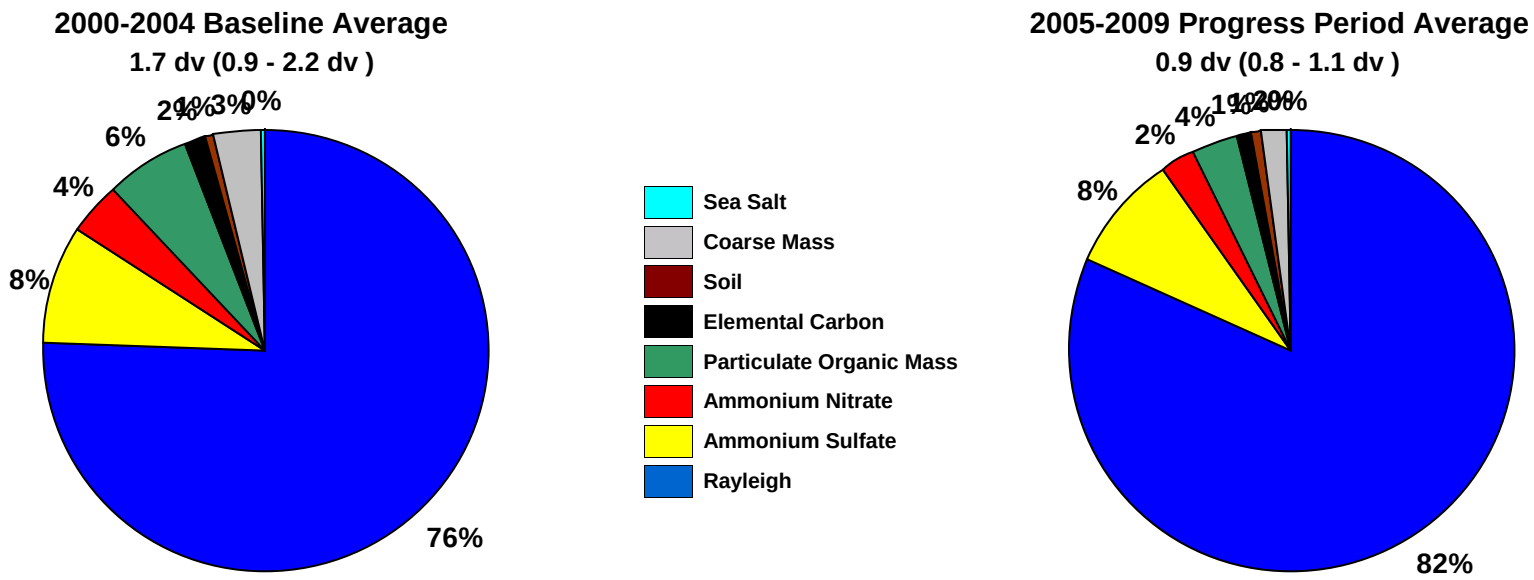
Figure G.2-3
Gates of the Mtn WA, MT (GAMO1 Site)
20% Most Impaired Visibility Days

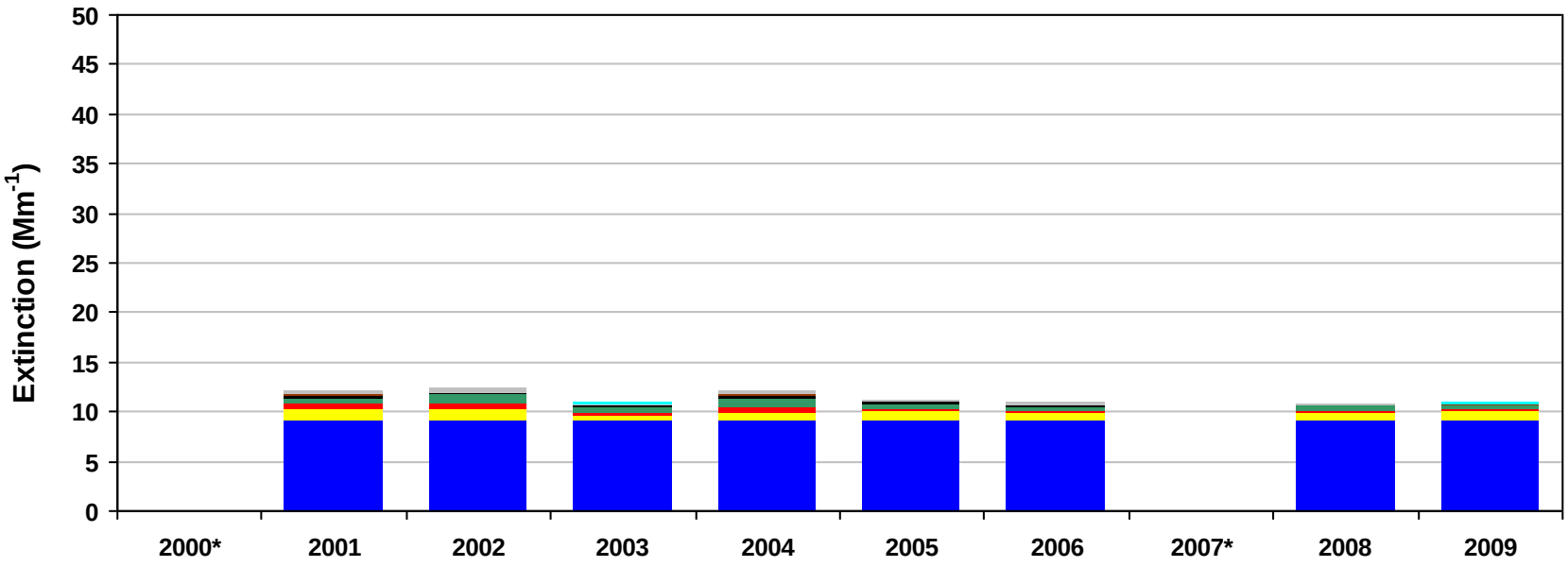




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

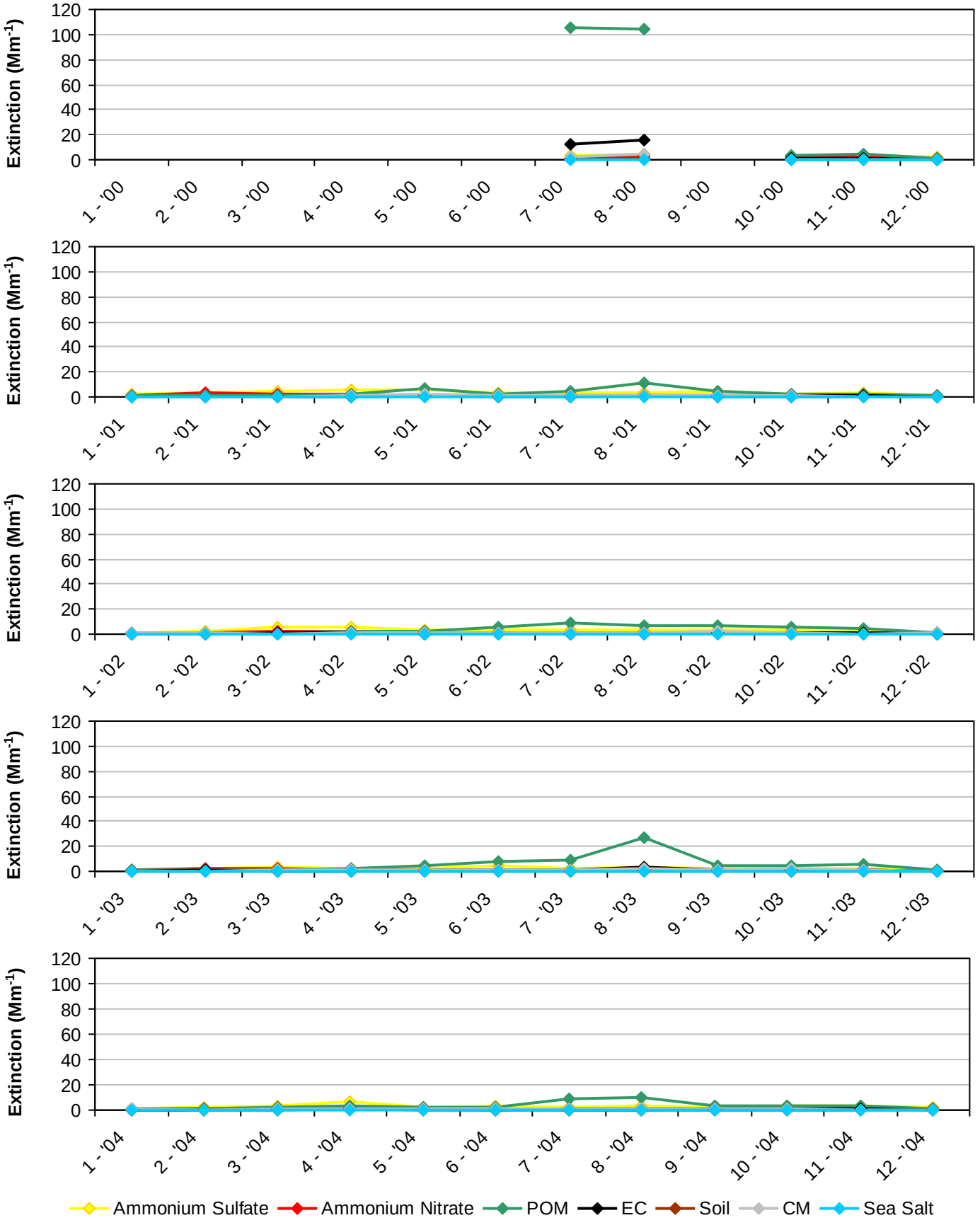
Figure G.2-4
Gates of the Mtn WA, MT (GAMO1 Site)
20% Least Impaired Visibility Days





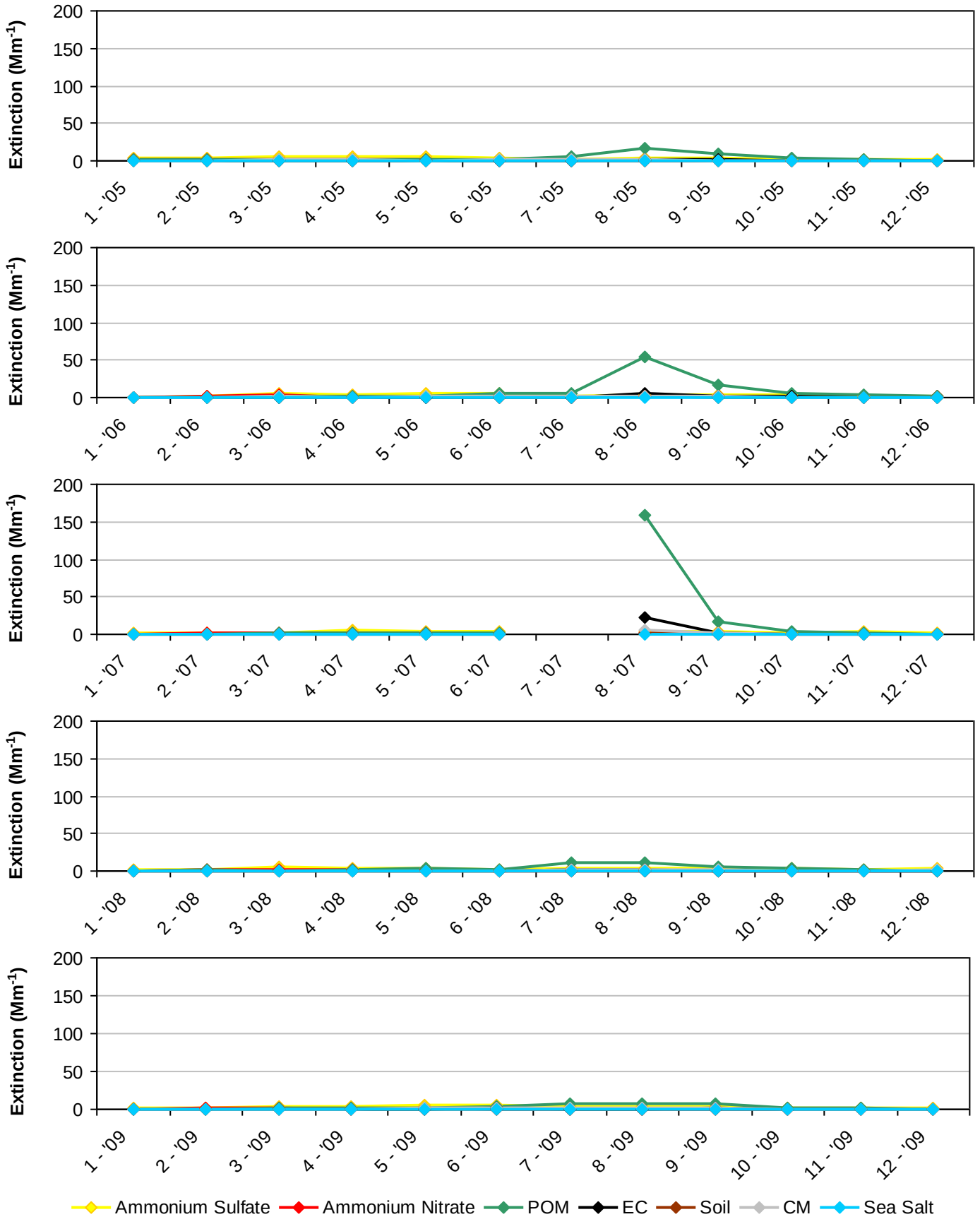
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure G.2-5
Gates of the Mtn WA, MT (GAMO1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



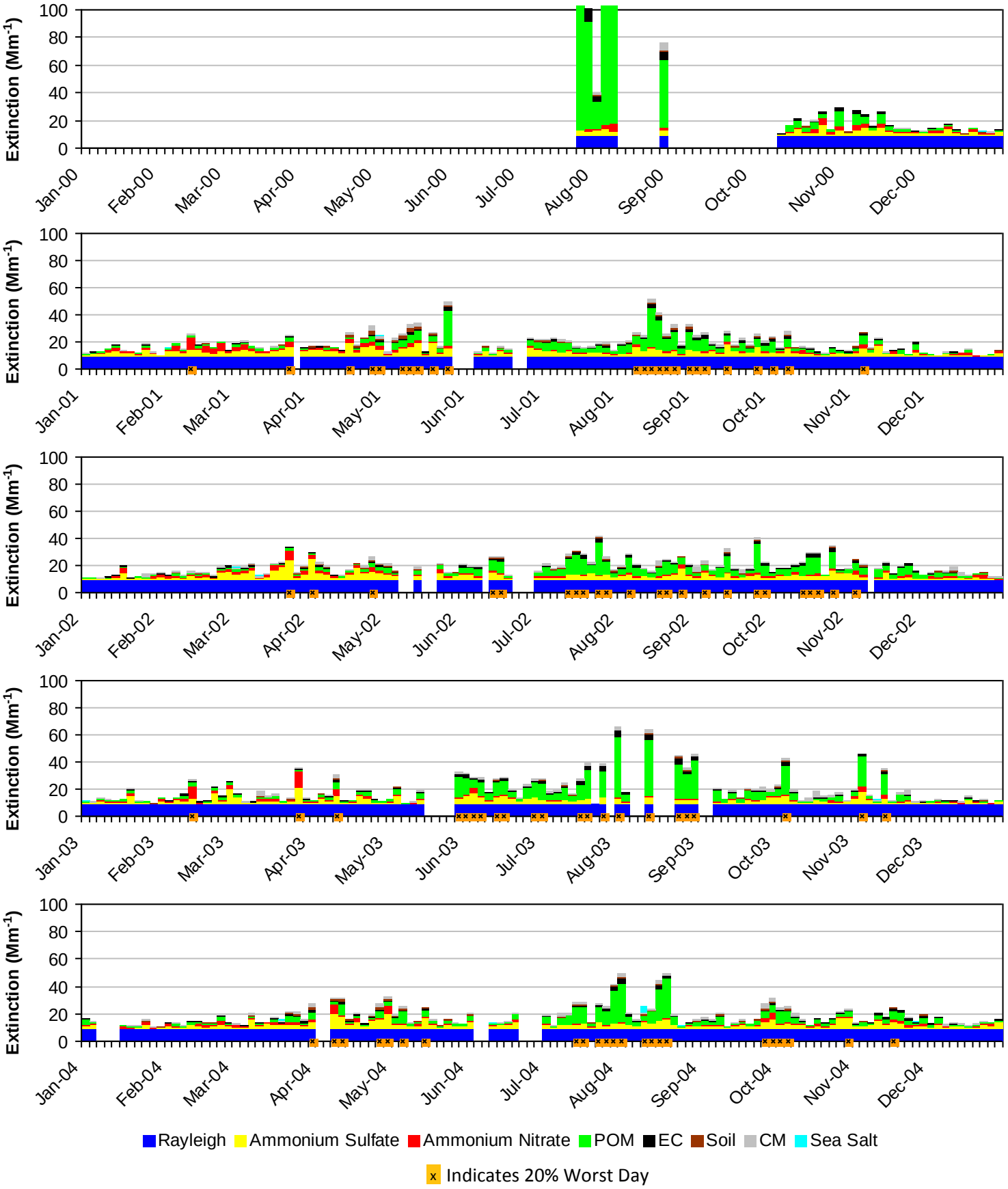
*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure G.2-6
Gates of the Mtn WA, MT (GAMO1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days



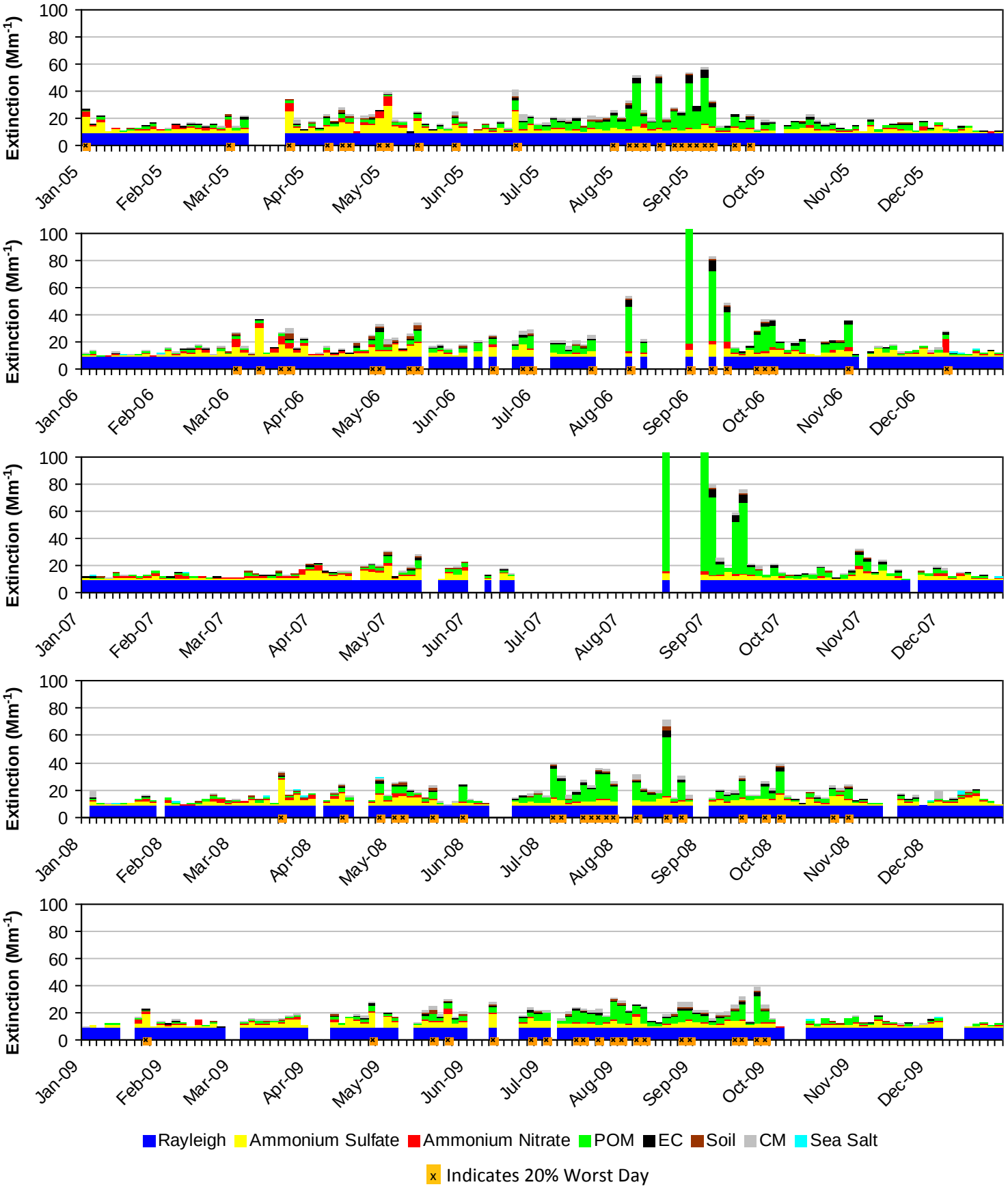
*Note that monthly averages for the year 2007 are shown here, but this year did not meet RHR data completeness criteria.

Figure G.2-7
Gates of the Mtn WA, MT (GAMO1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure G.2-8
Gates of the Mtn WA, MT (GAMO1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2007 are shown here, but this year did not meet RHR data completeness criteria.

G.3. GLACIER NP (GLAC1)

The following tables and figures are presented in this section for the Glacier NP represented by the GLAC1 IMPROVE Monitor:

- **Table G.3-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure G.3-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure G.3-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure G.3-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure G.3-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure G.3-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure G.3-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure G.3-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

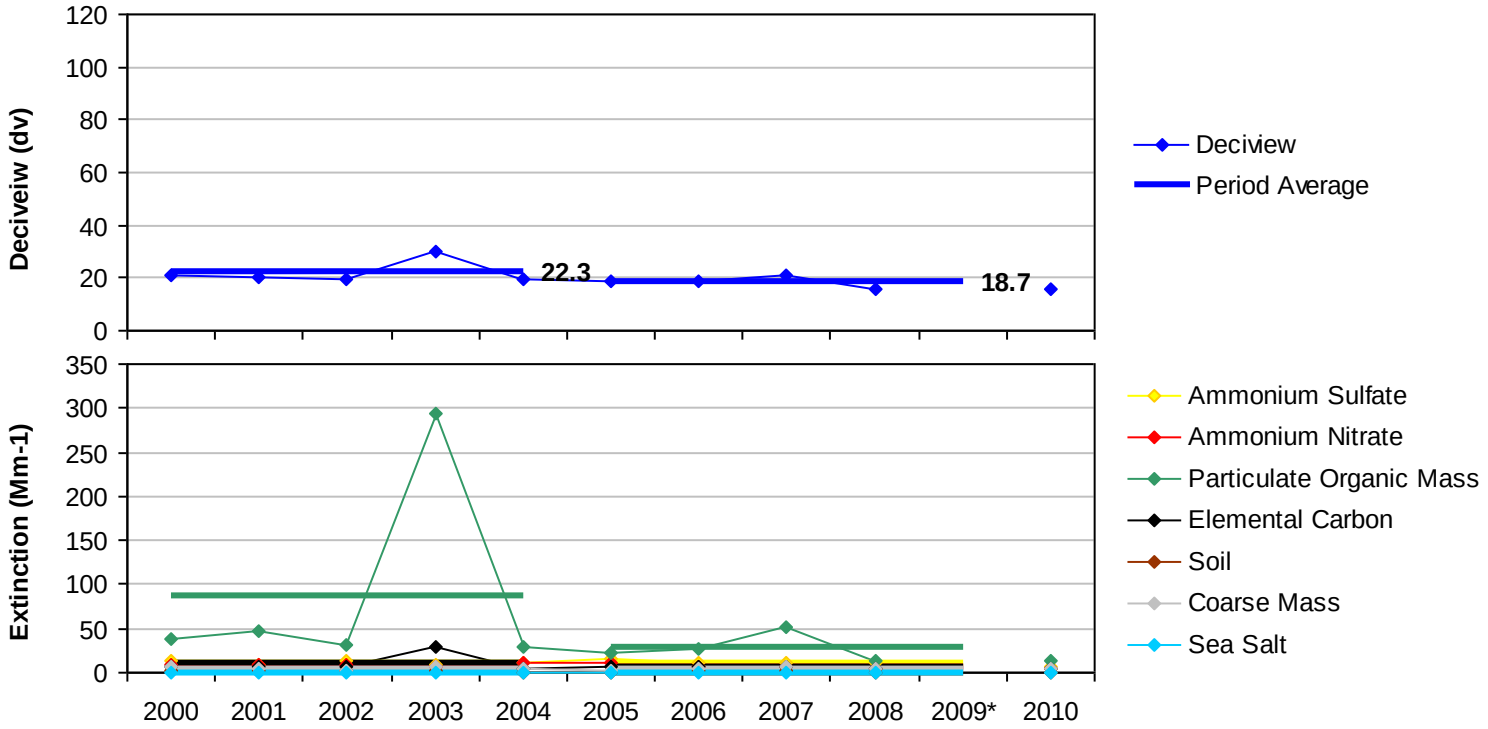
- **Figure G.3-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table G.3-1
Glacier NP, MT (GLAC1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	7.4	7.0	7.0	7.7	7.1	8.3	6.1	6.9	6.8	---	5.0	-0.1	0.1	7.3	7.0	-0.3	-4%
Worst 20% Days	21.3	20.4	19.7	30.2	19.7	19.1	18.6	21.2	16.0	---	15.5	-0.5	0.0	22.3	18.7	-3.6	-16%
All Days	13.7	13.0	12.7	15.8	13.0	13.2	12.0	12.9	11.2	---	10.2	-0.2	0.0	13.6	12.3	-1.3	-10%
Total Extinction (Mm-1)																	
Best 20% Days	21.2	20.2	20.4	21.8	20.6	23.1	18.4	20.1	19.9	---	16.6	-0.2	0.2	20.8	20.4	-0.4	-2%
Worst 20% Days	88.7	91.6	75.6	358.1	73.5	70.8	66.1	95.2	50.3	---	47.8	-4.0	0.1	137.5	70.6	-66.9	-49%
All Days	45.1	44.0	40.0	100.8	40.9	40.9	37.0	43.8	32.5	---	29.7	-1.2	0.1	54.2	38.6	-15.6	-29%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	3.4	3.1	3.0	3.1	2.8	4.2	2.2	2.8	3.3	---	1.8	-0.1	0.3	3.1	3.1	0.0	0%
Worst 20% Days	12.7	9.9	13.4	9.7	11.2	16.3	10.3	10.2	11.2	---	7.8	0.0	0.5	11.4	12.0	0.6	5%
All Days	7.4	6.9	7.8	6.9	7.0	8.8	6.8	6.6	6.2	---	4.8	-0.1	0.1	7.2	7.1	-0.1	-1%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.9	0.9	0.9	1.0	0.7	0.8	0.7	0.9	0.9	---	0.4	0.0	0.3	0.9	0.8	-0.1	-11%
Worst 20% Days	9.5	9.1	8.9	7.3	12.1	11.9	6.0	6.2	5.2	---	5.2	-0.5	0.0	9.4	7.3	-2.1	-22%
All Days	3.4	3.6	3.1	3.4	3.9	3.6	2.3	2.8	2.2	---	1.9	-0.1	0.1	3.5	2.7	-0.8	-23%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	3.5	3.1	2.7	3.7	3.4	3.7	2.5	2.9	2.6	---	1.7	-0.1	0.1	3.3	2.9	-0.4	-12%
Worst 20% Days	38.6	46.9	32.0	292.8	28.1	22.2	25.8	52.5	14.1	---	14.0	-3.0	0.1	87.7	28.6	-59.1	-67%
All Days	14.6	15.2	11.8	66.7	12.1	10.4	10.3	16.1	7.4	---	6.6	-0.9	0.1	24.1	11.0	-13.1	-54%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	1.4	1.2	1.4	1.9	1.3	1.9	1.3	1.5	1.1	---	1.0	0.0	0.4	1.4	1.5	0.1	7%
Worst 20% Days	7.5	7.4	6.6	29.2	5.3	6.5	6.1	6.7	3.7	---	3.5	-0.3	0.0	11.2	5.7	-5.5	-49%
All Days	4.0	3.7	3.2	8.5	3.2	4.0	3.3	3.4	2.6	---	2.3	-0.1	0.1	4.5	3.3	-1.2	-27%
Soil Extinction (Mm-1)																	
Best 20% Days	0.1	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.2	---	0.1	0.0	0.3	0.2	0.2	0.0	0%
Worst 20% Days	1.9	1.3	1.2	1.4	1.0	0.6	1.3	1.5	1.0	---	1.0	-0.1	0.1	1.4	1.1	-0.3	-21%
All Days	0.7	0.7	0.8	0.8	0.6	0.6	0.7	0.7	0.6	---	0.5	0.0	0.1	0.7	0.6	-0.1	-14%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	0.8	0.7	0.9	0.7	1.2	1.2	0.5	0.7	0.6	---	0.6	0.0	0.3	0.9	0.8	-0.1	-11%
Worst 20% Days	7.4	5.2	2.5	6.5	4.6	2.2	5.3	6.9	3.9	---	5.4	-0.2	0.3	5.2	4.6	-0.6	-12%
All Days	3.9	2.8	2.3	3.4	3.0	2.6	2.6	3.0	2.4	---	2.6	-0.1	0.2	3.1	2.7	-0.4	-13%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.0	0.0	0.1	0.2	0.1	0.0	0.2	0.1	0.1	---	0.0	0.0	0.1	0.1	0.1	0.0	0%
Worst 20% Days	0.2	0.8	0.0	0.1	0.2	0.1	0.2	0.2	0.2	---	0.0	0.0	0.4	0.3	0.2	-0.1	-33%
All Days	0.0	0.2	0.0	0.1	0.1	0.0	0.1	0.1	0.2	---	0.0	0.0	0.1	0.1	0.1	0.0	0%

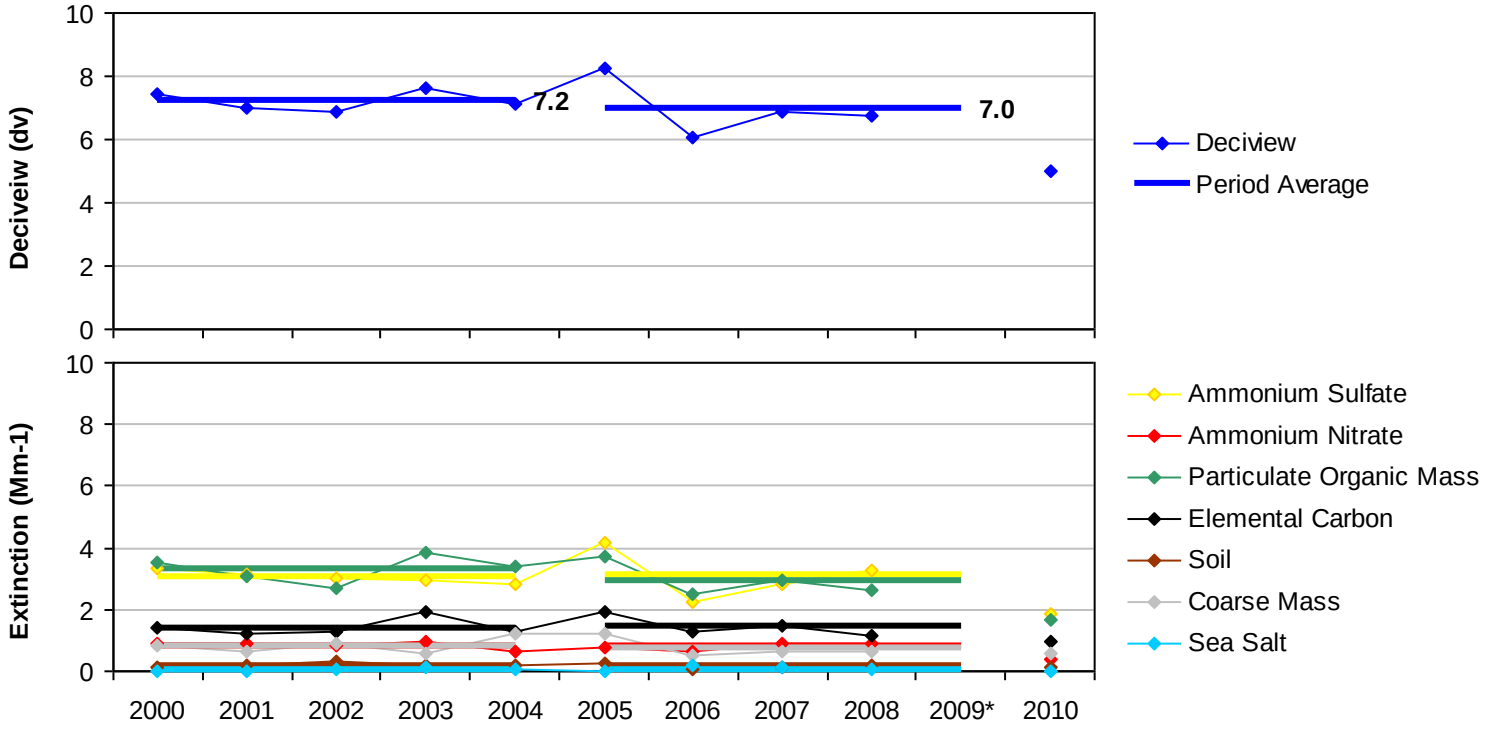
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure G.3-1
Glacier NP, MT (GLAC1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



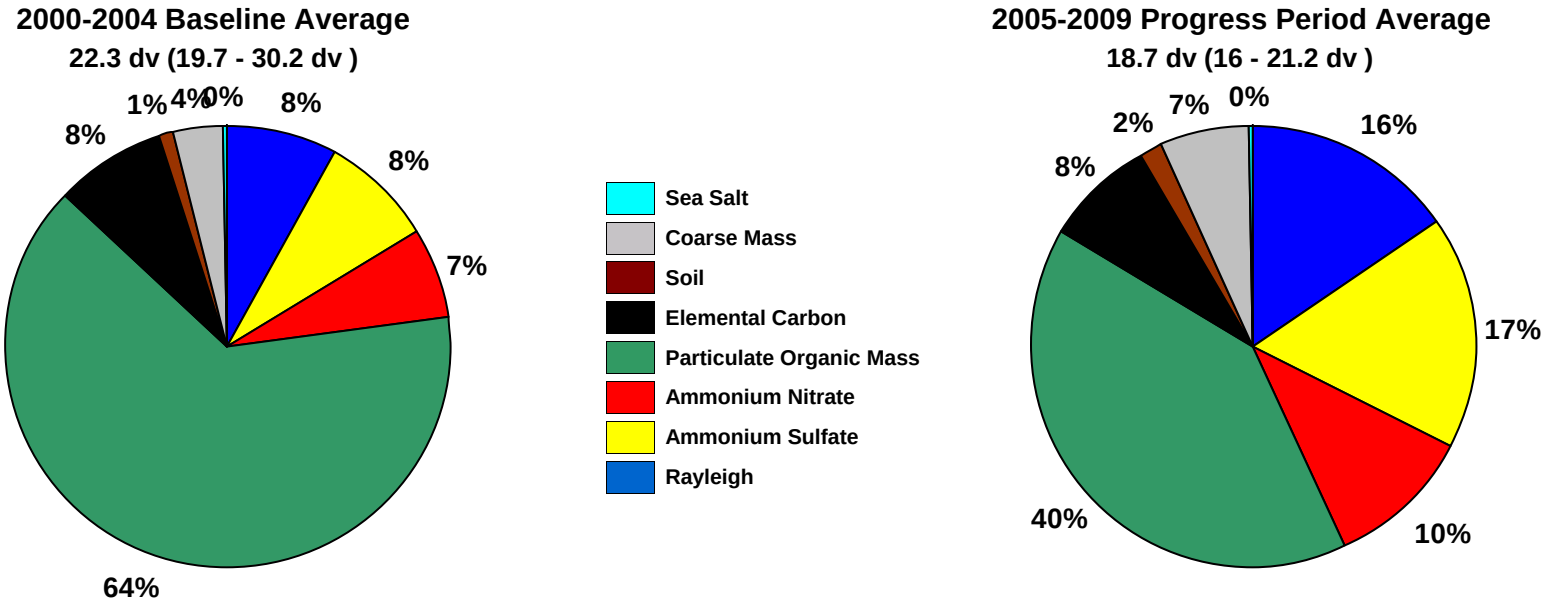
*Missing years did not meet RHR data completeness criteria.

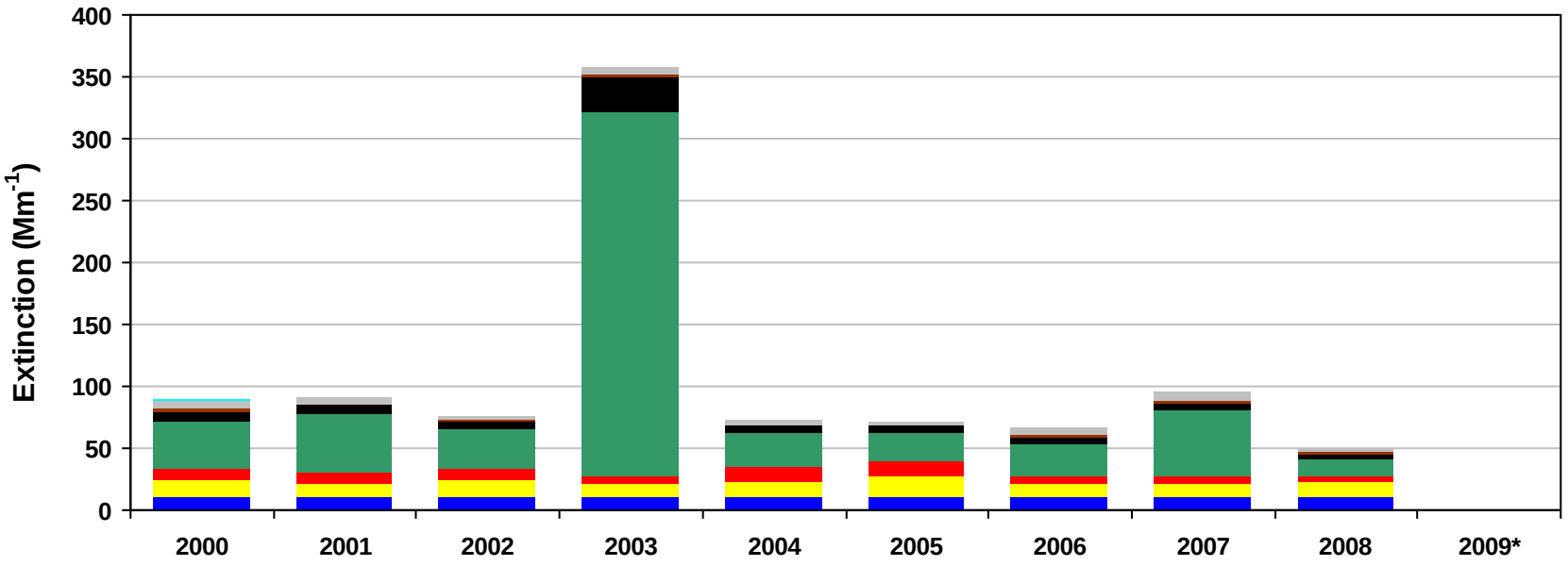
Figure G.3-2
Glacier NP, MT (GLAC1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

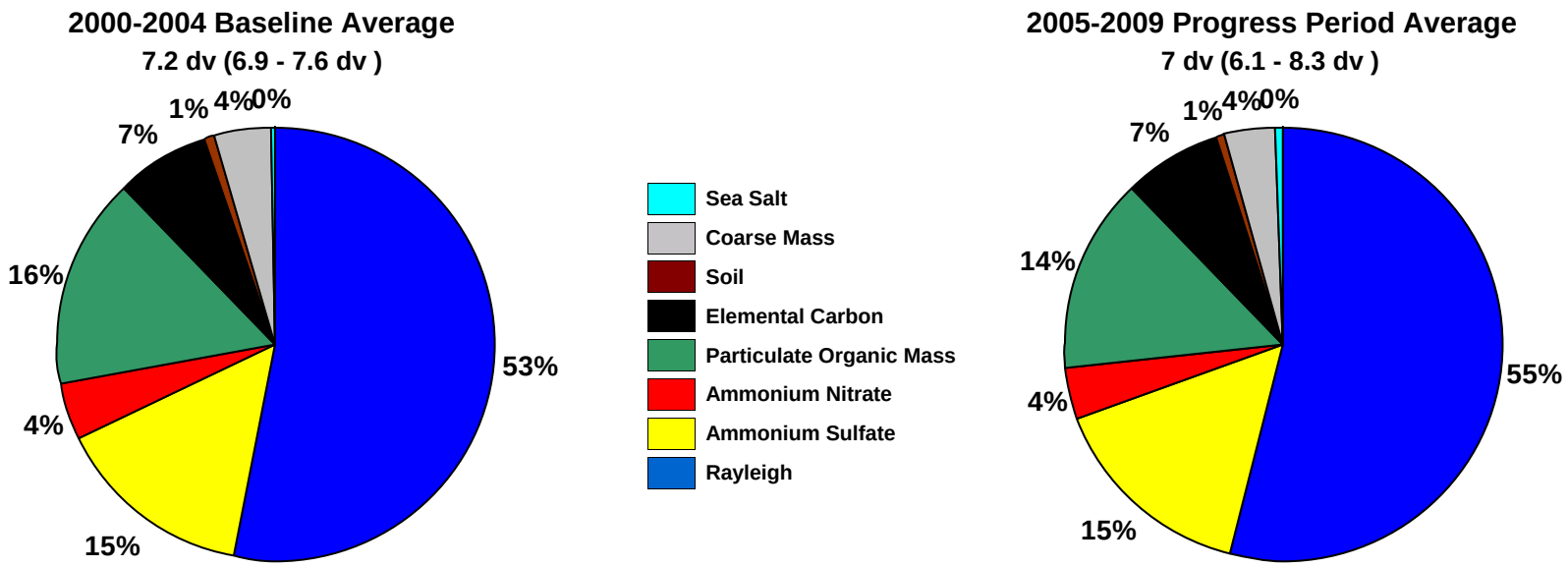
Figure G.3-3
Glacier NP, MT (GLAC1 Site)
20% Most Impaired Visibility Days

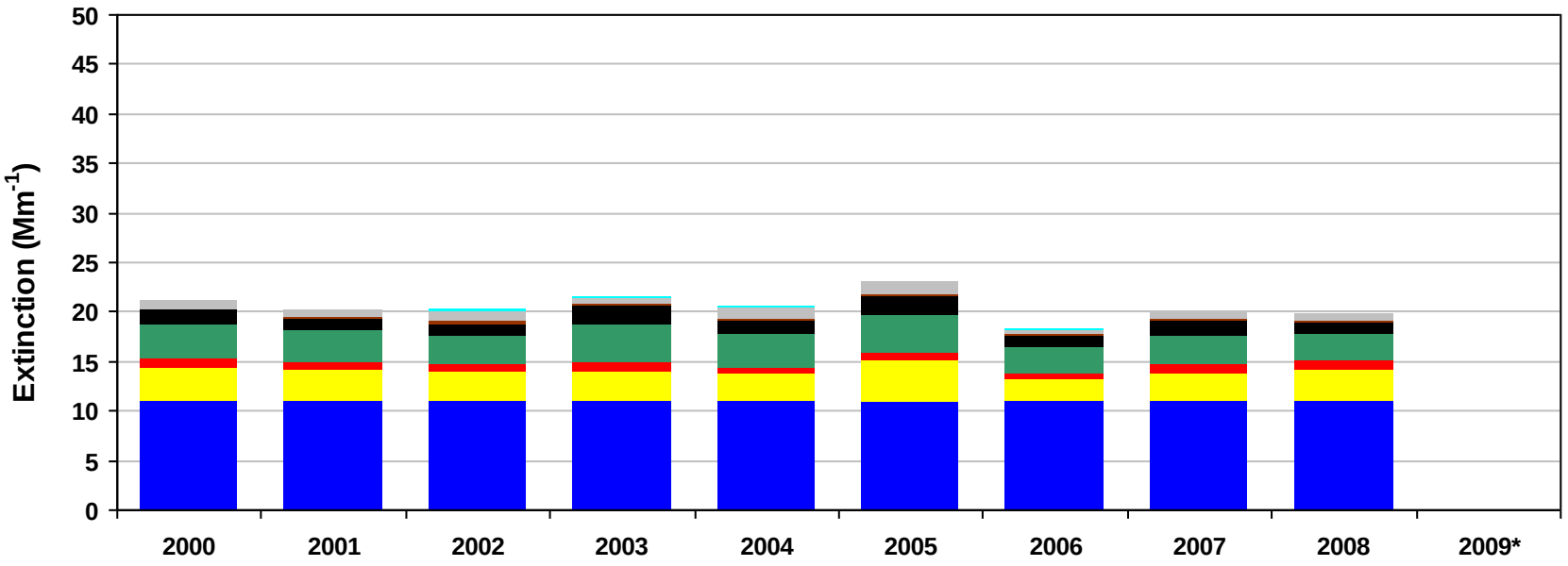




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure G.3-4
Glacier NP, MT (GLAC1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure G.3-5
Glacier NP, MT (GLAC1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

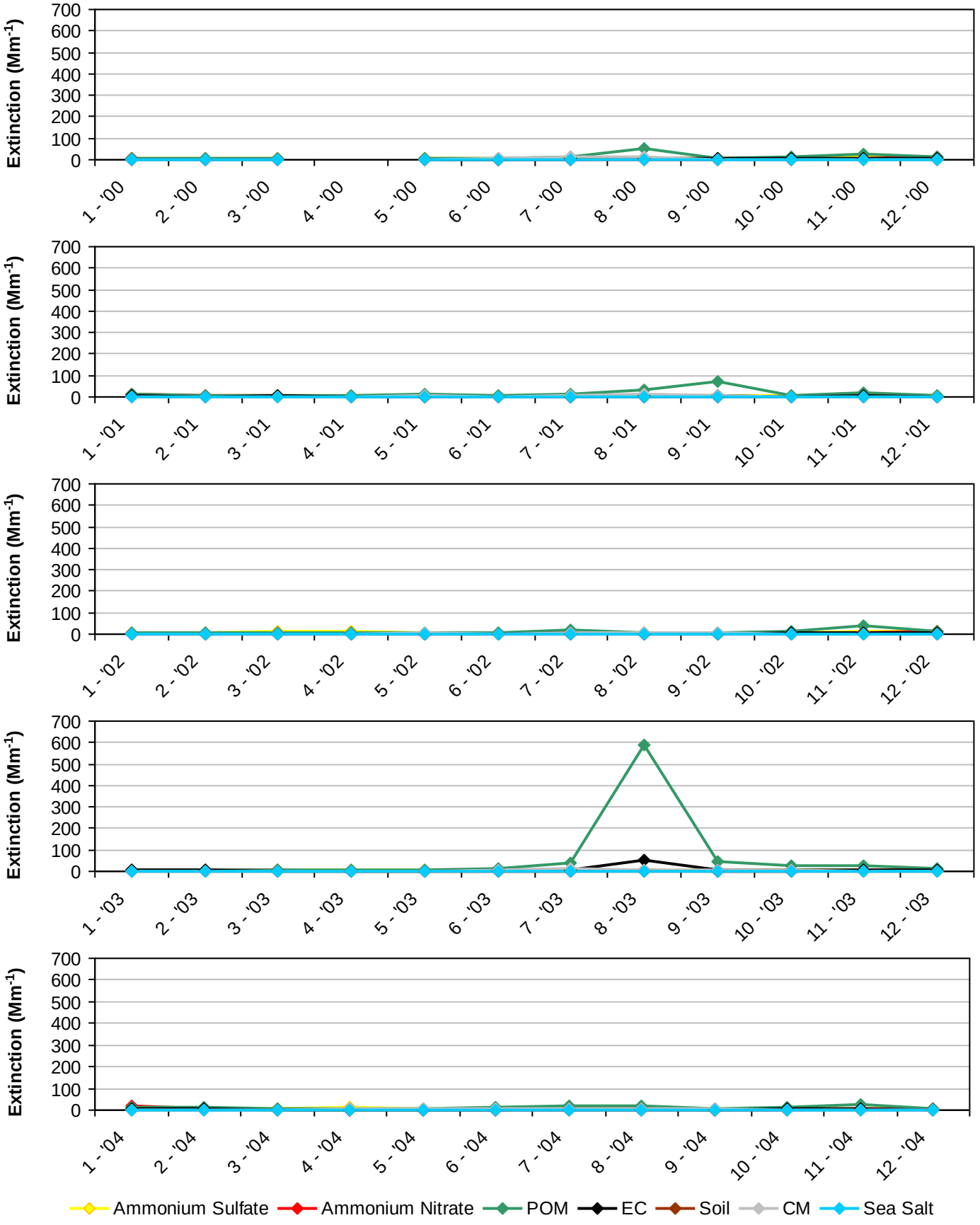
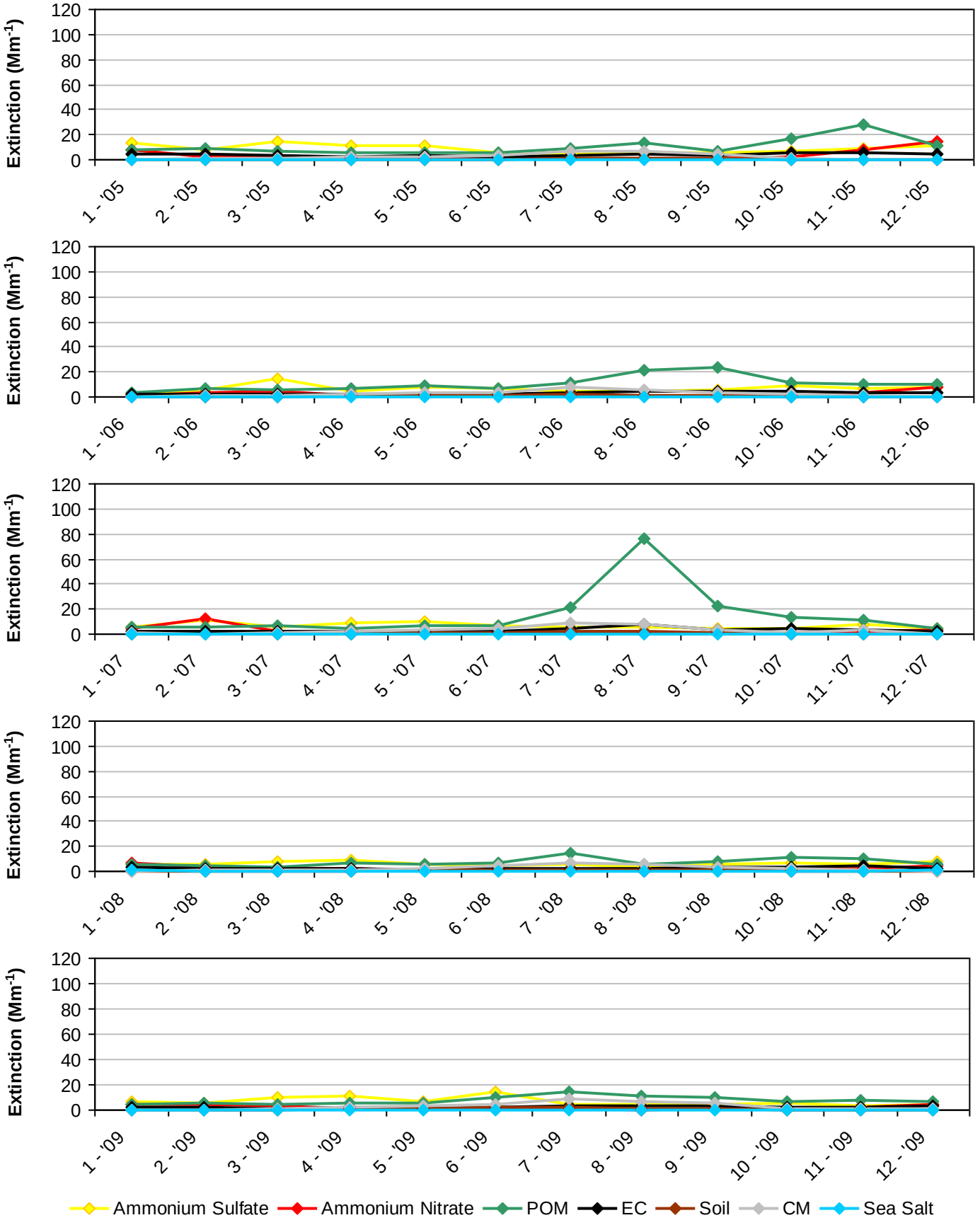


Figure G.3-6
Glacier NP, MT (GLAC1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2009 are shown here, but this year did not meet RHR data completeness criteria.

Figure G.3-7
Glacier NP, MT (GLAC1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

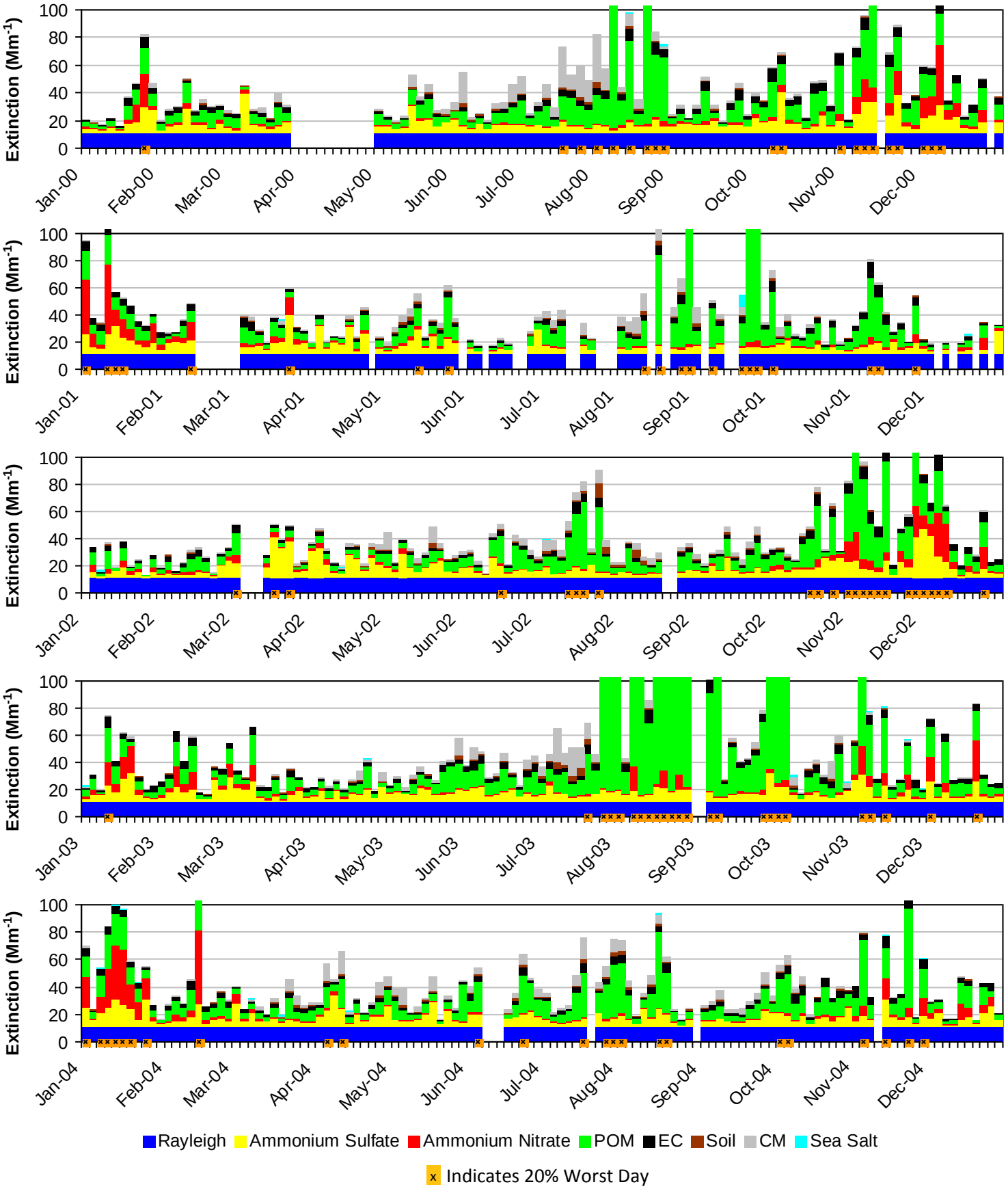
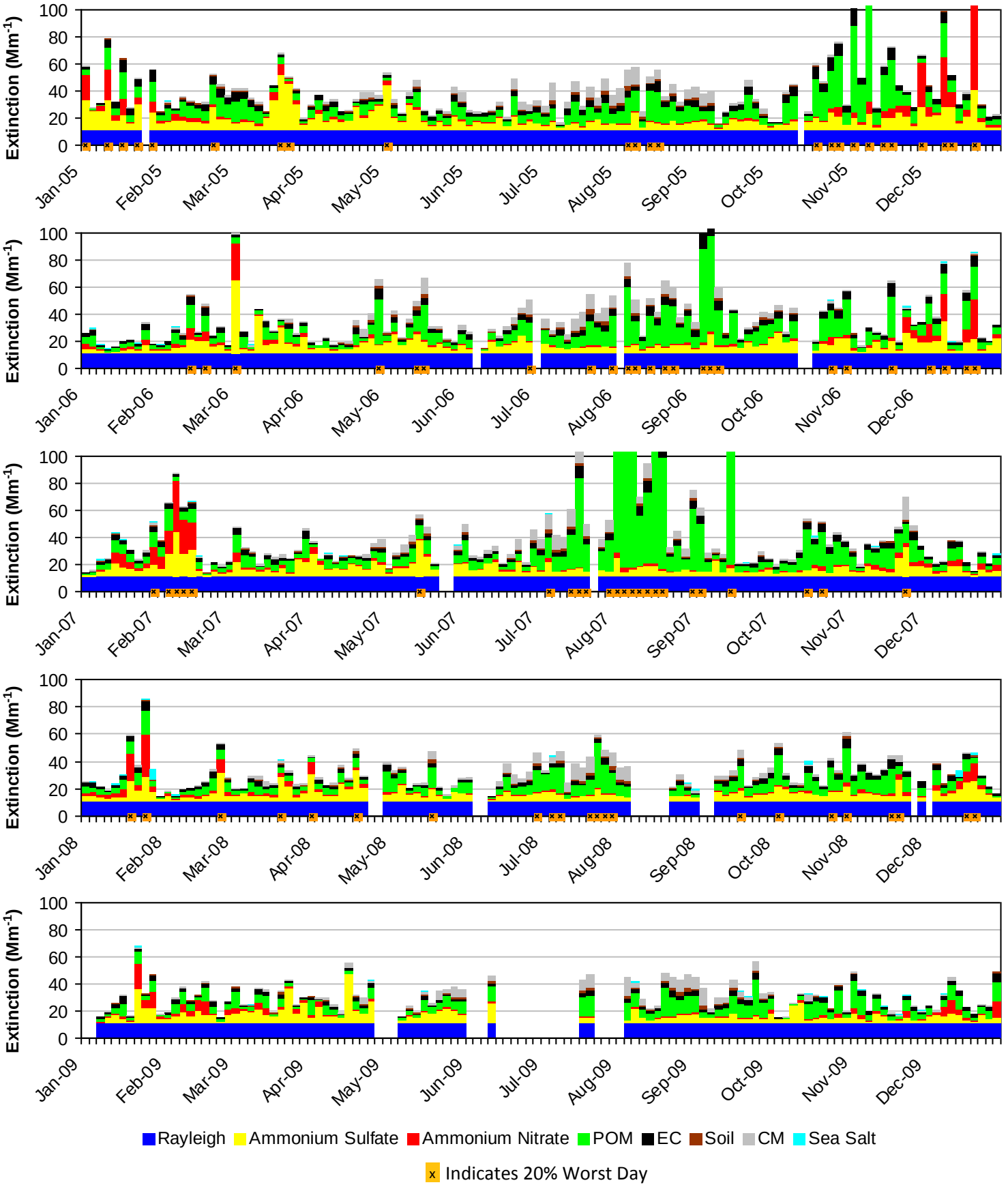


Figure G.3-8
Glacier NP, MT (GLAC1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2009 are shown here, but this year did not meet RHR data completeness criteria.

G.4. MEDICINE LAKE WA (MELA1)

The following tables and figures are presented in this section for the Medicine Lake WA represented by the MELA1 IMPROVE Monitor:

- **Table G.4-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure G.4-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure G.4-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure G.4-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure G.4-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure G.4-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure G.4-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure G.4-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure G.4-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table G.4-1
Medicine Lake WA, MT (MELA1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	8.0	7.6	6.8	6.9	7.0	7.0	5.8	6.5	6.9	6.4	5.9	-0.1	0.0	7.3	6.5	-0.8	-11%
Worst 20% Days	17.8	18.3	16.6	16.9	19.0	17.7	18.8	18.7	18.2	16.7	19.6	0.0	0.5	17.7	18.0	0.3	2%
All Days	12.5	12.5	11.5	11.9	12.0	11.7	12.0	12.0	12.4	11.5	11.9	0.0	0.3	12.1	11.9	-0.2	-2%
Total Extinction (Mm-1)																	
Best 20% Days	22.4	21.6	19.8	19.9	20.2	20.4	18.1	19.3	20.1	19.2	18.3	-0.3	0.0	20.8	19.4	-1.4	-7%
Worst 20% Days	62.3	64.9	53.4	54.7	71.3	60.0	69.4	68.6	64.9	54.5	75.0	0.2	0.4	61.3	63.5	2.2	4%
All Days	37.7	38.1	33.9	35.2	37.2	34.9	37.5	37.2	37.8	33.6	37.8	-0.1	0.3	36.4	36.2	-0.2	-1%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	4.3	3.4	3.1	3.3	3.4	4.2	3.0	3.2	3.6	3.7	3.1	0.0	0.5	3.5	3.5	0.0	0%
Worst 20% Days	14.9	18.1	15.9	14.1	21.8	19.4	19.9	22.2	17.4	16.7	27.0	0.3	0.2	17.0	19.1	2.1	12%
All Days	8.9	9.4	8.6	7.9	9.5	9.7	9.4	9.9	9.9	9.3	10.7	0.1	0.1	8.9	9.6	0.7	8%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	1.8	1.1	0.8	1.0	1.2	1.2	1.0	1.0	1.2	0.9	0.8	0.0	0.2	1.2	1.1	-0.1	-8%
Worst 20% Days	13.4	19.1	13.0	13.3	22.5	15.2	18.9	12.7	16.1	15.9	20.7	0.2	0.5	16.3	15.8	-0.5	-3%
All Days	5.8	7.1	6.0	5.6	7.1	5.2	6.2	5.7	5.9	5.6	6.6	-0.1	0.2	6.3	5.7	-0.6	-10%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	2.3	2.0	1.7	1.8	2.0	1.5	1.0	1.3	1.5	1.1	1.0	-0.1	0.0	1.9	1.3	-0.6	-32%
Worst 20% Days	12.3	8.0	6.9	9.4	10.9	7.0	12.5	12.1	11.7	4.8	9.4	0.0	0.5	9.5	9.6	0.1	1%
All Days	5.6	4.4	3.6	5.5	5.0	3.8	5.5	4.7	5.0	3.1	4.4	-0.1	0.2	4.8	4.4	-0.4	-8%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.8	0.7	0.6	0.5	0.5	0.7	0.5	0.6	0.5	0.4	0.4	0.0	0.0	0.6	0.5	-0.1	-17%
Worst 20% Days	3.4	2.2	2.0	2.2	1.9	2.5	2.5	2.4	1.9	1.5	2.2	-0.1	0.1	2.3	2.2	-0.1	-4%
All Days	1.8	1.3	1.1	1.4	1.1	1.5	1.4	1.3	1.1	0.9	1.2	-0.1	0.0	1.3	1.2	-0.1	-8%
Soil Extinction (Mm-1)																	
Best 20% Days	0.3	0.5	0.4	0.3	0.3	0.3	0.2	0.3	0.5	0.3	0.3	0.0	0.3	0.4	0.3	-0.1	-25%
Worst 20% Days	1.1	1.0	0.7	0.5	0.5	0.6	0.7	0.9	0.8	0.7	0.7	0.0	0.4	0.8	0.7	-0.1	-13%
All Days	0.6	0.8	0.5	0.4	0.6	0.5	0.5	0.6	0.8	0.5	0.6	0.0	0.5	0.6	0.6	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	1.8	2.9	2.2	2.1	1.8	1.4	1.3	1.8	1.8	1.8	1.6	-0.1	0.0	2.2	1.6	-0.6	-27%
Worst 20% Days	6.2	5.5	3.8	4.2	2.5	4.3	3.7	7.1	4.0	3.0	4.0	-0.2	0.2	4.5	4.4	-0.1	-2%
All Days	3.9	4.1	2.9	3.3	2.9	3.1	3.5	3.9	3.7	2.9	3.1	0.0	0.2	3.4	3.4	0.0	0%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.4	0.0	0.0	0.0	0%
Worst 20% Days	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.1	1.9	0.8	0.0	0.0	0.0	0.0	0.6	0.6	0%
All Days	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.2	0.0	0.0	0.0	0.0	0.2	0.2	0%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure G.4-1
Medicine Lake WA, MT (MELA1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

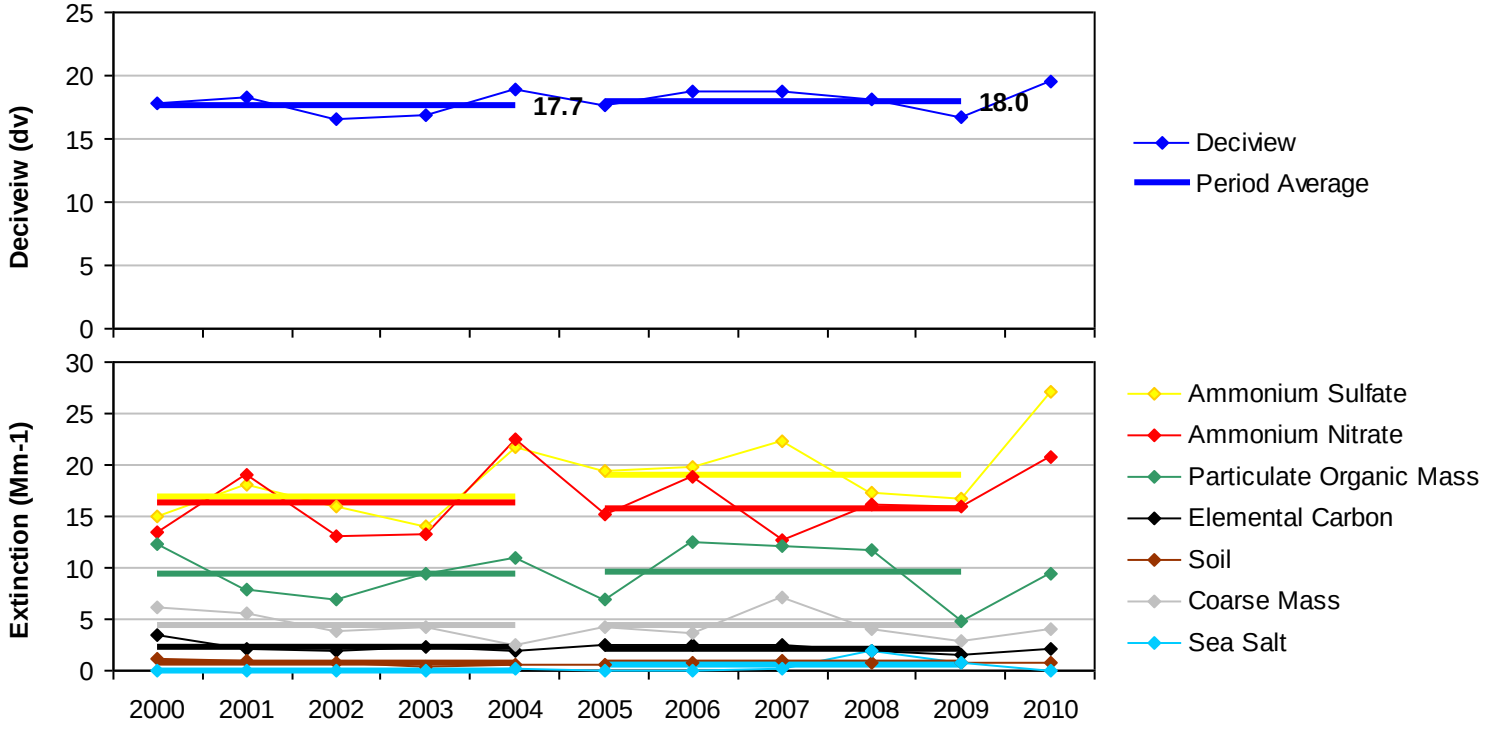


Figure G.4-2
Medicine Lake WA, MT (MELA1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

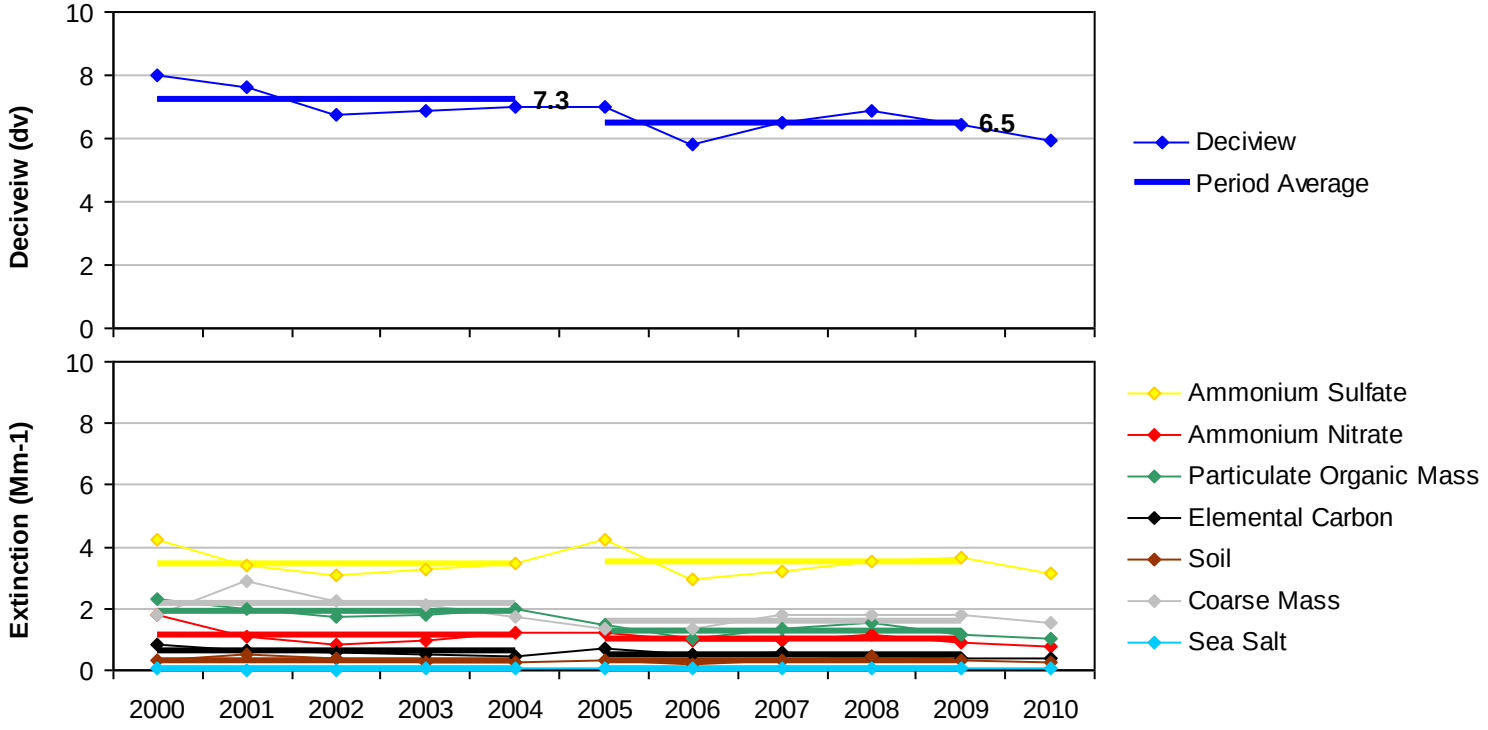
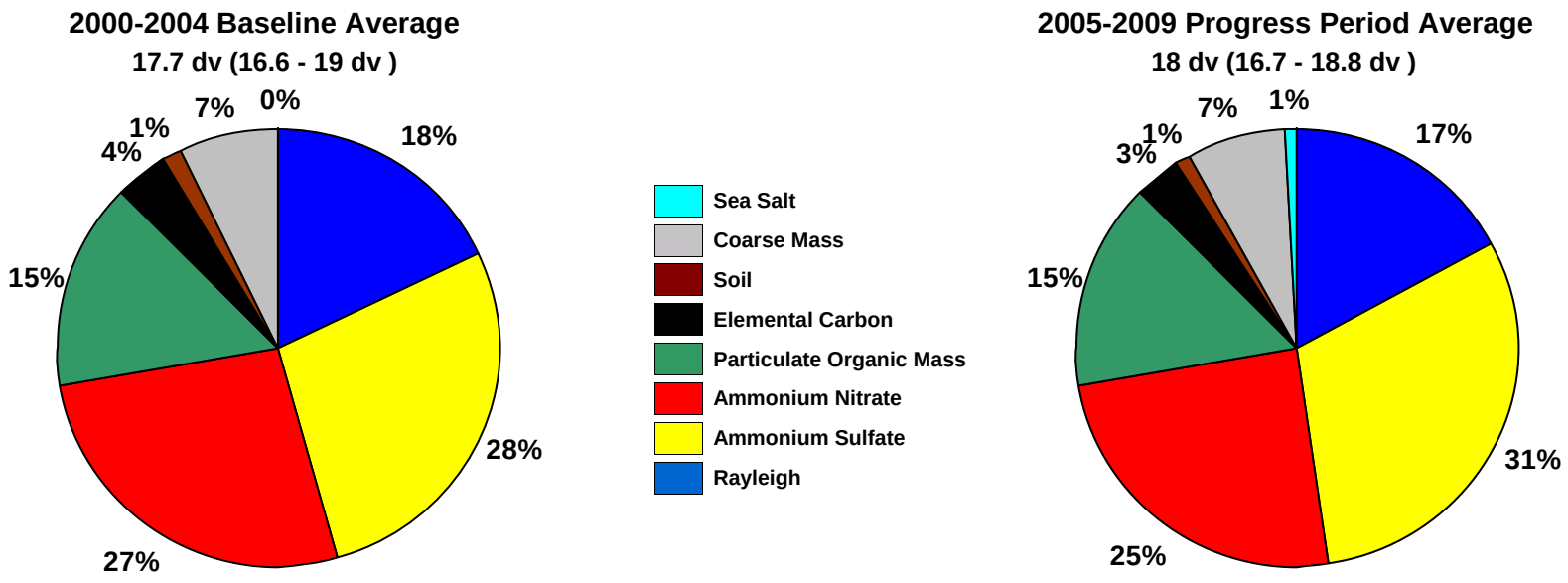


Figure G.4-3
Medicine Lake WA, MT (MELA1 Site)
20% Most Impaired Visibility Days



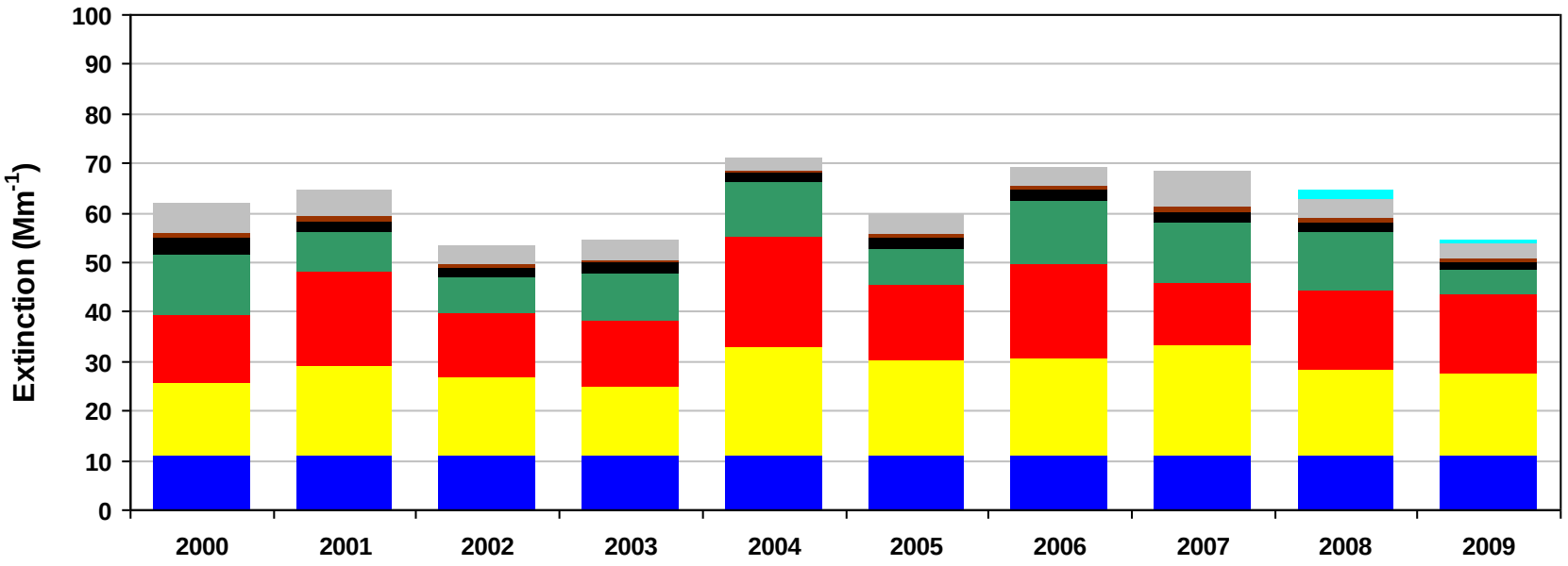
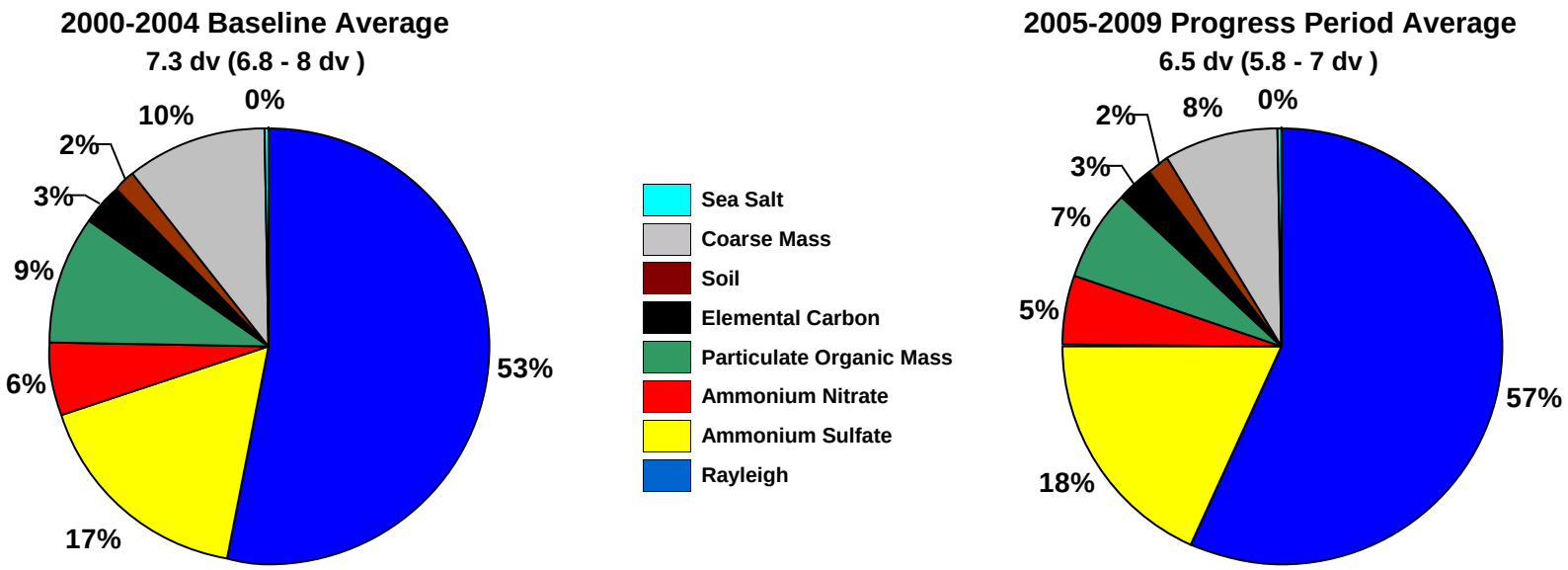


Figure G.4-4
Medicine Lake WA, MT (MELA1 Site)
20% Least Impaired Visibility Days



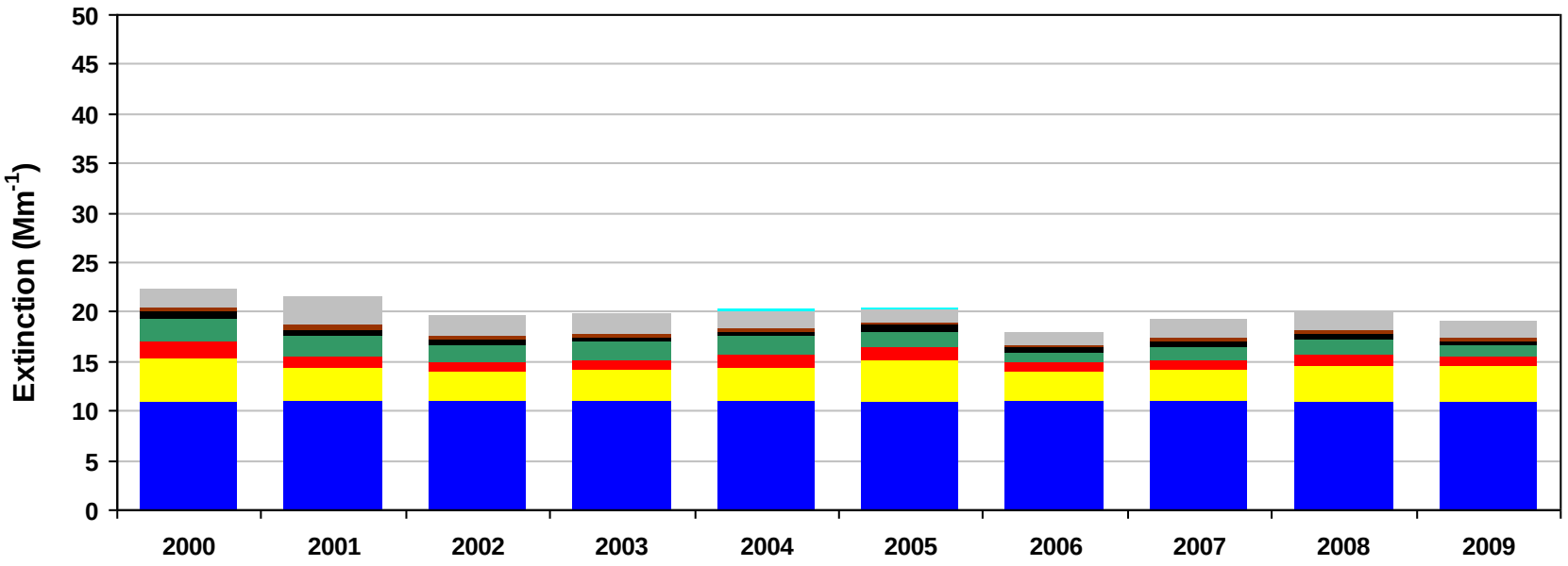


Figure G.4-5
Medicine Lake WA, MT (MELA1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

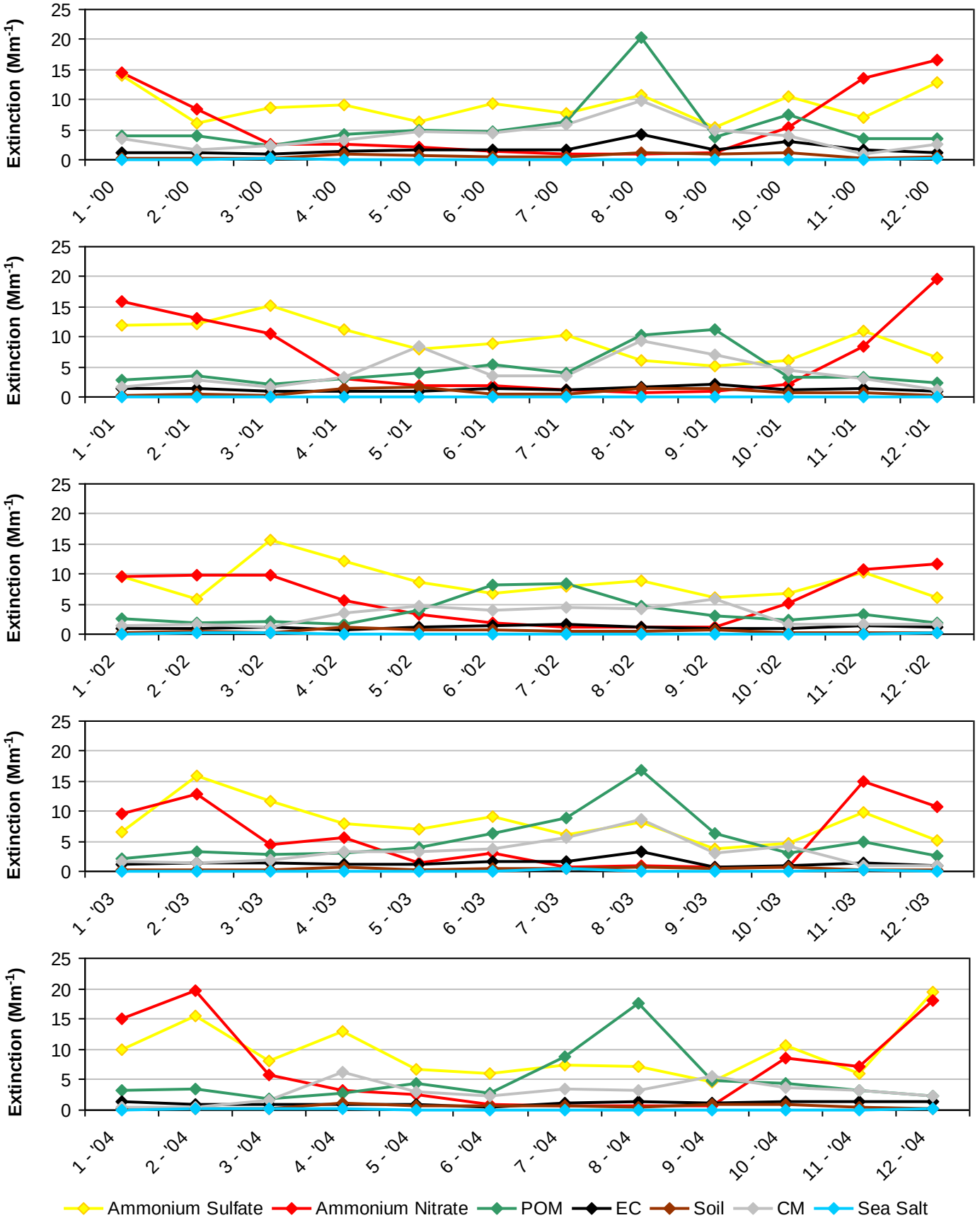


Figure G.4-6
Medicine Lake WA, MT (MELA1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

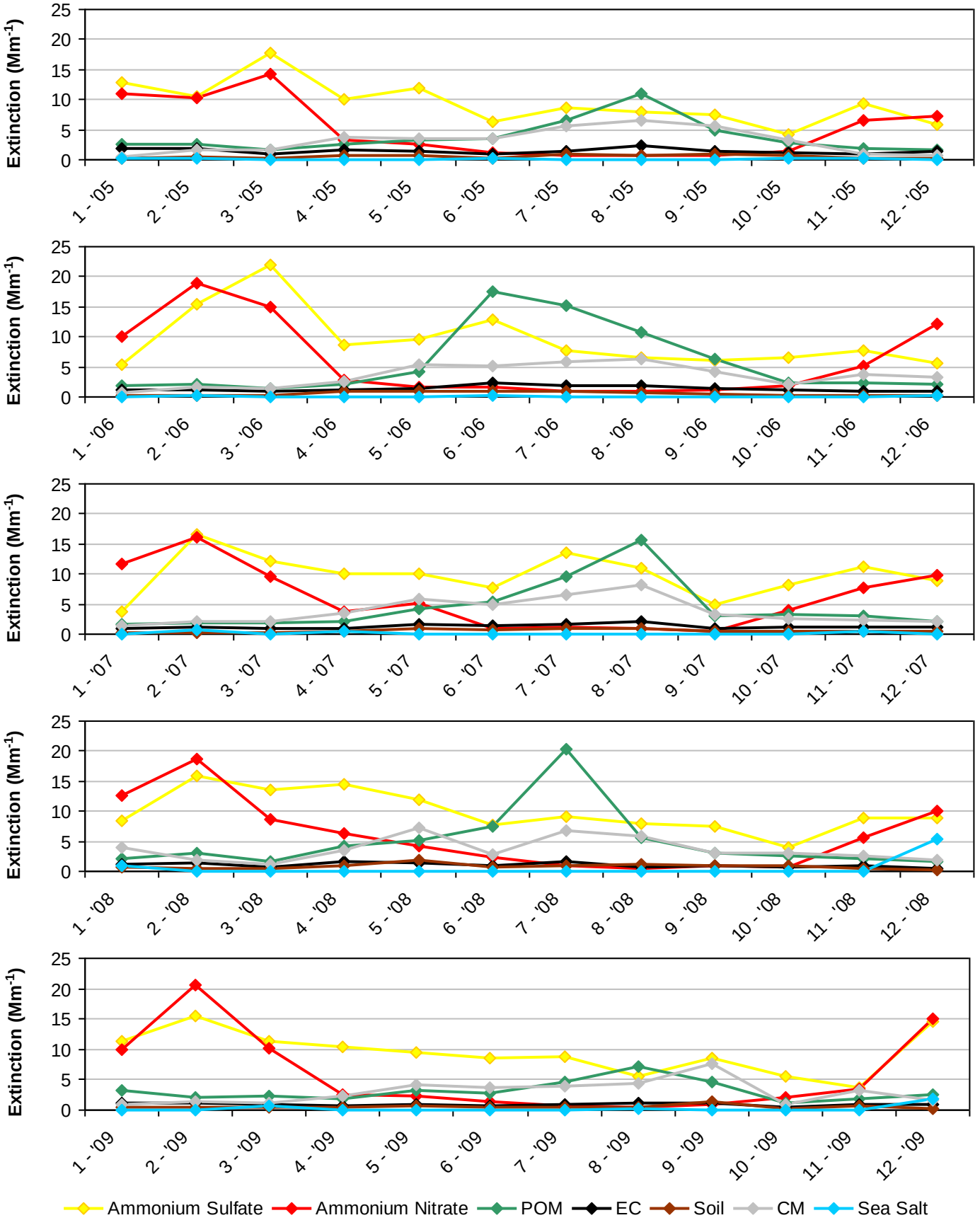


Figure G.4-7
Medicine Lake WA, MT (MELA1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

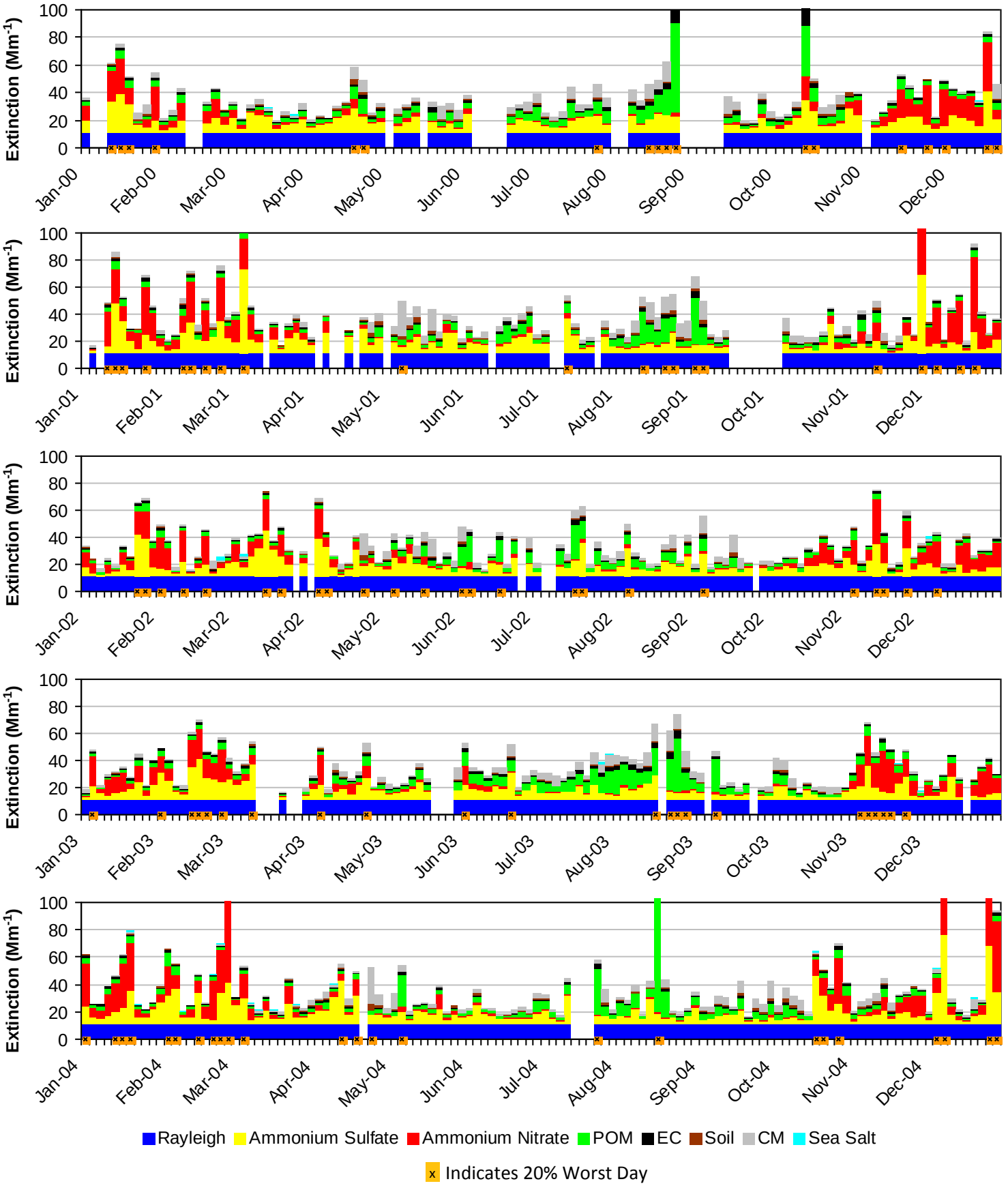
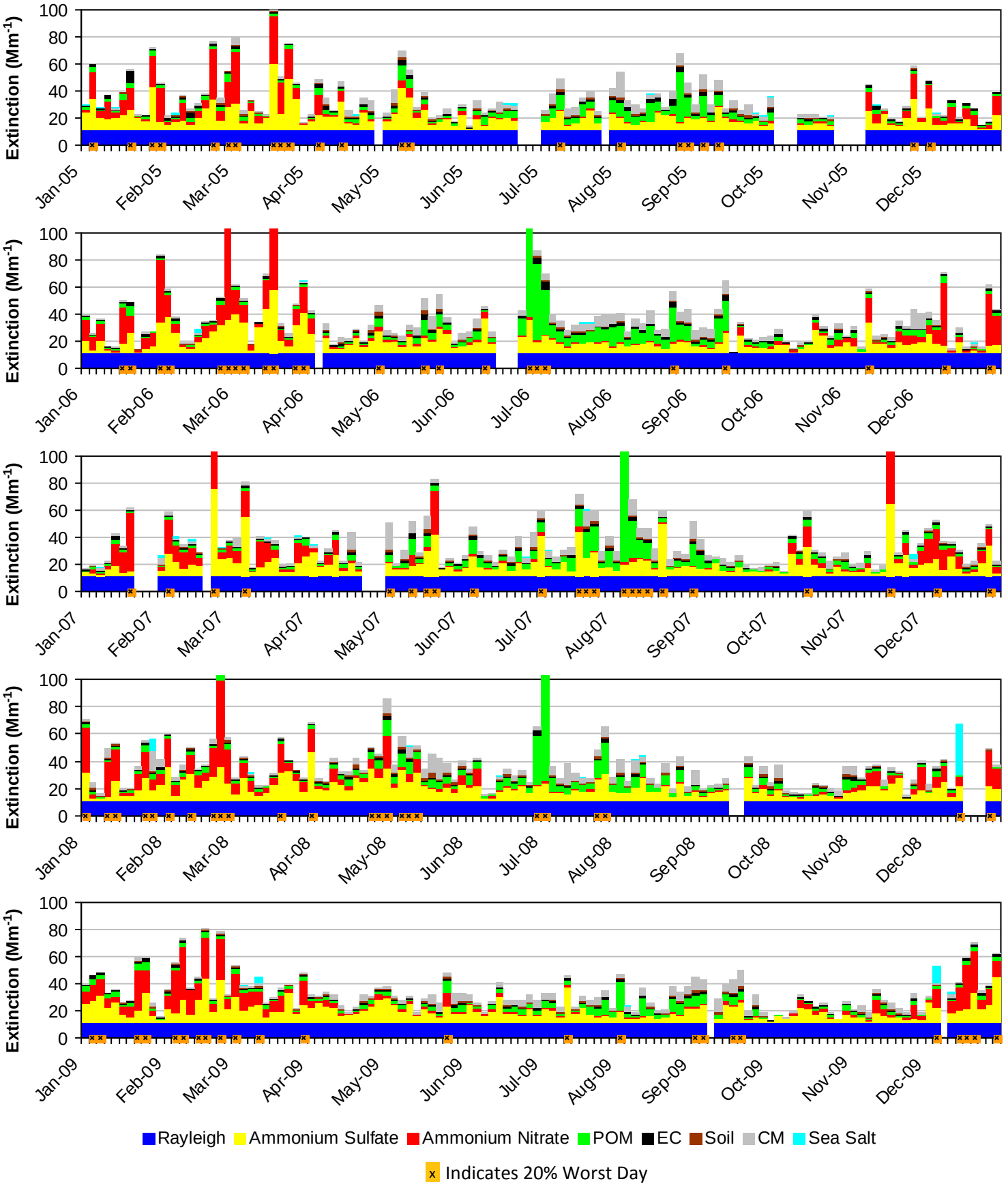


Figure G.4-8
Medicine Lake WA, MT (MELA1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



G.5. BOB MARSHALL WA, MISSION MOUNTAIN WA, AND SCAPEGOAT WA (MONT1)

The following tables and figures are presented in this section for the Bob Marshall WA, Mission Mountain WA, and Scapegoat WA represented by the MONT1 IMPROVE Monitor:

- **Table G.5-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure G.5-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure G.5-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure G.5-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure G.5-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure G.5-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure G.5-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure G.5-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

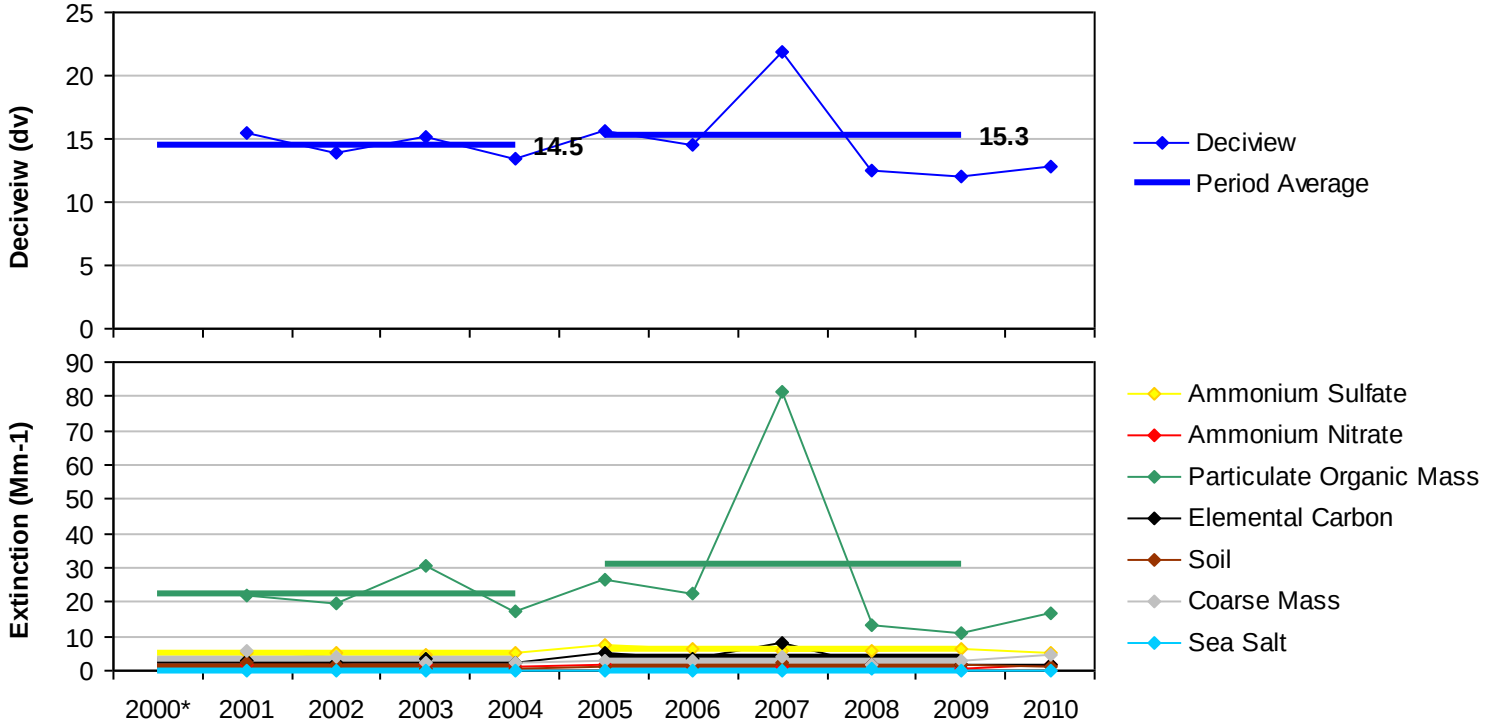
- **Figure G.5-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table G.5-1
Bob Marshall WA, Mission Mountain WA and Scapegoat WA, MT (MONT1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period						2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	4.9	3.5	3.1	3.9	3.8	3.1	2.8	2.8	3.1	2.6	-0.2	0.0	3.9	3.1	-0.8	-21%
Worst 20% Days	---	15.4	13.9	15.2	13.4	15.6	14.6	21.9	12.5	12.0	12.7	-0.2	0.2	14.5	15.3	0.8	6%
All Days	---	9.3	8.2	8.0	8.1	8.3	8.0	9.4	7.3	7.2	7.0	-0.2	0.1	8.4	8.0	-0.4	-5%
Total Extinction (Mm-1)																	
Best 20% Days	---	16.4	14.3	13.6	14.8	14.6	13.7	13.3	13.2	13.7	13.0	-0.2	0.0	14.8	13.7	-1.1	-7%
Worst 20% Days	---	49.1	44.4	53.5	39.3	54.6	47.4	113.2	35.5	33.9	41.5	-1.5	0.2	46.6	56.9	10.3	22%
All Days	---	27.6	25.2	26.1	24.0	26.7	25.1	38.6	22.1	21.6	22.7	-0.5	0.1	25.7	26.8	1.1	4%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	2.1	1.5	1.0	1.4	2.0	1.1	1.5	1.2	1.7	0.8	0.0	0.4	1.5	1.5	0.0	0%
Worst 20% Days	---	5.3	5.1	4.8	5.3	7.3	6.2	5.8	5.7	6.1	5.1	0.1	0.1	5.1	6.2	1.1	22%
All Days	---	4.1	3.7	3.0	3.6	4.3	3.7	4.0	3.7	3.9	3.2	0.0	0.5	3.6	3.9	0.3	8%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.8	0.5	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.0	0.0	0.5	0.3	-0.2	-40%
Worst 20% Days	---	1.4	1.6	1.6	1.1	2.0	1.0	1.3	1.5	0.7	1.9	-0.1	0.1	1.4	1.3	-0.1	-7%
All Days	---	1.1	0.9	0.9	0.7	0.8	0.6	0.8	0.7	0.6	0.8	-0.1	0.0	0.9	0.7	-0.2	-22%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	2.3	1.4	1.5	2.1	1.4	1.3	0.8	1.1	1.1	1.1	-0.1	0.0	1.8	1.2	-0.6	-33%
Worst 20% Days	---	21.7	19.6	30.5	17.4	26.5	22.4	81.6	13.1	10.9	16.7	-1.2	0.2	22.3	30.9	8.6	39%
All Days	---	8.1	6.9	9.3	7.0	8.1	7.3	19.3	5.2	4.5	5.6	-0.4	0.2	7.8	8.9	1.1	14%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.6	0.5	0.5	0.5	0.5	0.5	0.3	0.3	0.3	0.4	0.0	0.0	0.5	0.4	-0.1	-20%
Worst 20% Days	---	3.0	2.6	3.3	2.3	5.0	3.6	8.2	1.7	1.6	2.0	-0.1	0.4	2.8	4.0	1.2	43%
All Days	---	1.4	1.3	1.4	1.2	1.8	1.6	2.3	0.9	0.9	1.0	-0.1	0.4	1.3	1.5	0.2	15%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.0	0.1	0.1	0.1	0.0	0%
Worst 20% Days	---	2.0	1.5	0.8	0.8	1.1	1.4	2.4	1.1	1.4	1.4	0.0	0.5	1.3	1.5	0.2	15%
All Days	---	0.7	0.7	0.4	0.4	0.4	0.6	0.8	0.5	0.6	0.7	0.0	0.5	0.5	0.6	0.1	20%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.5	0.3	0.1	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.0	0.1	0.3	0.2	-0.1	-33%
Worst 20% Days	---	5.6	4.0	2.4	2.4	2.6	2.7	3.8	1.7	3.1	4.5	-0.2	0.2	3.6	2.8	-0.8	-22%
All Days	---	2.2	1.6	1.0	1.2	1.2	1.2	1.5	0.9	1.2	1.5	-0.1	0.2	1.5	1.2	-0.3	-20%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.0	0.0	0.1	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.4	0.0	0.1	0.1	0%
Worst 20% Days	---	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.6	0.0	0.0	0.0	0.1	0.0	0.2	0.2	0%
All Days	---	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.2	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0%

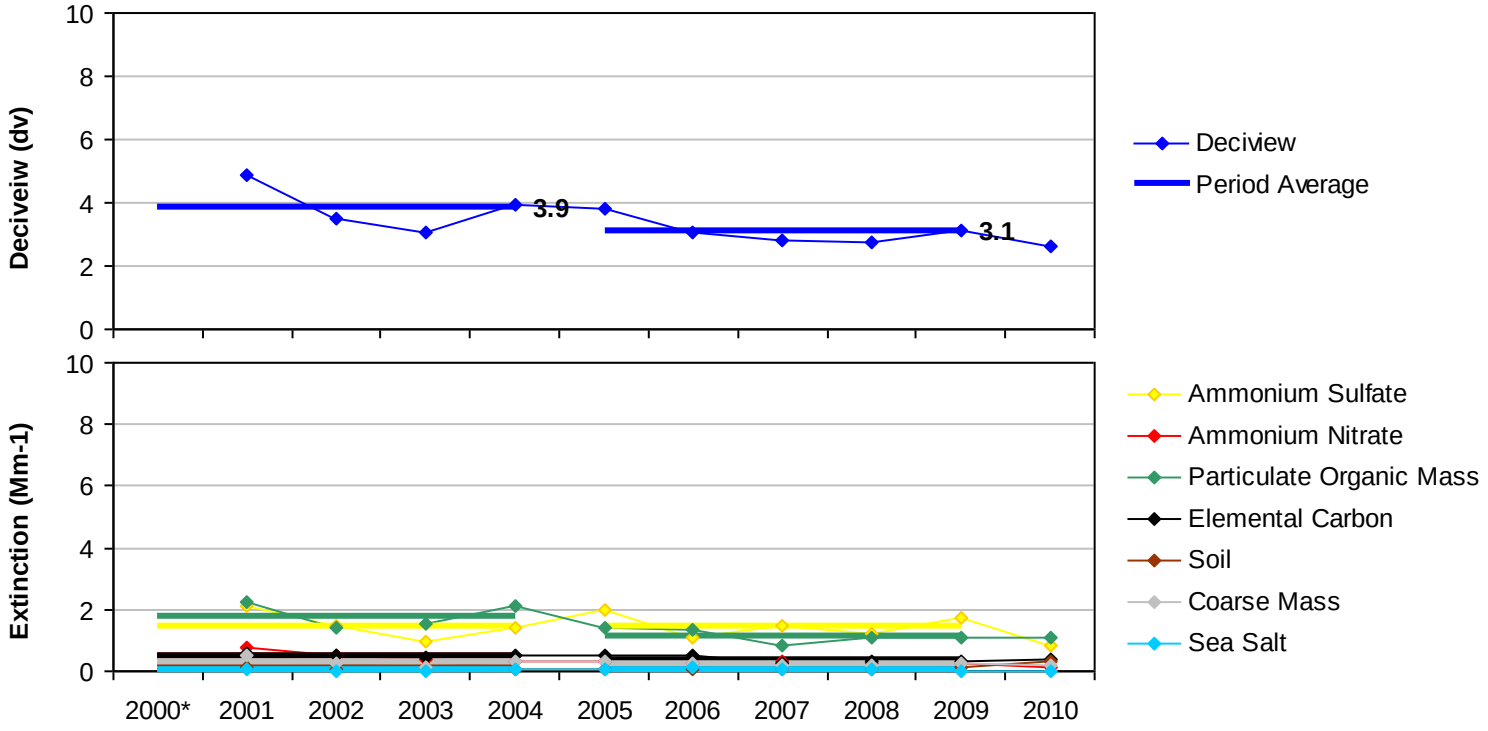
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure G.5-1
Bob Marshall WA, Mission Mountain WA and Scapegoat WA, MT (MONT1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure G.5-2
Bob Marshall WA, Mission Mountain WA and Scapegoat WA, MT (MONT1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

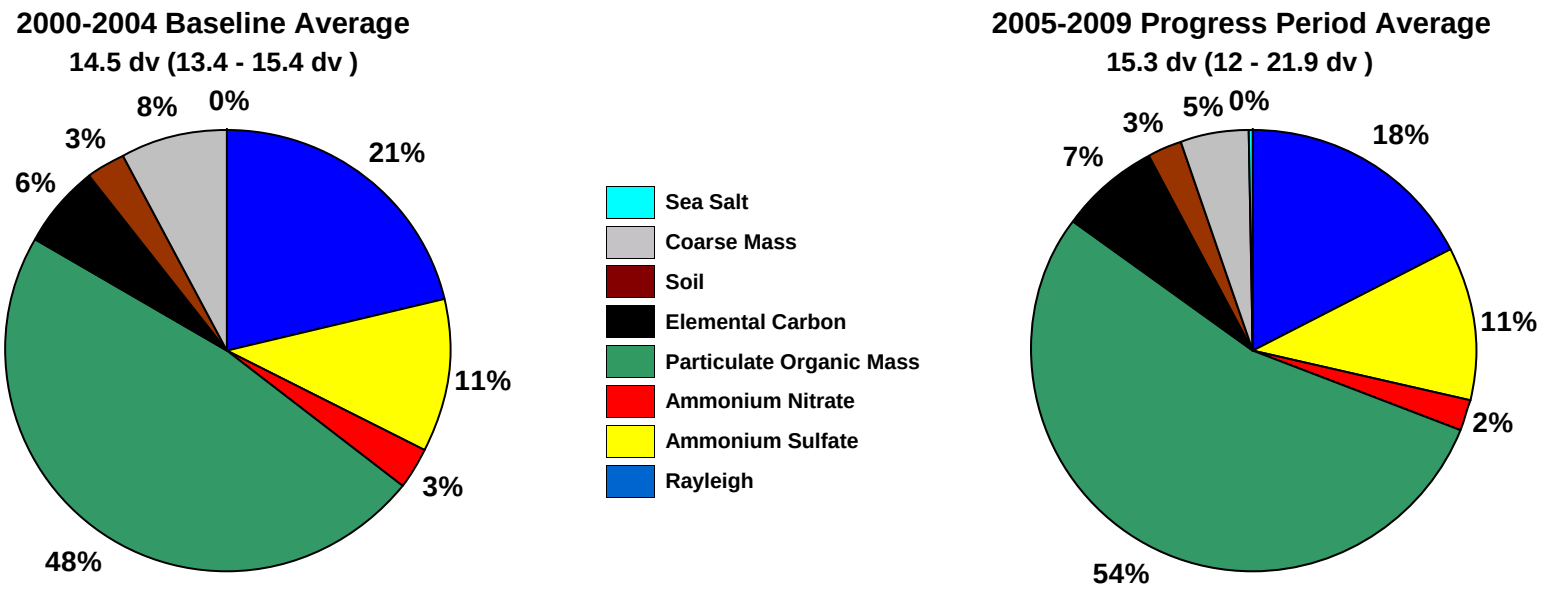


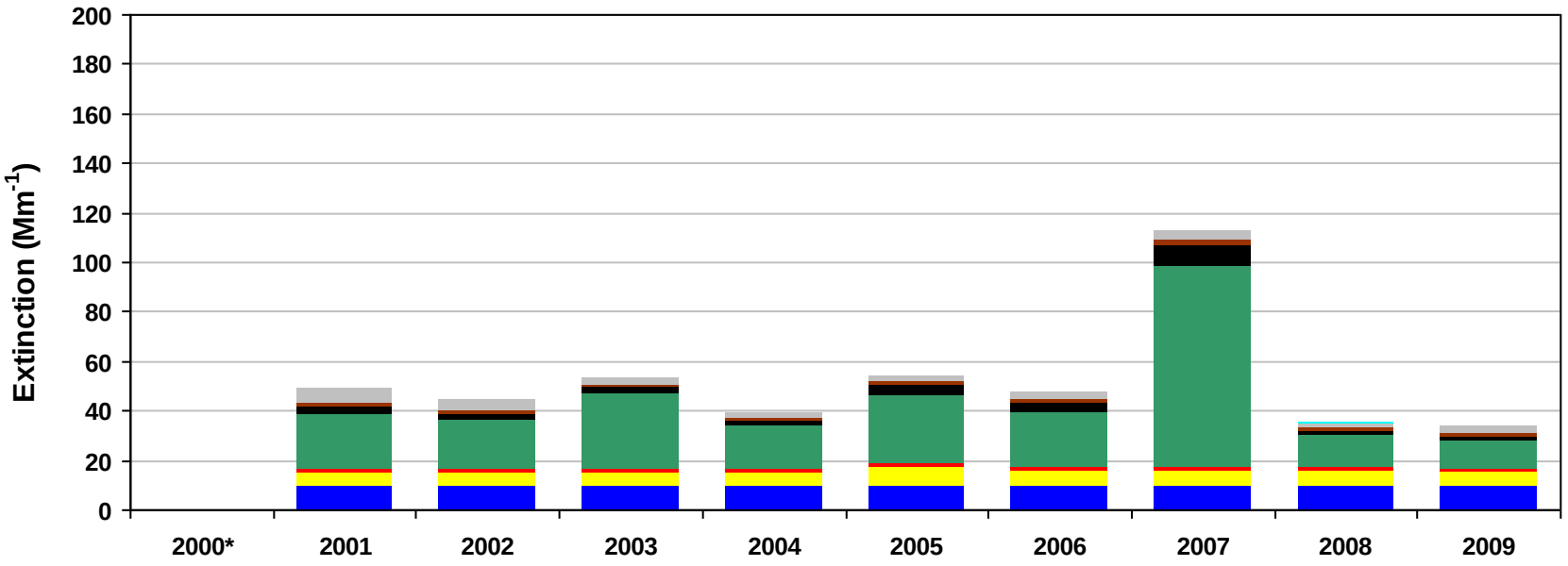
*Missing years did not meet RHR data completeness criteria.

Figure G.5-3

Bob Marshall WA, Mission Mountain WA and Scapegoat WA, MT (MONT1 Site)

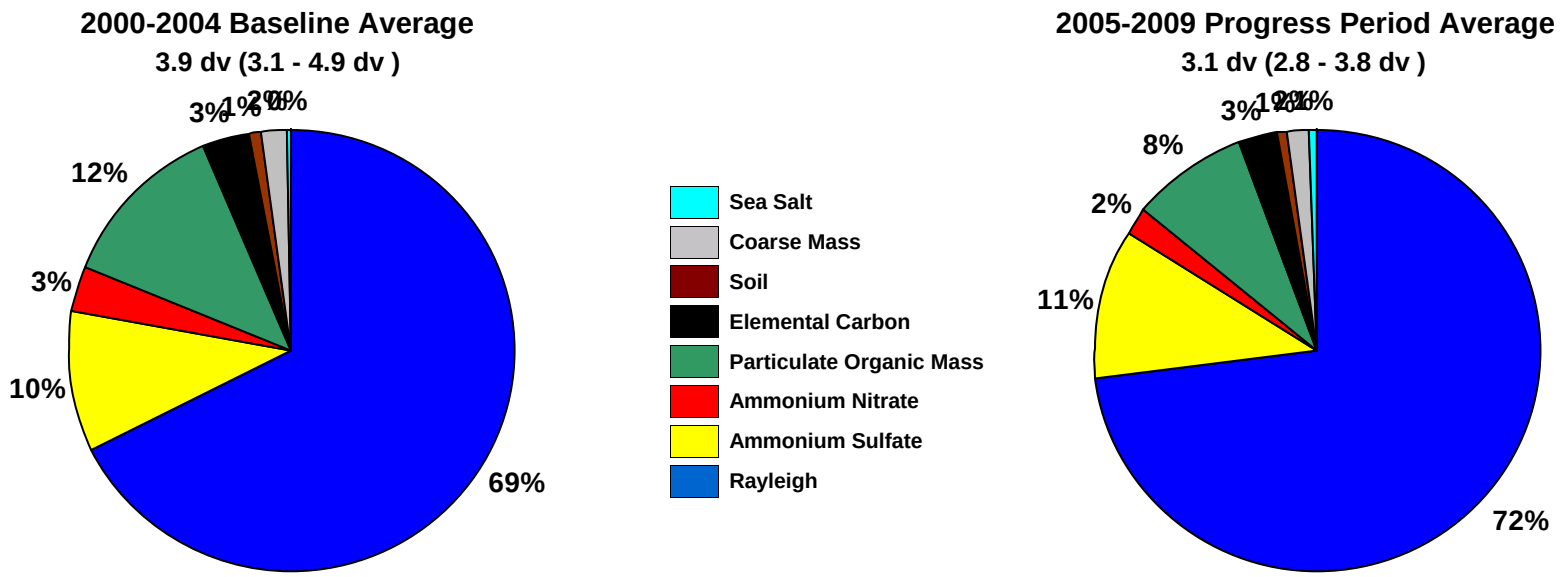
20% Most Impaired Visibility Days

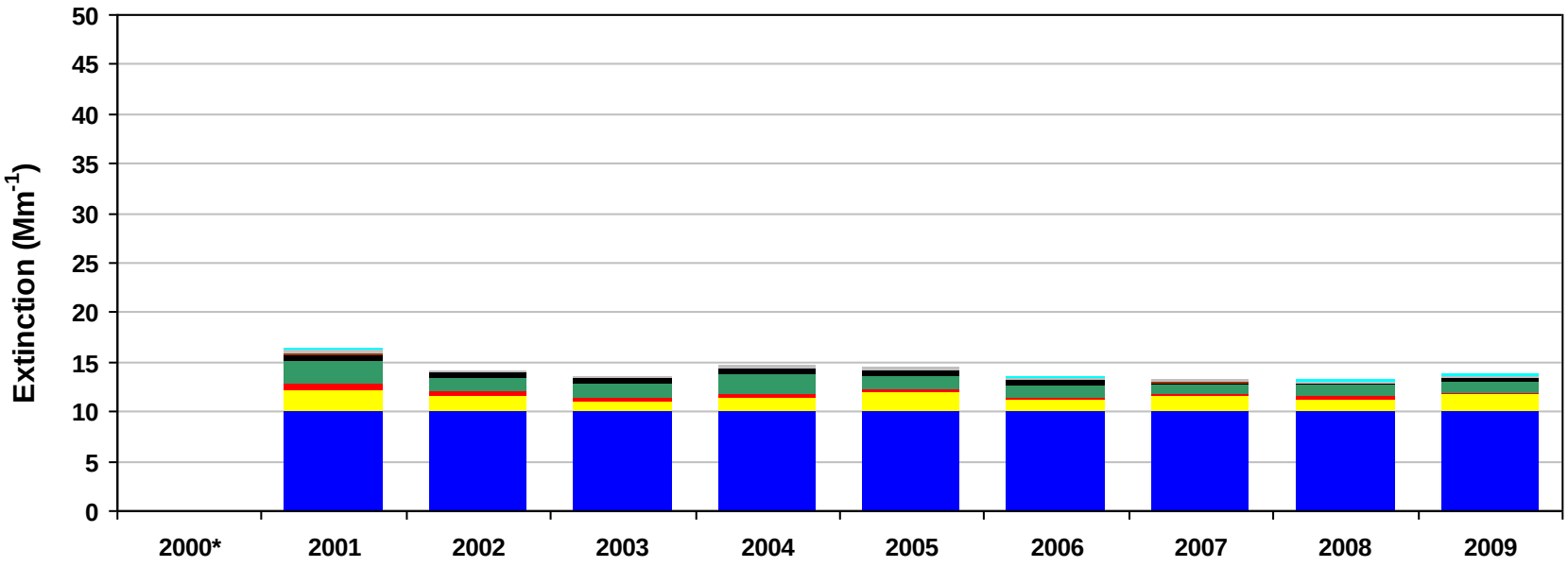




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

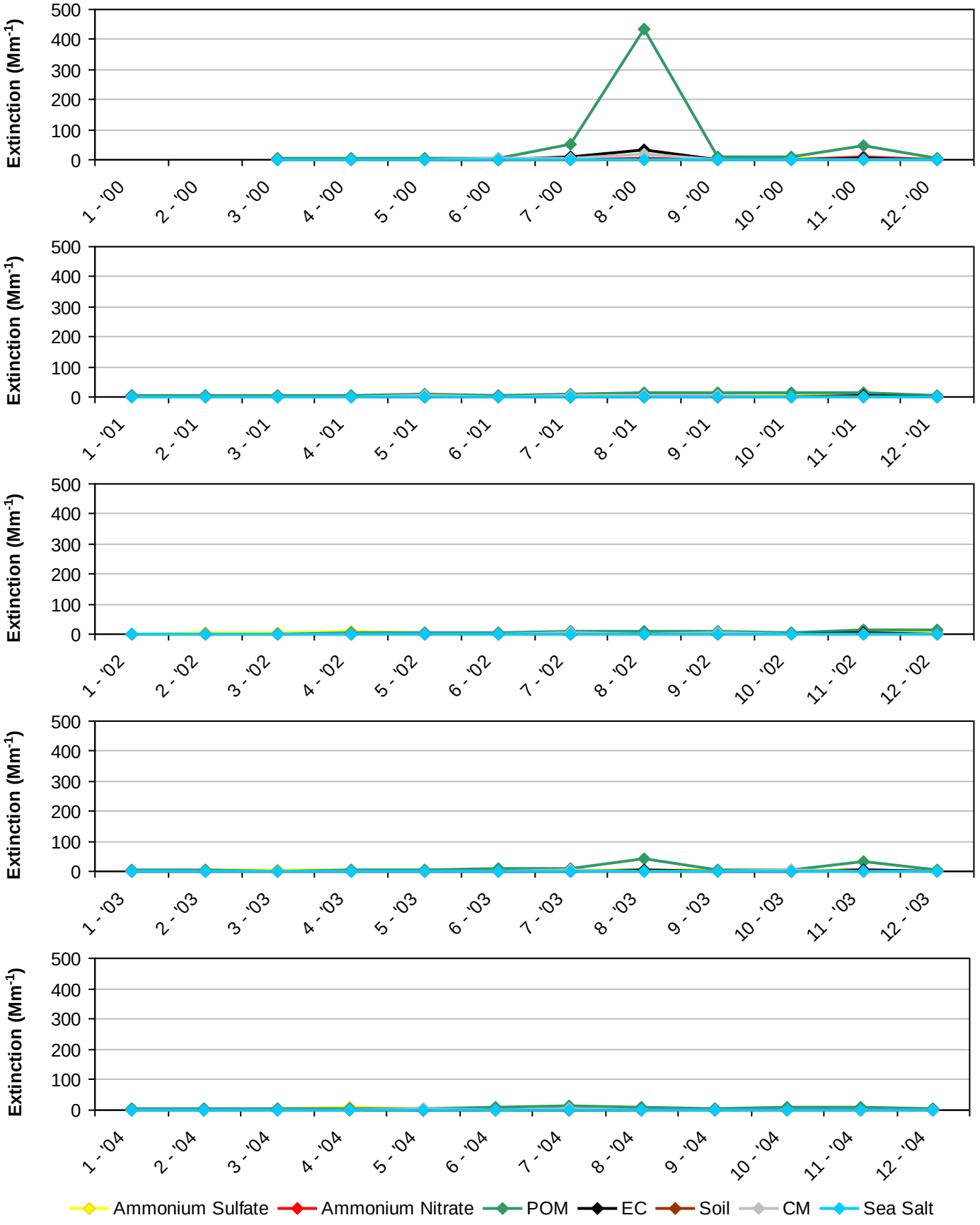
Figure G.5-4
Bob Marshall WA, Mission Mountain WA and Scapegoat WA, MT (MONT1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure G.5-5
Bob Marshall WA, Mission Mountain WA and Scapegoat WA, MT (MONT1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure G.5-6
Bob Marshall WA, Mission Mountain WA and Scapegoat WA, MT (MONT1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

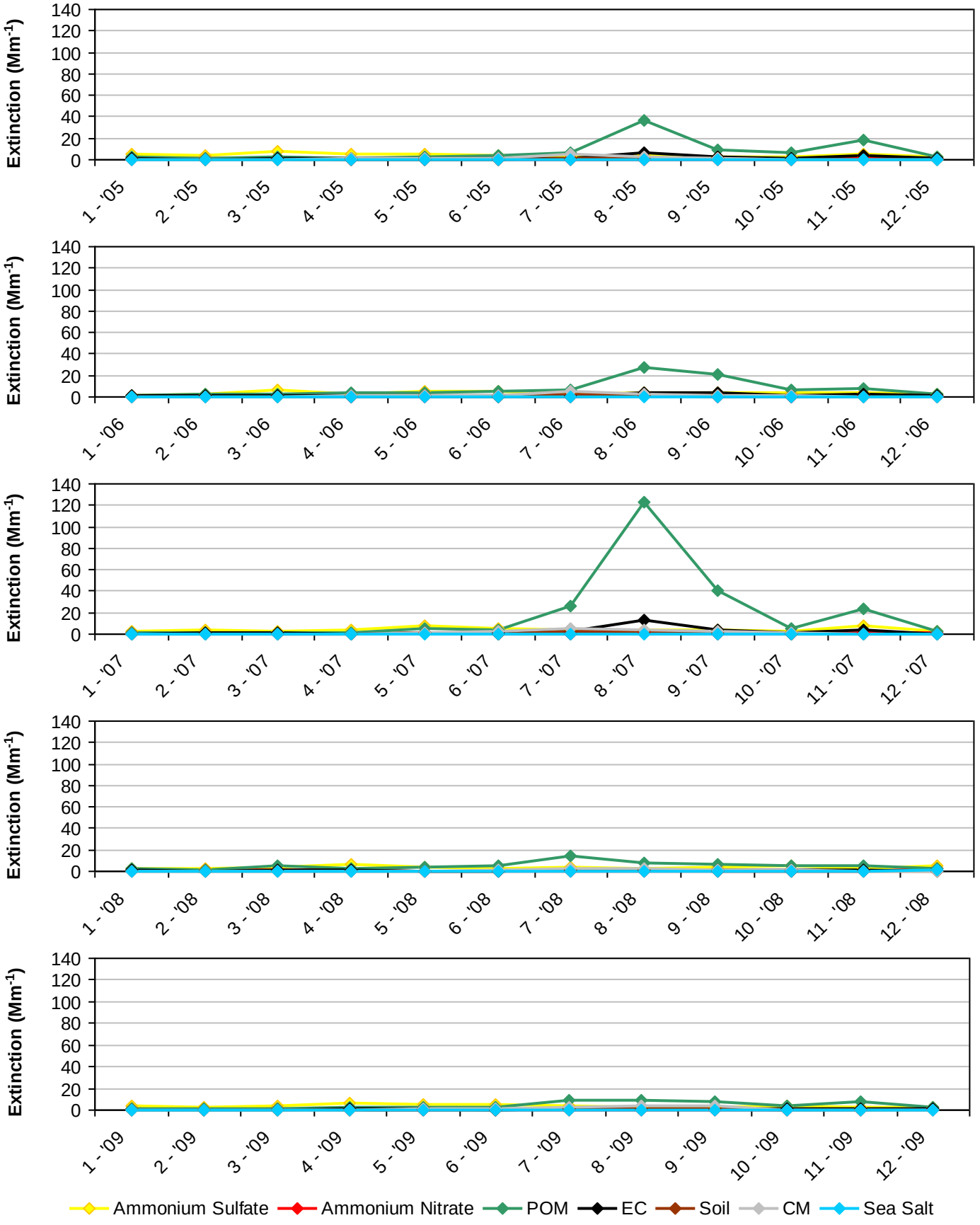
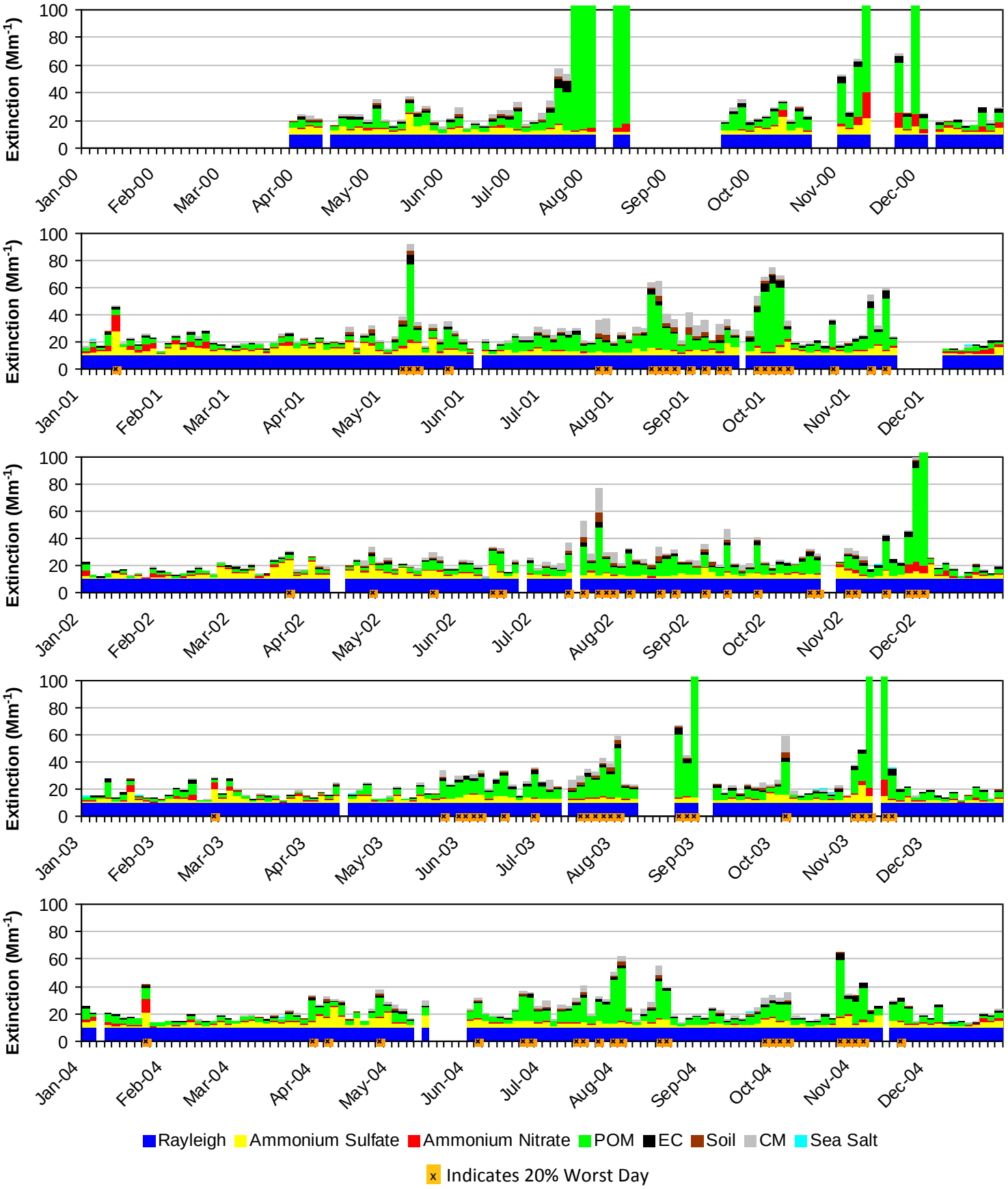
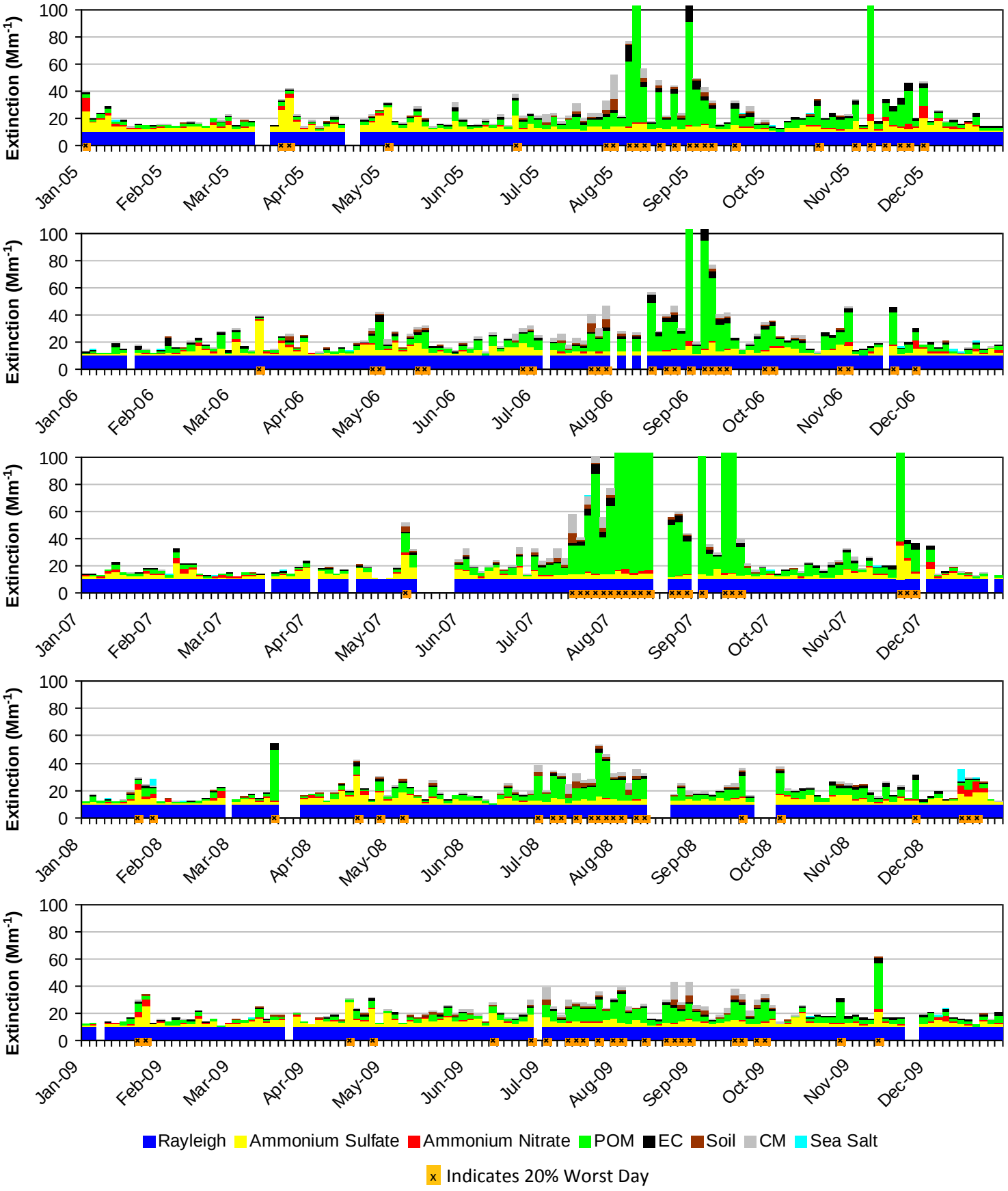


Figure G.5-7
Bob Marshall WA, Mission Mountain WA and Scapegoat WA, MT (MONT1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure G.5-8
Bob Marshall WA, Mission Mountain WA and Scapegoat WA, MT (MONT1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



G.6. ANACONDA-PINTLAR WA AND SELWAY-BITTERROOT WA (SULA1)

The following tables and figures are presented in this section for the Anaconda-Pintlar WA and Selway-Bitterroot WA represented by the SULA1 IMPROVE Monitor:

- **Table G.6-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure G.6-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure G.6-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure G.6-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure G.6-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure G.6-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure G.6-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure G.6-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

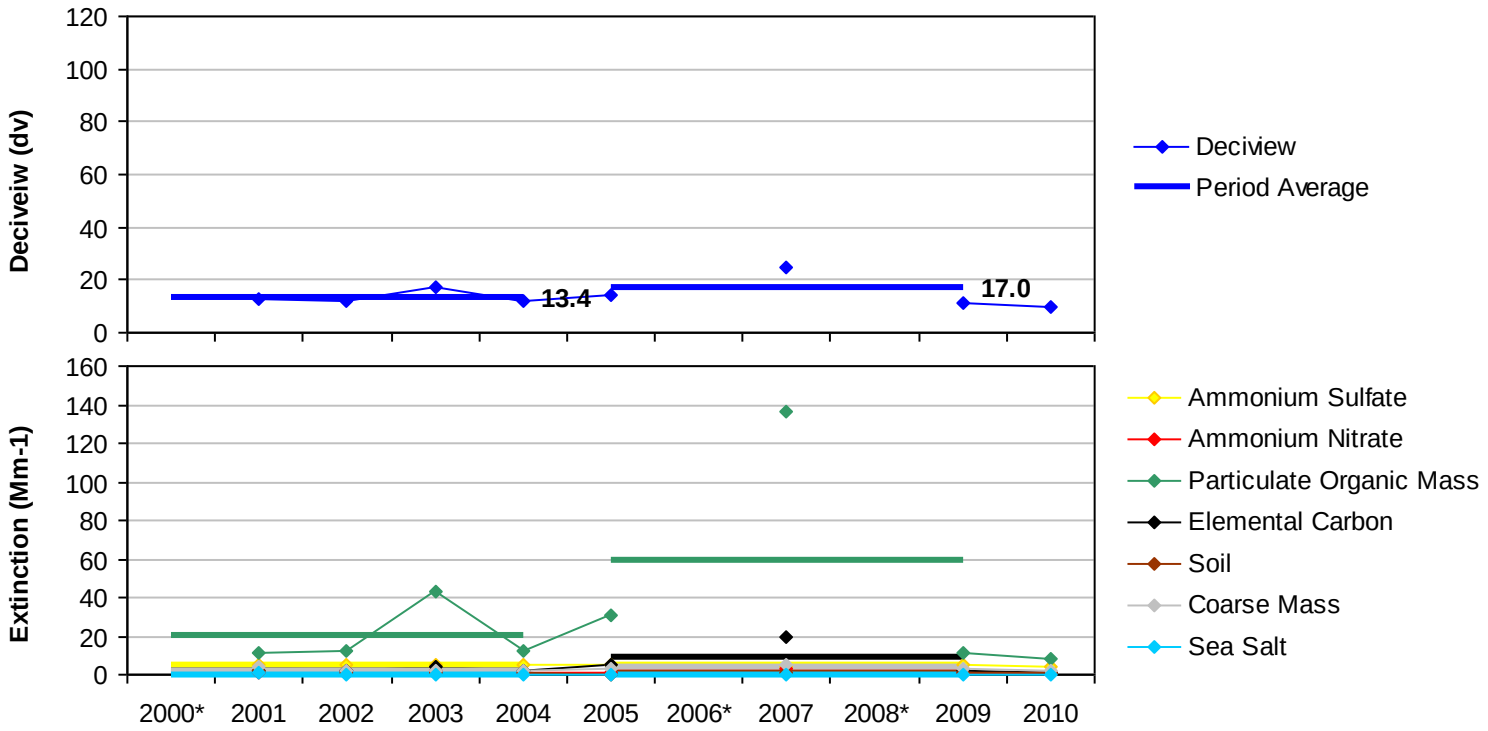
- **Figure G.6-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table G.6-1
Anaconda-Pintlar WA and Selway-Bitterroot WA, MT (SULA1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	3.1	2.7	1.8	2.7	2.5	---	2.5	---	2.3	1.7	-0.1	0.1	2.6	2.5	-0.1	-4%
Worst 20% Days	---	12.6	12.1	16.9	12.0	14.6	---	24.9	---	11.6	9.6	-0.1	0.5	13.4	17.0	3.6	27%
All Days	---	7.5	7.2	7.5	6.8	7.0	---	9.6	---	6.2	5.3	-0.1	0.3	7.2	7.6	0.4	6%
Total Extinction (Mm-1)																	
Best 20% Days	---	13.6	13.2	12.0	13.2	12.9	---	12.9	---	12.6	11.9	-0.1	0.1	13.0	12.8	-0.2	-2%
Worst 20% Days	---	35.7	34.2	66.3	33.8	55.4	---	178.9	---	32.6	27.4	-0.2	0.5	42.5	88.9	46.4	>100%
All Days	---	22.5	21.8	27.1	21.0	24.9	---	51.3	---	19.9	18.0	-0.2	0.5	23.1	32.0	8.9	39%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	1.3	1.1	0.7	1.2	1.4	---	1.3	---	1.2	0.9	0.0	0.5	1.1	1.3	0.2	18%
Worst 20% Days	---	4.8	4.6	4.8	5.1	5.2	---	3.8	---	5.1	4.3	0.0	0.3	4.8	4.7	-0.1	-2%
All Days	---	3.4	3.1	2.7	3.2	3.2	---	3.0	---	3.0	2.7	0.0	0.3	3.1	3.1	0.0	0%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.4	0.2	0.4	0.3	---	0.3	---	0.2	0.1	0.0	0.1	0.3	0.3	0.0	0%
Worst 20% Days	---	1.3	1.6	1.6	1.4	1.4	---	2.7	---	1.0	0.8	0.0	0.4	1.5	1.7	0.2	13%
All Days	---	1.1	1.1	0.8	0.9	0.8	---	1.1	---	0.6	0.6	0.0	0.2	1.0	0.9	-0.1	-10%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	1.0	1.0	0.8	1.0	0.6	---	0.7	---	0.6	0.5	-0.1	0.0	0.9	0.6	-0.3	-33%
Worst 20% Days	---	11.5	12.6	43.3	12.7	30.6	---	136.5	---	11.3	7.8	1.1	0.3	20.0	59.5	39.5	>100%
All Days	---	4.7	5.0	11.1	4.7	7.9	---	30.1	---	3.9	2.8	0.3	0.5	6.4	14.0	7.6	>100%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.3	0.3	0.2	0.3	0.2	---	0.2	---	0.1	0.1	0.0	0.1	0.3	0.2	-0.1	-33%
Worst 20% Days	---	2.0	2.1	4.3	1.7	4.9	---	19.8	---	1.7	1.3	0.3	0.4	2.5	8.8	6.3	>100%
All Days	---	1.0	1.1	1.4	0.9	1.5	---	4.6	---	0.7	0.6	0.1	0.4	1.1	2.3	1.2	>100%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.1	0.0	0.1	0.1	---	0.1	---	0.1	0.1	0.0	0.5	0.1	0.1	0.0	0%
Worst 20% Days	---	1.6	0.9	0.6	0.7	0.5	---	0.7	---	0.6	1.0	0.0	0.1	0.9	0.6	-0.3	-33%
All Days	---	0.6	0.5	0.3	0.3	0.3	---	0.3	---	0.3	0.4	0.0	0.2	0.4	0.3	-0.1	-25%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.3	0.2	0.1	0.2	0.3	---	0.4	---	0.4	0.2	0.0	0.1	0.2	0.3	0.1	50%
Worst 20% Days	---	3.7	2.4	1.7	2.1	2.8	---	5.2	---	2.8	2.2	0.1	0.3	2.5	3.6	1.1	44%
All Days	---	1.4	1.1	0.8	1.0	1.2	---	2.0	---	1.2	0.9	0.0	0.3	1.1	1.4	0.3	27%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.0	0.0	0.0	0.0	---	0.1	---	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0%
Worst 20% Days	---	1.0	0.0	0.0	0.0	0.0	---	0.1	---	0.0	0.0	0.0	0.3	0.3	0.0	-0.3	-100%
All Days	---	0.2	0.0	0.0	0.0	0.0	---	0.1	---	0.0	0.0	0.0	0.5	0.1	0.0	-0.1	-100%

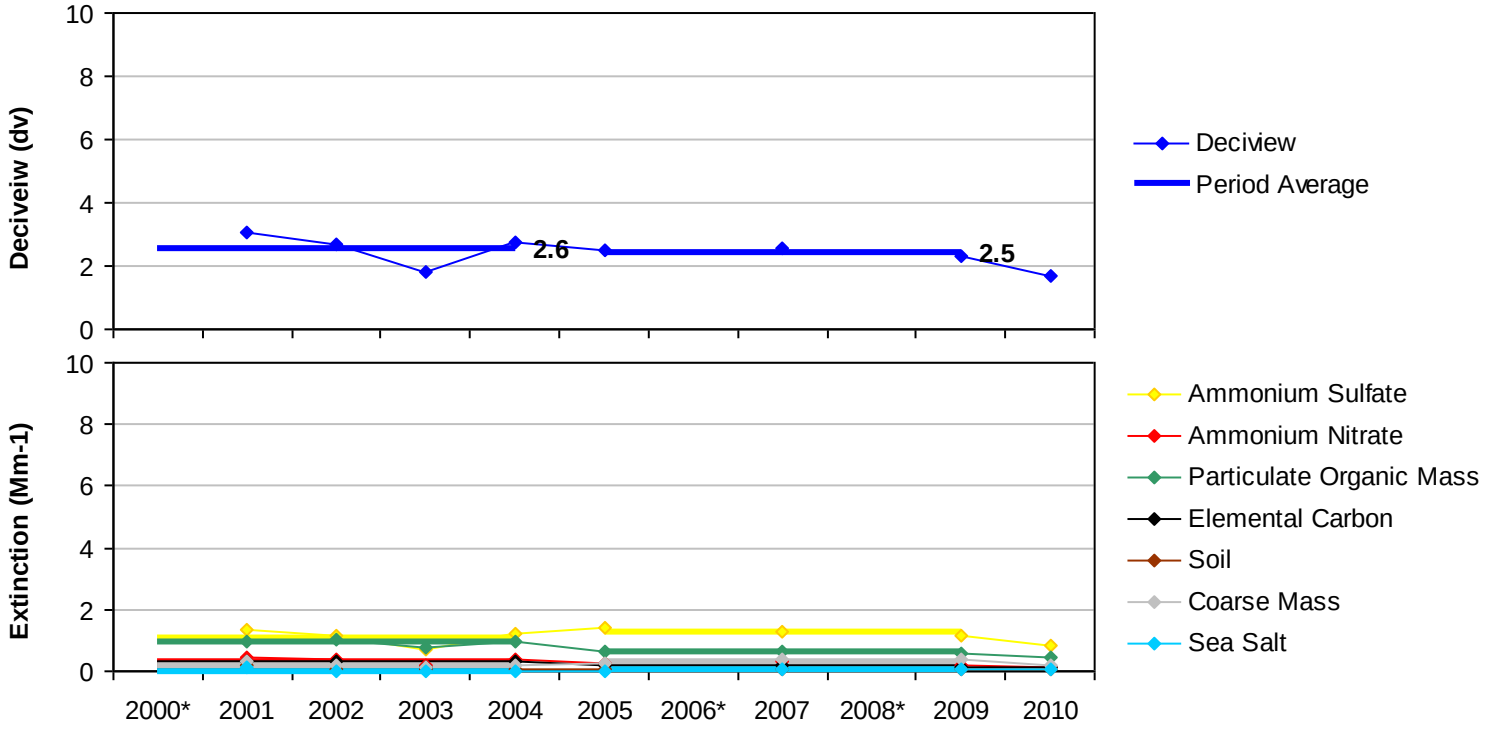
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure G.6-1
Anaconda-Pintlar WA and Selway-Bitterroot WA, MT (SULA1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure G.6-2
Anaconda-Pintlar WA and Selway-Bitterroot WA, MT (SULA1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

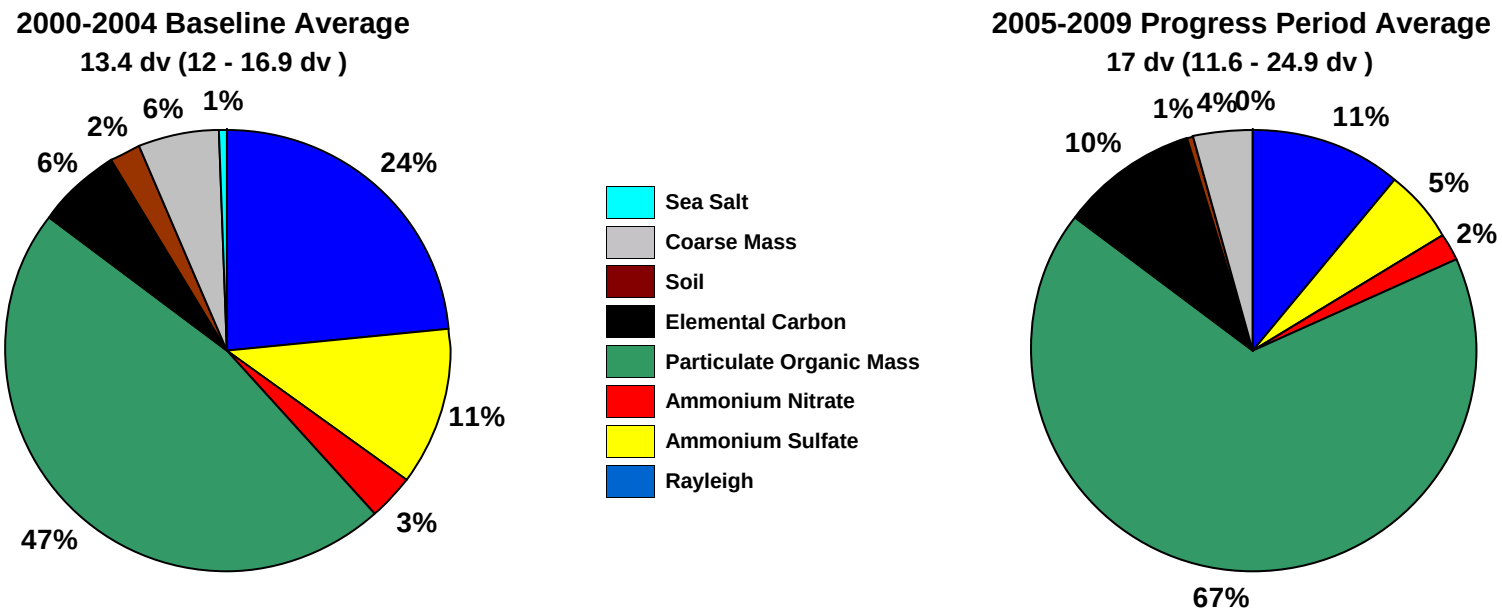


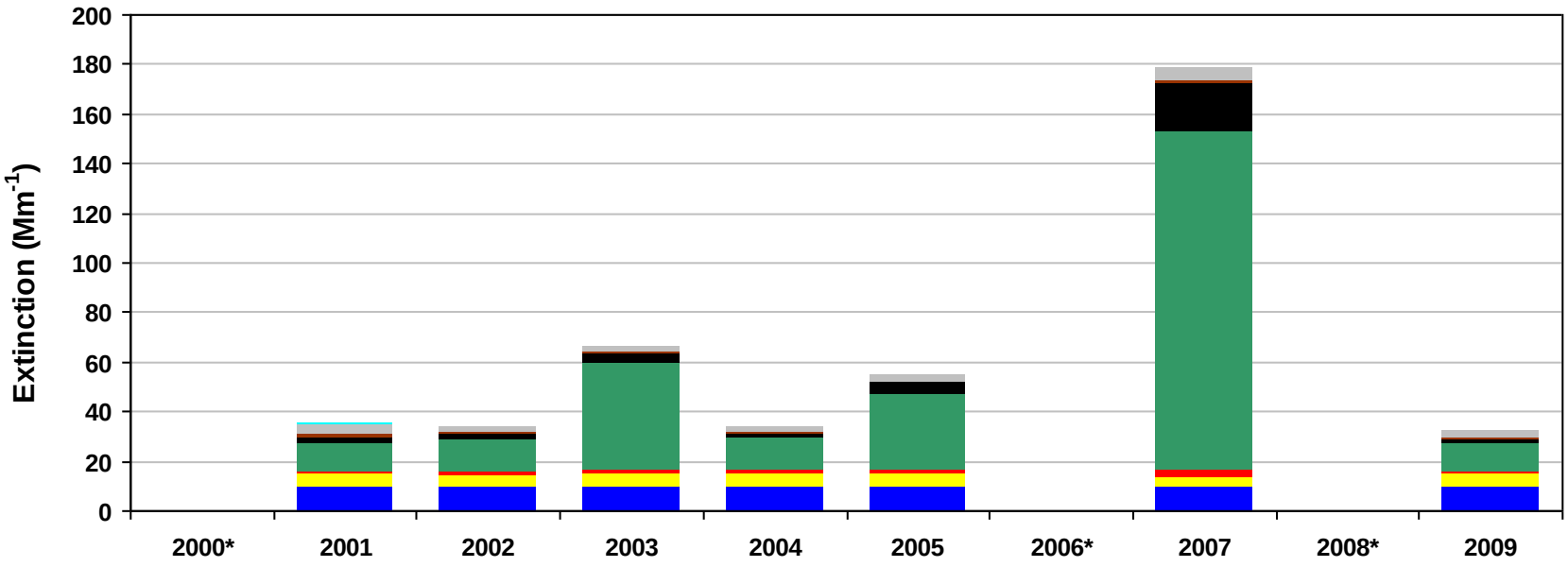
*Missing years did not meet RHR data completeness criteria.

Figure G.6-3

Anaconda-Pintlar WA and Selway-Bitterroot WA, MT (SULA1 Site)

20% Most Impaired Visibility Days



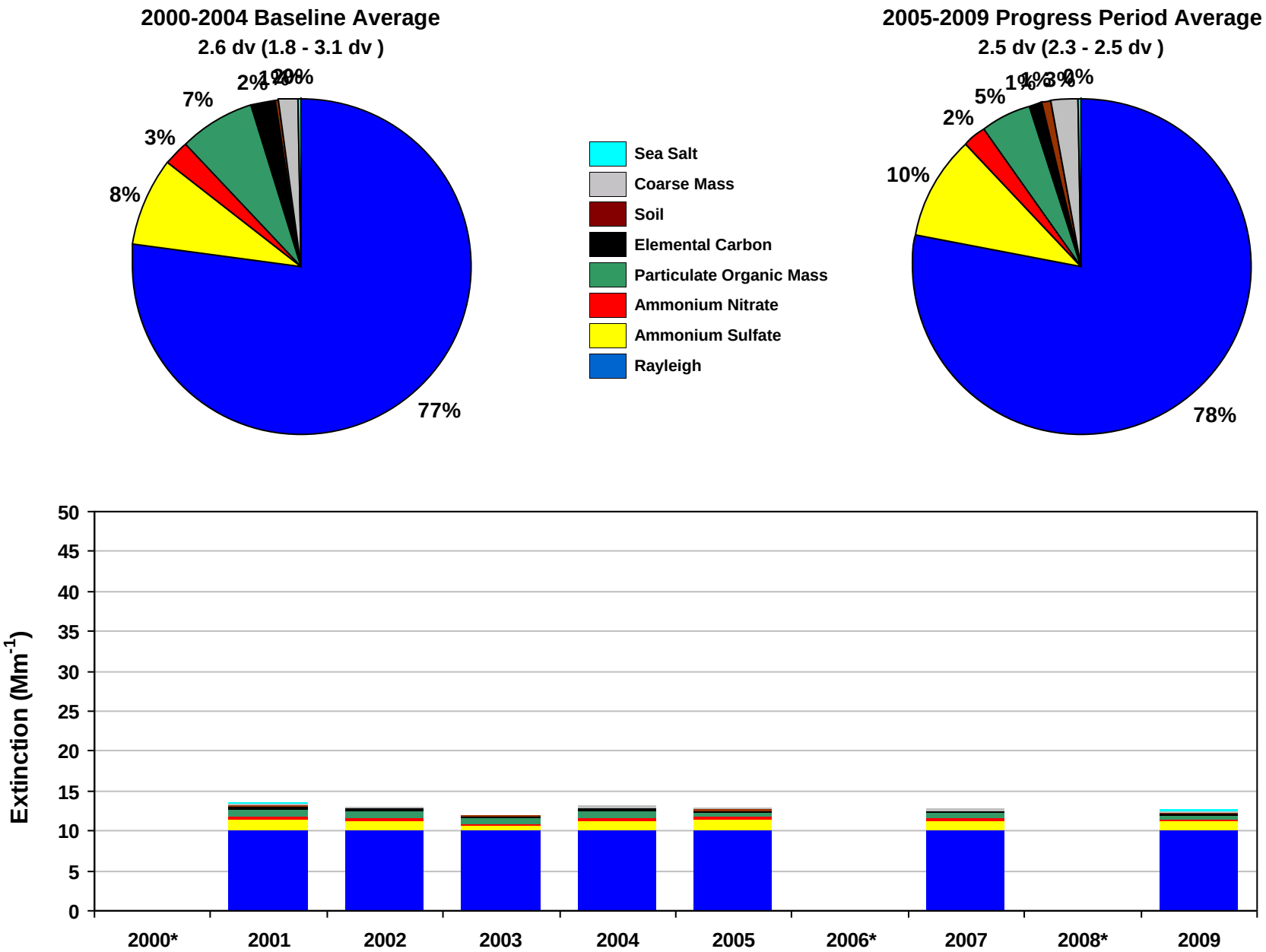


*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure G.6-4

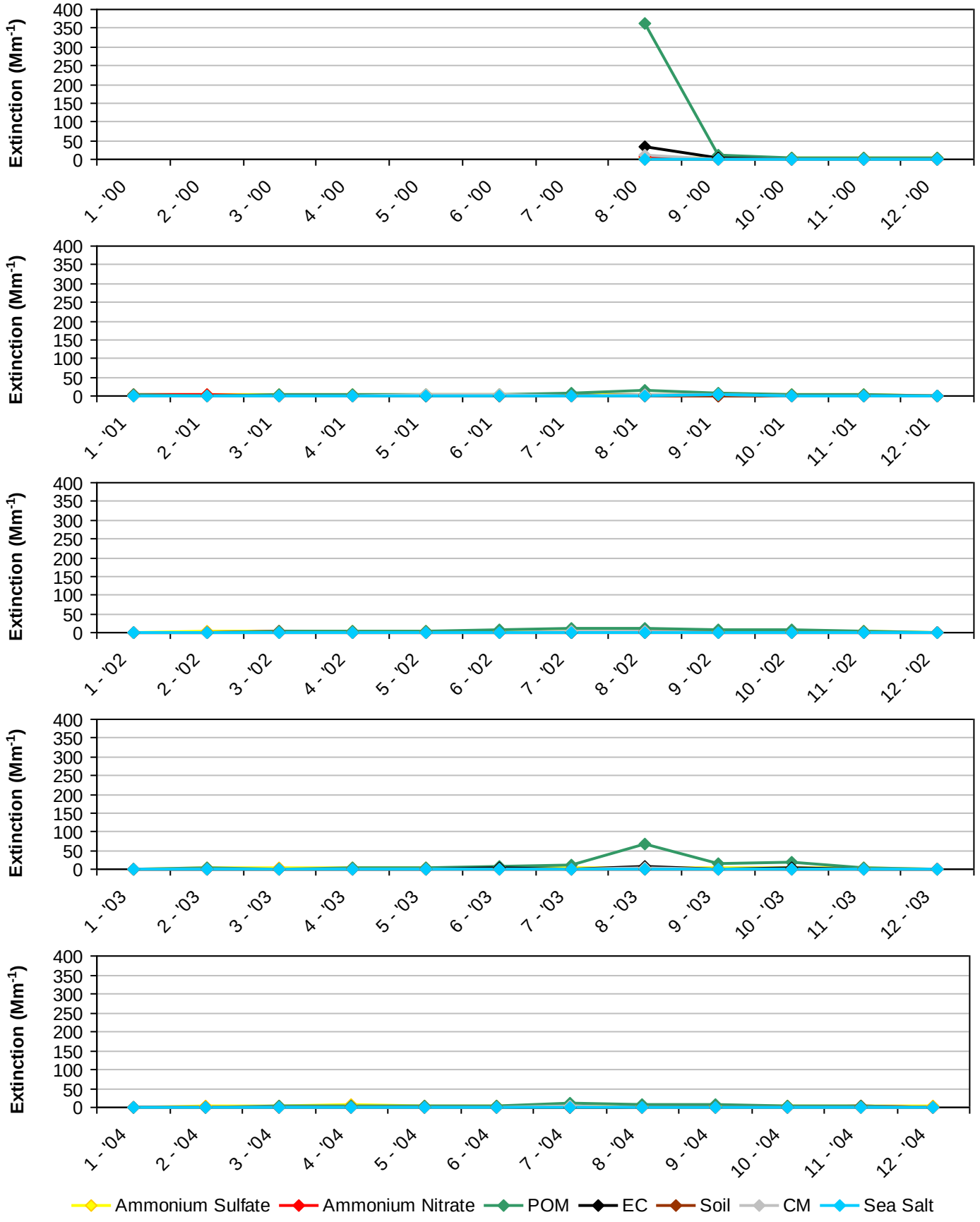
Anaconda-Pintlar WA and Selway-Bitterroot WA, MT (SULA1 Site)

20% Least Impaired Visibility Days



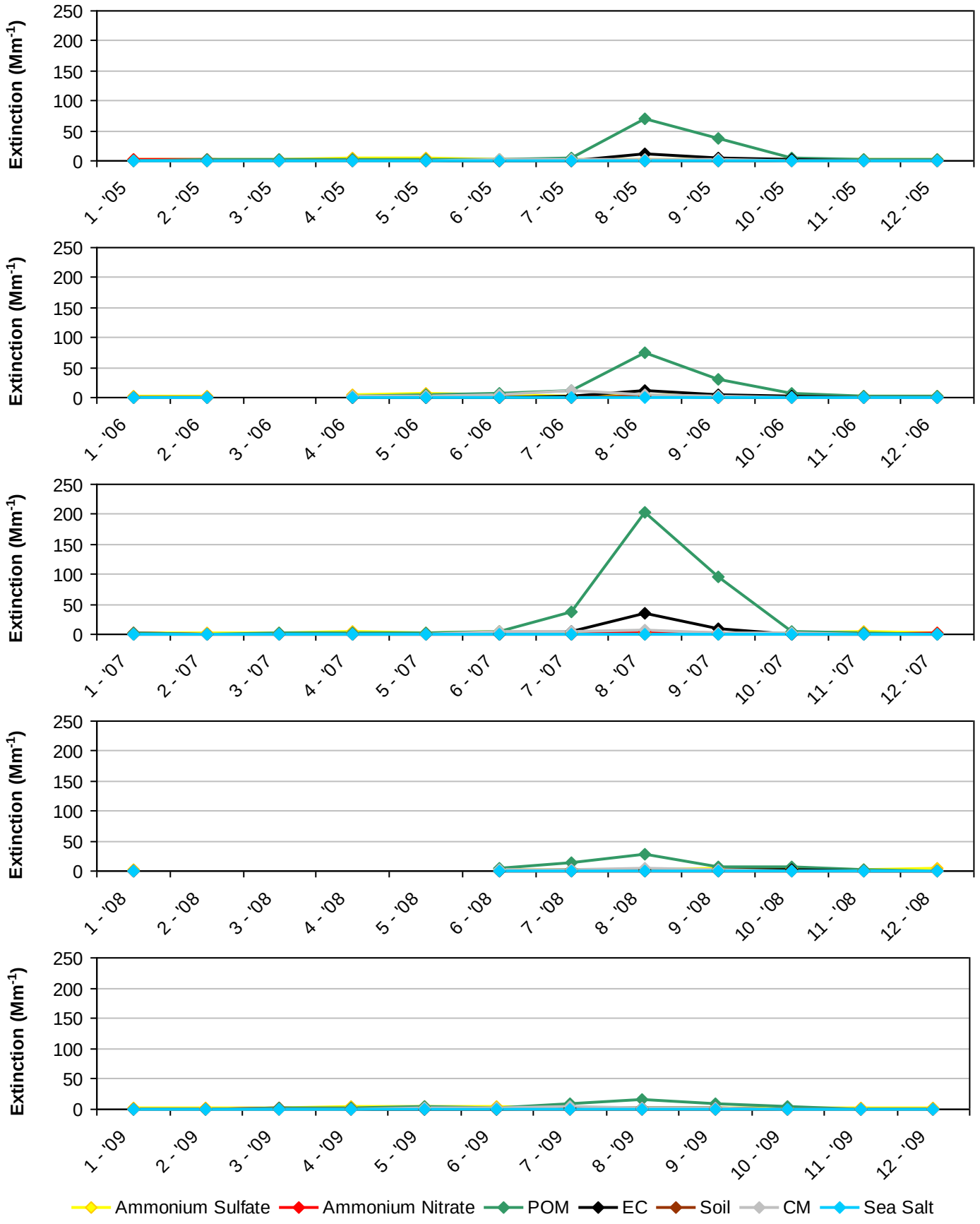
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure G.6-5
Anaconda-Pintlar WA and Selway-Bitterroot WA, MT (SULA1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



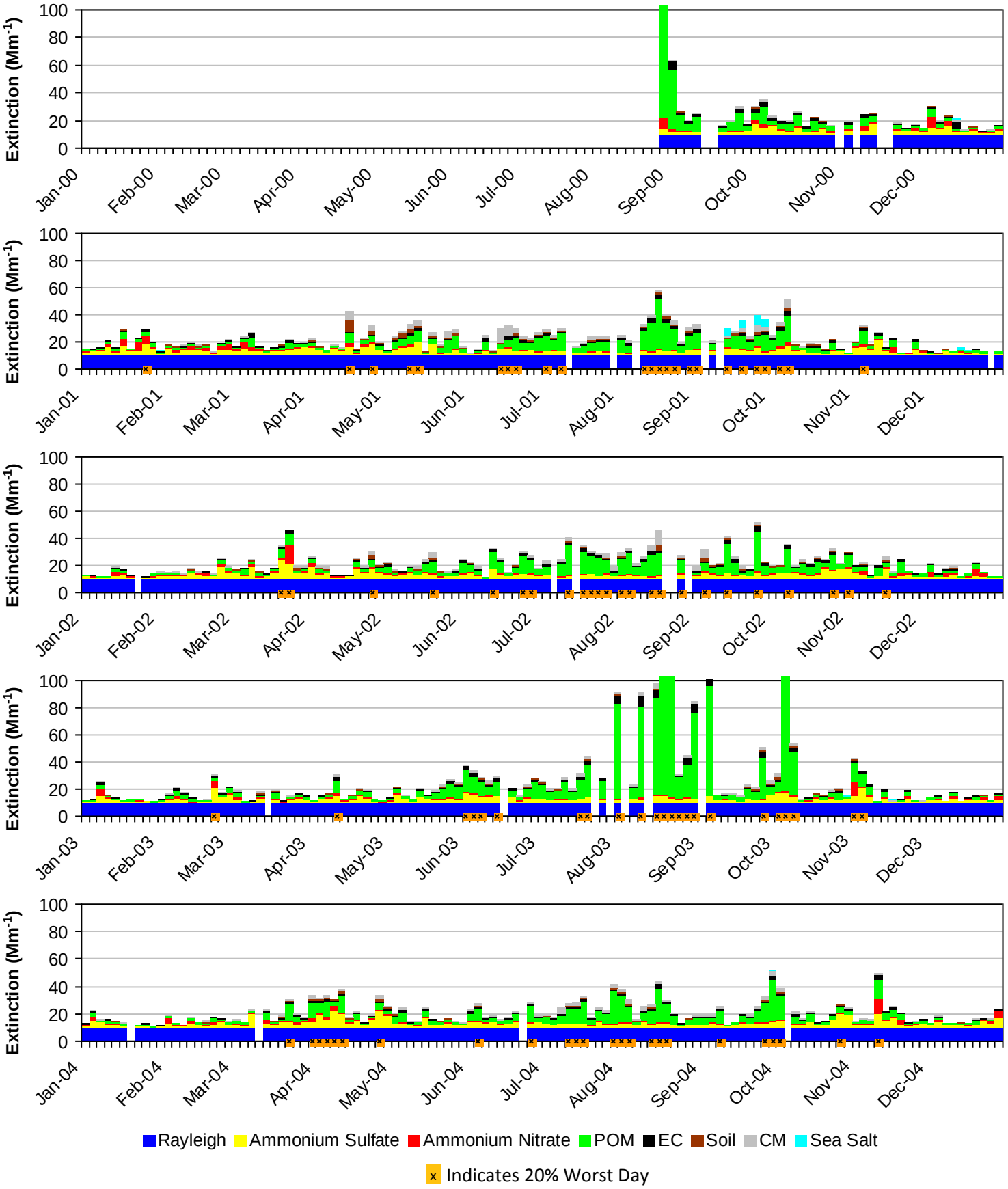
*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure G.6-6
Anaconda-Pintlar WA and Selway-Bitterroot WA, MT (SULA1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days



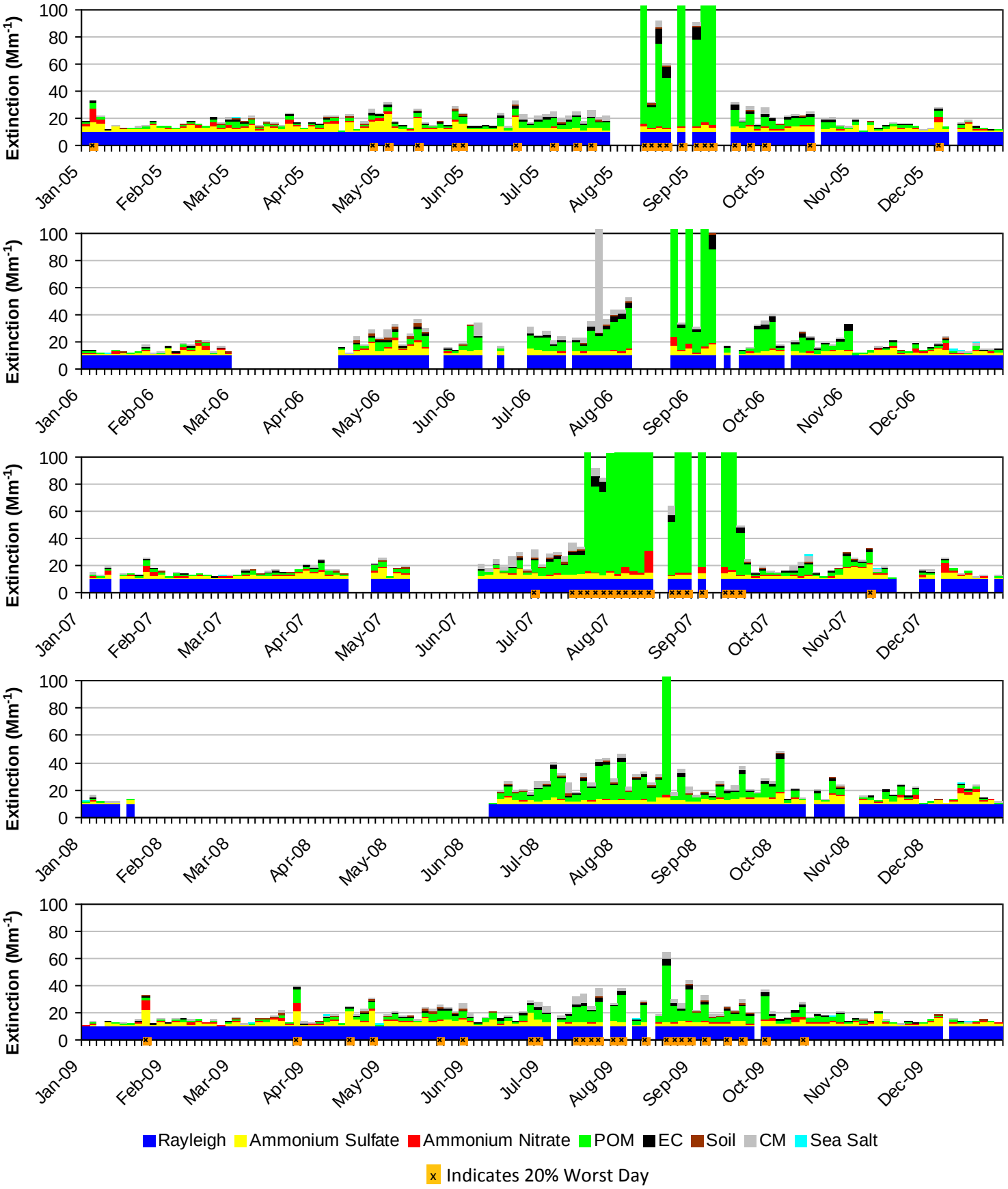
*Note that monthly averages for the years 2006 and 2008 are shown here, but these years did not meet RHR data completeness criteria.

Figure G.6-7
Anaconda-Pintlar WA and Selway-Bitterroot WA, MT (SULA1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure G.6-8
Anaconda-Pintlar WA and Selway-Bitterroot WA, MT (SULA1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2006 and 2008 are shown here, but these years did not meet RHR data completeness criteria.

G.7. U L BEND WA (ULBE1)

The following tables and figures are presented in this section for the U L Bend WA represented by the ULBE1 IMPROVE Monitor:

- **Table G.7-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure G.7-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure G.7-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure G.7-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure G.7-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure G.7-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure G.7-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure G.7-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

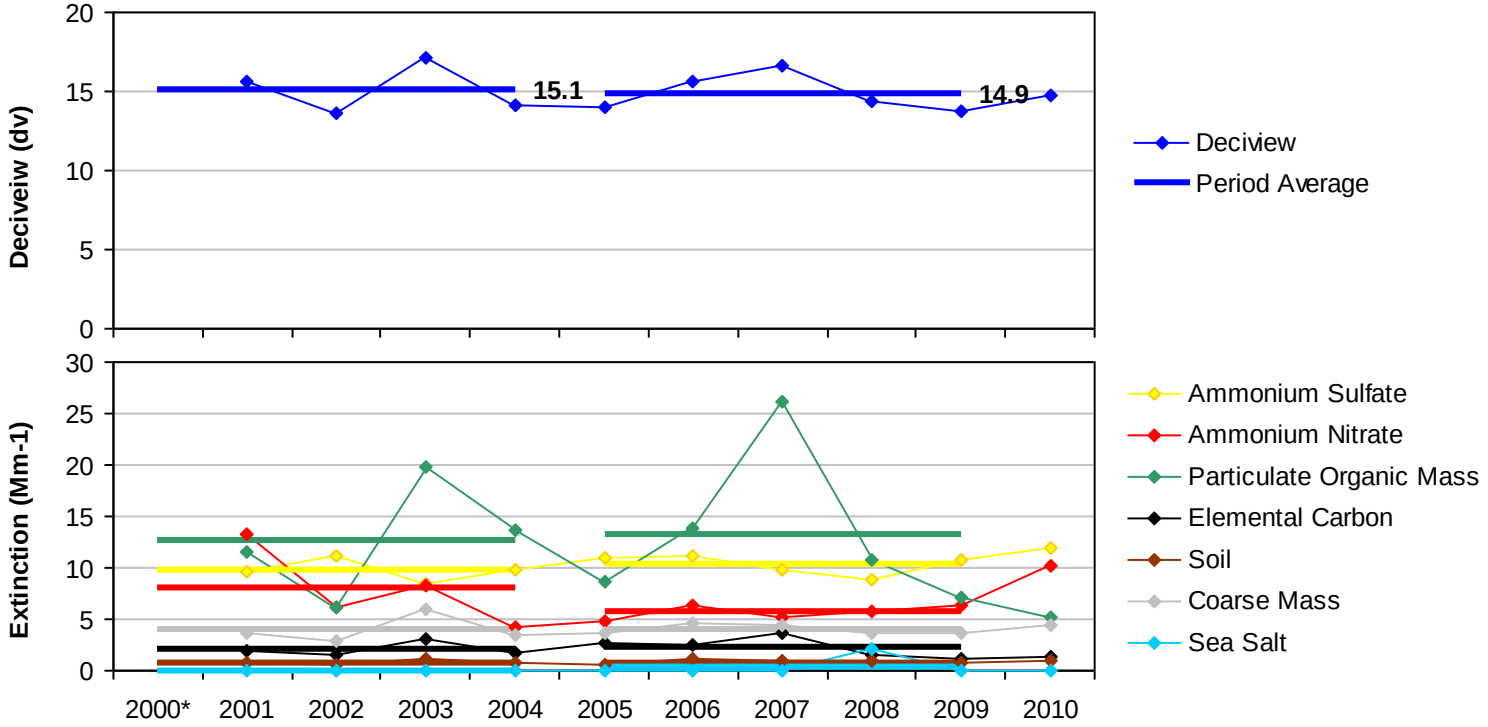
- **Figure G.7-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table G.7-1
U L Bend WA, MT (ULBE1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	5.2	4.6	4.6	4.6	4.4	4.0	4.4	4.3	4.6	4.3	-0.1	0.0	4.7	4.3	-0.4	-9%
Worst 20% Days	---	15.6	13.6	17.1	14.2	13.9	15.6	16.6	14.4	13.8	14.7	-0.1	0.4	15.1	14.9	-0.2	-1%
All Days	---	9.5	9.1	9.8	8.9	8.8	9.3	9.2	8.7	8.8	8.8	-0.1	0.1	9.3	9.0	-0.3	-3%
Total Extinction (Mm-1)																	
Best 20% Days	---	16.9	15.9	15.9	15.9	15.7	14.9	15.6	15.5	15.9	15.4	-0.1	0.0	16.1	15.5	-0.6	-4%
Worst 20% Days	---	52.0	39.5	57.7	44.5	42.3	50.8	61.4	44.7	41.1	45.1	-0.3	0.5	48.4	48.0	-0.4	-1%
All Days	---	28.7	26.2	30.0	26.3	25.9	28.3	29.5	25.9	25.7	26.1	-0.1	0.1	27.8	27.1	-0.7	-3%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	2.1	1.6	1.6	1.8	1.8	1.4	1.8	1.9	2.0	1.8	0.0	0.2	1.8	1.8	0.0	0%
Worst 20% Days	---	9.6	11.2	8.5	9.8	10.9	11.2	9.8	8.8	10.8	11.9	0.0	0.5	9.8	10.3	0.5	5%
All Days	---	5.3	5.8	5.0	5.3	5.4	5.8	5.2	5.1	5.7	5.5	0.0	0.5	5.3	5.4	0.1	2%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.6	0.5	0.4	0.5	0.3	0.2	0.4	0.5	0.3	0.3	0.0	0.0	0.5	0.3	-0.2	-40%
Worst 20% Days	---	13.3	6.1	8.3	4.3	4.7	6.4	5.3	5.8	6.3	10.3	-0.2	0.3	8.0	5.7	-2.3	-29%
All Days	---	3.8	2.2	2.7	1.8	1.8	2.1	2.0	1.9	2.3	2.9	-0.1	0.2	2.6	2.0	-0.6	-23%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	1.3	1.1	1.3	1.2	1.2	1.0	0.8	0.9	0.9	1.0	-0.1	0.0	1.2	1.0	-0.2	-17%
Worst 20% Days	---	11.6	6.2	19.7	13.6	8.6	13.9	26.2	10.7	7.2	5.3	0.0	0.5	12.8	13.3	0.5	4%
All Days	---	4.6	3.6	6.7	5.0	4.0	5.0	7.1	4.1	3.3	3.1	-0.1	0.5	5.0	4.7	-0.3	-6%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.6	0.5	0.5	0.4	0.4	0.5	0.3	0.3	0.3	0.3	0.0	0.0	0.5	0.3	-0.2	-40%
Worst 20% Days	---	2.0	1.5	3.1	1.7	2.7	2.4	3.7	1.5	1.2	1.3	-0.1	0.4	2.1	2.3	0.2	10%
All Days	---	1.1	0.9	1.4	0.9	1.2	1.2	1.3	0.7	0.7	0.7	0.0	0.2	1.1	1.0	-0.1	-9%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.0	0.4	0.2	0.2	0.0	0%
Worst 20% Days	---	0.8	0.5	1.1	0.7	0.6	1.1	0.9	0.9	0.8	0.9	0.0	0.3	0.8	0.9	0.1	13%
All Days	---	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.0	0.4	0.5	0.5	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	1.1	1.0	0.8	0.8	0.8	0.7	1.1	0.7	1.0	0.7	0.0	0.2	0.9	0.9	0.0	0%
Worst 20% Days	---	3.7	2.9	5.9	3.4	3.7	4.7	4.5	3.7	3.6	4.5	0.0	0.5	4.0	4.0	0.0	0%
All Days	---	2.4	2.2	2.7	1.9	2.1	2.6	2.4	2.1	2.1	2.4	0.0	0.2	2.3	2.3	0.0	0%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.5	0.0	0.0	0.0	0%
Worst 20% Days	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.1	0.0	0.0	0.0	0.0	0.5	0.5	0%
All Days	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0%

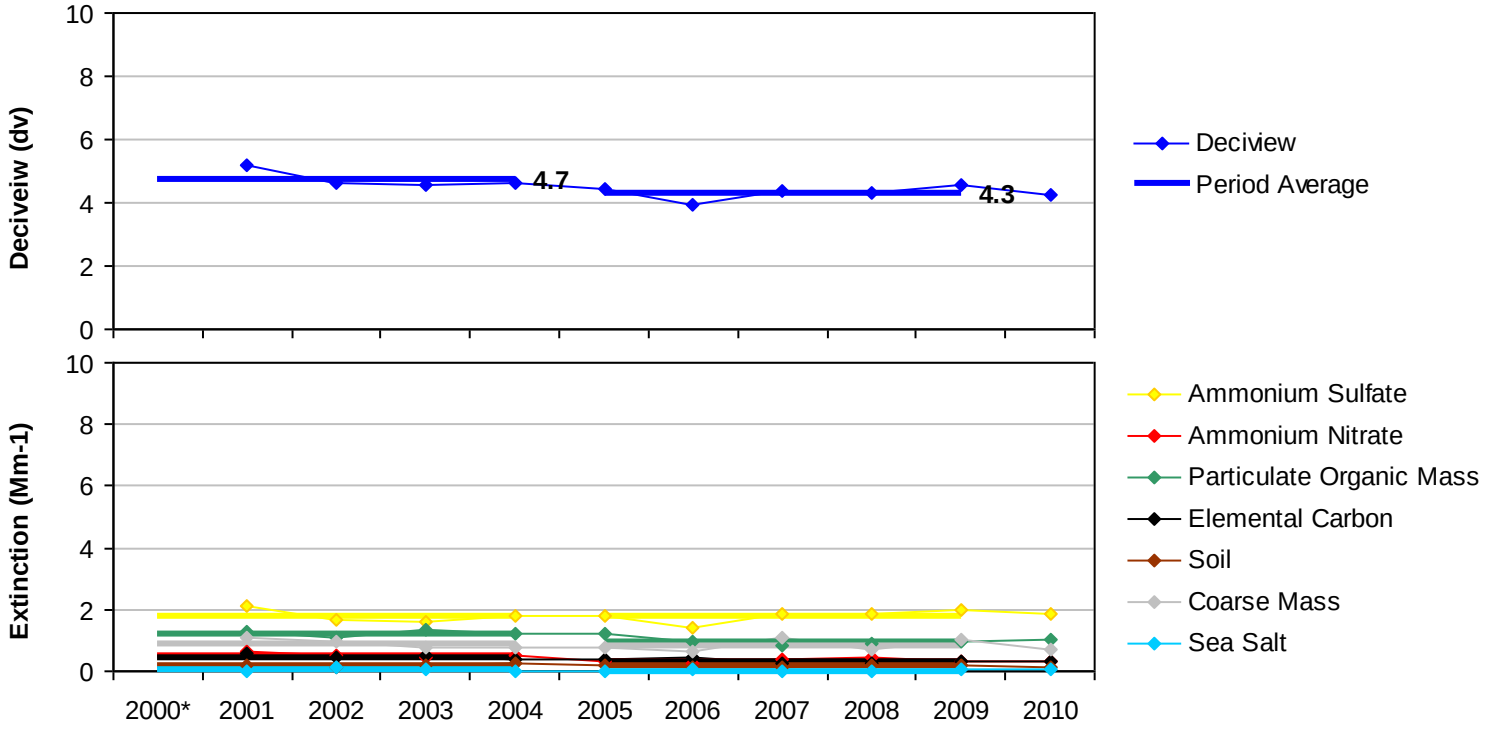
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure G.7-1
U L Bend WA, MT (ULBE1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



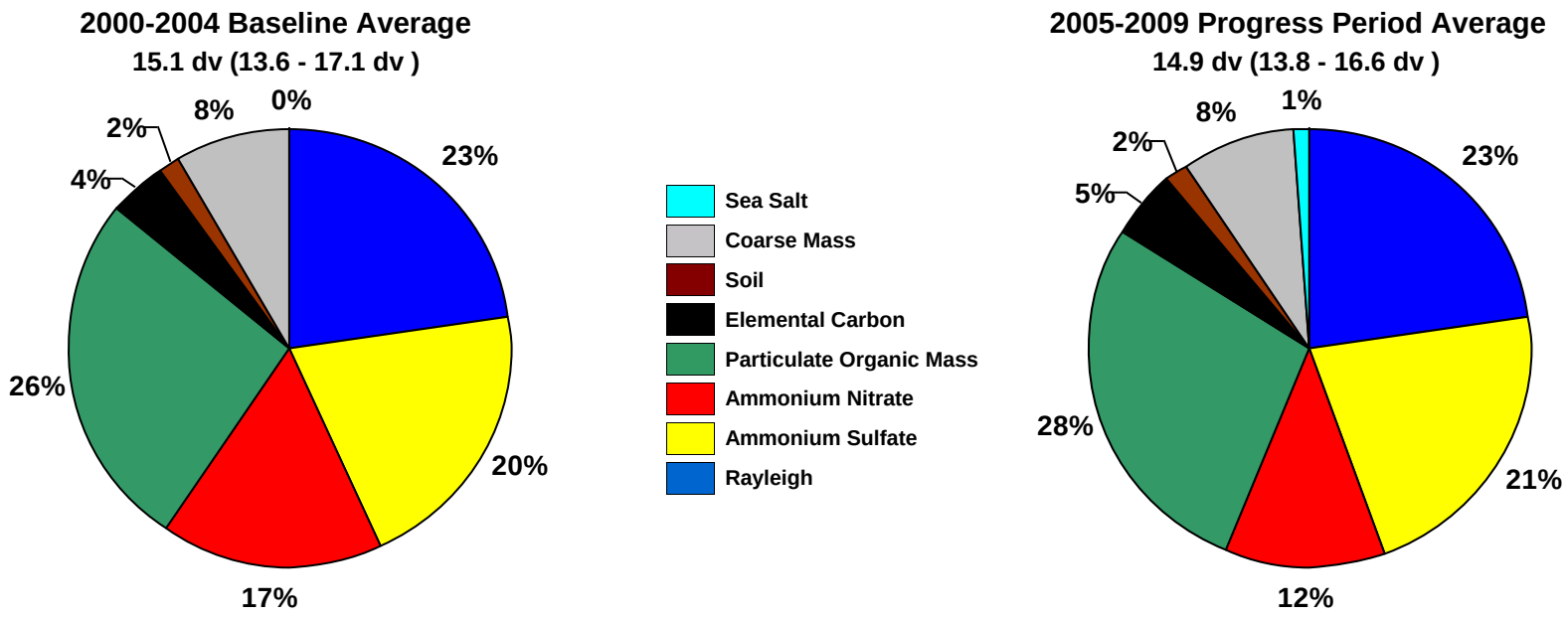
*Missing years did not meet RHR data completeness criteria.

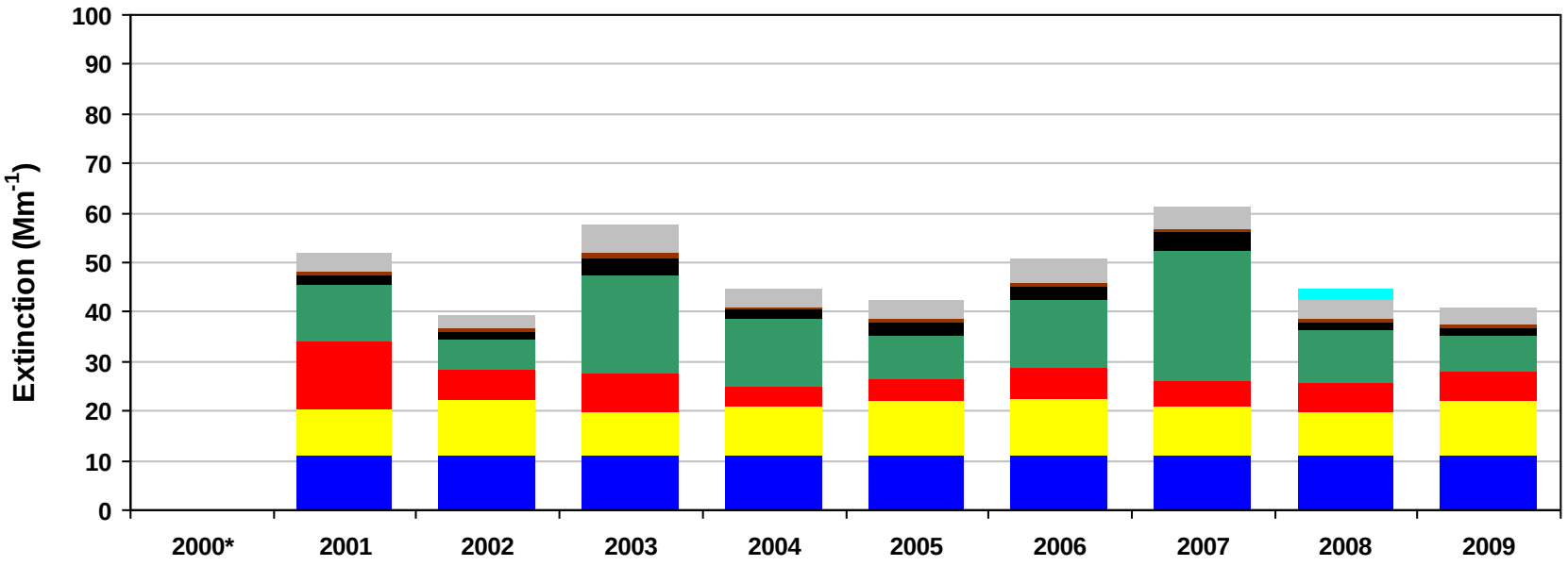
Figure G.7-2
U L Bend WA, MT (ULBE1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

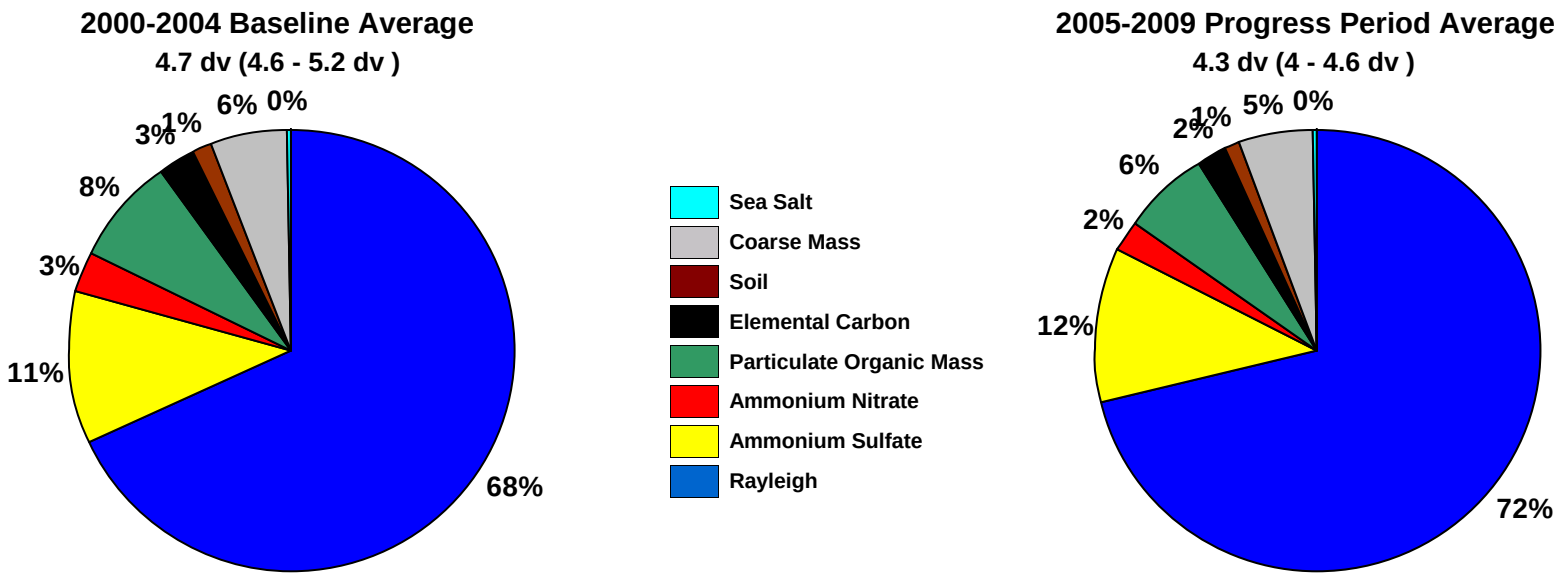
Figure G.7-3
U L Bend WA, MT (ULBE1 Site)
20% Most Impaired Visibility Days

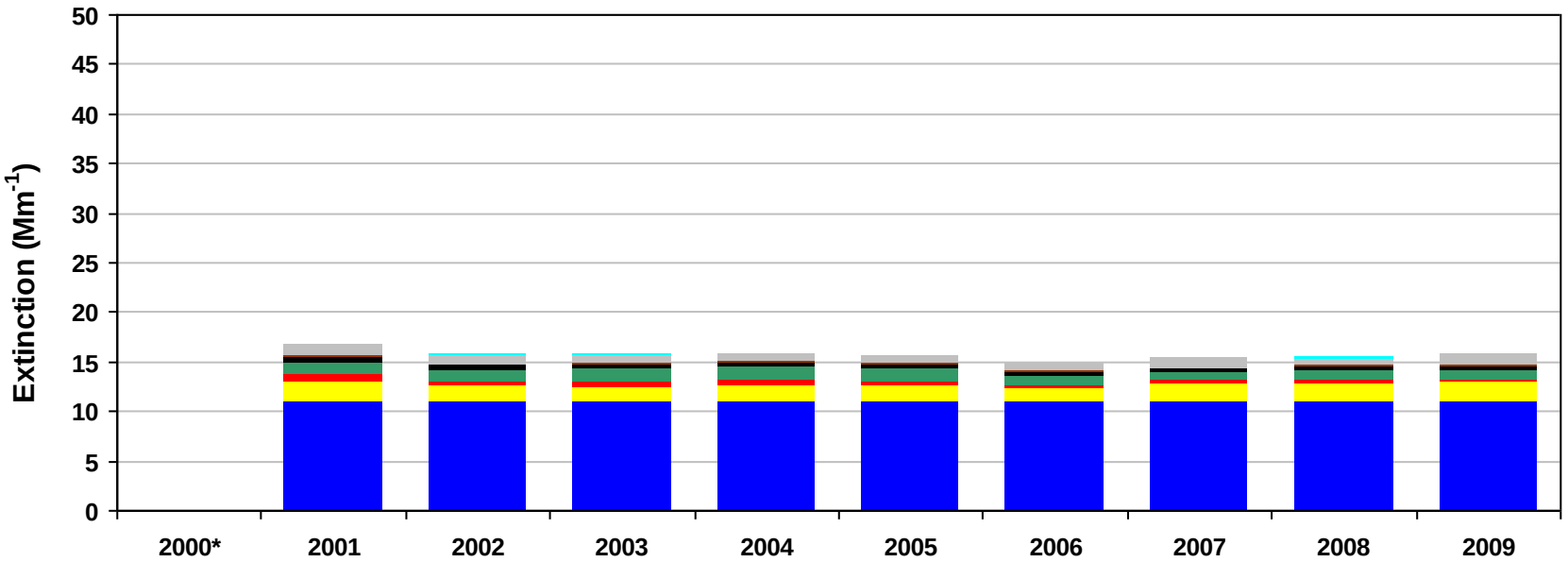




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

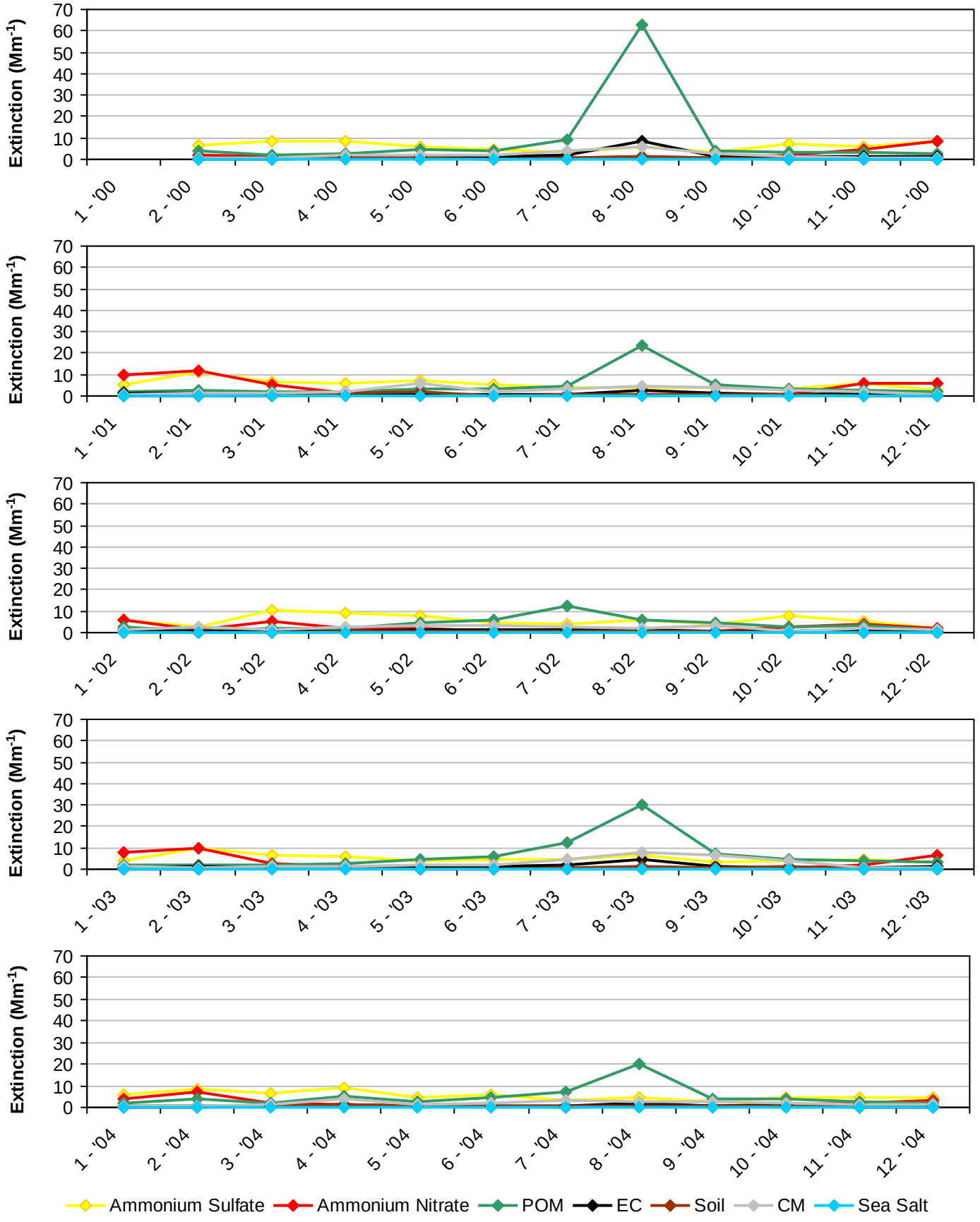
Figure G.7-4
U L Bend WA, MT (ULBE1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure G.7-5
U L Bend WA, MT (ULBE1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure G.7-6
U L Bend WA, MT (ULBE1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

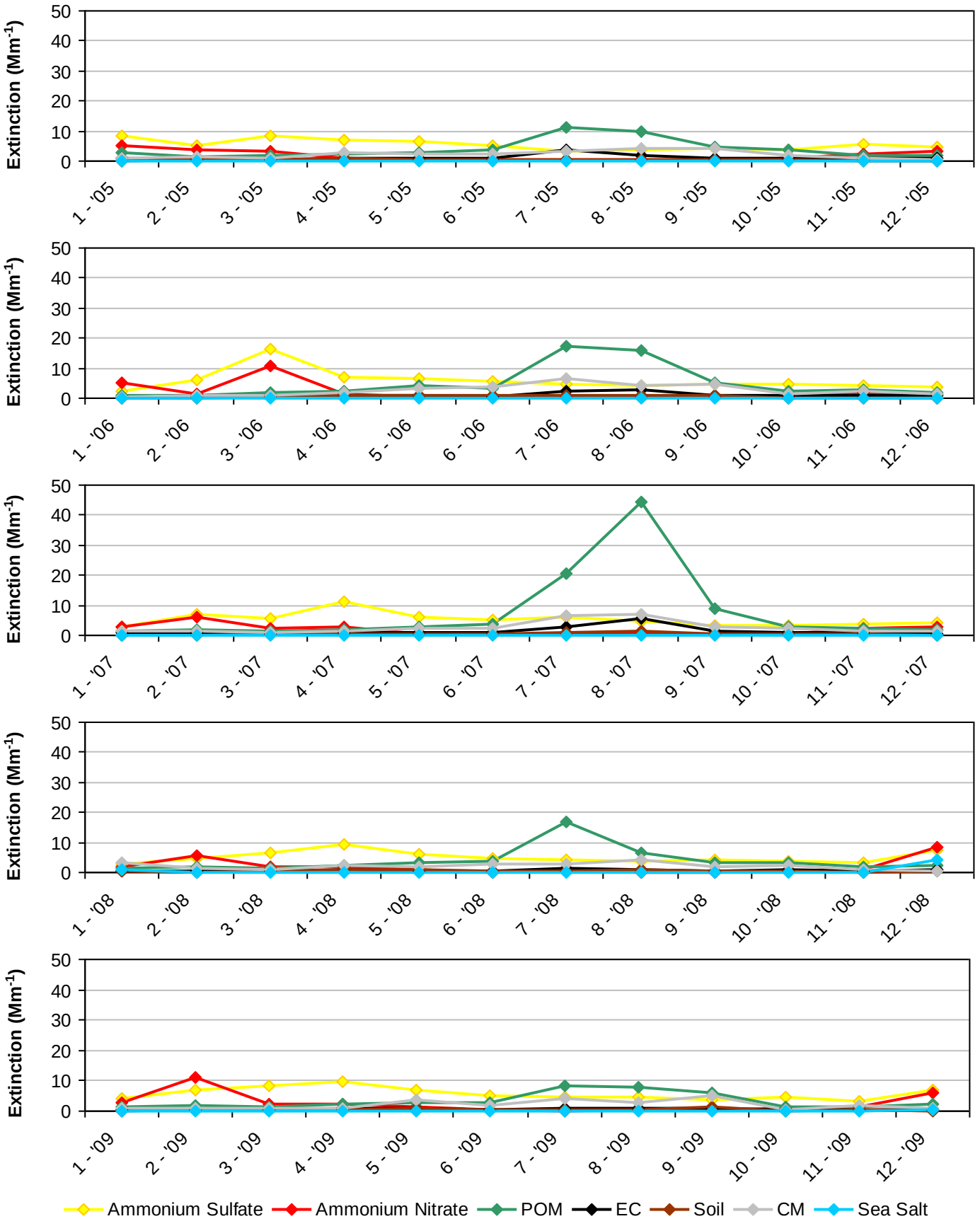
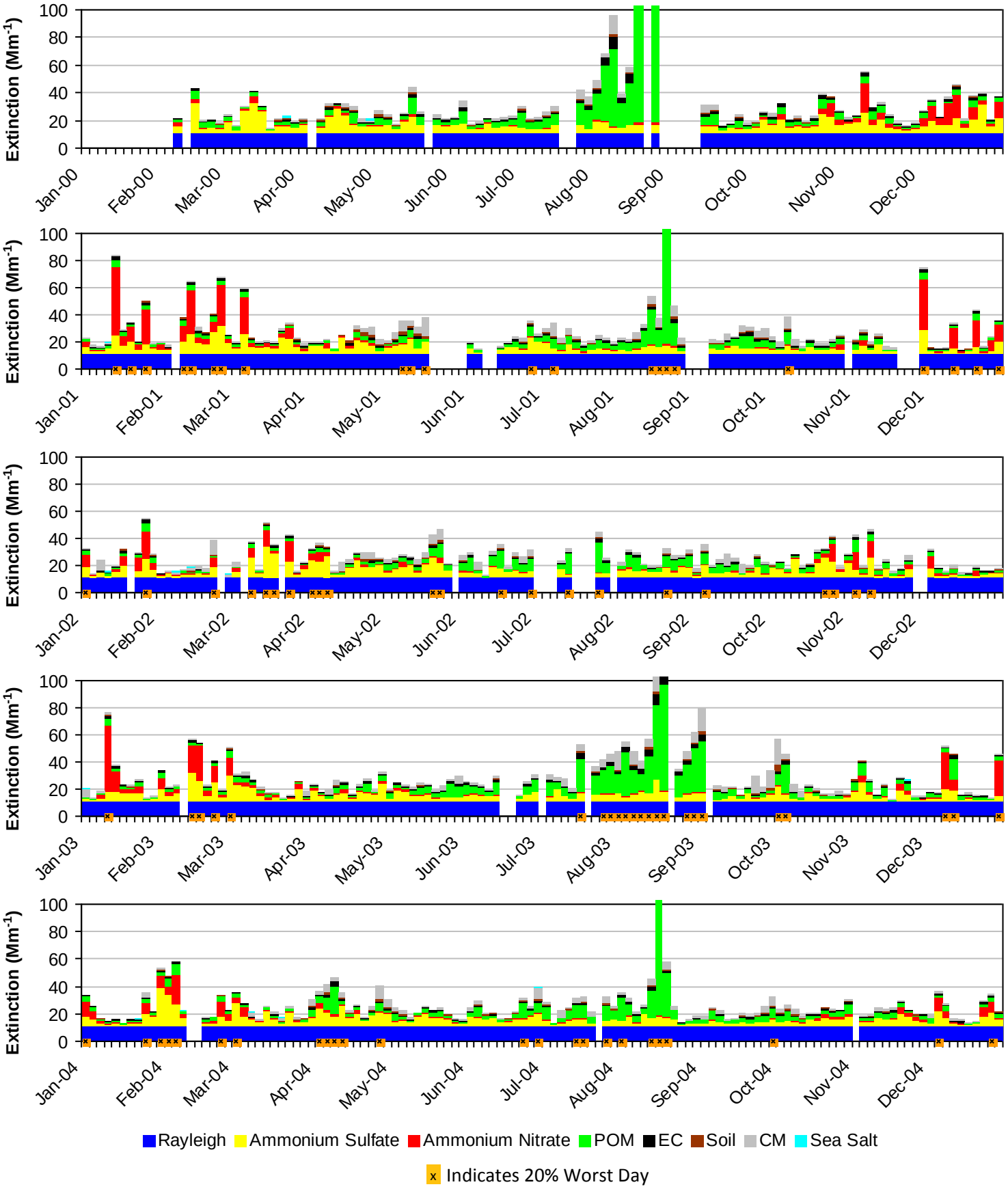
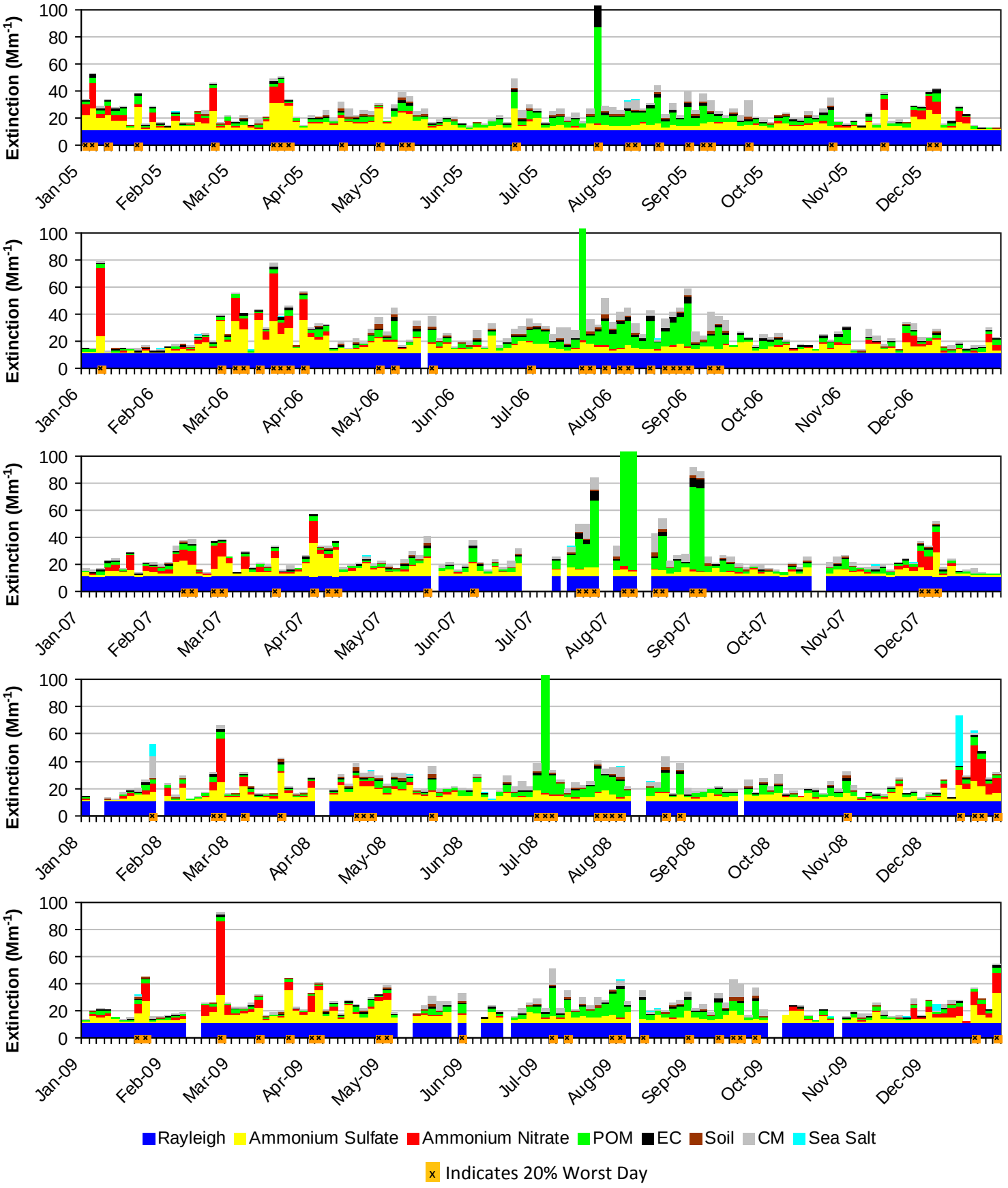


Figure G.7-7
U L Bend WA, MT (ULBE1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure G.7-8
U L Bend WA, MT (ULBE1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



G.8. YELLOWSTONE NP (YELL2)

The following tables and figures are presented in this section for Yellowstone NP represented by the YELL2 IMPROVE Monitor:

- **Table G.8-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure G.8-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure G.8-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure G.8-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure G.8-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure G.8-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure G.8-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure G.8-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure G.8-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table G.8-1
Yellowstone NP, WY (YELL2 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period						2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	2.8	3.0	2.6	1.9	2.6	2.1	2.3	2.2	1.8	1.9	0.9	-0.1	0.0	2.6	2.0	-0.6	-23%
Worst 20% Days	12.9	12.6	11.4	11.2	10.8	9.6	11.8	12.6	14.0	9.6	9.9	-0.2	0.2	11.8	11.5	-0.3	-3%
All Days	7.1	7.1	6.8	6.1	6.5	5.8	6.6	6.8	6.7	5.4	4.8	-0.1	0.1	6.7	6.3	-0.4	-6%
Total Extinction (Mm-1)																	
Best 20% Days	13.3	13.6	13.0	12.2	13.0	12.3	12.6	12.5	12.0	12.2	10.9	-0.1	0.0	13.0	12.3	-0.7	-5%
Worst 20% Days	40.9	38.9	31.8	31.4	29.8	26.3	36.2	36.3	47.6	34.1	27.4	-0.5	0.4	34.5	36.1	1.6	5%
All Days	22.5	22.2	20.7	19.7	20.0	18.5	21.3	21.4	23.1	19.4	17.1	-0.2	0.3	21.0	20.7	-0.3	-1%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	1.7	1.9	1.3	1.1	1.3	1.5	1.6	1.2	1.1	1.4	1.0	0.0	0.2	1.5	1.4	-0.1	-7%
Worst 20% Days	4.2	4.7	3.8	4.1	4.6	4.8	5.1	4.3	5.0	3.5	3.4	0.1	0.3	4.3	4.6	0.3	7%
All Days	3.1	3.6	3.0	2.5	3.1	3.3	3.5	3.1	3.1	2.7	2.4	0.0	0.5	3.1	3.2	0.1	3%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.9	0.8	0.8	0.5	0.6	0.3	0.4	0.7	0.6	0.6	0.2	0.0	0.1	0.7	0.5	-0.2	-29%
Worst 20% Days	2.0	2.4	1.6	1.4	1.5	1.6	0.9	2.4	1.7	1.6	1.2	0.0	0.3	1.8	1.6	-0.2	-11%
All Days	1.5	1.5	1.6	1.2	1.3	1.1	1.1	1.7	1.3	1.1	0.8	0.0	0.2	1.4	1.2	-0.2	-14%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.1	1.2	1.1	0.9	1.3	1.1	0.8	1.0	0.8	0.5	0.3	-0.1	0.0	1.1	0.8	-0.3	-27%
Worst 20% Days	18.4	16.1	11.2	12.8	8.9	6.7	15.1	14.7	25.6	15.2	6.8	0.0	0.5	13.5	15.5	2.0	15%
All Days	6.0	5.3	4.4	4.7	4.0	3.1	5.1	4.8	7.2	4.4	2.4	-0.1	0.3	4.9	4.9	0.0	0%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.2	0.4	0.3	0.2	0.5	0.3	0.4	0.3	0.1	0.2	0.1	0.0	0.2	0.3	0.3	0.0	0%
Worst 20% Days	3.7	2.6	1.9	2.3	1.9	1.8	2.3	2.4	2.6	1.7	1.6	0.0	0.2	2.5	2.2	-0.3	-12%
All Days	1.3	1.1	1.0	1.0	1.0	0.9	1.1	1.0	0.9	0.7	0.6	0.0	0.0	1.1	0.9	-0.2	-18%
Soil Extinction (Mm-1)																	
Best 20% Days	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0%
Worst 20% Days	0.8	1.4	1.2	0.4	0.9	0.6	1.1	0.8	1.0	0.6	1.3	0.0	0.3	1.0	0.8	-0.2	-20%
All Days	0.4	0.6	0.5	0.3	0.4	0.3	0.4	0.5	0.4	0.3	0.5	0.0	0.4	0.4	0.4	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	0.3	0.2	0.3	0.2	0.3	0.1	0.2	0.2	0.3	0.3	0.1	0.0	0.5	0.2	0.2	0.0	0%
Worst 20% Days	2.8	2.7	3.1	1.3	2.9	1.8	2.6	2.6	2.6	2.3	4.2	0.0	0.1	2.6	2.4	-0.2	-8%
All Days	1.2	1.2	1.3	0.9	1.1	0.8	1.1	1.4	1.0	1.2	1.4	0.0	0.3	1.1	1.1	0.0	0%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0%
Worst 20% Days	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0%
All Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure G.8-1
Yellowstone NP, WY (YELL2 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

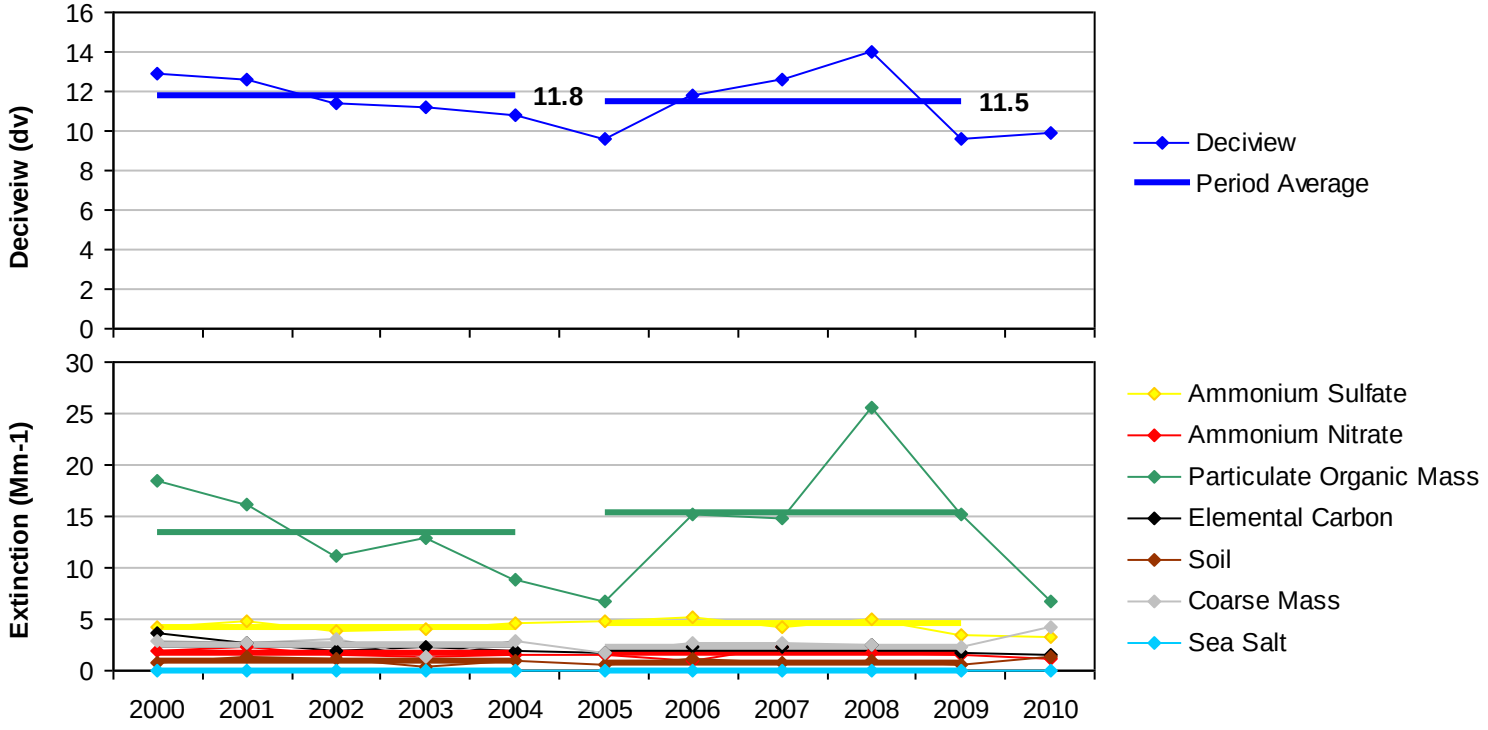


Figure G.8-2
Yellowstone NP, WY (YELL2 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

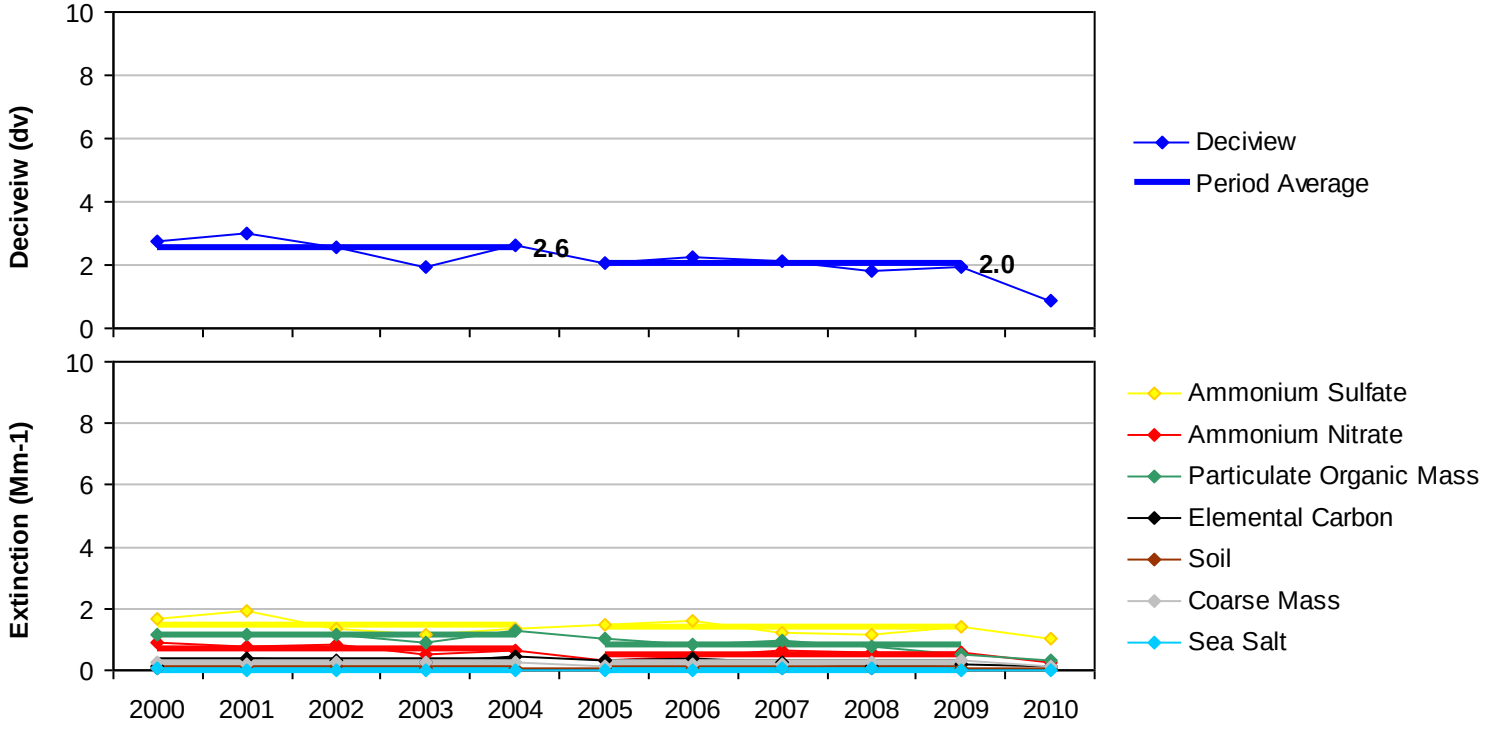
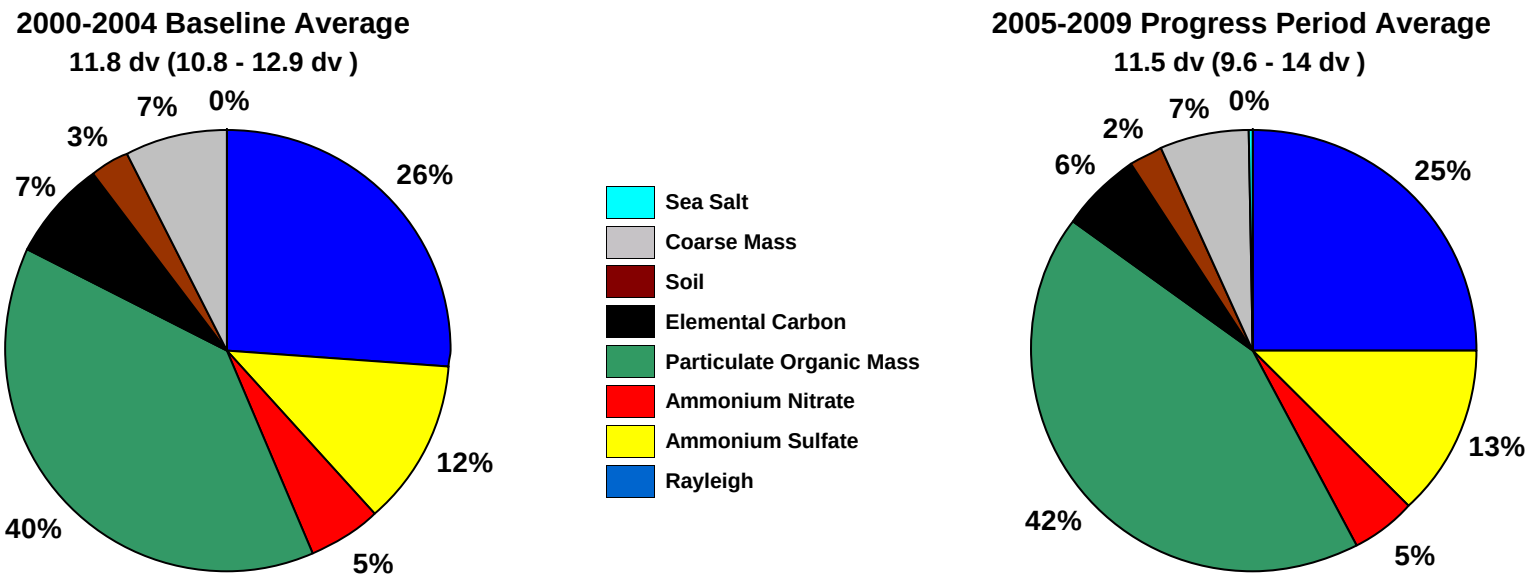
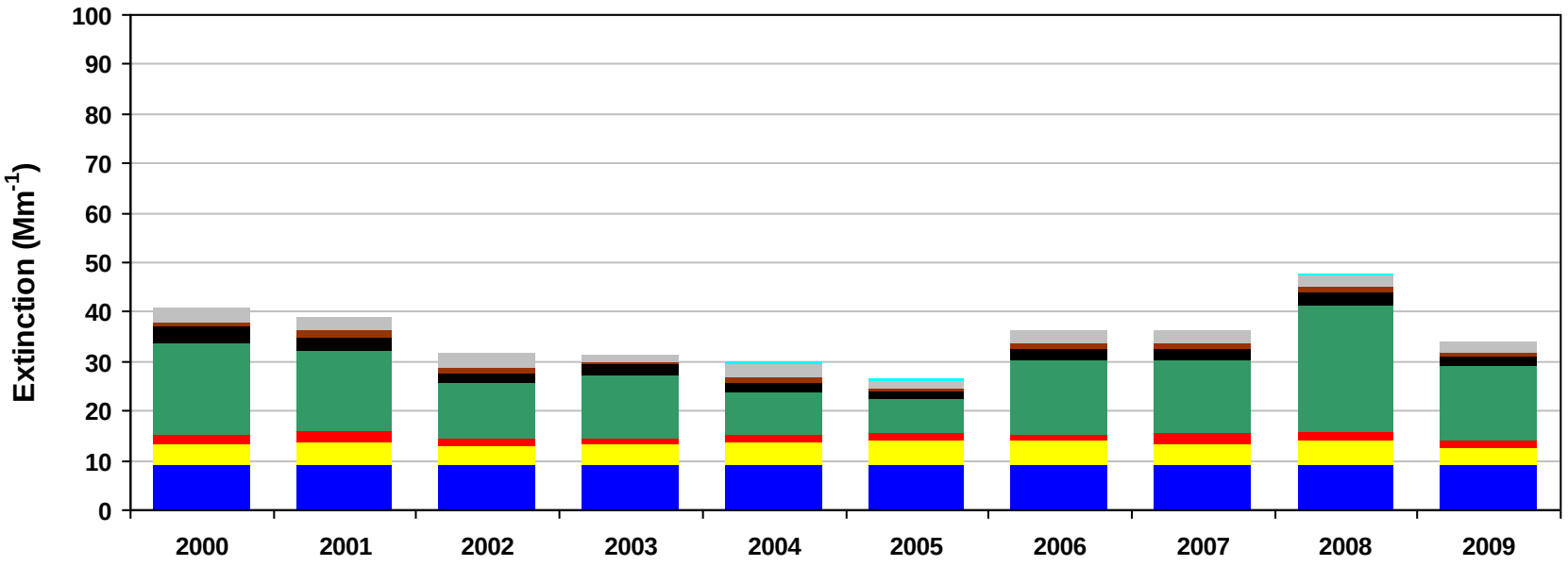


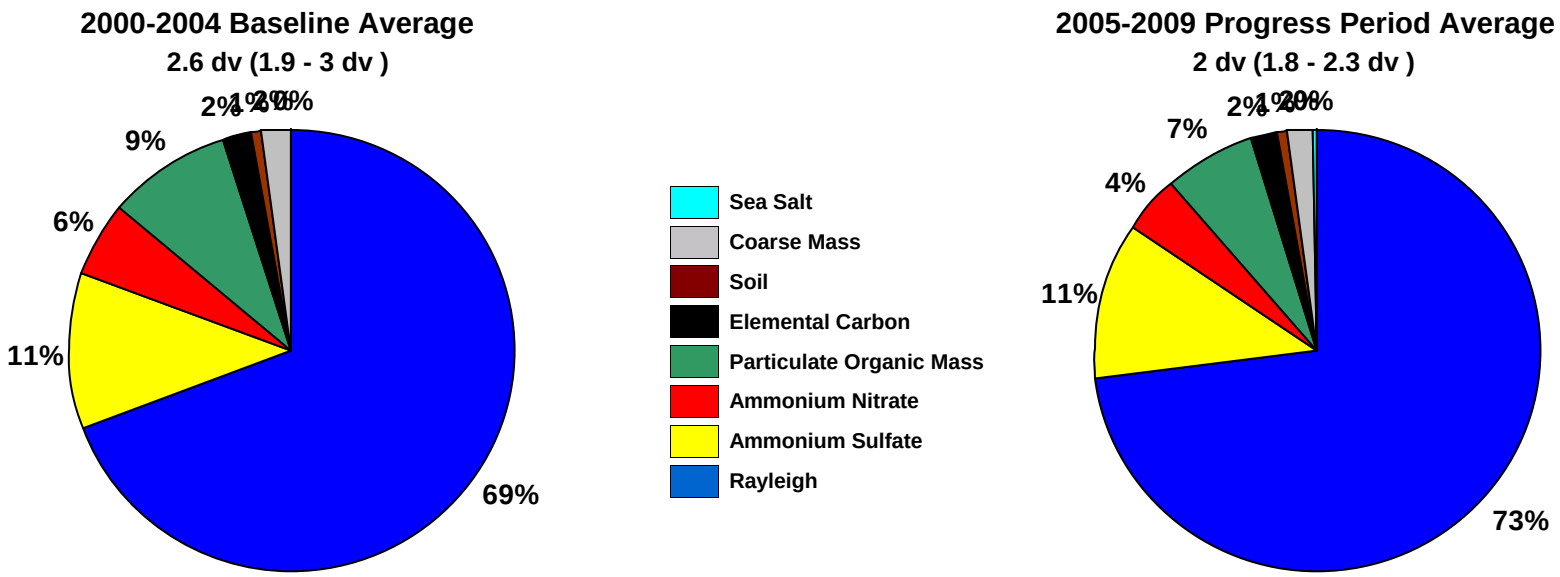
Figure G.8-3
Yellowstone NP, WY (YELL2 Site)
20% Most Impaired Visibility Days

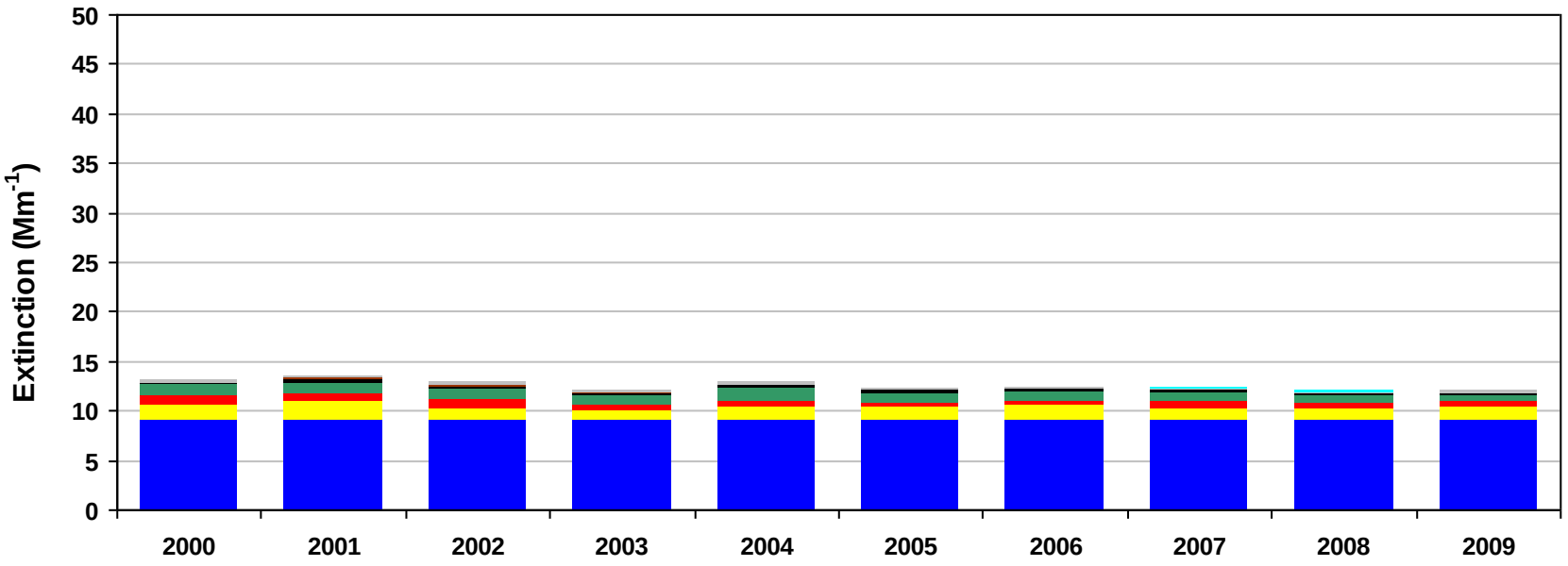




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure G.8-4
Yellowstone NP, WY (YELL2 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure G.8-5
Yellowstone NP, WY (YELL2 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

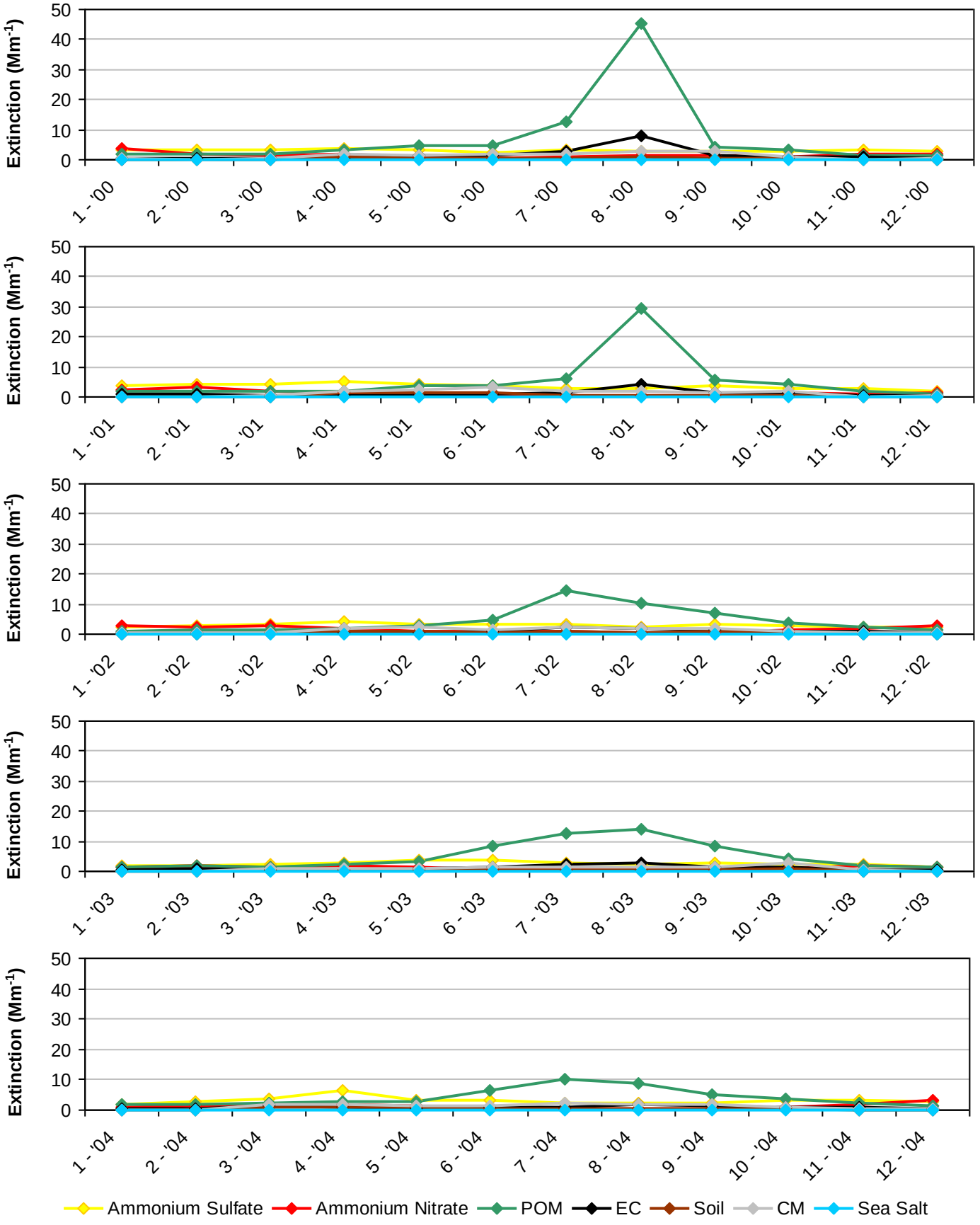


Figure G.8-6
Yellowstone NP, WY (YELL2 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

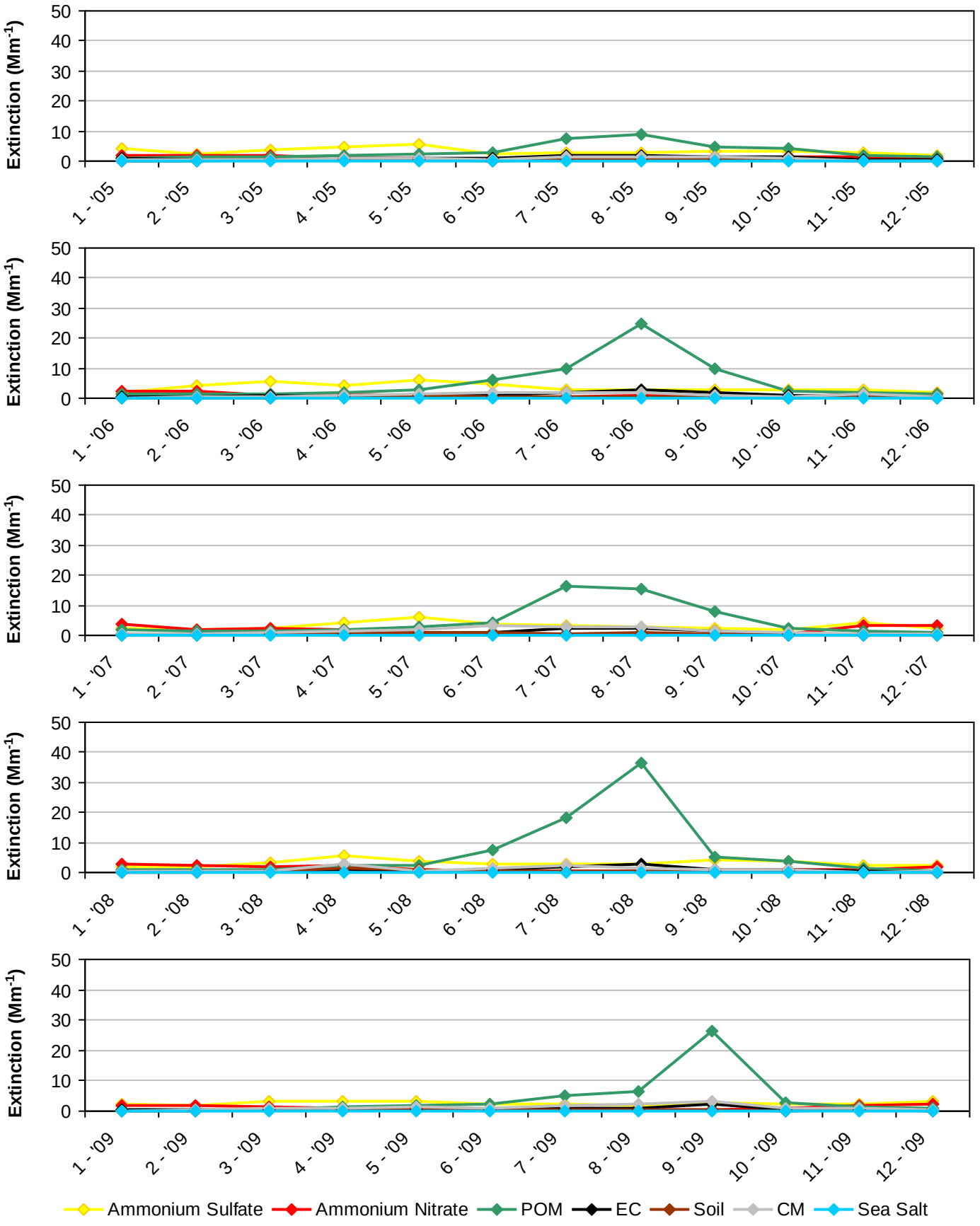


Figure G.8-7
Yellowstone NP, WY (YELL2 Site)
2000-2004 Progress Period Extinction, All Sampled Days

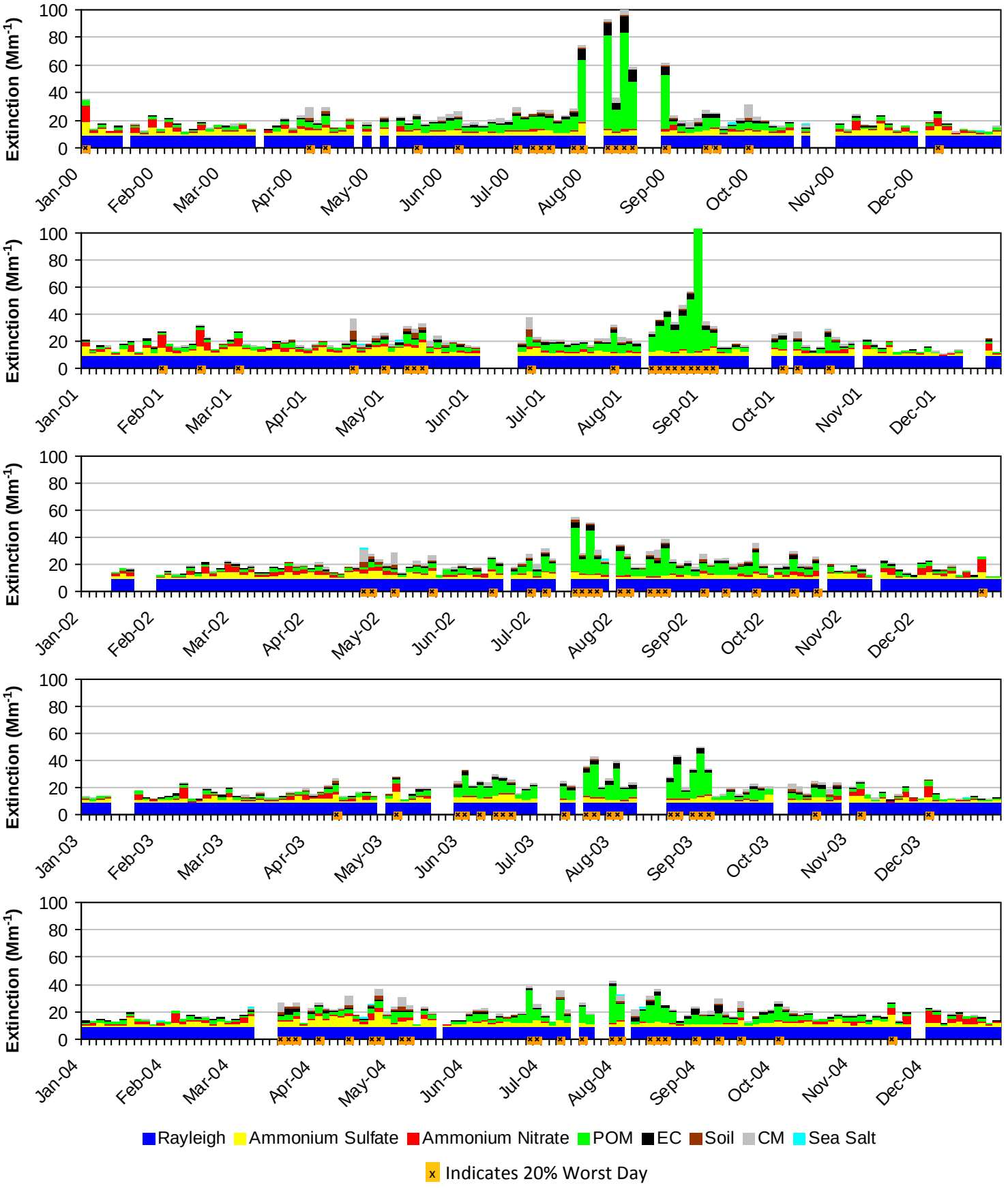
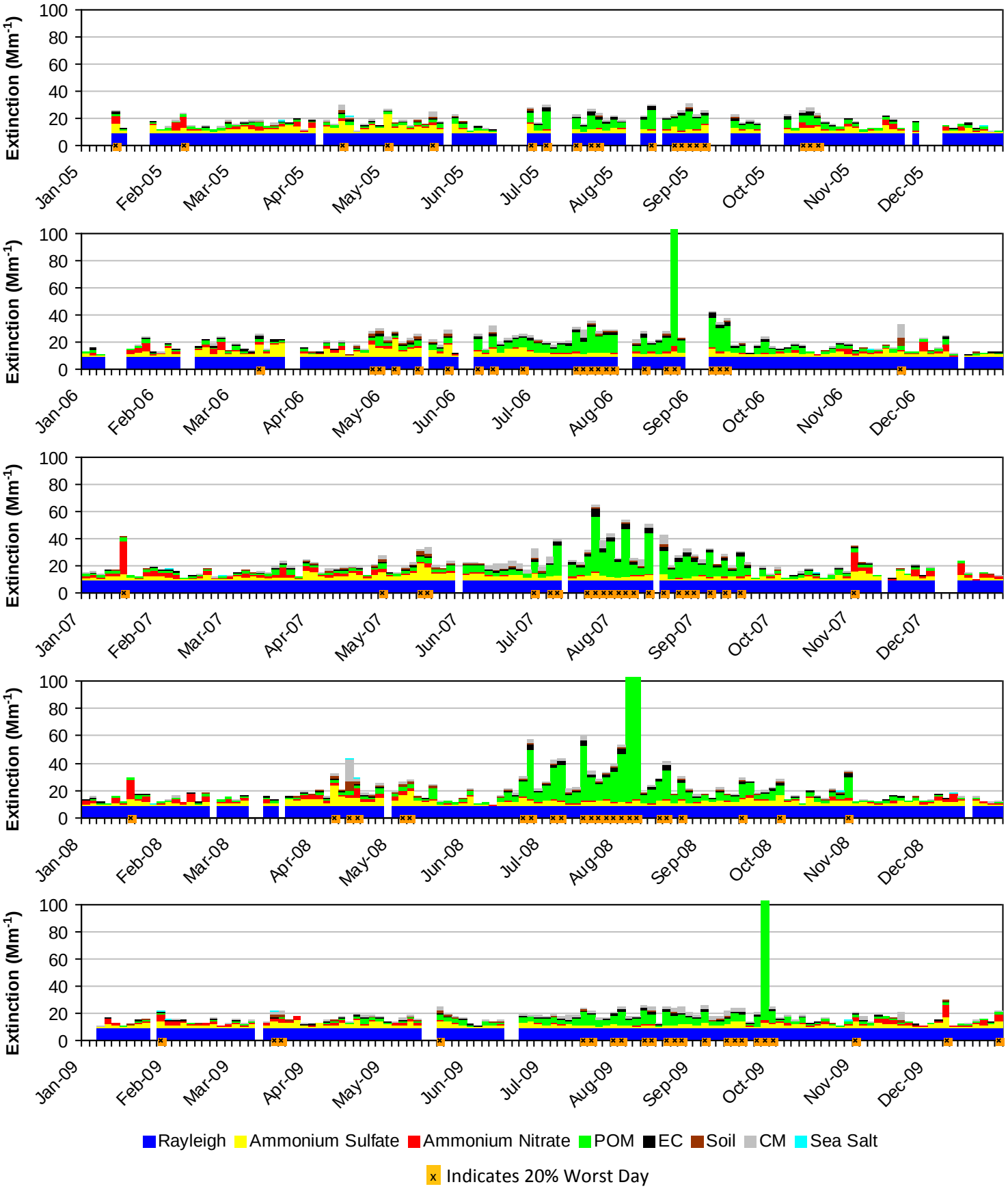


Figure G.8-8
Yellowstone NP, WY (YELL2 Site)
2005-2009 Progress Period Extinction, All Sampled Days



APPENDIX H:

Nevada Class I Area Monitoring Data Summary Tables and Charts

Includes the following subsections:

Subsection	IMPROVE Monitor	Class I Area(s) Represented
H.1	JARB1	Jarbidge WA

H.1. JARBIDGE WA (JARB1)

The following tables and figures are presented in this section for the Jarbidge WA represented by the JARB1 IMPROVE Monitor:

- **Table H.1-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure H.1-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure H.1-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure H.1-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure H.1-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure H.1-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure H.1-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure H.1-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

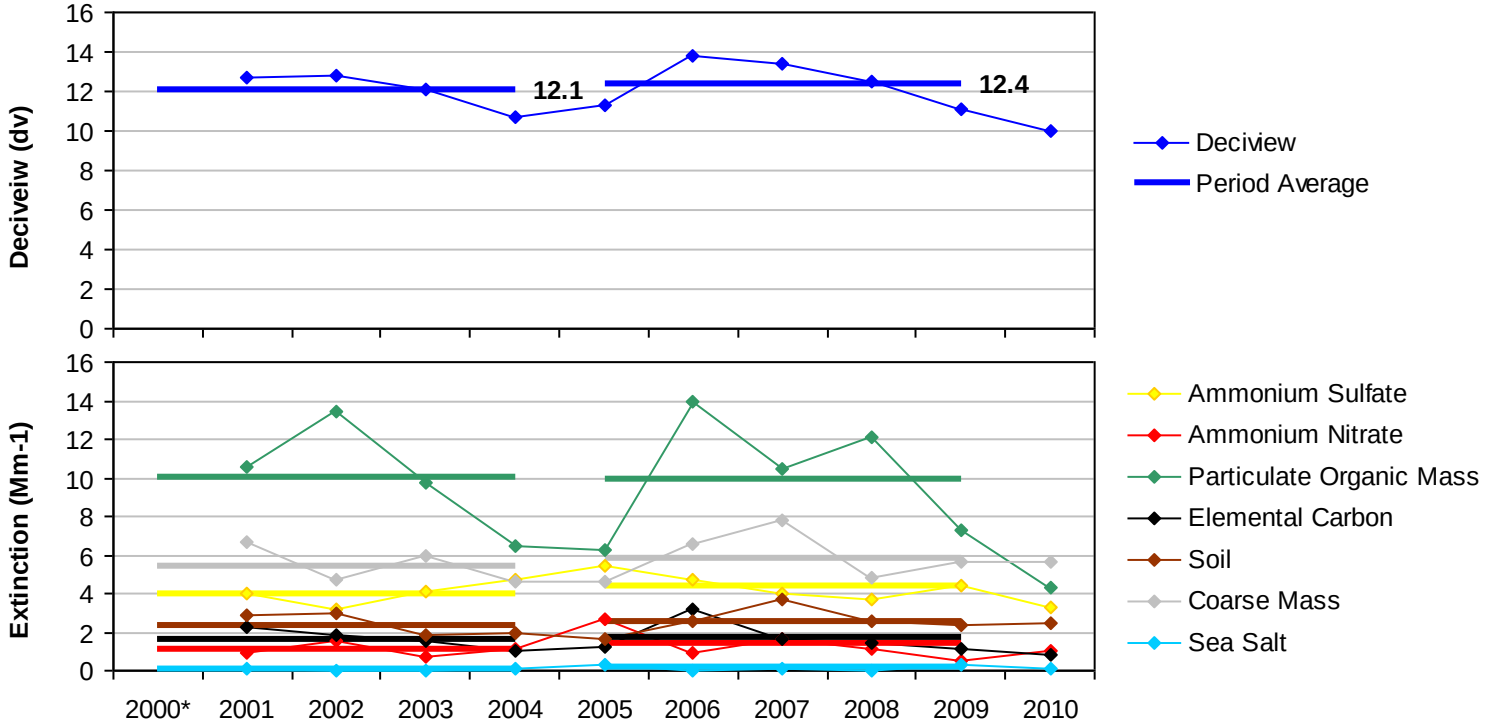
- **Figure H.1-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table H.1-1
Jarbidge WA, NV (JARB1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period						2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	2.7	2.4	2.5	2.5	2.5	2.4	2.2	1.9	1.8	1.8	-0.1	0.0	2.6	2.2	-0.4	-15%
Worst 20% Days	---	12.7	12.8	12.1	10.7	11.3	13.8	13.4	12.5	11.1	10.0	-0.1	0.4	12.1	12.4	0.3	3%
All Days	---	7.1	7.0	6.9	6.4	6.5	7.1	7.0	6.5	5.9	5.7	-0.1	0.1	6.9	6.6	-0.3	-4%
Total Extinction (Mm-1)																	
Best 20% Days	---	13.2	12.8	12.9	12.9	12.8	12.7	12.5	12.1	12.0	12.0	-0.1	0.0	12.9	12.4	-0.5	-4%
Worst 20% Days	---	37.4	37.7	33.8	29.9	32.2	41.8	39.3	35.9	31.7	27.7	-0.3	0.4	34.7	36.2	1.5	4%
All Days	---	22.1	21.9	21.2	20.0	20.4	22.7	22.1	20.8	19.3	18.6	-0.2	0.2	21.3	21.0	-0.3	-1%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	1.5	1.1	1.0	1.3	1.3	1.2	1.1	1.1	1.0	1.1	0.0	0.1	1.2	1.1	-0.1	-8%
Worst 20% Days	---	4.0	3.2	4.1	4.7	5.4	4.7	4.0	3.7	4.4	3.3	0.1	0.5	4.0	4.4	0.4	10%
All Days	---	2.9	2.2	2.3	2.7	3.2	3.1	2.9	2.5	2.7	2.4	0.0	0.4	2.5	2.9	0.4	16%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.2	0.3	0.3	0.2	0.1	0.3	0.2	0.2	0.1	0.0	0.1	0.3	0.2	-0.1	-33%
Worst 20% Days	---	1.0	1.5	0.7	1.1	2.7	1.0	1.7	1.1	0.5	1.0	0.0	0.5	1.1	1.4	0.3	27%
All Days	---	0.8	0.8	0.7	0.7	1.0	0.7	0.9	0.6	0.6	0.7	0.0	0.1	0.7	0.8	0.1	14%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	0.7	0.7	0.9	0.7	0.8	0.6	0.5	0.2	0.3	0.3	-0.1	0.0	0.8	0.5	-0.3	-38%
Worst 20% Days	---	10.6	13.4	9.7	6.5	6.3	13.9	10.4	12.1	7.3	4.3	-0.2	0.4	10.0	10.0	0.0	0%
All Days	---	3.8	4.6	4.0	3.1	2.9	4.3	3.4	3.9	2.6	2.0	-0.1	0.1	3.9	3.4	-0.5	-13%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.3	0.2	-0.1	-33%
Worst 20% Days	---	2.3	1.8	1.5	1.0	1.2	3.2	1.6	1.5	1.1	0.8	-0.1	0.1	1.6	1.7	0.1	6%
All Days	---	0.9	0.8	0.8	0.6	0.7	1.1	0.7	0.6	0.5	0.4	0.0	0.0	0.8	0.7	-0.1	-13%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0%
Worst 20% Days	---	2.8	3.0	1.8	1.9	1.6	2.5	3.7	2.6	2.3	2.5	0.0	0.5	2.4	2.6	0.2	8%
All Days	---	1.0	1.1	0.8	0.8	0.6	0.9	1.3	1.1	0.9	1.0	0.0	0.4	0.9	1.0	0.1	11%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.3	0.3	0.2	0.3	0.4	0.3	0.3	0.3	0.2	0.0	0.4	0.3	0.3	0.0	0%
Worst 20% Days	---	6.6	4.7	5.9	4.6	4.6	6.5	7.8	4.8	5.7	5.7	0.0	0.5	5.5	5.9	0.4	7%
All Days	---	2.4	2.3	2.6	2.1	1.8	2.4	2.8	2.1	1.9	2.1	-0.1	0.2	2.3	2.2	-0.1	-4%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0%
Worst 20% Days	---	0.1	0.0	0.0	0.1	0.3	0.0	0.1	0.0	0.3	0.1	0.0	0.3	0.1	0.2	0.1	100%
All Days	---	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0%

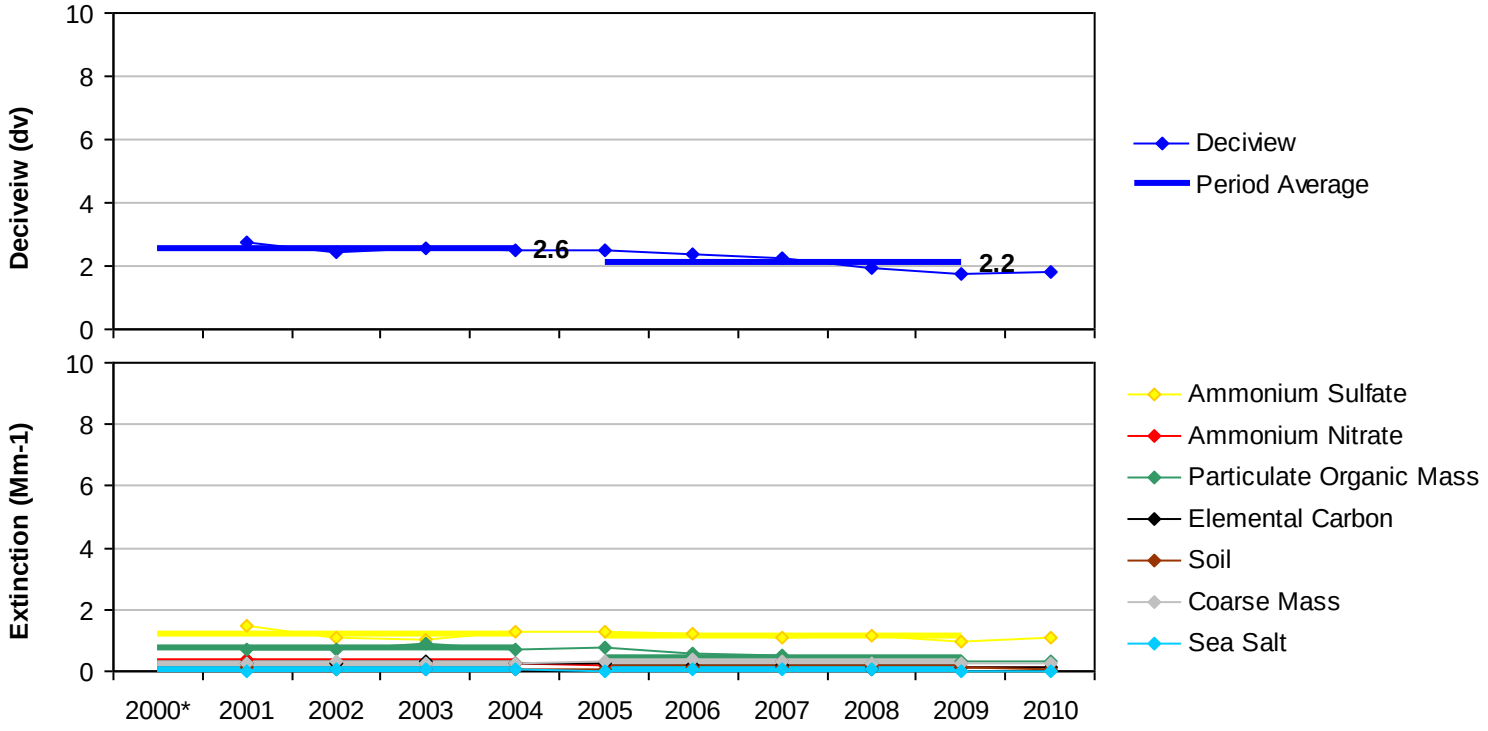
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure H.1-1
Jarbidge WA, NV (JARB1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



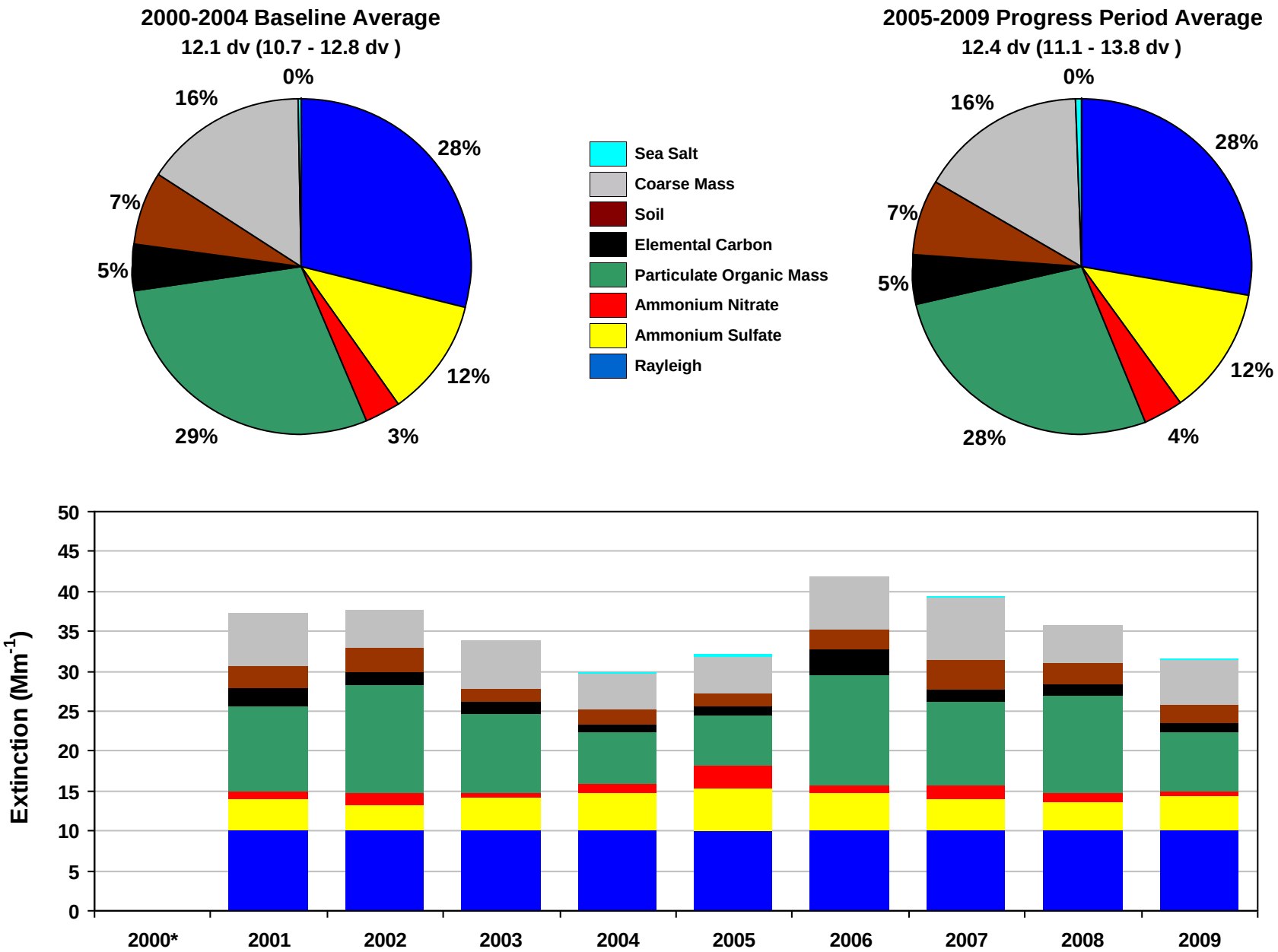
*Missing years did not meet RHR data completeness criteria.

Figure H.1-2
Jarbidge WA, NV (JARB1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



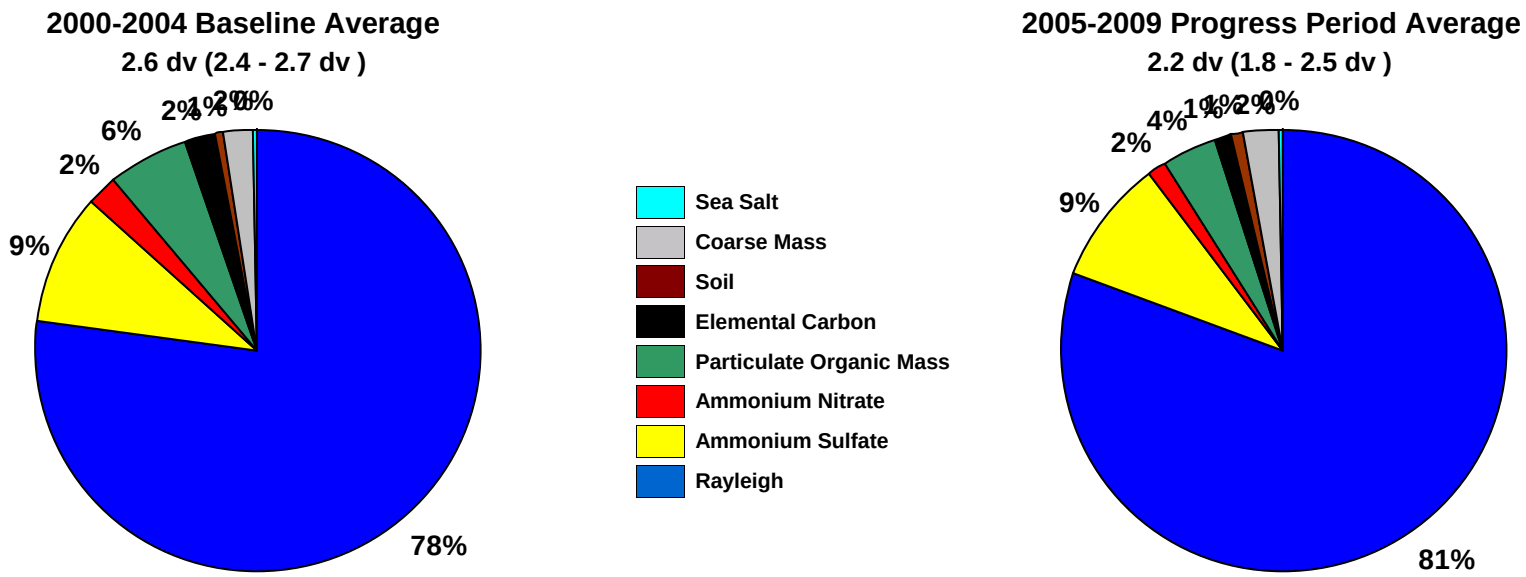
*Missing years did not meet RHR data completeness criteria.

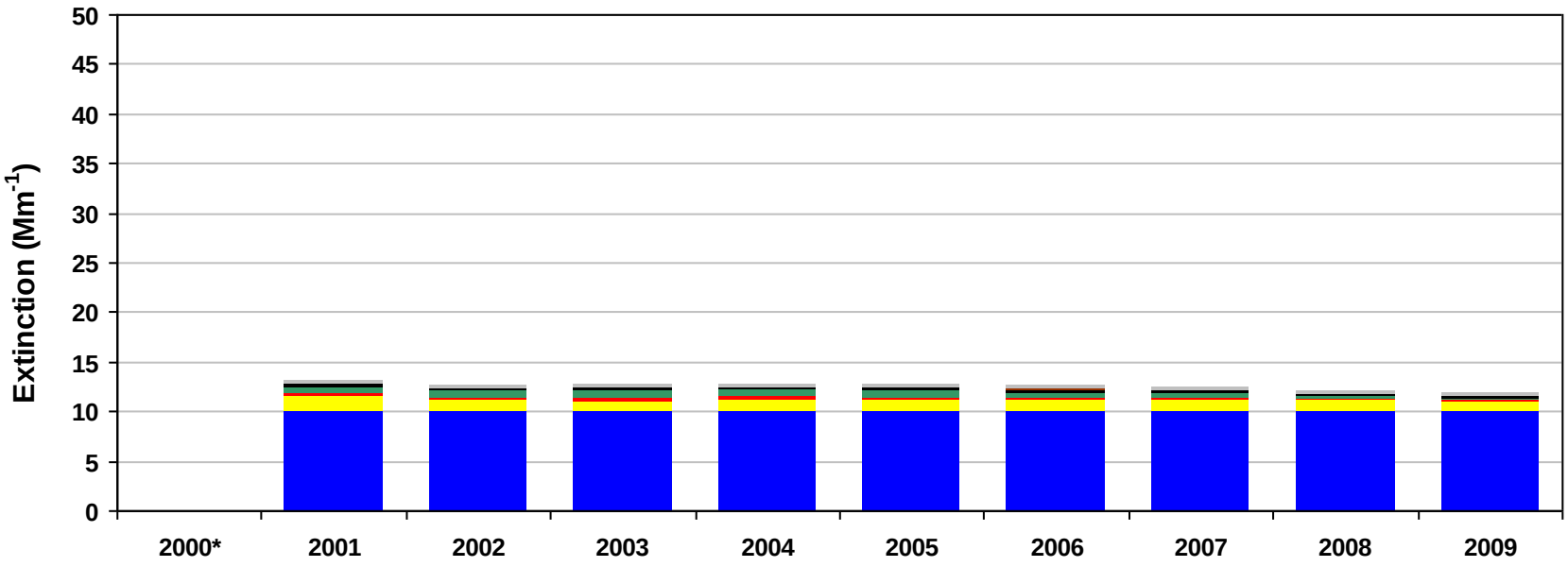
Figure H.1-3
Jarbidge WA, NV (JARB1 Site)
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

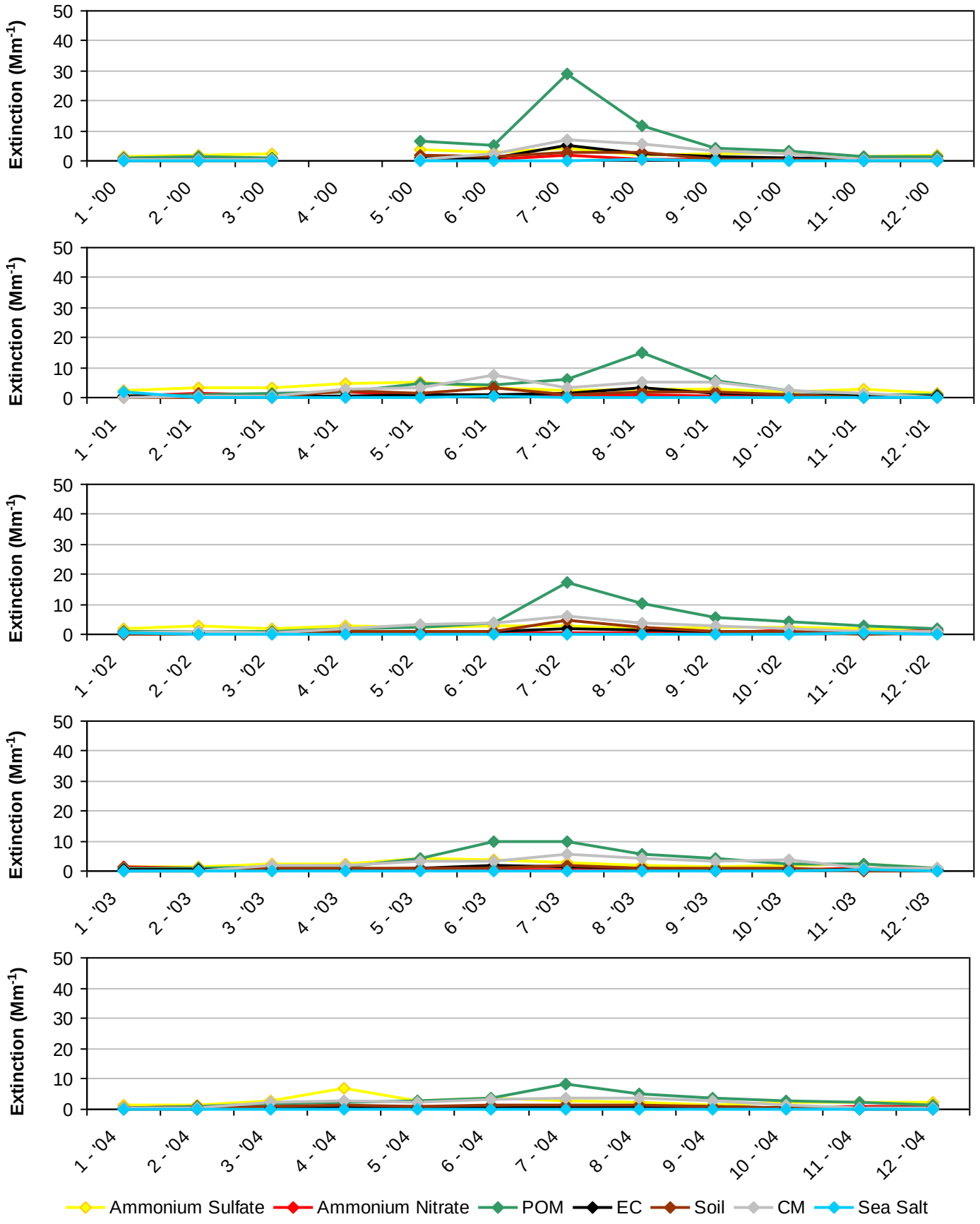
Figure H.1-4
Jarbidge WA, NV (JARB1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure H.1-5
Jarbidge WA, NV (JARB1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure H.1-6
Jarbidge WA, NV (JARB1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

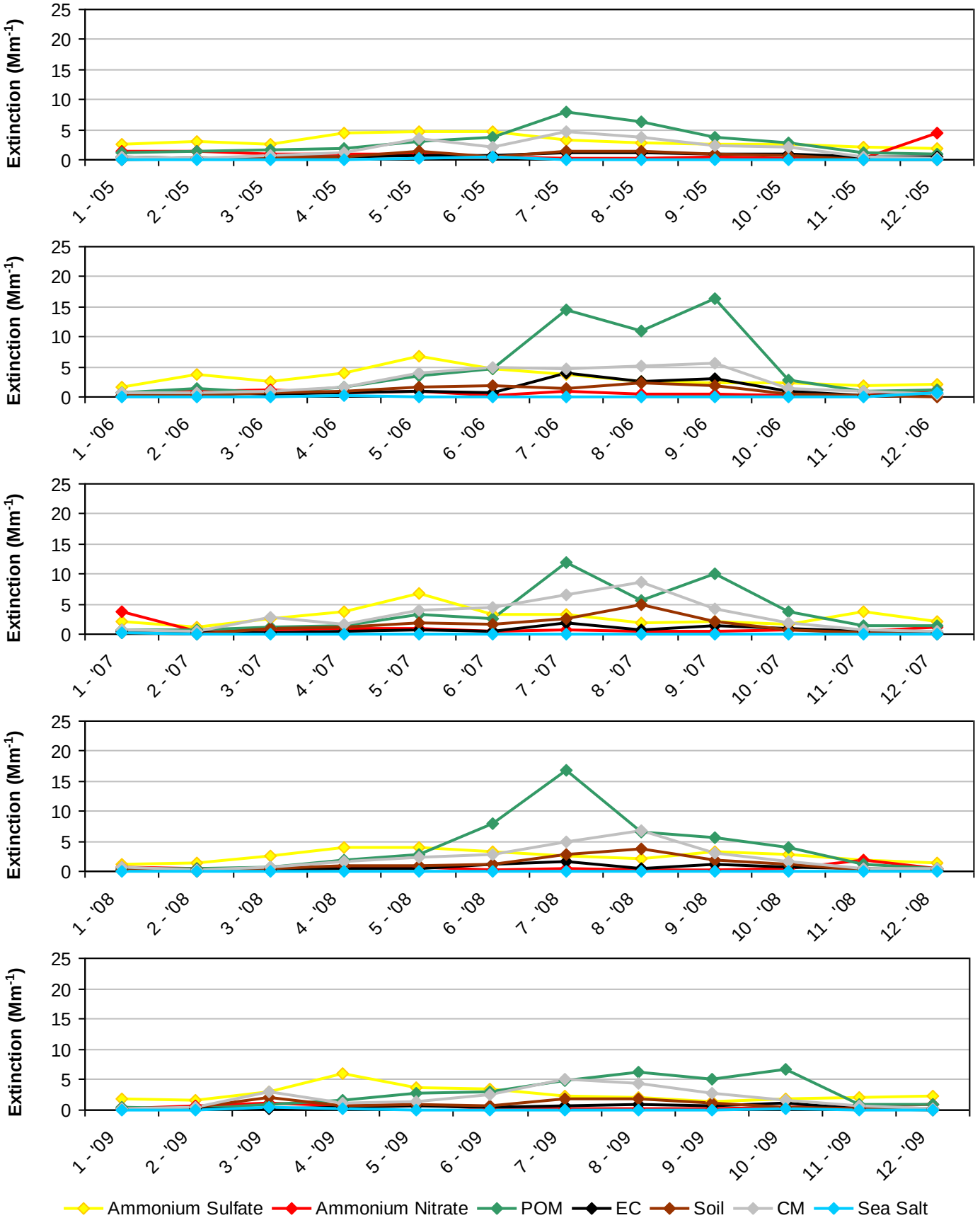
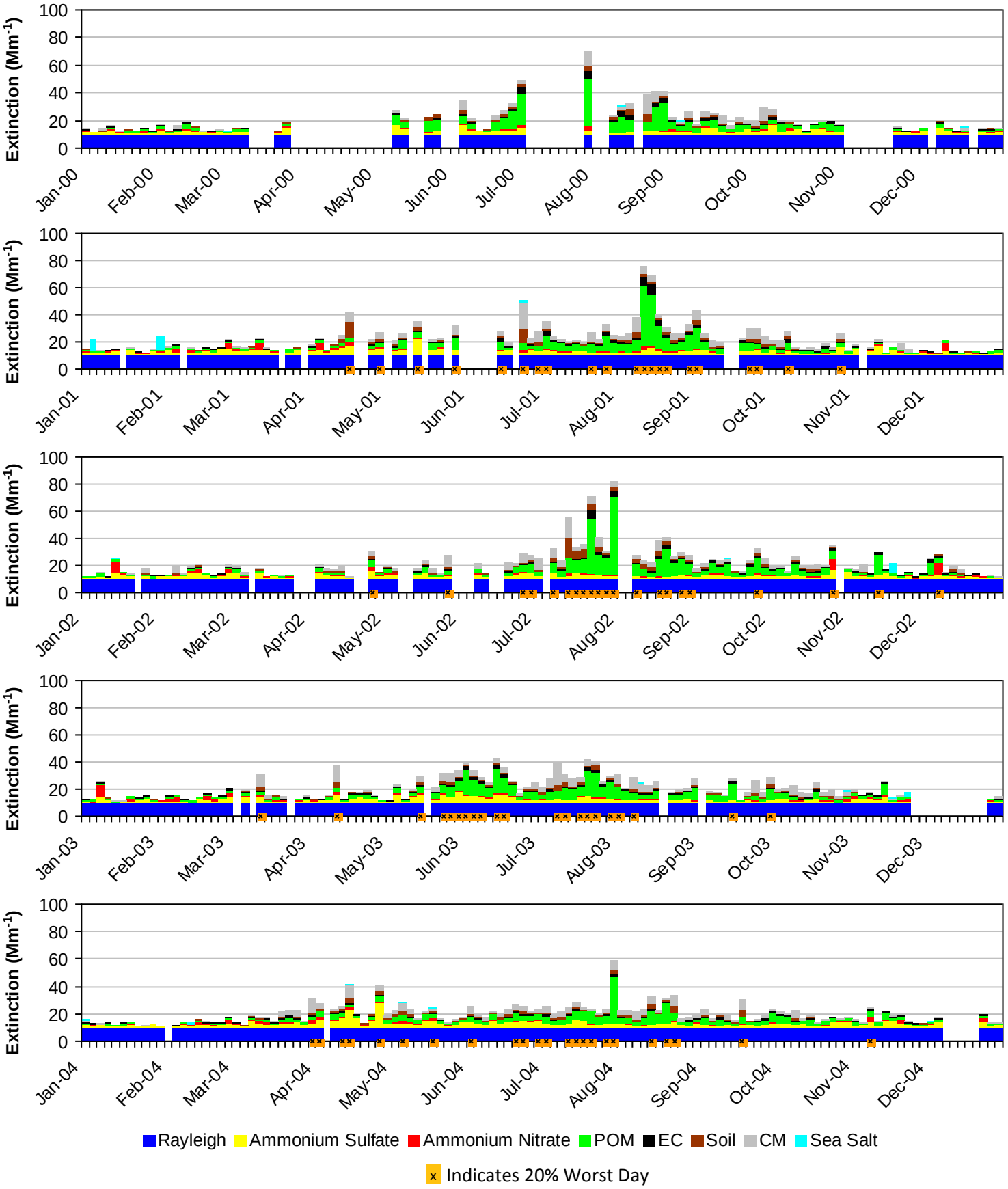
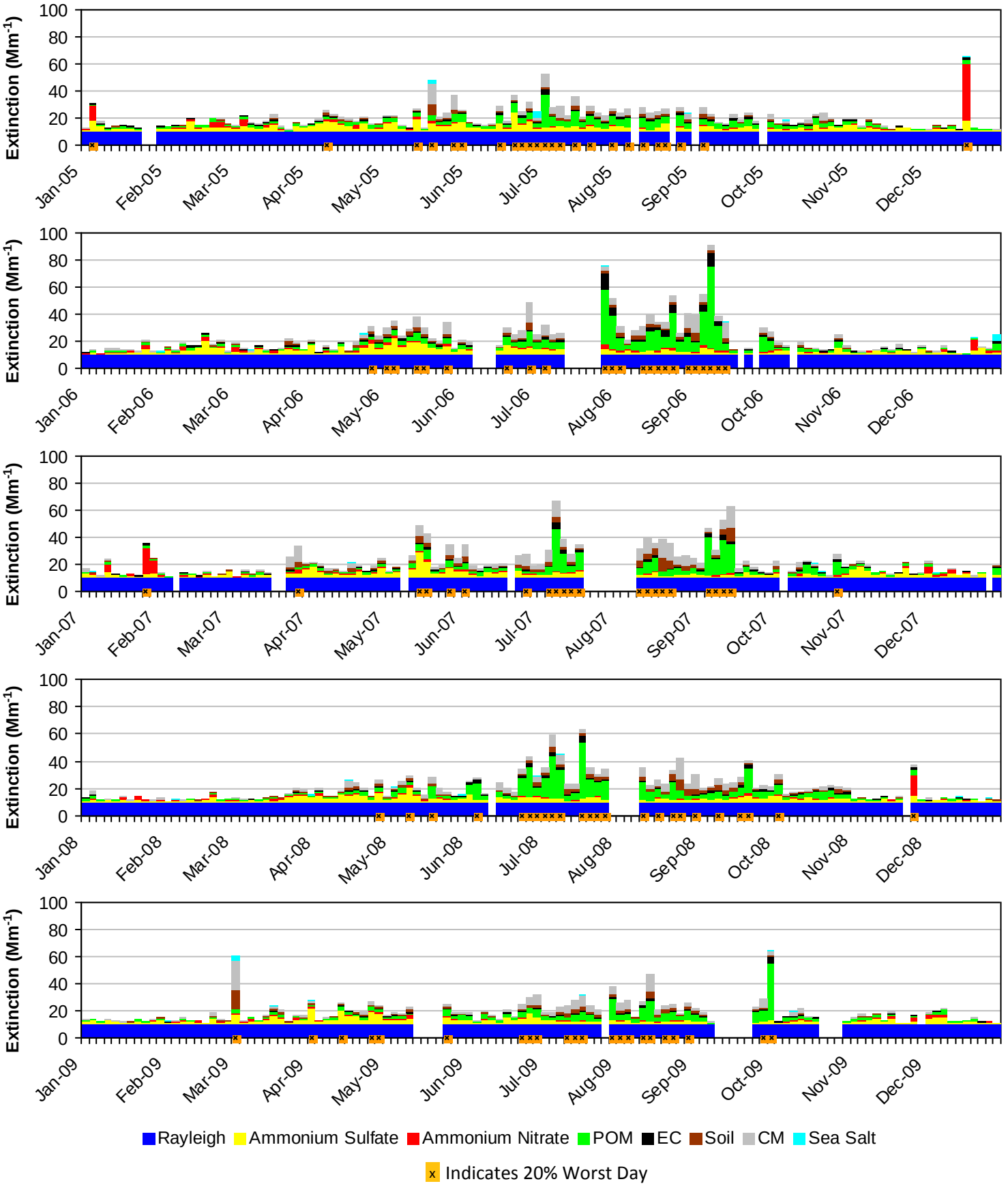


Figure H.1-7
Jarbidge WA, NV (JARB1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure H.1-8
Jarbidge WA, NV (JARB1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



APPENDIX I:

New Mexico Class I Area Monitoring Data Summary Tables and Charts

Includes the following subsections:

Subsection	IMPROVE Monitor	Class I Area(s) Represented
I.1	BAND1	Bandelier NM
I.2	BOAP1	Bosque del Apache WA
I.3	GICL1	Gila WA
I.4	GUMO1	Guadalupe Mountains NP and Carlsbad Caverns NP
I.5	SACR1	Salt Creek WA
I.6	SAPE1	San Pedro Parks WA
I.7	WHIT1	White Mountain WA
I.8	WHPE1	Wheeler Peak WA and Pecos WA

I.1. BANDELIER NM (BAND1)

The following tables and figures are presented in this section for the Bandelier NM represented by the BAND1 IMPROVE Monitor:

- **Table I.1-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure I.1-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure I.1-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure I.1-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure I.1-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure I.1-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure I.1-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure I.1-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure I.1-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table I.1-1
Bandelier NM, NM (BAND1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	4.9	4.9	5.0	4.9	4.9	4.1	4.6	4.5	3.9	3.6	3.4	-0.1	0.0	5.0	4.2	-0.8	-16%
Worst 20% Days	14.6	11.1	12.3	12.7	10.5	12.3	11.6	12.8	11.5	11.0	9.7	-0.2	0.2	12.2	11.8	-0.4	-3%
All Days	9.1	7.9	8.4	8.4	7.8	8.0	7.8	8.2	7.6	7.1	6.5	-0.1	0.0	8.3	7.7	-0.6	-7%
Total Extinction (Mm-1)																	
Best 20% Days	16.4	16.4	16.6	16.4	16.5	15.1	15.9	15.8	14.8	14.4	14.1	-0.2	0.0	16.5	15.2	-1.3	-8%
Worst 20% Days	67.6	30.5	35.8	37.7	28.7	34.8	32.2	38.7	31.8	32.1	26.8	-0.6	0.2	40.1	33.9	-6.2	-16%
All Days	31.4	22.5	24.2	24.4	22.2	23.2	22.5	24.2	22.1	21.5	19.6	-0.4	0.0	25.0	22.7	-2.3	-9%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	2.4	2.9	2.5	2.0	2.4	2.0	2.5	2.4	1.7	1.9	1.8	-0.1	0.0	2.4	2.1	-0.3	-13%
Worst 20% Days	7.6	7.5	7.1	7.1	5.2	10.6	7.7	8.4	7.3	7.9	5.3	0.0	0.3	6.9	8.4	1.5	22%
All Days	5.0	4.9	4.6	4.4	4.0	5.3	4.5	4.9	4.4	4.2	3.5	-0.1	0.1	4.6	4.7	0.1	2%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.8	0.6	0.8	0.8	0.7	0.6	0.5	0.6	0.7	0.4	0.5	0.0	0.0	0.7	0.6	-0.1	-14%
Worst 20% Days	2.8	2.2	2.6	2.8	2.2	1.4	2.1	4.1	2.3	2.0	1.6	0.0	0.2	2.5	2.4	-0.1	-4%
All Days	1.6	1.4	1.6	1.4	1.4	1.0	1.1	1.6	1.2	1.1	0.9	0.0	0.1	1.4	1.2	-0.2	-14%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	2.0	1.7	2.1	2.4	2.4	1.6	1.7	2.0	1.9	1.5	1.2	0.0	0.2	2.1	1.8	-0.3	-14%
Worst 20% Days	38.1	5.4	9.5	11.6	6.5	8.0	6.9	11.8	5.0	6.3	4.1	-0.5	0.2	14.2	7.6	-6.6	-47%
All Days	11.1	3.3	4.6	5.5	4.2	4.2	3.6	5.0	3.4	3.4	2.8	-0.2	0.1	5.7	3.9	-1.8	-32%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.9	0.8	0.9	1.0	0.9	0.9	1.0	0.8	0.7	0.6	0.5	0.0	0.2	0.9	0.8	-0.1	-11%
Worst 20% Days	6.8	2.0	2.5	2.5	1.9	2.2	2.1	2.8	1.5	1.9	1.2	-0.1	0.1	3.1	2.1	-1.0	-32%
All Days	2.6	1.3	1.6	1.5	1.4	1.6	1.4	1.5	1.1	1.2	0.9	-0.1	0.1	1.7	1.3	-0.4	-24%
Soil Extinction (Mm-1)																	
Best 20% Days	0.3	0.4	0.4	0.2	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.0	0.1	0.3	0.2	-0.1	-33%
Worst 20% Days	0.9	1.1	1.4	1.2	1.0	0.7	1.0	0.5	2.3	1.5	1.1	0.0	0.4	1.1	1.2	0.1	9%
All Days	0.5	0.7	0.8	0.7	0.6	0.4	0.7	0.5	0.9	0.8	0.6	0.0	0.2	0.6	0.7	0.1	17%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	1.0	1.0	1.0	1.0	0.7	0.9	1.0	0.8	0.6	0.7	0.8	0.0	0.0	0.9	0.8	-0.1	-11%
Worst 20% Days	2.4	2.6	3.5	3.4	2.8	2.7	3.4	1.9	4.4	3.5	4.3	0.1	0.2	2.9	3.2	0.3	10%
All Days	1.6	1.9	1.9	2.0	1.6	1.6	2.1	1.6	2.0	1.9	1.9	0.0	0.2	1.8	1.8	0.0	0%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0%
Worst 20% Days	0.1	0.7	0.3	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.2	0.2	0.1	-0.1	-50%
All Days	0.0	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	-0.1	-100%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure I.1-1
Bandelier NM, NM (BAND1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

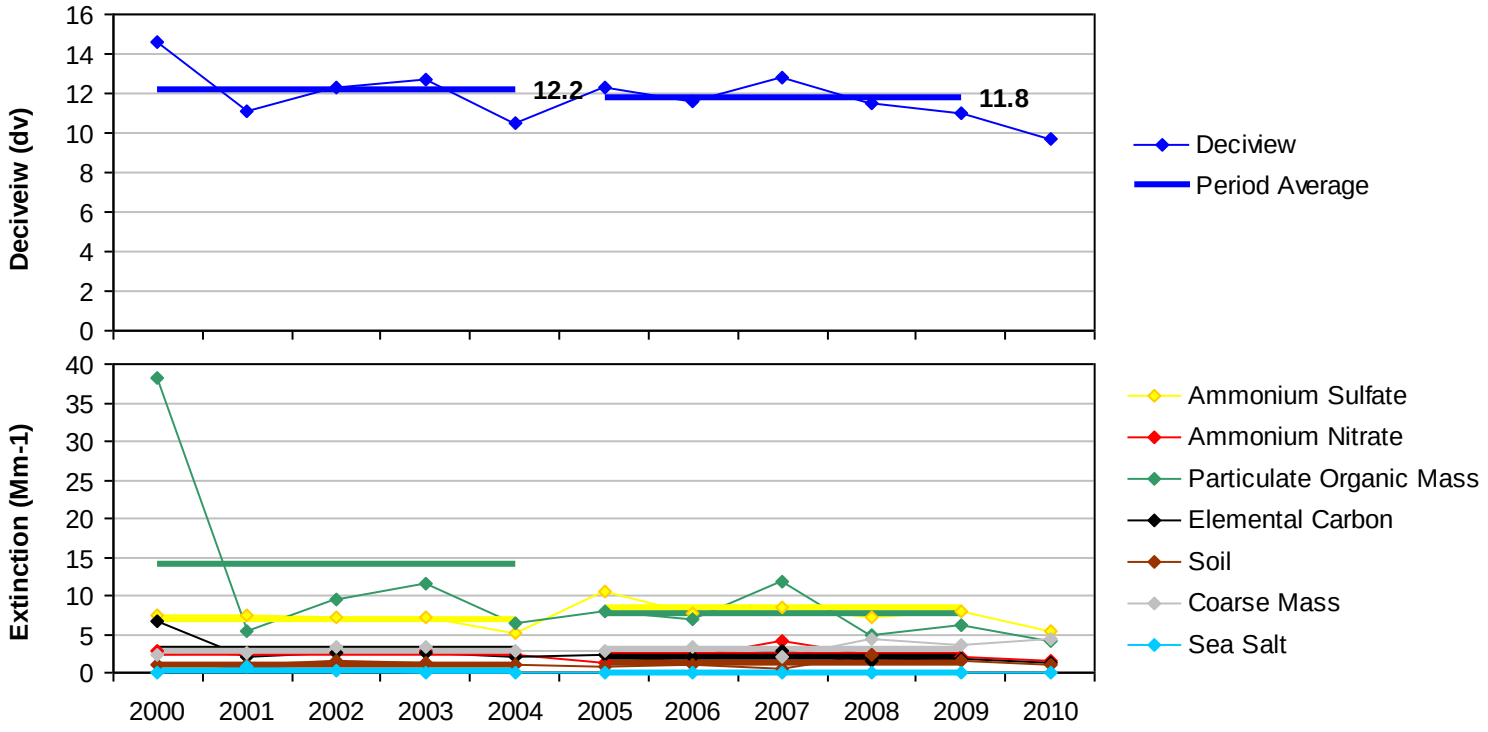


Figure I.1-2
Bandelier NM, NM (BAND1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

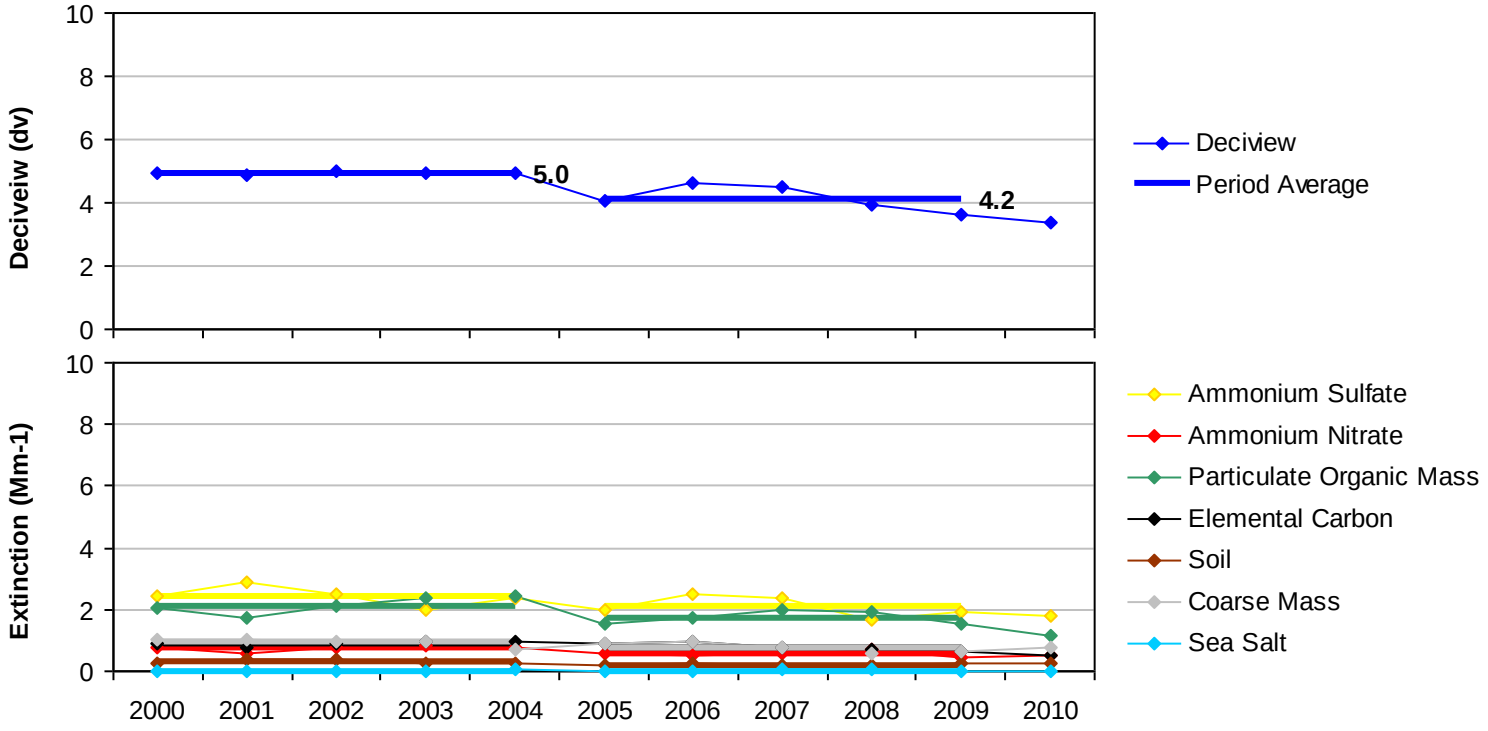


Figure I.1-3
Bandelier NM, NM (BAND1 Site)
20% Most Impaired Visibility Days

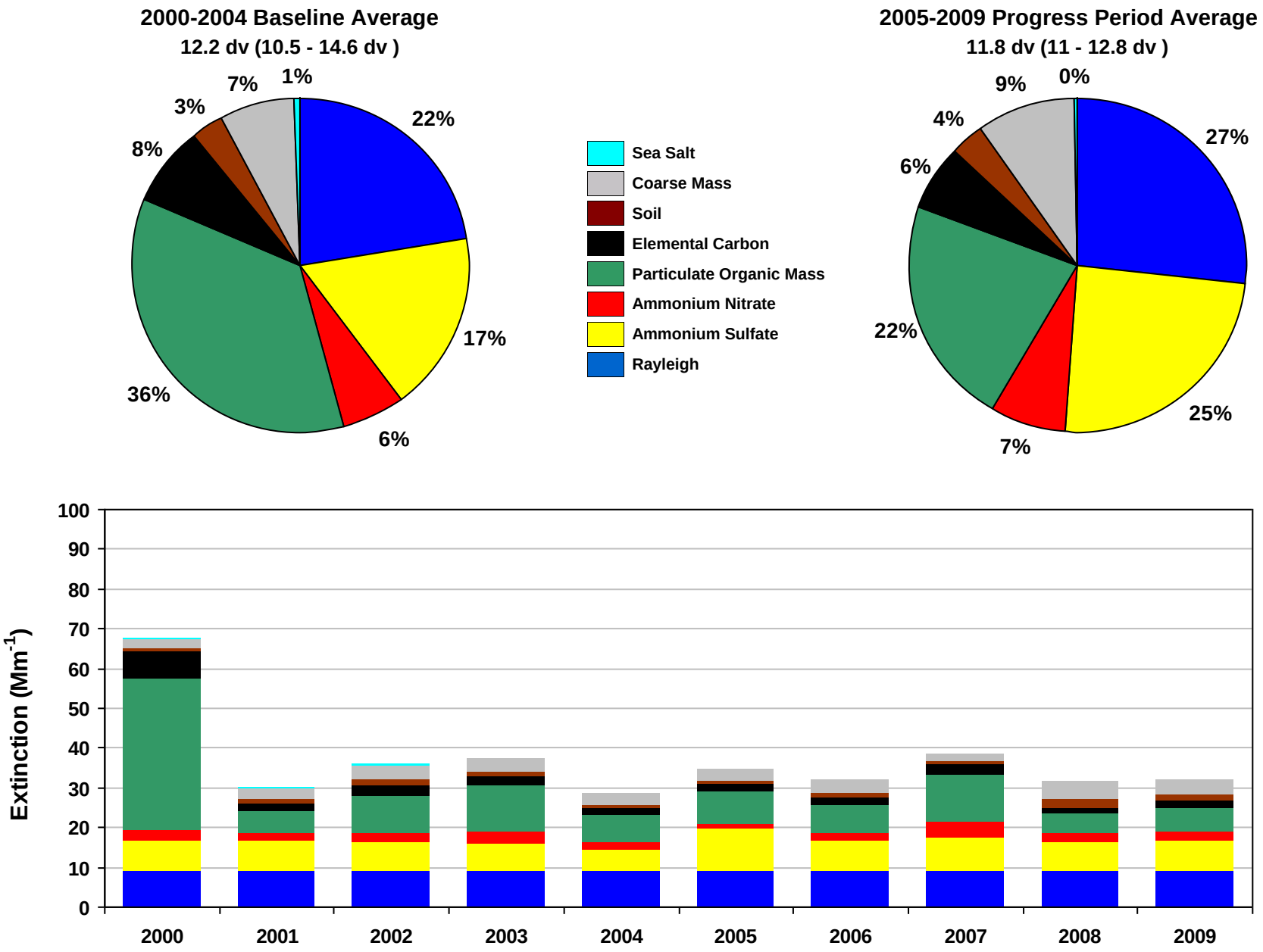
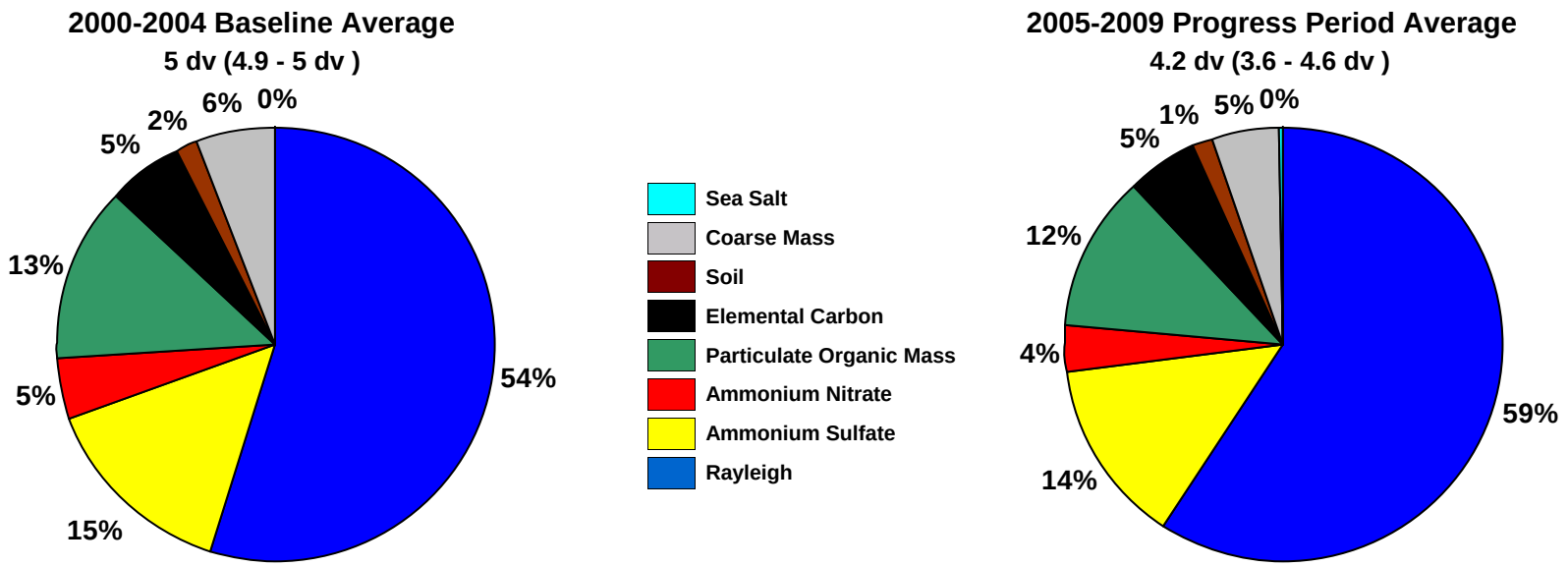


Figure I.1-4
Bandelier NM, NM (BAND1 Site)
20% Least Impaired Visibility Days



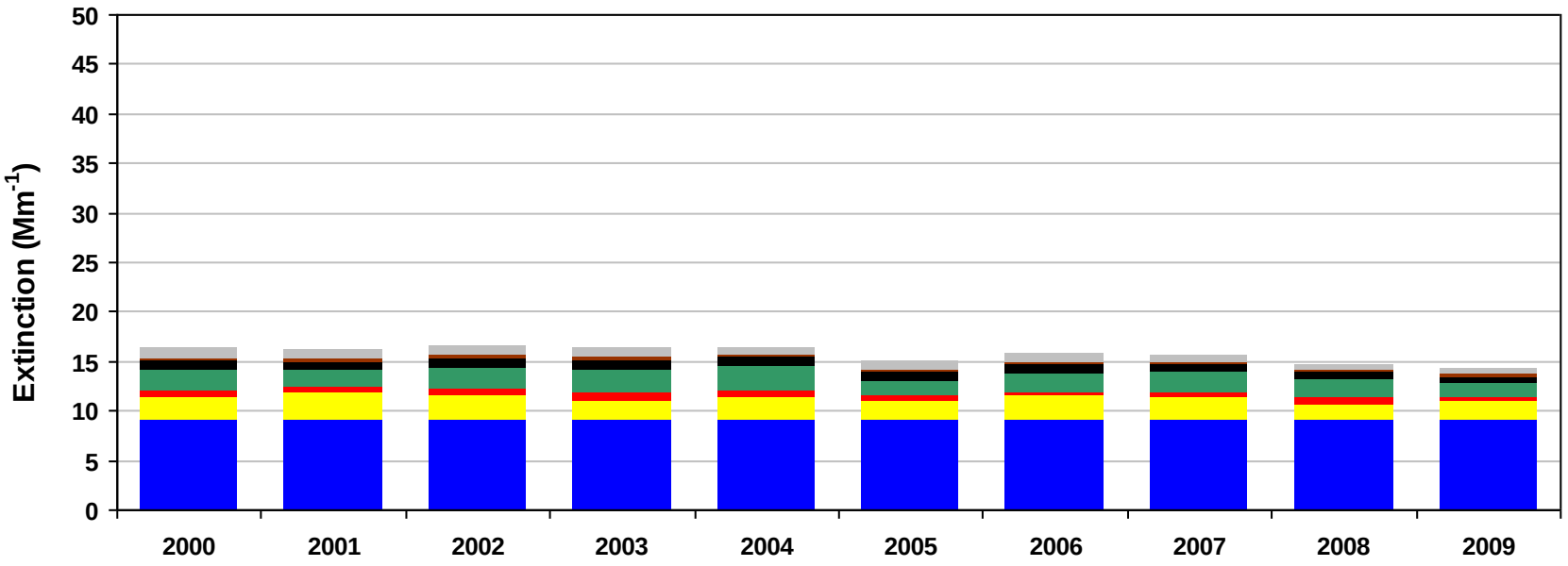


Figure I.1-5
Bandelier NM, NM (BAND1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

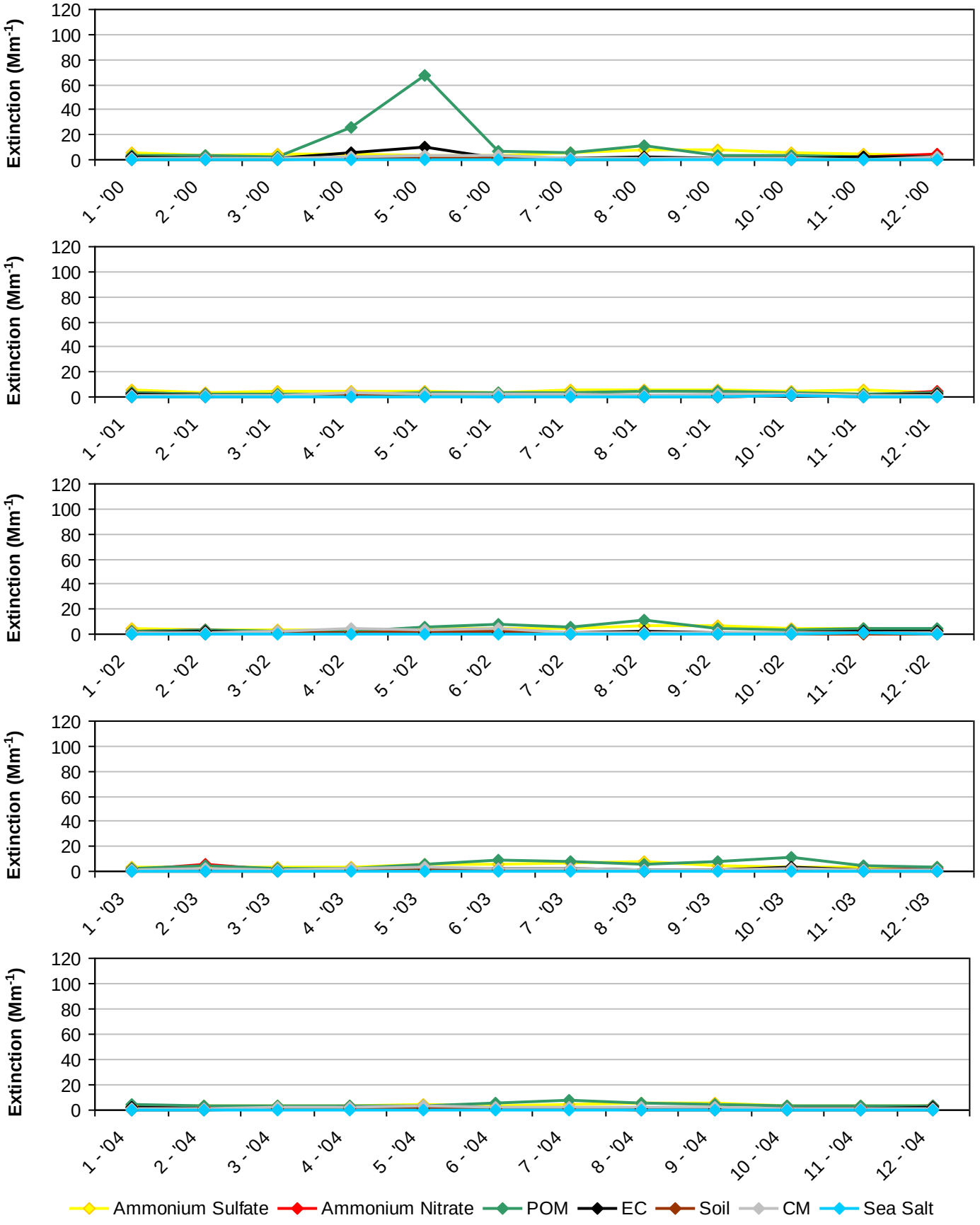


Figure I.1-6
Bandelier NM, NM (BAND1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

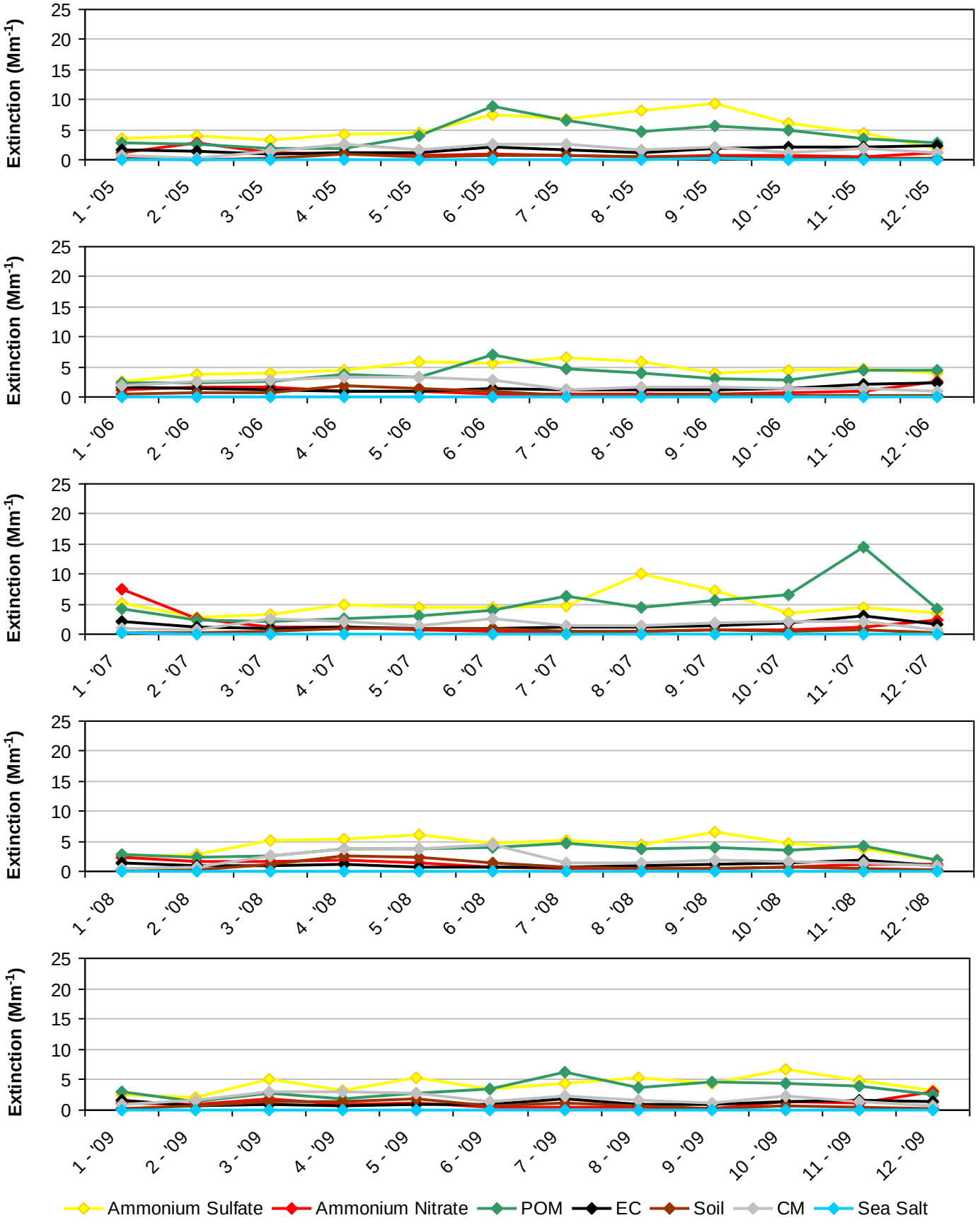


Figure I.1-7
Bandelier NM, NM (BAND1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

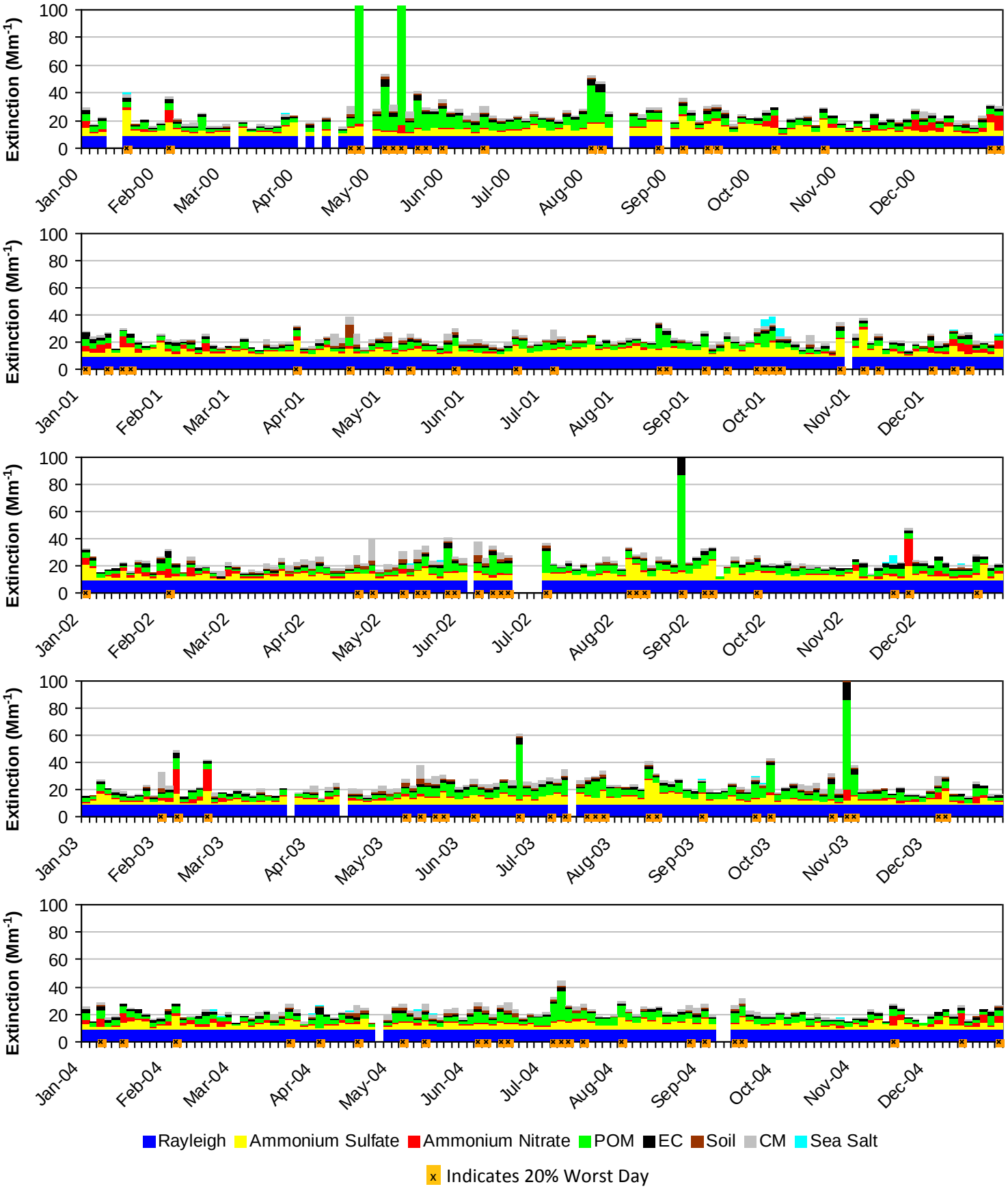
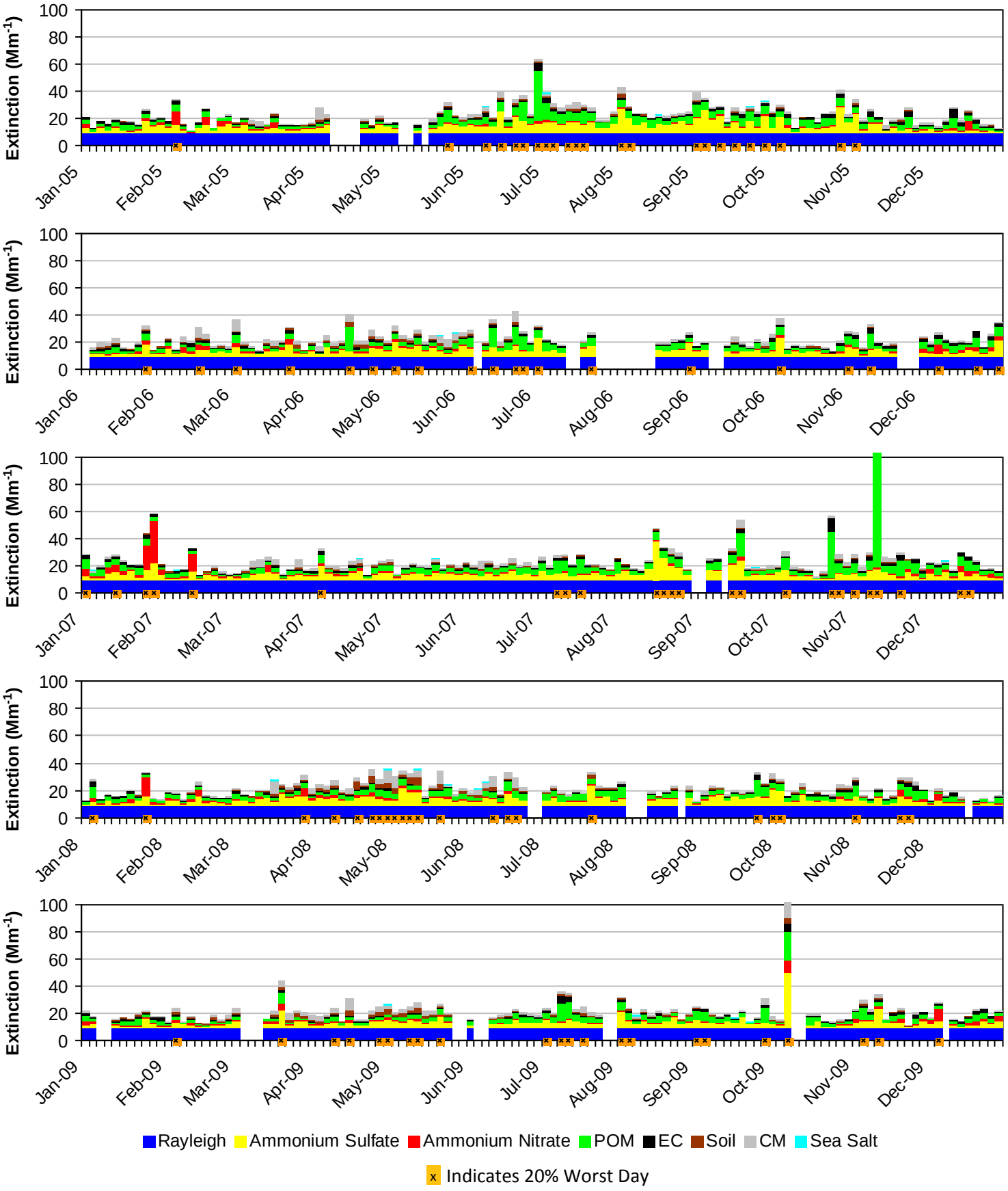


Figure I.1-8
Bandelier NM, NM (BAND1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



I.2. BOSQUE DEL APACHE WA (BOAP1)

The following tables and figures are presented in this section for the Bosque del Apache WA represented by the BOAP1 IMPROVE Monitor:

- **Table I.2-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure I.2-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure I.2-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure I.2-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure I.2-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure I.2-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure I.2-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure I.2-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

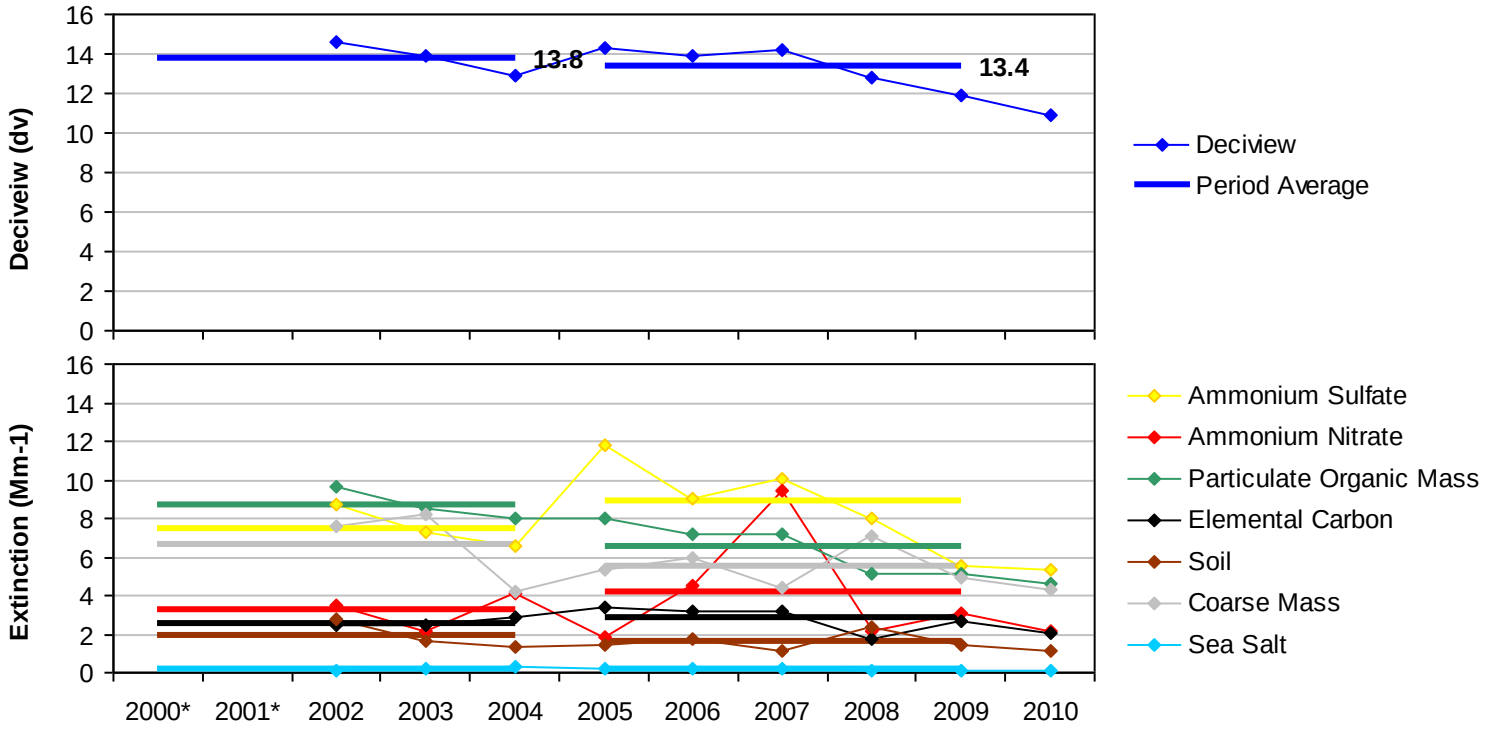
- **Figure I.2-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table I.2-1
Bosque del Apache WA, NM (BOAP1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	---	6.5	6.8	5.5	5.9	6.3	5.9	5.2	5.5	4.6	-0.2	0.1	6.3	5.8	-0.5	-8%
Worst 20% Days	---	---	14.6	13.9	12.9	14.3	13.9	14.2	12.8	11.9	10.9	-0.3	0.0	13.8	13.4	-0.4	-3%
All Days	---	---	10.1	10.4	8.9	9.6	9.6	9.4	8.9	8.6	7.9	-0.2	0.0	9.8	9.2	-0.6	-6%
Total Extinction (Mm-1)																	
Best 20% Days	---	---	19.3	19.8	17.5	18.1	18.8	18.1	16.9	17.5	15.9	-0.3	0.1	18.9	17.9	-1.0	-5%
Worst 20% Days	---	---	44.7	40.5	37.5	42.1	41.8	45.7	36.5	32.9	29.7	-0.9	0.1	40.9	39.8	-1.1	-3%
All Days	---	---	28.7	29.3	25.4	27.4	27.4	27.5	25.4	24.3	22.5	-0.6	0.1	27.8	26.4	-1.4	-5%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	---	2.8	2.9	2.6	2.8	2.9	2.9	2.2	2.4	2.1	-0.1	0.1	2.8	2.6	-0.2	-7%
Worst 20% Days	---	---	8.7	7.3	6.6	11.8	9.1	10.1	8.0	5.5	5.3	-0.2	0.4	7.5	8.9	1.4	19%
All Days	---	---	5.2	5.1	4.4	6.4	5.4	5.5	4.9	4.2	3.9	-0.1	0.3	4.9	5.3	0.4	8%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	---	0.8	0.9	0.8	0.6	0.6	0.7	0.6	0.6	0.5	0.0	0.1	0.8	0.6	-0.2	-25%
Worst 20% Days	---	---	3.4	2.1	4.1	1.9	4.5	9.4	2.1	3.1	2.2	0.1	0.5	3.2	4.2	1.0	31%
All Days	---	---	1.6	1.4	1.7	1.1	1.6	2.6	1.2	1.3	1.0	0.0	0.4	1.6	1.6	0.0	0%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	---	2.3	2.4	1.8	1.7	1.8	1.9	1.7	1.7	1.1	-0.1	0.1	2.1	1.8	-0.3	-14%
Worst 20% Days	---	---	9.6	8.5	8.0	8.0	7.2	7.2	5.2	5.2	4.6	-0.6	0.0	8.7	6.5	-2.2	-25%
All Days	---	---	4.7	5.1	4.2	4.1	3.8	3.9	3.5	3.2	2.8	-0.2	0.0	4.7	3.7	-1.0	-21%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	---	1.2	1.2	0.9	1.0	1.1	0.9	0.8	0.9	0.5	-0.1	0.0	1.1	0.9	-0.2	-18%
Worst 20% Days	---	---	2.5	2.5	2.9	3.4	3.2	3.2	1.8	2.6	2.0	0.0	0.5	2.6	2.8	0.2	8%
All Days	---	---	1.7	1.8	1.6	2.0	1.9	1.7	1.3	1.4	1.2	-0.1	0.1	1.7	1.7	0.0	0%
Soil Extinction (Mm-1)																	
Best 20% Days	---	---	0.4	0.4	0.3	0.3	0.5	0.3	0.3	0.4	0.4	0.0	0.6	0.3	0.4	0.1	33%
Worst 20% Days	---	---	2.8	1.7	1.4	1.5	1.7	1.1	2.3	1.4	1.1	-0.1	0.3	1.9	1.6	-0.3	-16%
All Days	---	---	1.3	1.0	0.8	0.8	1.0	0.8	1.2	1.0	0.8	0.0	0.5	1.0	0.9	-0.1	-10%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	---	1.9	1.9	0.9	1.6	1.8	1.2	1.1	1.5	1.3	-0.1	0.1	1.6	1.4	-0.2	-13%
Worst 20% Days	---	---	7.6	8.3	4.2	5.3	5.9	4.4	7.0	4.9	4.4	-0.3	0.3	6.7	5.5	-1.2	-18%
All Days	---	---	4.1	4.8	2.6	2.8	3.5	2.8	3.3	3.1	2.7	-0.1	0.3	3.8	3.1	-0.7	-18%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	---	0.0	0.2	0.2	0.1	0.2	0.1	0.1	0.0	0.1	0.0	0.4	0.1	0.1	0.0	0%
Worst 20% Days	---	---	0.1	0.2	0.3	0.2	0.3	0.2	0.1	0.1	0.1	0.0	0.5	0.2	0.2	0.0	0%
All Days	---	---	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.6	0.1	0.2	0.1	100%

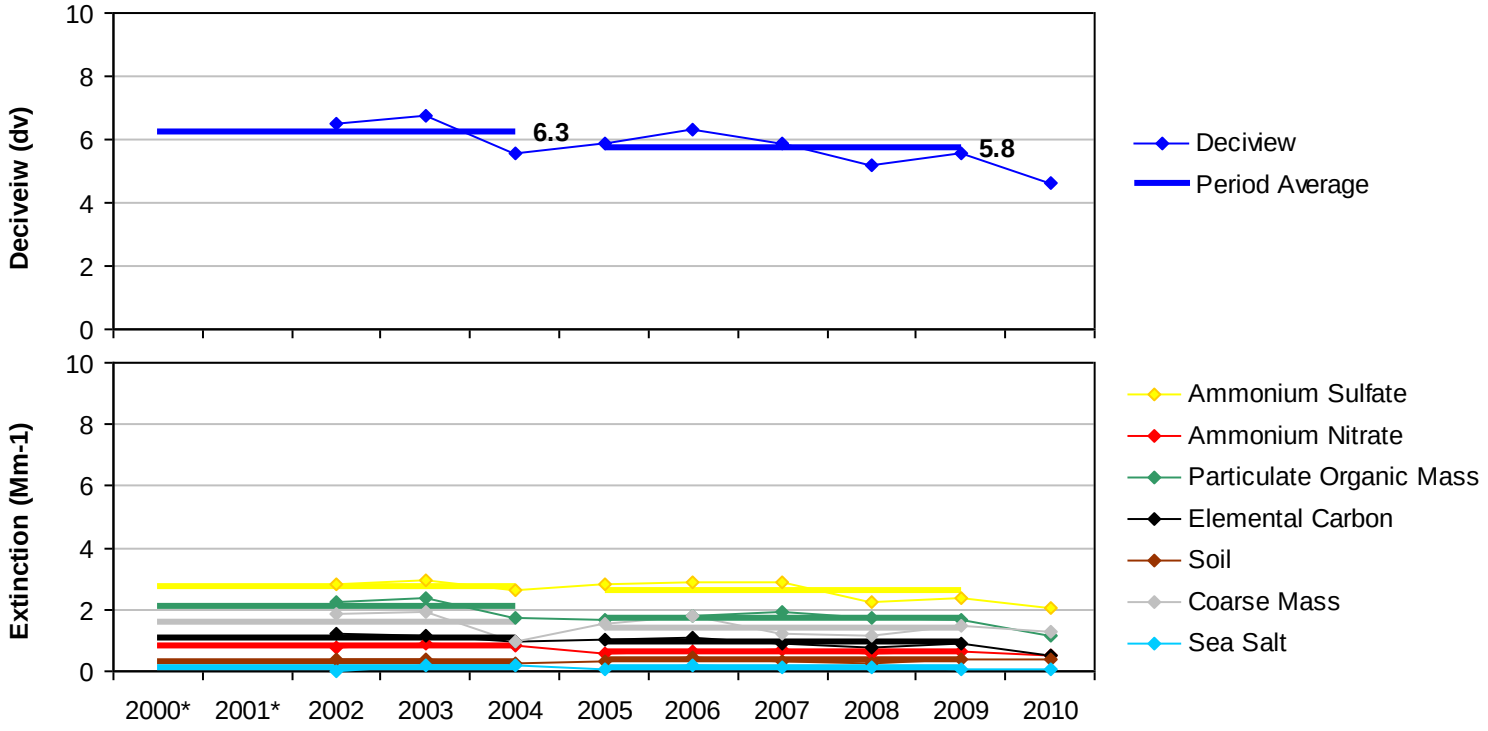
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure I.2-1
Bosque del Apache WA, NM (BOAP1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



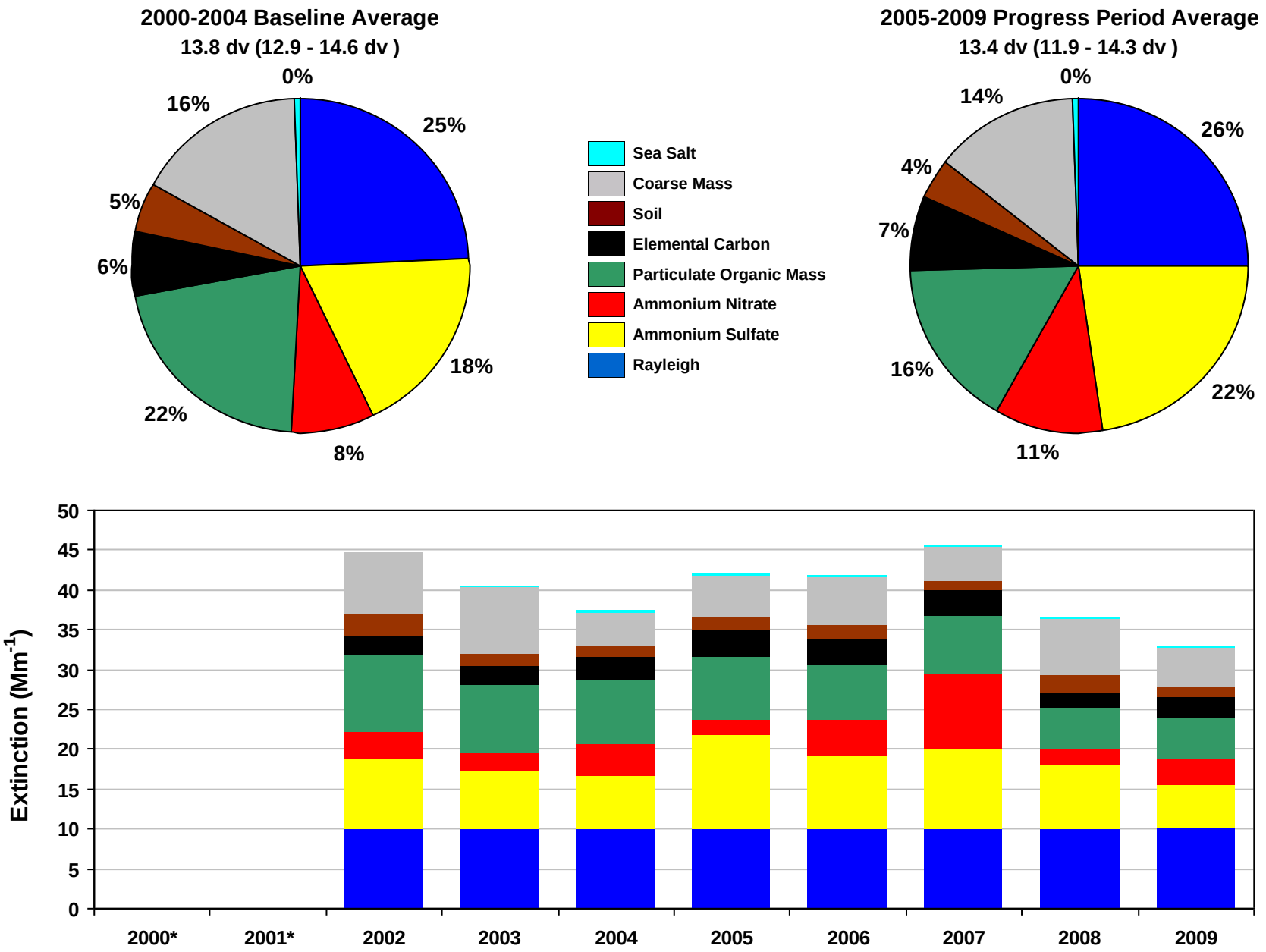
*Missing years did not meet RHR data completeness criteria.

Figure I.2-2
Bosque del Apache WA, NM (BOAP1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



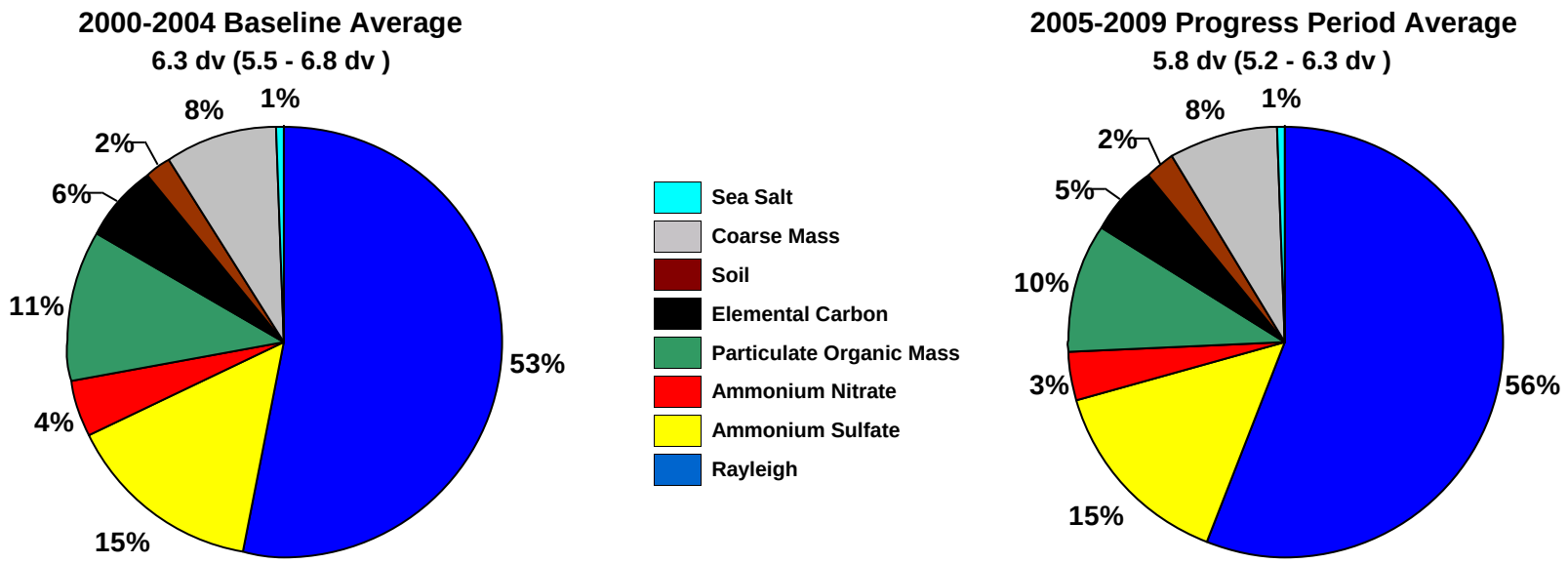
*Missing years did not meet RHR data completeness criteria.

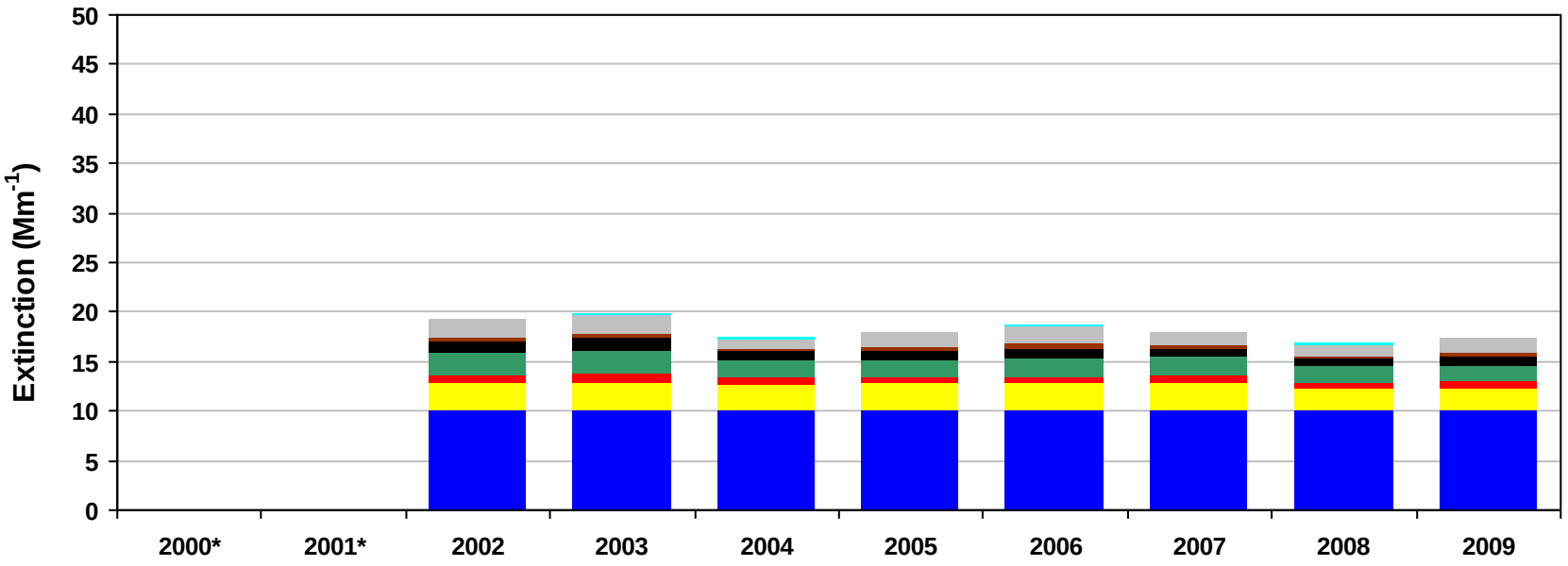
Figure I.2-3
Bosque del Apache WA, NM (BOAP1 Site)
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

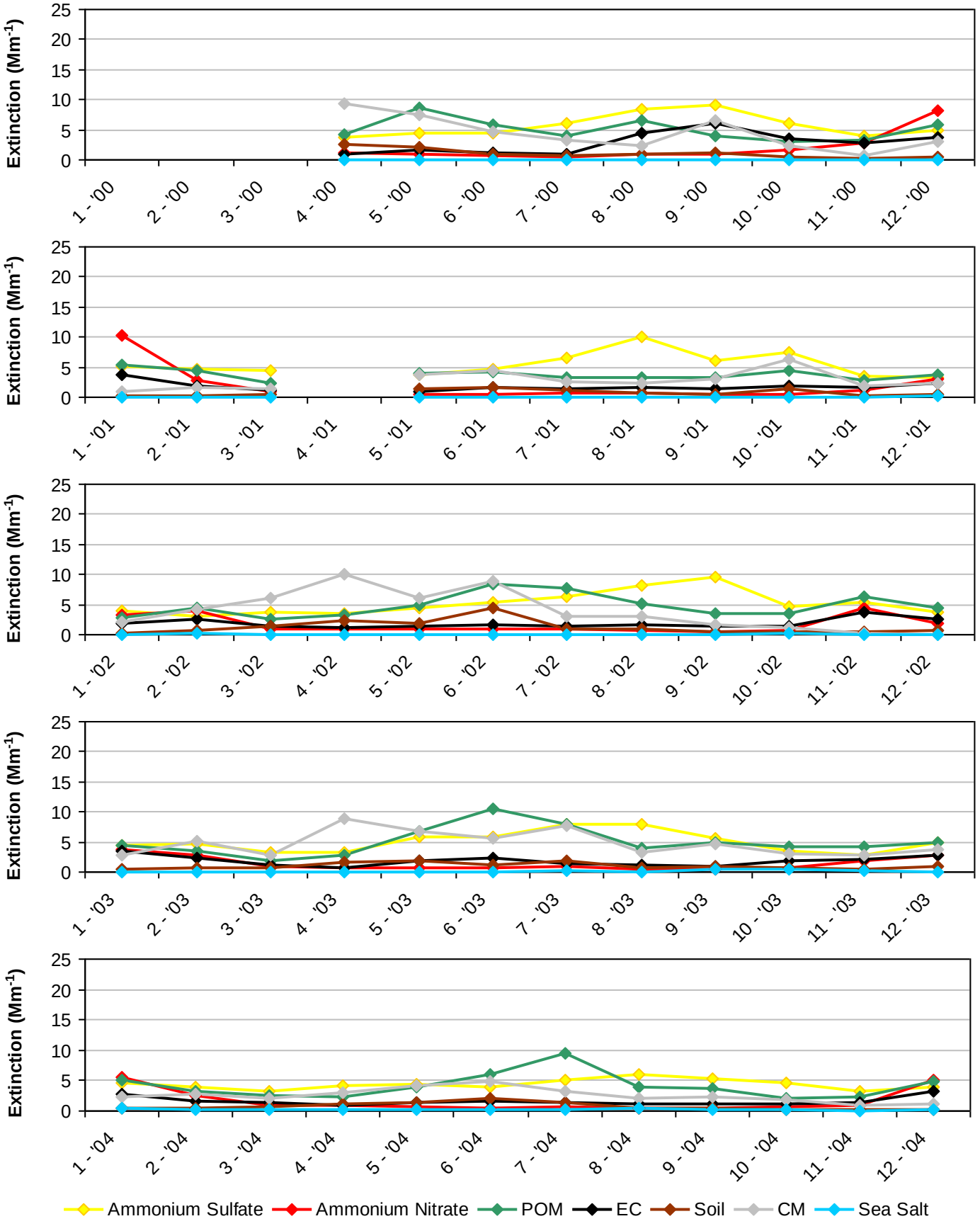
Figure I.2-4
Bosque del Apache WA, NM (BOAP1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure I.2-5
Bosque del Apache WA, NM (BOAP1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure I.2-6
Bosque del Apache WA, NM (BOAP1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

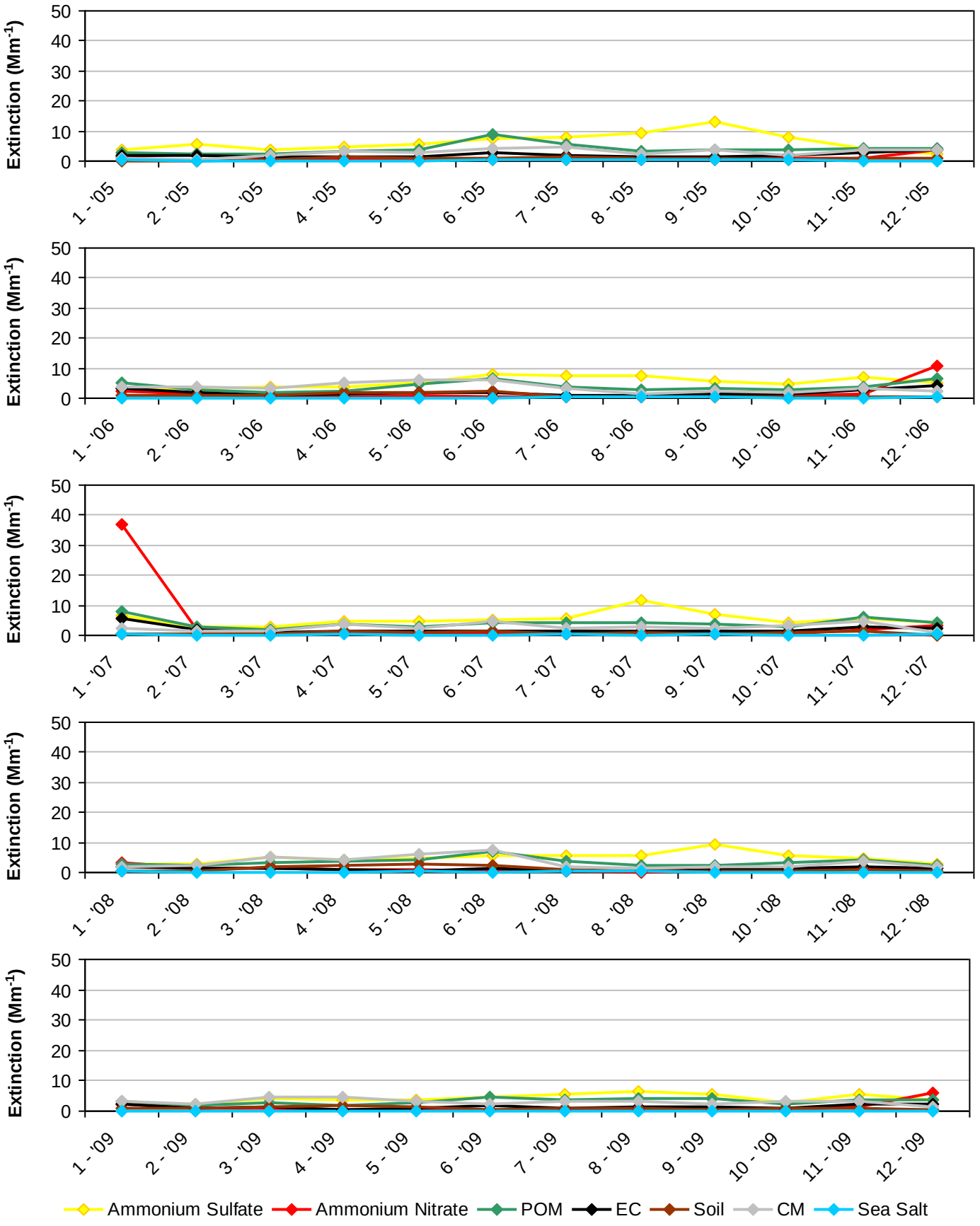
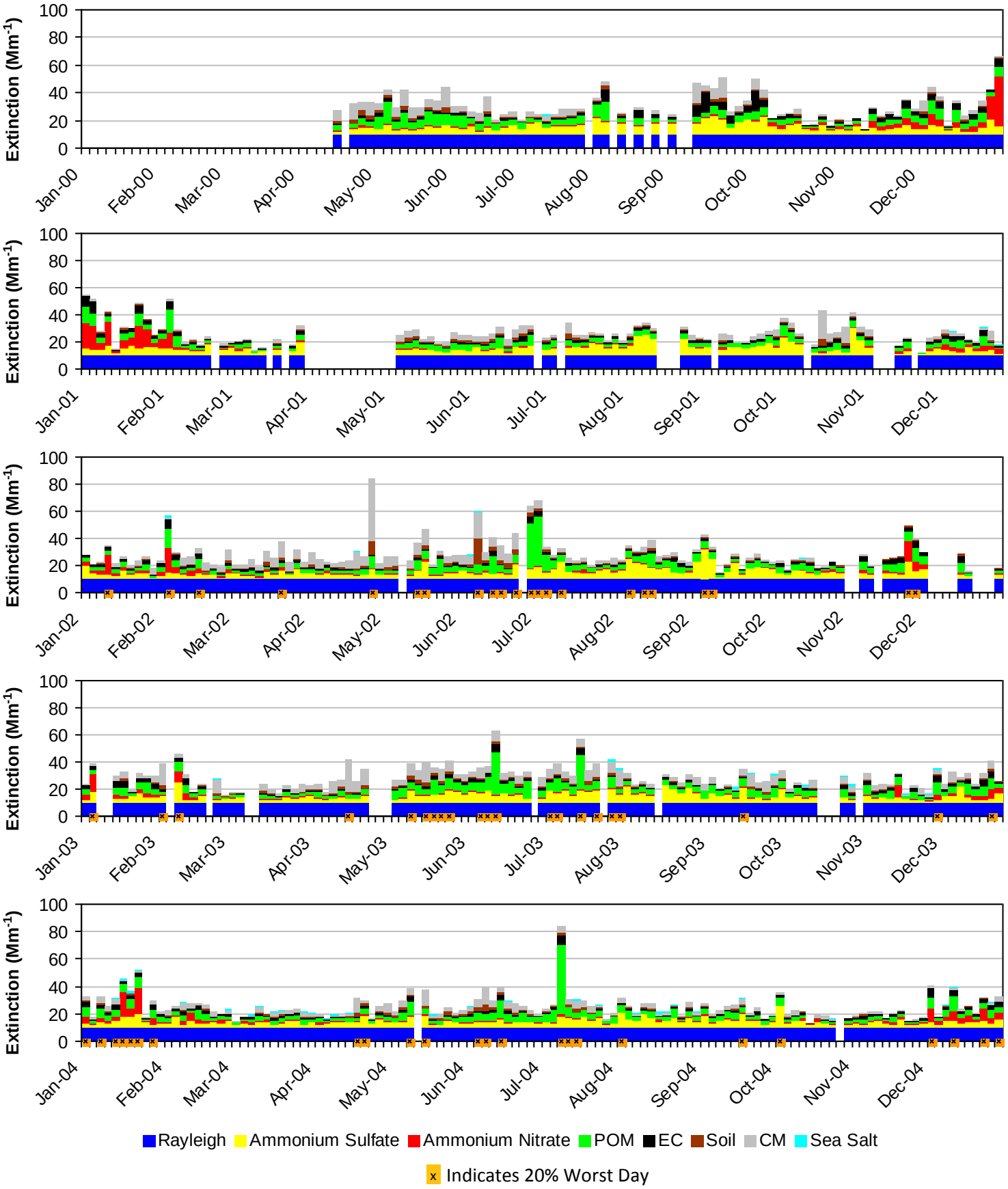
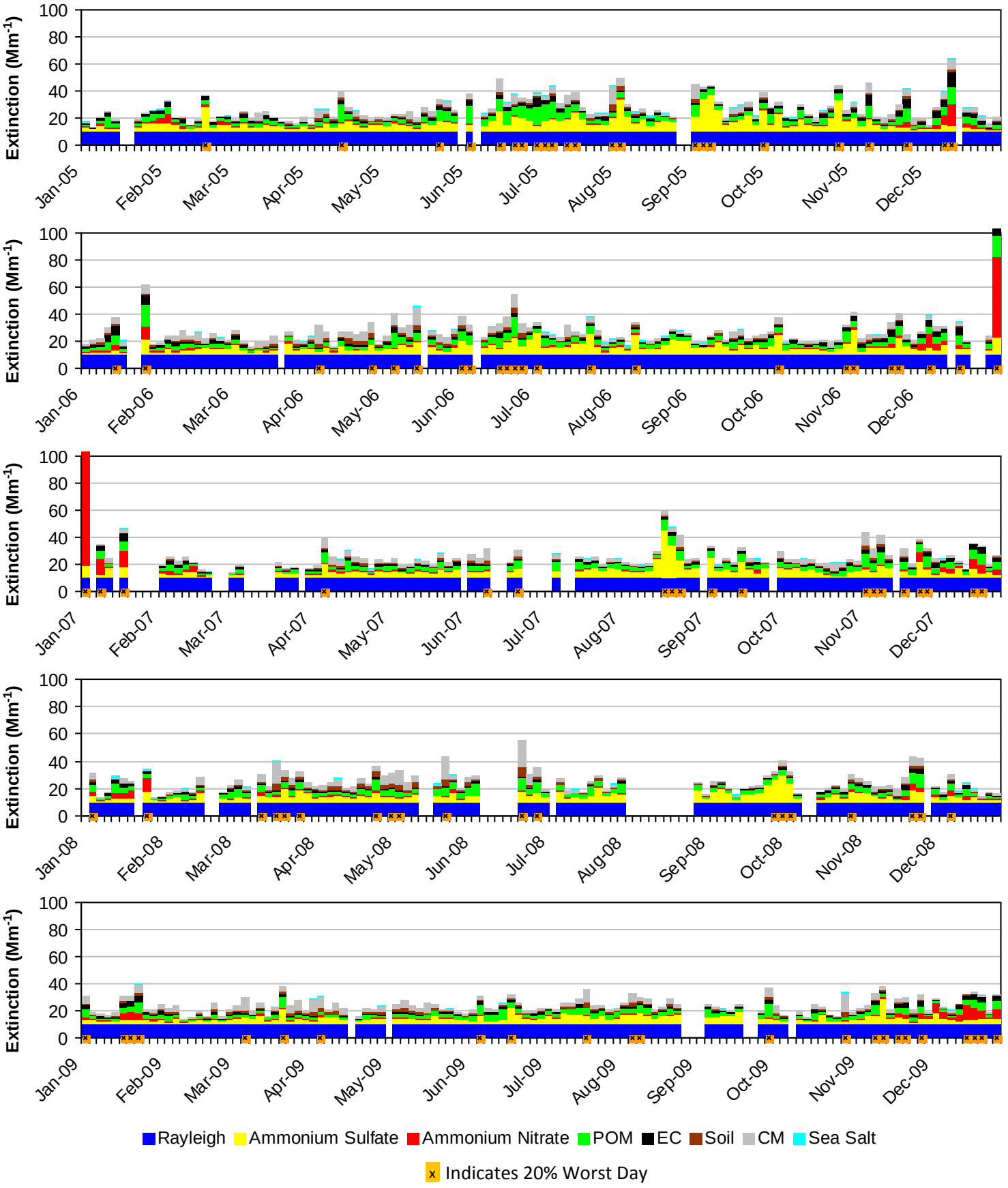


Figure I.2-7
Bosque del Apache WA, NM (BOAP1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure I.2-8
Bosque del Apache WA, NM (BOAP1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



I.3. GILA WA (GICL1)

The following tables and figures are presented in this section for the Gila WA represented by the GICL1 IMPROVE Monitor:

- **Table I.3-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure I.3-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure I.3-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure I.3-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure I.3-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure I.3-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure I.3-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure I.3-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

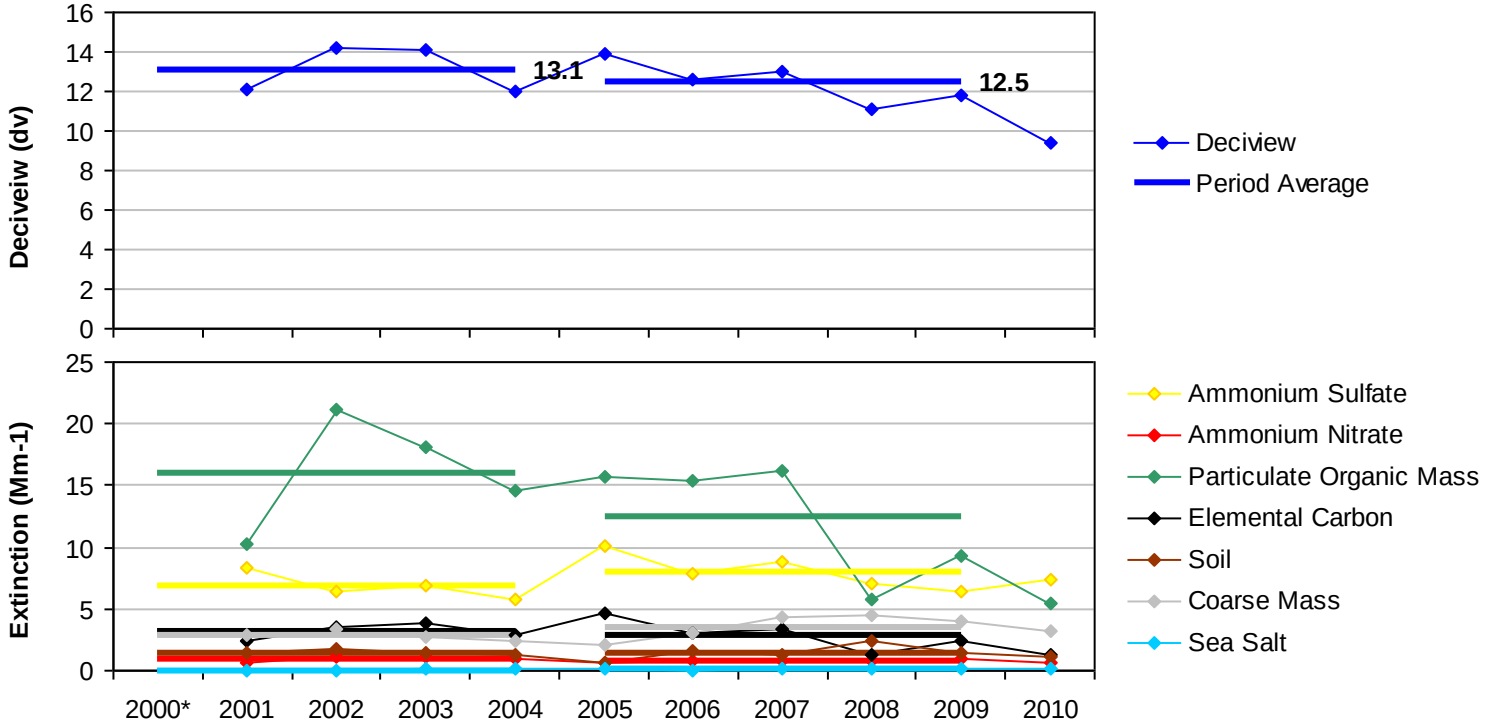
- **Figure I.3-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table I.3-1
Gila WA, NM (GICL1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	3.7	3.4	2.9	3.3	3.1	3.3	2.7	1.9	2.7	2.3	-0.1	0.0	3.3	2.7	-0.6	-18%
Worst 20% Days	---	12.1	14.2	14.1	12.0	13.9	12.6	13.0	11.1	11.8	9.4	-0.2	0.1	13.1	12.5	-0.6	-5%
All Days	---	7.6	7.9	7.5	7.1	7.5	7.2	7.2	6.3	6.7	5.6	-0.1	0.0	7.5	7.0	-0.5	-7%
Total Extinction (Mm-1)																	
Best 20% Days	---	14.5	14.1	13.4	14.0	13.6	13.9	13.2	12.1	13.1	12.7	-0.2	0.0	14.0	13.2	-0.8	-6%
Worst 20% Days	---	34.8	46.2	43.4	36.8	42.7	40.7	44.0	30.7	33.6	28.2	-0.8	0.2	40.3	38.3	-2.0	-5%
All Days	---	22.6	24.7	23.6	22.0	23.2	22.8	23.4	19.8	20.8	18.6	-0.3	0.1	23.2	22.0	-1.2	-5%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	2.3	1.8	1.4	1.9	2.0	1.9	1.6	1.3	1.8	1.6	-0.1	0.1	1.9	1.7	-0.2	-11%
Worst 20% Days	---	8.3	6.4	6.9	5.8	10.1	7.9	8.8	7.0	6.4	7.3	0.0	0.5	6.9	8.0	1.1	16%
All Days	---	4.8	4.3	4.0	3.9	5.2	4.3	4.5	4.0	3.9	3.8	-0.1	0.2	4.2	4.4	0.2	5%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.3	0.2	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.0	0.0	0.3	0.2	-0.1	-33%
Worst 20% Days	---	0.6	1.0	1.1	0.9	0.6	0.7	0.9	0.8	0.9	0.7	0.0	0.5	0.9	0.8	-0.1	-11%
All Days	---	0.6	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.0	0.1	0.6	0.5	-0.1	-17%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	1.4	1.6	1.6	1.5	1.2	1.2	1.2	0.8	0.9	0.7	-0.1	0.0	1.5	1.1	-0.4	-27%
Worst 20% Days	---	10.2	21.2	18.0	14.5	15.7	15.4	16.2	5.7	9.3	5.5	-1.0	0.1	16.0	12.5	-3.5	-22%
All Days	---	4.7	6.6	6.2	5.2	5.1	5.1	5.5	2.8	3.6	2.5	-0.3	0.1	5.7	4.4	-1.3	-23%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.6	0.8	0.6	0.6	0.5	0.6	0.4	0.3	0.4	0.3	0.0	0.0	0.6	0.4	-0.2	-33%
Worst 20% Days	---	2.3	3.5	3.9	2.9	4.6	3.0	3.3	1.2	2.4	1.3	-0.1	0.3	3.2	2.9	-0.3	-9%
All Days	---	1.3	1.5	1.5	1.3	1.7	1.3	1.3	0.7	1.0	0.7	-0.1	0.1	1.4	1.2	-0.2	-14%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.0	0.3	0.2	0.2	0.0	0%
Worst 20% Days	---	1.4	1.7	1.5	1.2	0.6	1.6	1.4	2.4	1.4	1.1	0.0	0.5	1.5	1.5	0.0	0%
All Days	---	0.8	0.9	0.7	0.6	0.5	0.8	0.7	0.9	0.9	0.6	0.0	0.4	0.8	0.7	-0.1	-13%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.6	0.4	0.4	0.3	0.4	0.7	0.5	0.4	0.6	0.6	0.0	0.3	0.4	0.5	0.1	25%
Worst 20% Days	---	2.9	3.4	2.8	2.3	2.0	3.1	4.4	4.5	4.0	3.2	0.2	0.1	2.8	3.6	0.8	29%
All Days	---	1.5	1.7	1.6	1.3	1.3	1.7	1.8	1.8	1.8	1.5	0.0	0.1	1.5	1.7	0.2	13%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0%
Worst 20% Days	---	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.1	0.1	0.1	0.0	0%
All Days	---	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0%

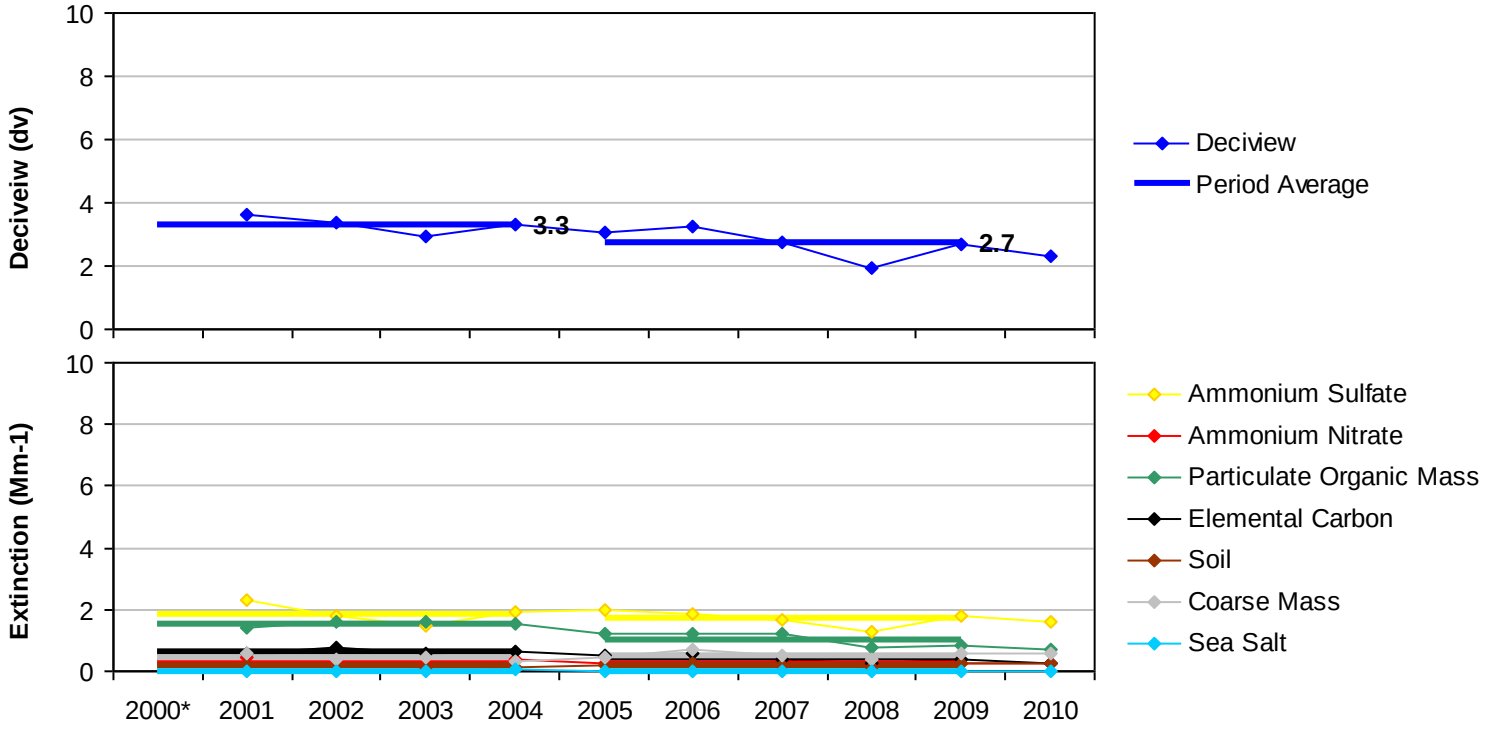
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure I.3-1
Gila WA, NM (GICL1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



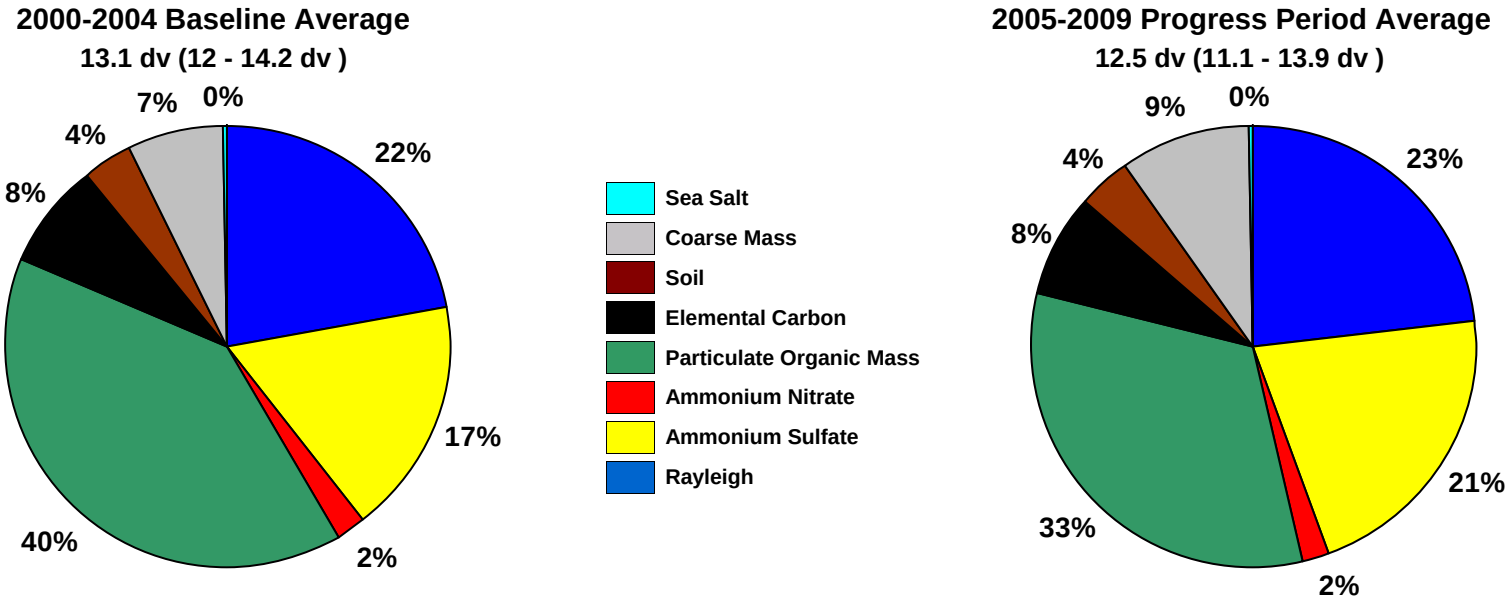
*Missing years did not meet RHR data completeness criteria.

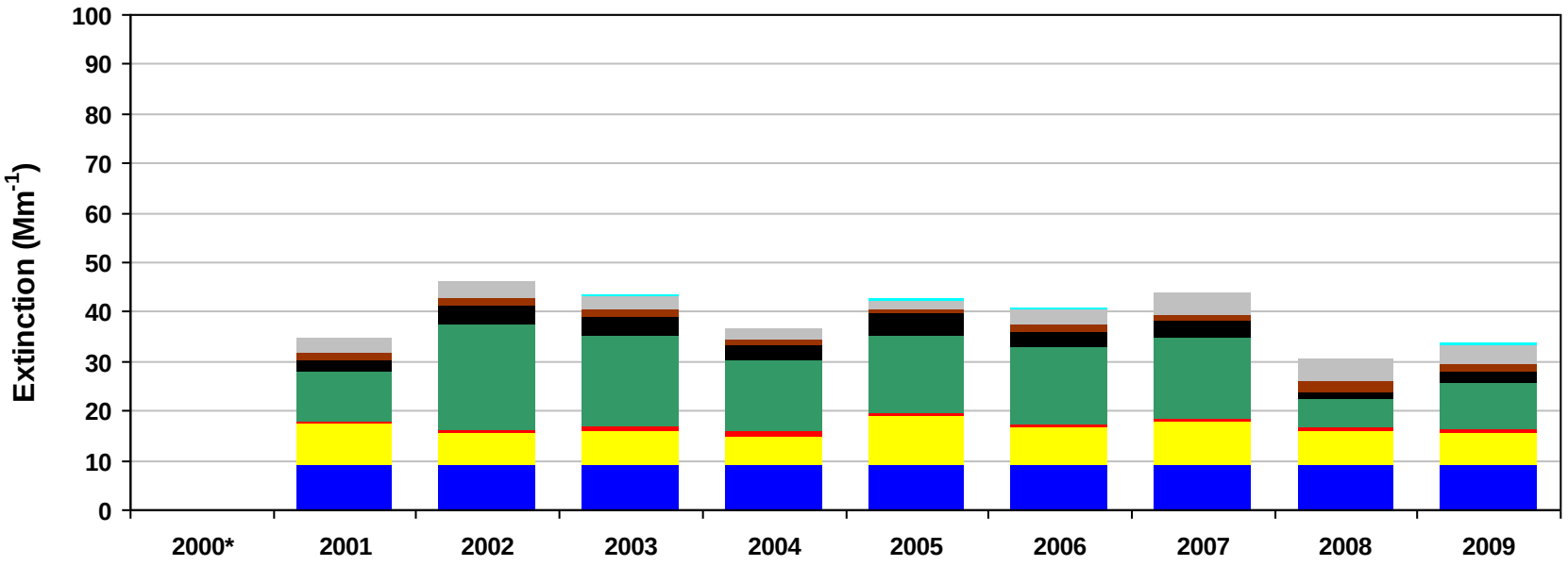
Figure I.3-2
Gila WA, NM (GICL1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

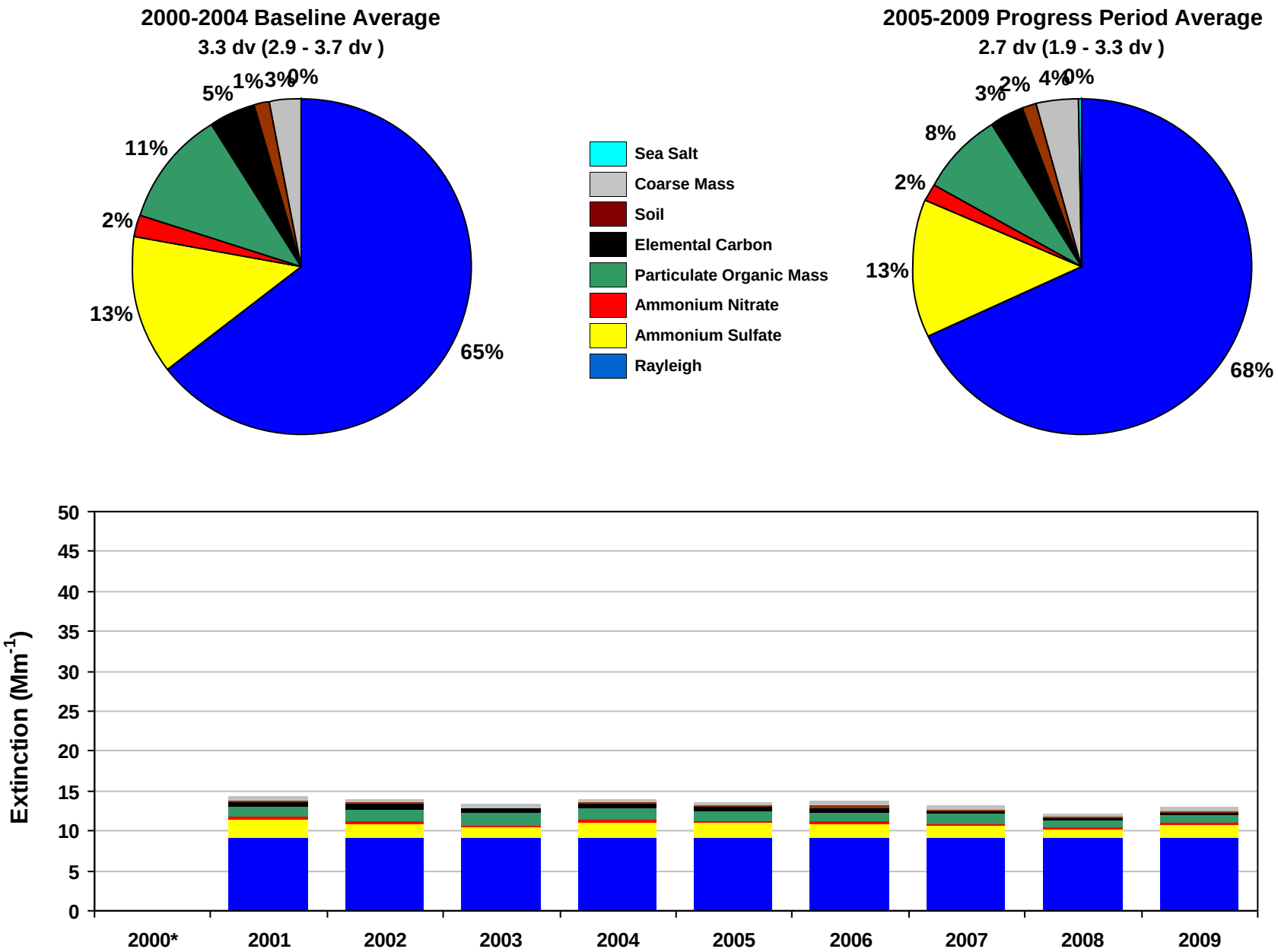
Figure I.3-3
Gila WA, NM (GICL1 Site)
20% Most Impaired Visibility Days





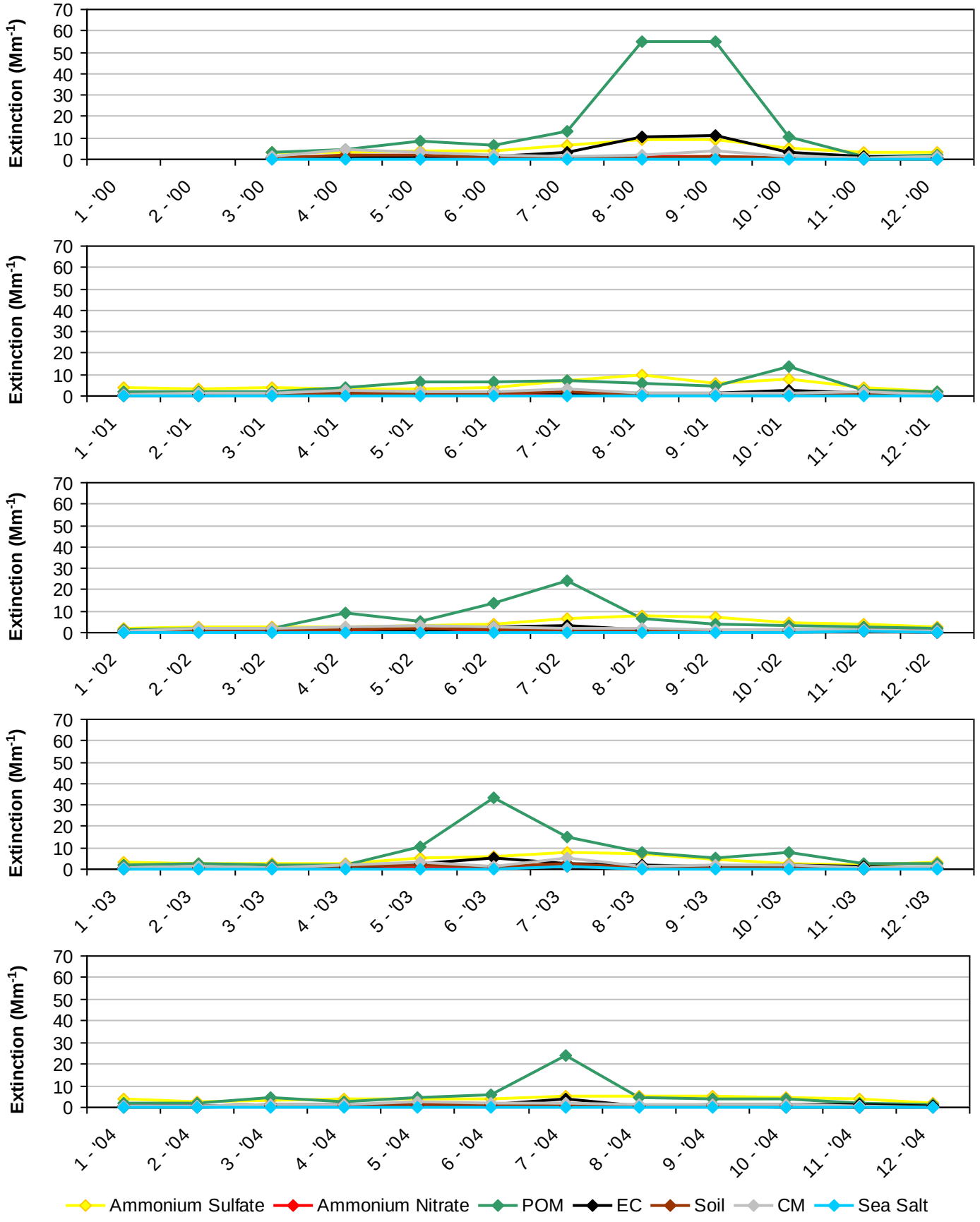
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure I.3-4
Gila WA, NM (GICL1 Site)
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure I.3-5
Gila WA, NM (GICL1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure I.3-6
Gila WA, NM (GICL1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

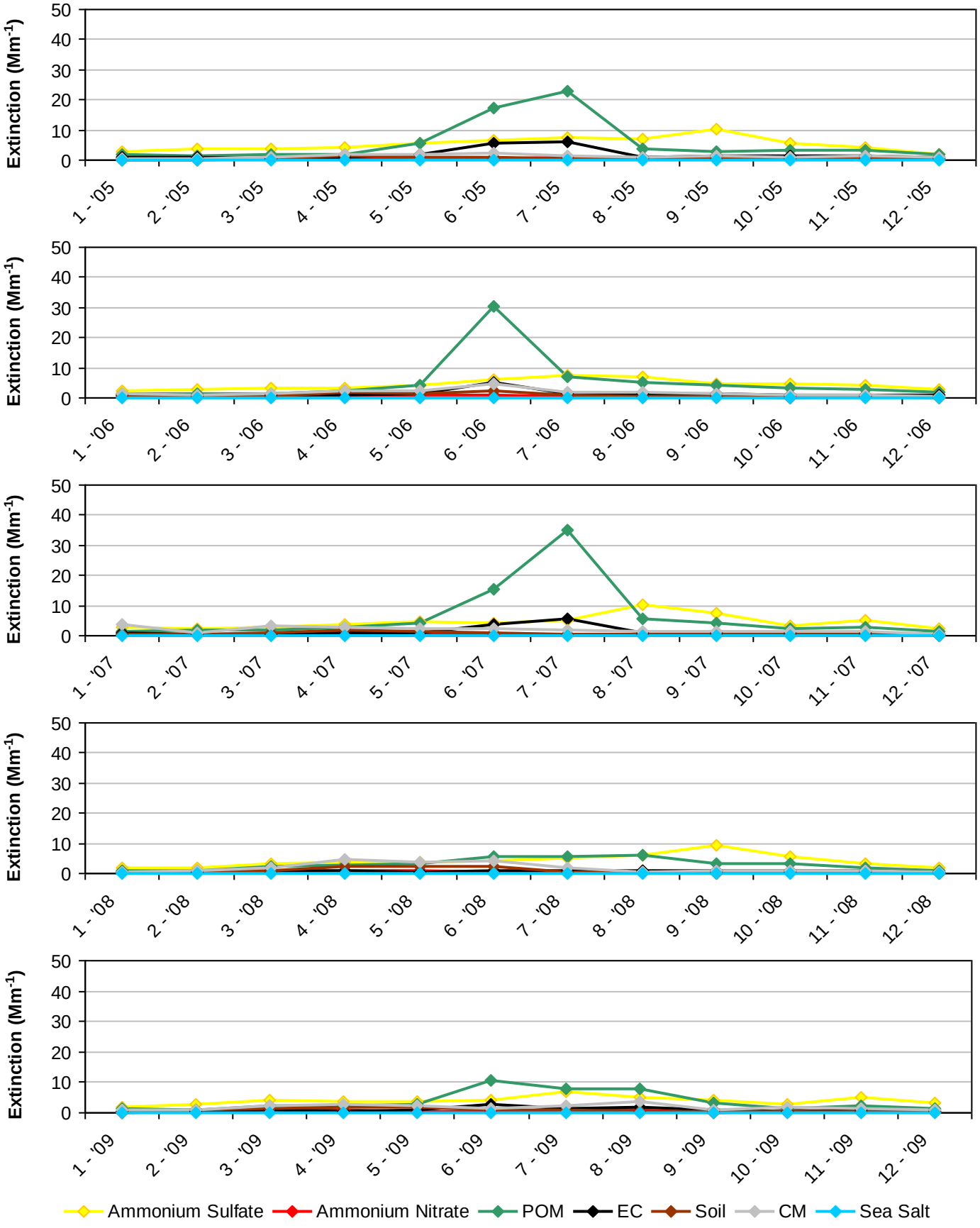
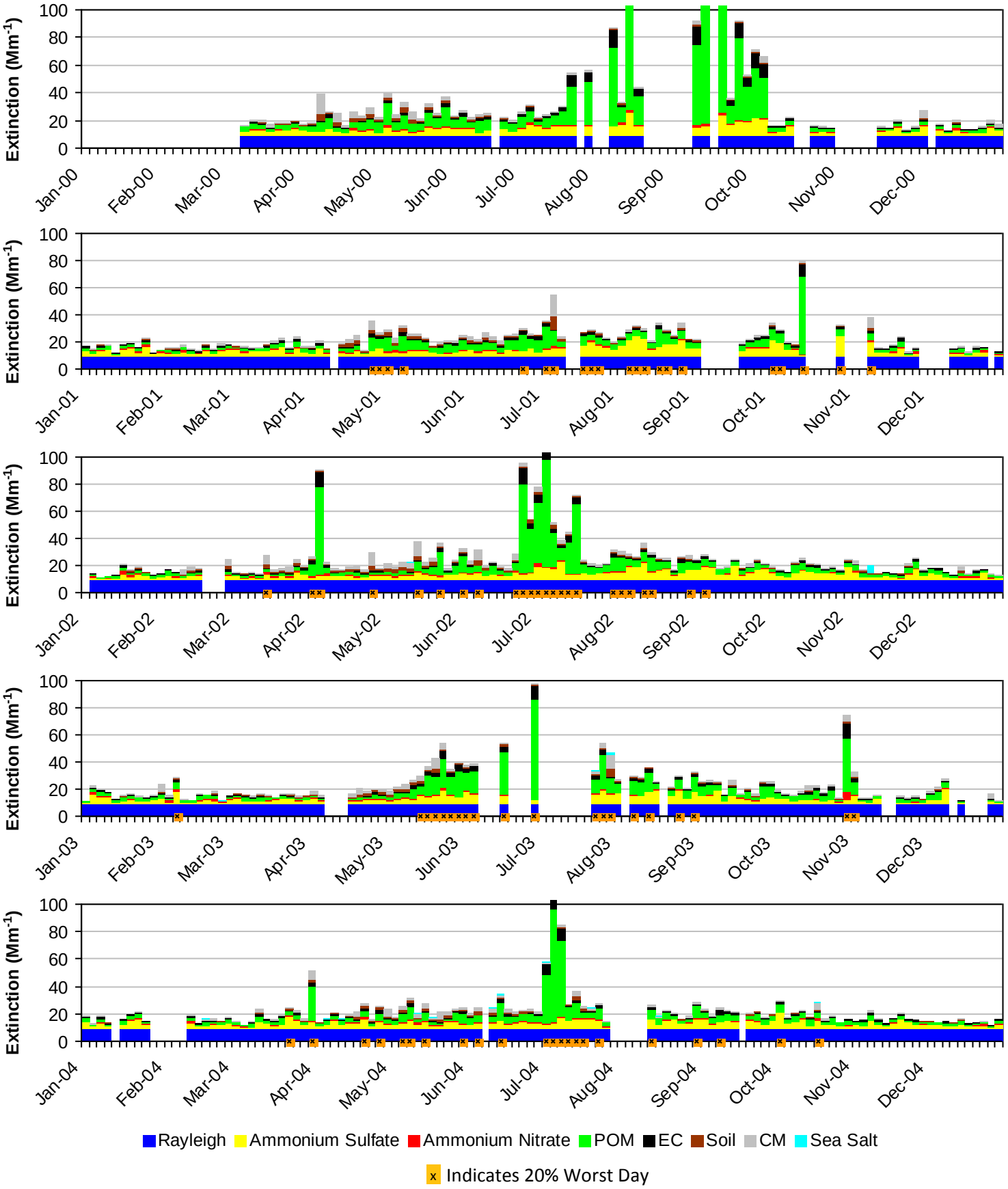
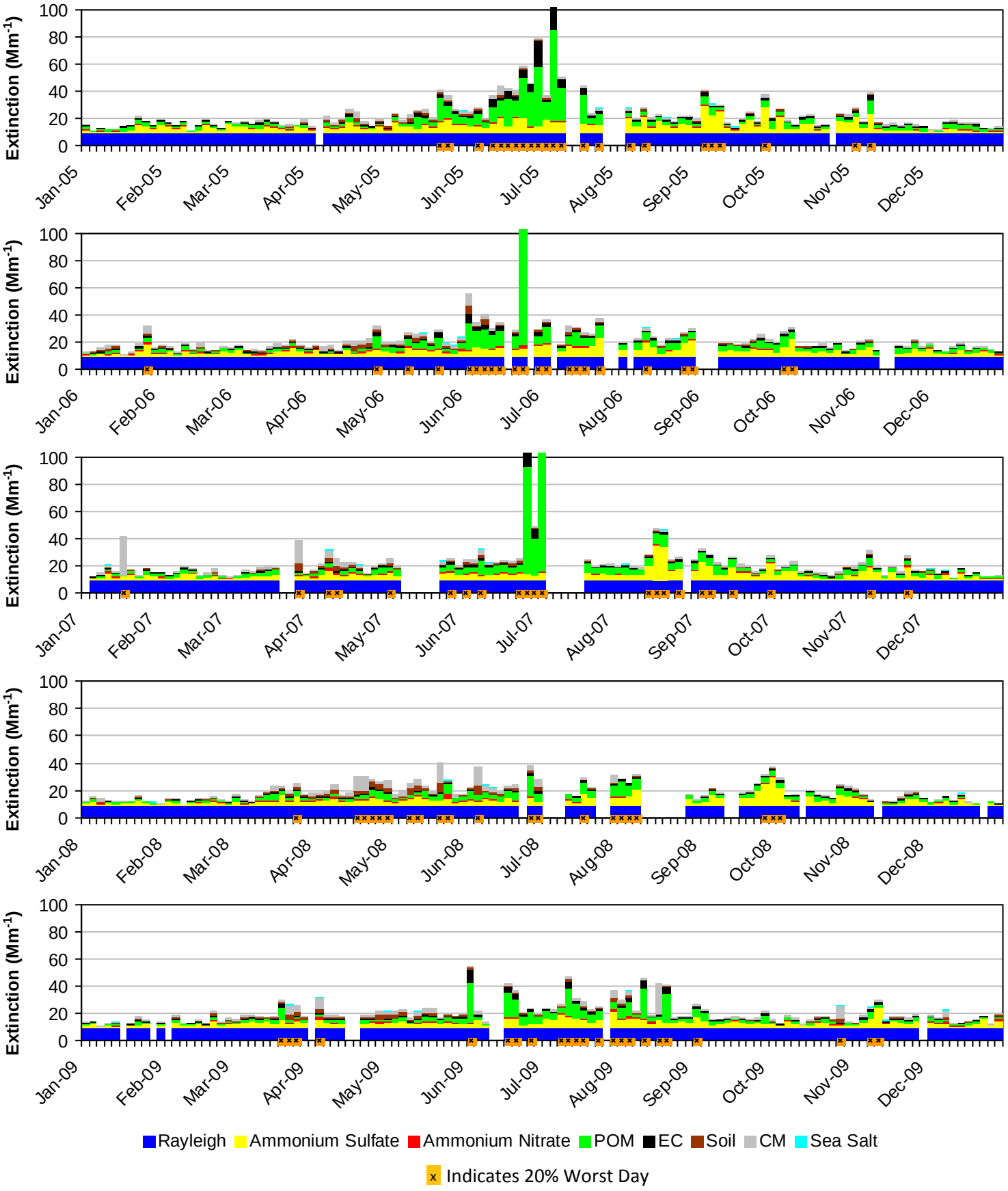


Figure I.3-7
Gila WA, NM (GICL1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure I.3-8
Gila WA, NM (GICL1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



I.4. GUADALUPE MOUNTAINS NP AND CARLSBAD CAVERNS NP (GUMO1)

The following tables and figures are presented in this section for Guadalupe Mountains NP and Carlsbad Caverns NP represented by the GUMO1 IMPROVE Monitor:

- **Table I.4-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure I.4-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure I.4-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure I.4-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure I.4-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure I.4-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure I.4-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure I.4-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure I.4-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table I.4-1
Guadalupe Mountains NP and Carlsbad Caverns NP, TX (GUMO1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	6.3	6.3	6.4	5.9	4.8	6.1	5.9	5.3	5.4	4.6	3.9	-0.2	0.0	5.9	5.4	-0.5	-9%
Worst 20% Days	17.1	16.6	18.1	18.5	15.6	17.5	15.3	15.7	16.8	14.1	13.7	-0.3	0.1	17.2	15.9	-1.3	-8%
All Days	11.6	11.4	12.2	11.7	9.9	11.2	10.5	10.2	10.5	9.3	8.5	-0.2	0.0	11.4	10.3	-1.1	-10%
Total Extinction (Mm-1)																	
Best 20% Days	18.8	19.1	19.5	18.3	16.4	18.6	18.1	17.1	17.3	16.0	14.9	-0.3	0.0	18.4	17.4	-1.0	-5%
Worst 20% Days	56.1	53.6	62.5	68.2	49.0	59.0	46.5	49.6	56.5	41.4	40.7	-1.5	0.1	57.9	50.6	-7.3	-13%
All Days	34.5	33.6	37.1	36.3	29.2	33.5	30.3	29.8	31.4	26.9	24.9	-0.8	0.0	34.1	30.4	-3.7	-11%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	3.9	3.9	3.6	2.9	2.9	3.7	3.3	3.0	3.1	2.6	2.4	-0.1	0.0	3.4	3.1	-0.3	-9%
Worst 20% Days	16.6	18.6	20.5	12.4	14.4	26.0	16.6	21.5	14.5	14.4	11.9	-0.1	0.4	16.5	18.6	2.1	13%
All Days	9.6	10.0	9.7	7.8	7.5	11.2	9.2	9.6	7.9	7.3	5.9	-0.2	0.1	8.9	9.0	0.1	1%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.9	1.3	1.5	1.1	1.0	1.0	0.7	1.1	0.8	0.9	0.5	0.0	0.1	1.1	0.9	-0.2	-18%
Worst 20% Days	5.4	3.2	2.8	2.6	5.1	3.8	2.7	3.7	2.6	1.5	2.1	-0.2	0.0	3.8	2.9	-0.9	-24%
All Days	2.7	2.2	2.4	1.6	2.3	1.9	1.6	1.8	1.6	1.2	1.2	-0.1	0.0	2.2	1.6	-0.6	-27%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.9	1.6	1.9	1.5	1.1	1.8	1.9	1.5	1.5	1.0	0.9	-0.1	0.1	1.6	1.5	-0.1	-6%
Worst 20% Days	7.4	5.0	7.8	7.4	6.2	7.4	5.9	5.8	5.6	4.9	4.8	-0.2	0.0	6.7	5.9	-0.8	-12%
All Days	4.2	3.2	4.1	3.9	3.3	4.0	3.6	3.4	3.3	2.8	2.5	-0.1	0.0	3.8	3.4	-0.4	-11%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.9	0.7	0.7	0.6	0.6	0.9	0.9	0.7	0.6	0.4	0.4	0.0	0.0	0.7	0.7	0.0	0%
Worst 20% Days	2.0	1.0	1.3	1.0	1.3	2.2	1.6	1.5	1.0	1.2	1.3	0.0	0.5	1.3	1.5	0.2	15%
All Days	1.4	0.9	1.0	1.0	1.1	1.4	1.2	1.1	0.8	0.9	0.8	0.0	0.3	1.1	1.1	0.0	0%
Soil Extinction (Mm-1)																	
Best 20% Days	0.5	0.5	0.4	0.4	0.3	0.4	0.4	0.4	0.5	0.6	0.7	0.0	0.5	0.4	0.5	0.1	25%
Worst 20% Days	2.4	4.1	5.1	7.5	2.9	2.1	2.0	2.0	4.8	2.7	3.3	-0.1	0.2	4.4	2.7	-1.7	-39%
All Days	1.4	2.0	2.2	2.3	1.2	1.1	1.1	1.1	1.9	1.5	1.5	-0.1	0.2	1.9	1.3	-0.6	-32%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	1.6	2.0	2.3	2.7	1.5	1.9	2.0	1.4	1.9	1.5	1.1	0.0	0.1	2.0	1.7	-0.3	-15%
Worst 20% Days	13.2	12.7	16.0	28.1	10.1	8.3	8.6	6.0	18.8	7.7	8.3	-0.8	0.1	16.0	9.9	-6.1	-38%
All Days	6.1	6.1	8.7	10.6	4.6	4.7	4.6	3.8	6.8	4.2	4.0	-0.3	0.1	7.2	4.8	-2.4	-33%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.4	0.1	0.0	-0.1	-100%
Worst 20% Days	0.1	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.0	0%
All Days	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.0	0%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure I.4-1
Guadalupe Mountains NP and Carlsbad Caverns NP, TX (GUMO1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

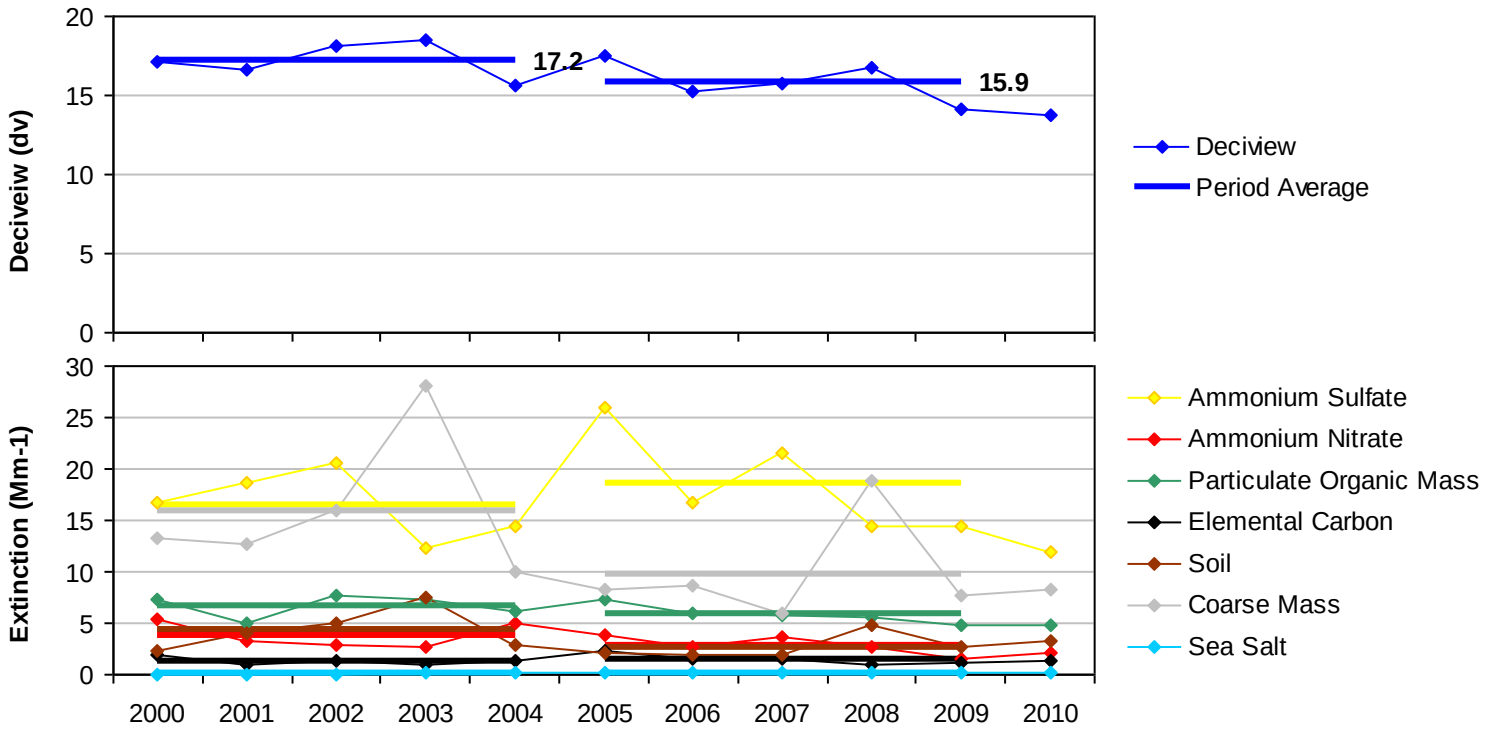


Figure I.4-2
Guadalupe Mountains NP and Carlsbad Caverns NP, TX (GUMO1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

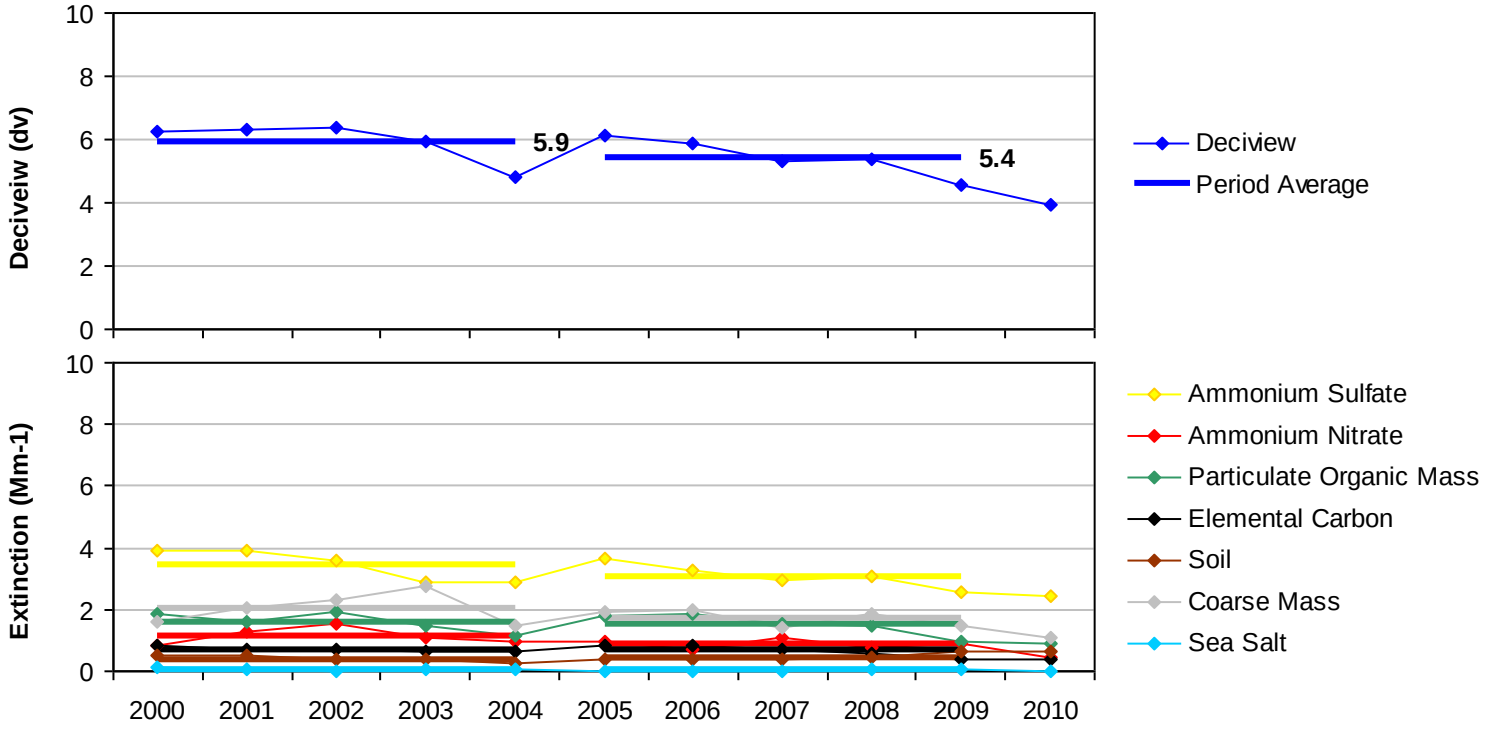


Figure I.4-3

Guadalupe Mountains NP and Carlsbad Caverns NP, TX (GUMO1 Site)

20% Most Impaired Visibility Days

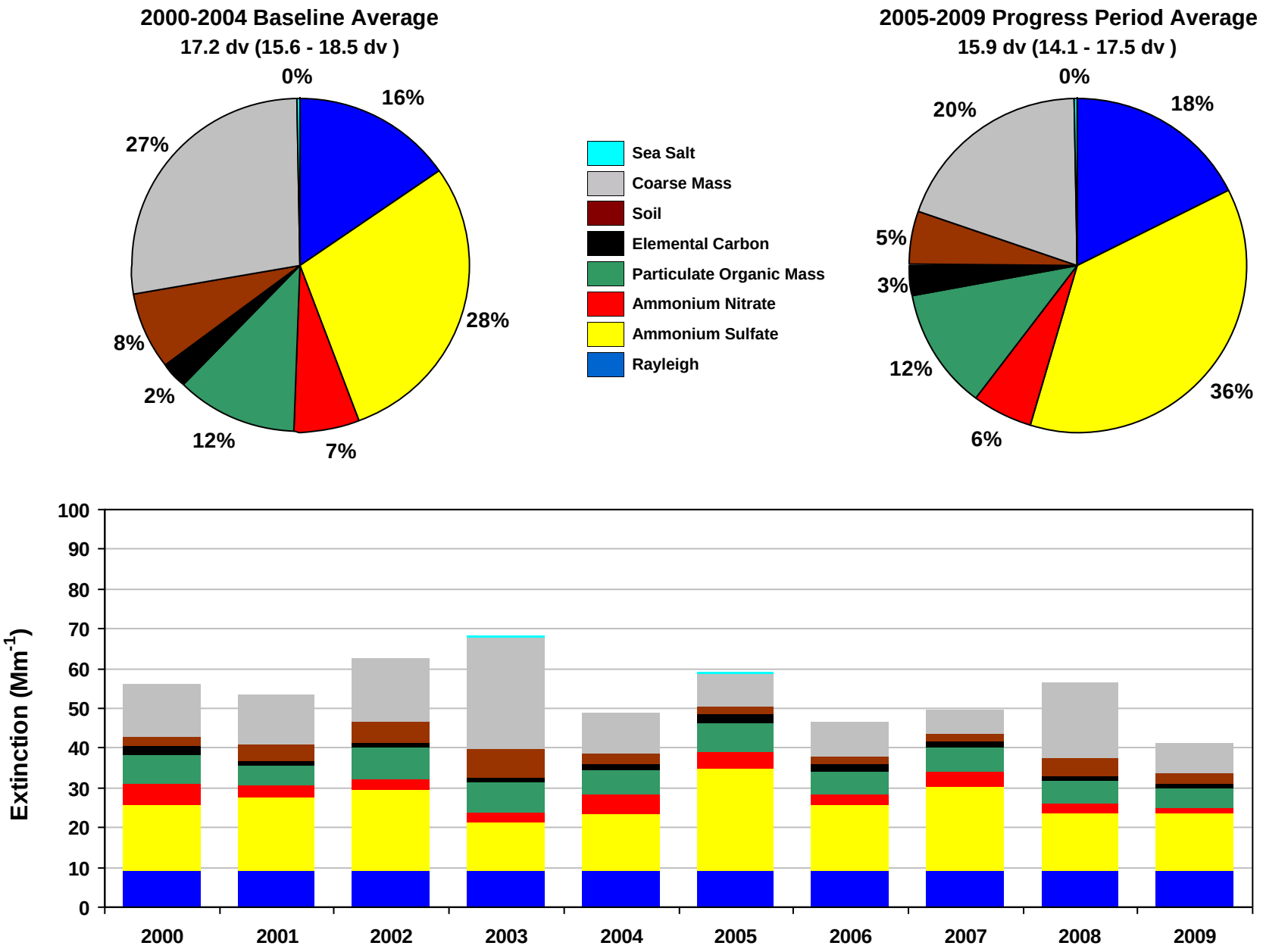
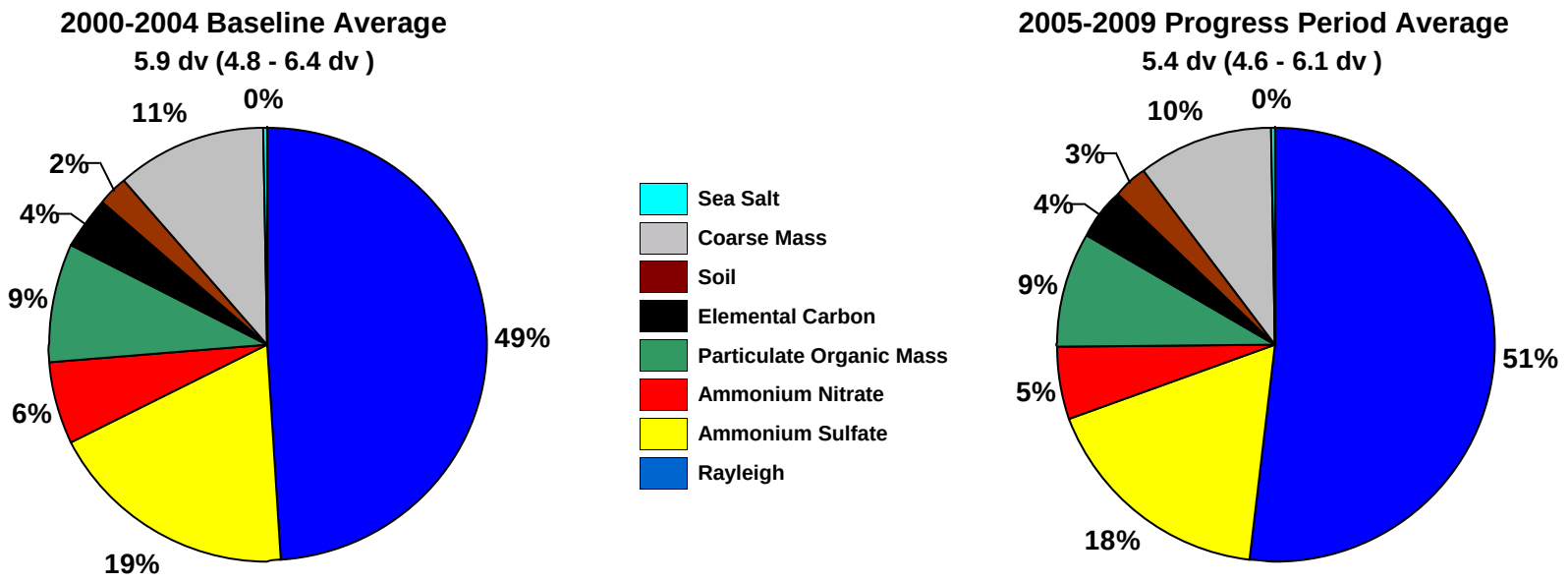


Figure I.4-4

Guadalupe Mountains NP and Carlsbad Caverns NP, TX (GUMO1 Site)

20% Least Impaired Visibility Days



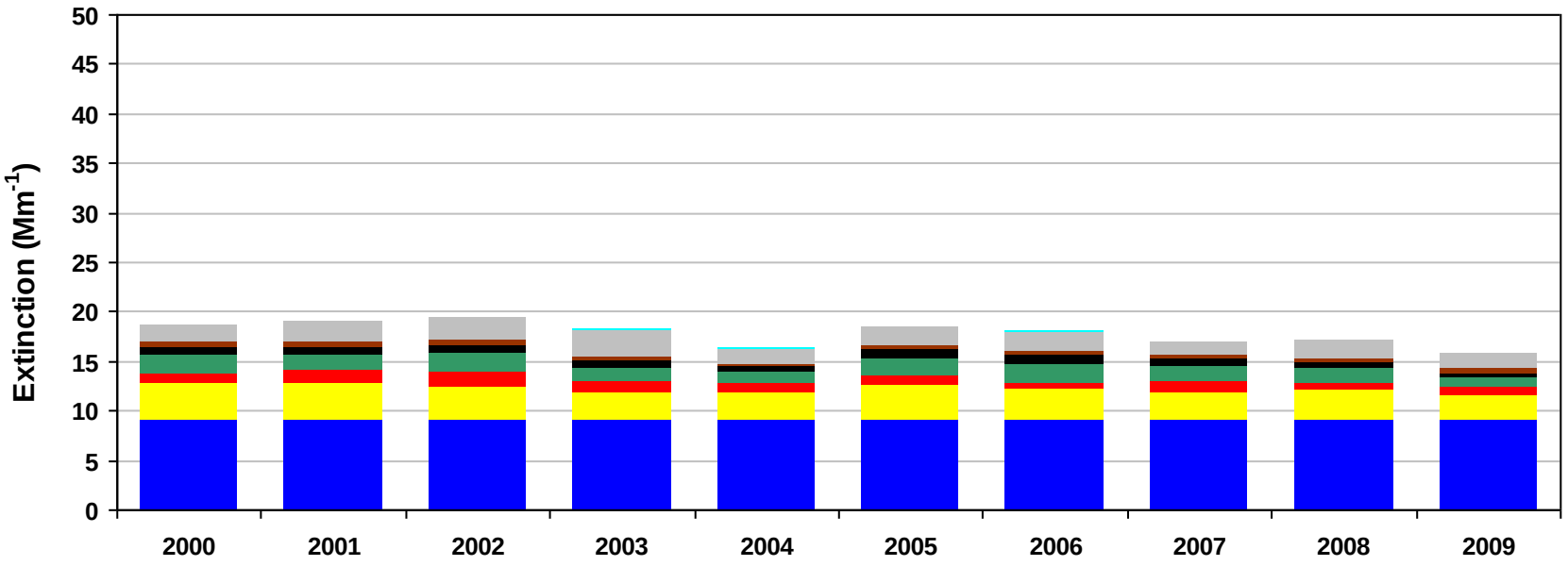


Figure I.4-5
Guadalupe Mountains NP and Carlsbad Caverns NP, TX (GUMO1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

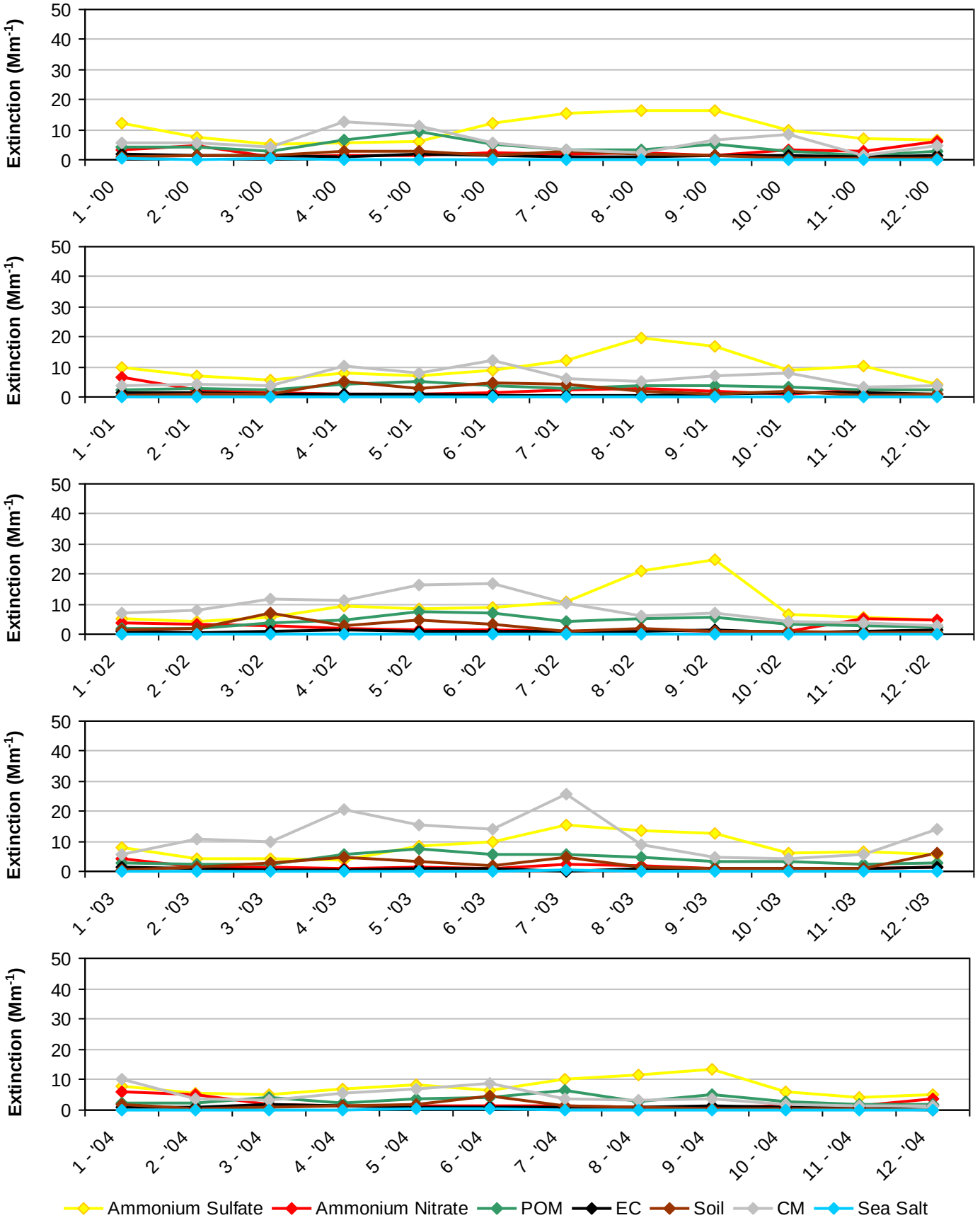


Figure I.4-6
Guadalupe Mountains NP and Carlsbad Caverns NP, TX (GUMO1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

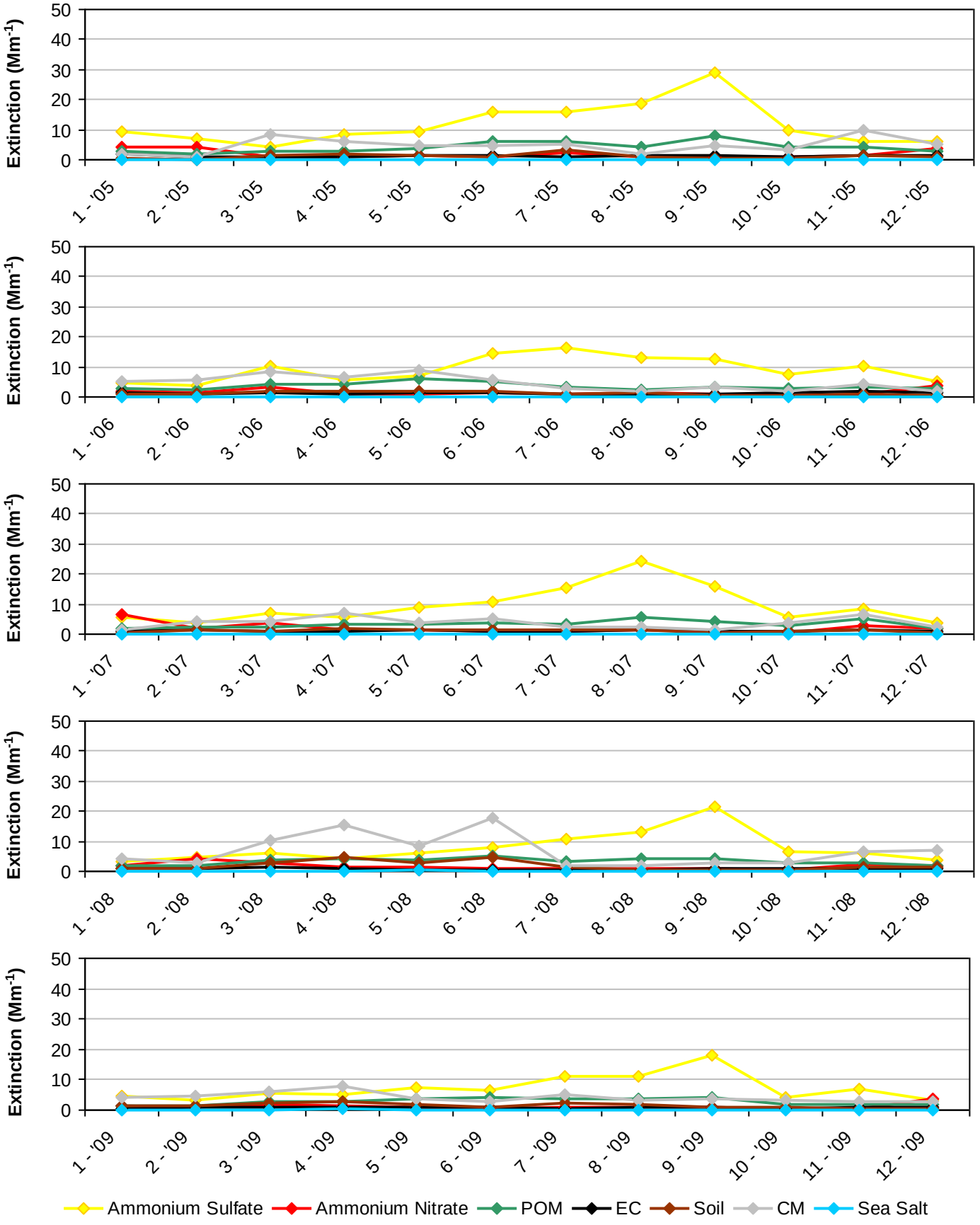


Figure I.4-7
Guadalupe Mountains NP and Carlsbad Caverns NP, TX (GUMO1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

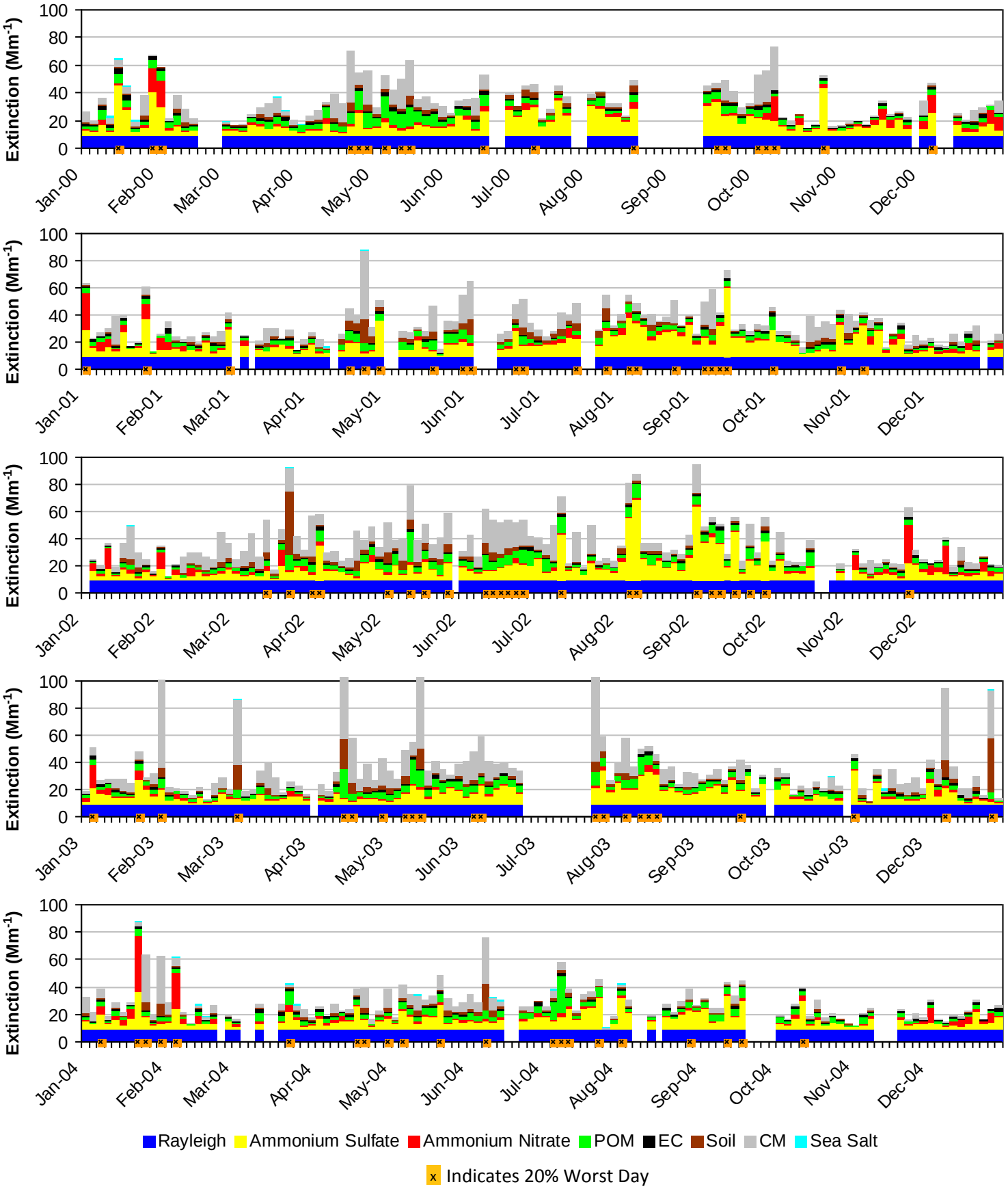
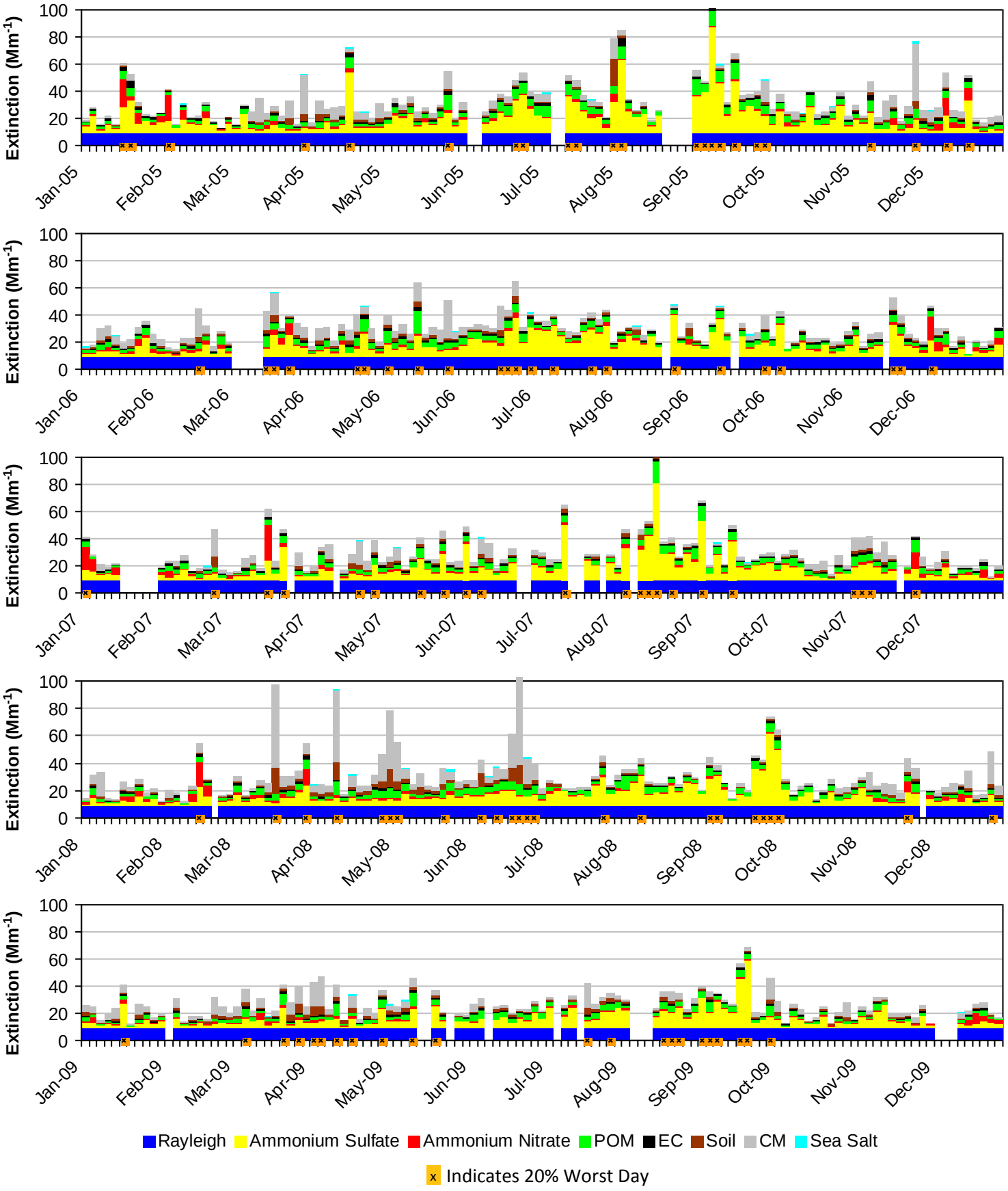


Figure I.4-8
Guadalupe Mountains NP and Carlsbad Caverns NP, TX (GUMO1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



I.5. SALT CREEK WA (SACR1)

The following tables and figures are presented in this section for the Salt Creek WA represented by the SACR1 IMPROVE Monitor:

- **Table I.5-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure I.5-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure I.5-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure I.5-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure I.5-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure I.5-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure I.5-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure I.5-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

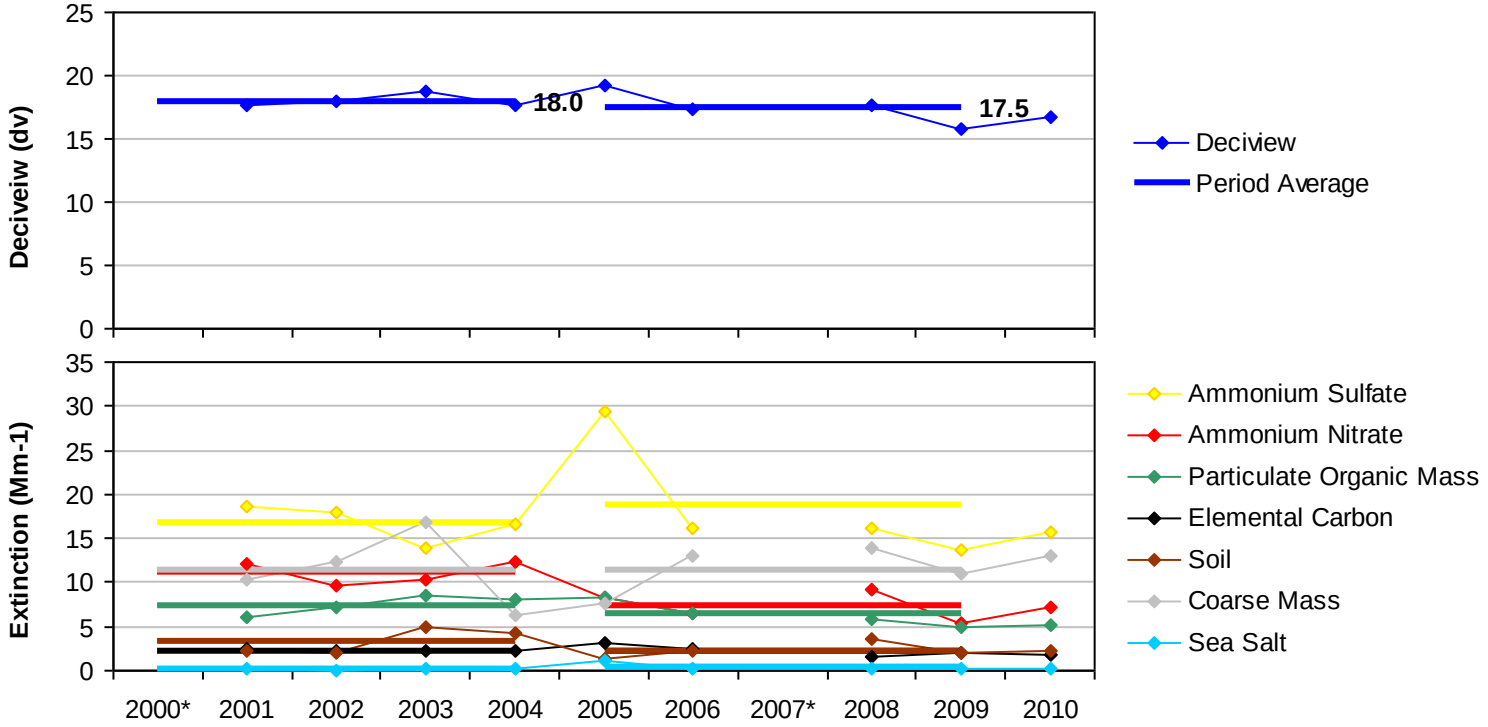
- **Figure I.5-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table I.5-1
Salt Creek WA, NM (SACR1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	7.9	7.9	8.5	7.1	7.9	8.0	---	6.8	6.4	6.0	-0.2	0.1	7.8	7.3	-0.5	-6%
Worst 20% Days	---	17.6	18.0	18.8	17.7	19.2	17.3	---	17.6	15.7	16.8	-0.1	0.2	18.0	17.5	-0.5	-3%
All Days	---	12.4	12.8	13.5	12.4	13.1	12.5	---	12.1	11.3	11.2	-0.2	0.1	12.8	12.3	-0.5	-4%
Total Extinction (Mm-1)																	
Best 20% Days	---	22.3	22.3	23.5	20.5	22.1	22.5	---	19.9	19.2	18.5	-0.4	0.1	22.1	20.9	-1.2	-5%
Worst 20% Days	---	62.2	61.4	67.0	60.2	69.4	57.2	---	60.5	49.5	55.5	-1.0	0.1	62.7	59.1	-3.6	-6%
All Days	---	37.4	38.4	41.2	37.0	40.5	36.9	---	36.5	32.7	33.2	-0.4	0.0	38.5	36.6	-1.9	-5%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	3.5	3.3	3.7	3.3	4.2	3.6	---	3.2	2.6	2.9	-0.1	0.1	3.4	3.4	0.0	0%
Worst 20% Days	---	18.7	17.9	13.9	16.5	29.3	16.2	---	16.1	13.7	15.7	-0.5	0.1	16.7	18.9	2.2	13%
All Days	---	9.2	9.1	9.7	9.3	13.1	9.0	---	8.6	7.9	7.8	-0.2	0.1	9.3	9.7	0.4	4%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	2.6	2.0	1.8	1.8	2.2	1.3	---	1.0	0.7	0.9	-0.2	0.0	2.0	1.3	-0.7	-35%
Worst 20% Days	---	12.2	9.5	10.4	12.4	8.4	6.4	---	9.3	5.4	7.3	-0.8	0.0	11.1	7.4	-3.7	-33%
All Days	---	5.1	5.4	4.4	4.8	4.1	3.3	---	3.7	2.5	3.2	-0.3	0.0	4.9	3.4	-1.5	-31%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	2.3	2.2	2.1	2.4	2.2	2.3	---	1.7	1.8	1.6	-0.1	0.1	2.3	2.0	-0.3	-13%
Worst 20% Days	---	6.1	7.3	8.5	8.1	8.4	6.5	---	5.8	5.0	5.2	-0.3	0.1	7.5	6.4	-1.1	-15%
All Days	---	4.0	4.5	4.6	4.8	4.9	4.2	---	3.8	3.5	3.5	-0.1	0.3	4.5	4.1	-0.4	-9%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	1.2	1.1	1.1	1.0	1.1	1.2	---	0.7	0.7	0.5	0.0	0.1	1.1	0.9	-0.2	-18%
Worst 20% Days	---	2.5	2.2	2.3	2.3	3.3	2.4	---	1.6	2.1	1.8	0.0	0.2	2.3	2.3	0.0	0%
All Days	---	1.6	1.6	1.6	1.6	2.0	1.7	---	1.2	1.3	1.2	0.0	0.2	1.6	1.6	0.0	0%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.5	1.4	0.5	0.4	0.6	---	0.5	0.5	0.6	0.0	0.6	0.7	0.5	-0.2	-29%
Worst 20% Days	---	2.1	2.1	4.9	4.2	1.4	2.3	---	3.6	2.0	2.3	0.0	0.4	3.3	2.3	-1.0	-30%
All Days	---	1.3	1.2	3.0	2.4	0.9	1.2	---	1.7	1.2	1.3	0.0	0.4	2.0	1.2	-0.8	-40%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	2.4	3.1	3.4	1.3	2.0	3.5	---	2.7	2.7	1.9	0.0	0.4	2.5	2.7	0.2	8%
Worst 20% Days	---	10.3	12.4	16.8	6.4	7.5	13.1	---	13.8	11.0	13.1	0.2	0.4	11.5	11.4	-0.1	-1%
All Days	---	6.0	6.6	7.8	3.9	5.0	7.3	---	7.2	6.2	6.1	0.1	0.5	6.1	6.4	0.3	5%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.0	0.1	0.1	0.1	0.1	0.1	---	0.0	0.0	0.1	0.0	0.6	0.1	0.1	0.0	0%
Worst 20% Days	---	0.2	0.1	0.1	0.3	1.0	0.3	---	0.3	0.3	0.1	0.0	0.1	0.2	0.5	0.3	>100%
All Days	---	0.1	0.1	0.1	0.2	0.4	0.2	---	0.2	0.2	0.1	0.0	0.1	0.1	0.2	0.1	100%

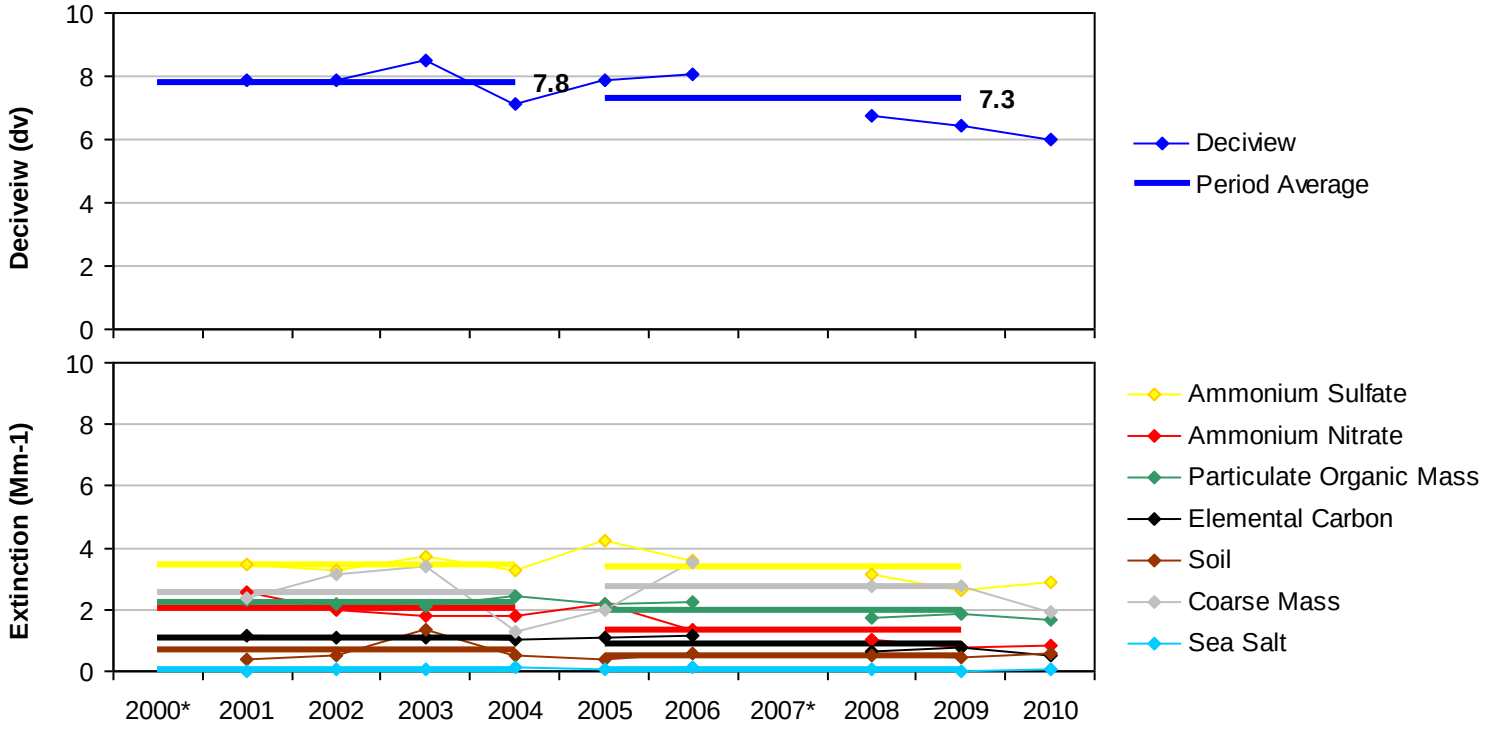
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure I.5-1
Salt Creek WA, NM (SACR1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



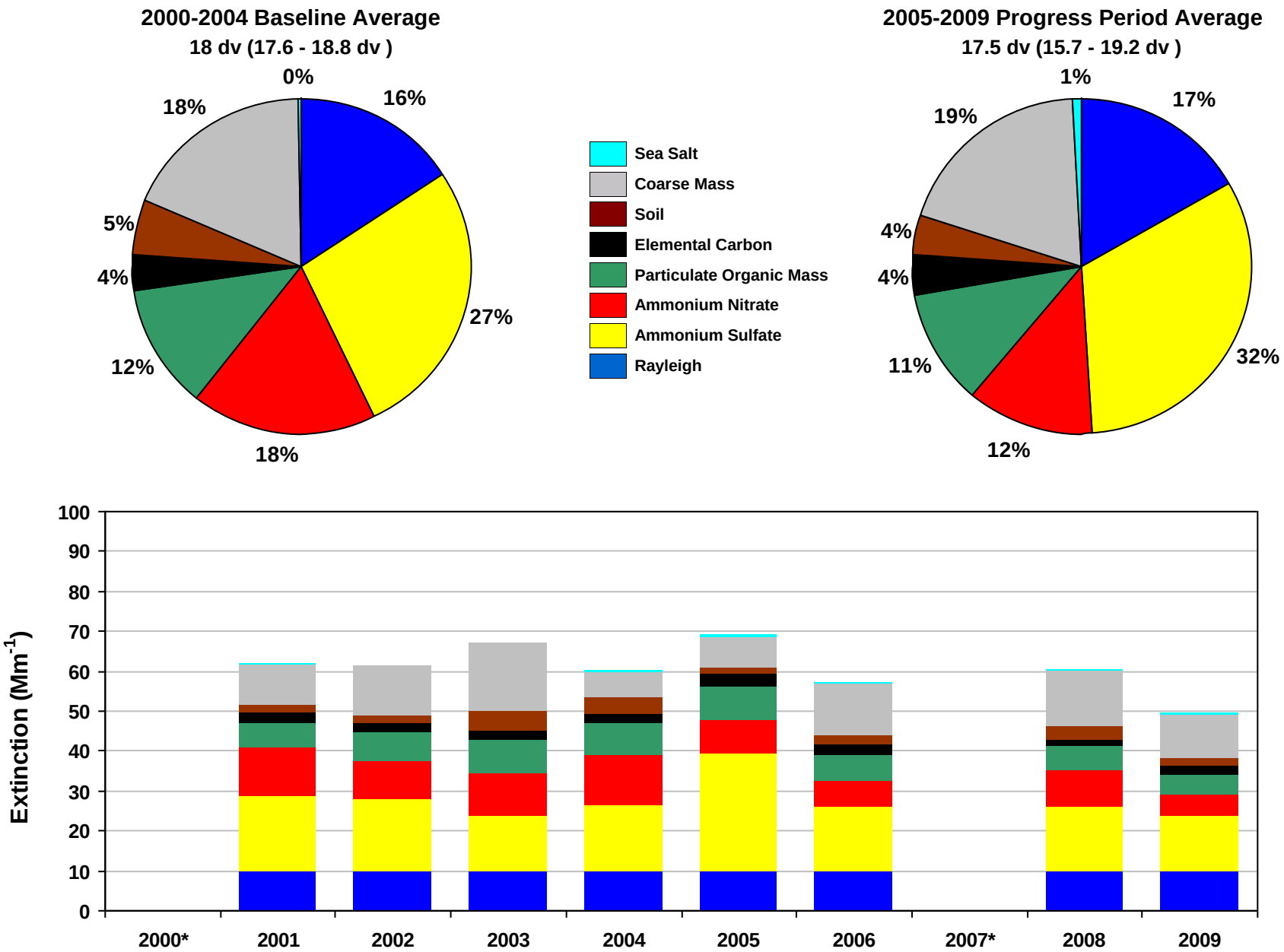
*Missing years did not meet RHR data completeness criteria.

Figure I.5-2
Salt Creek WA, NM (SACR1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



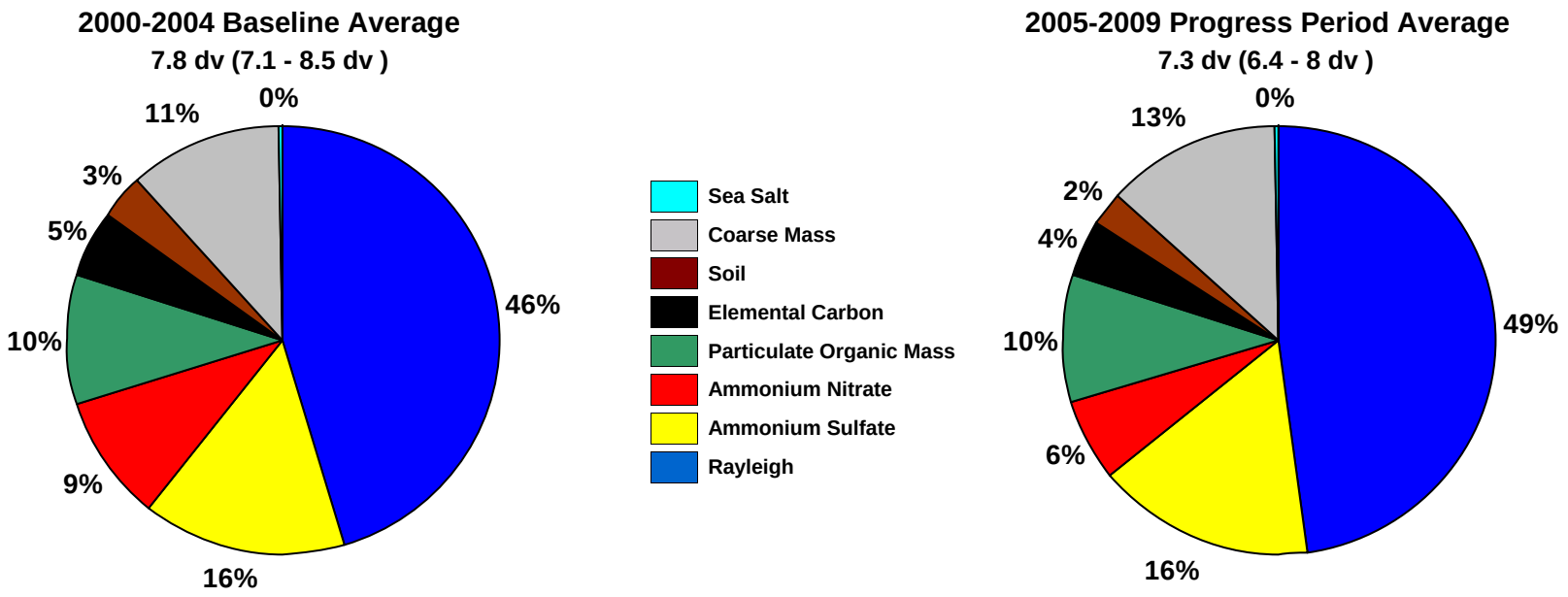
*Missing years did not meet RHR data completeness criteria.

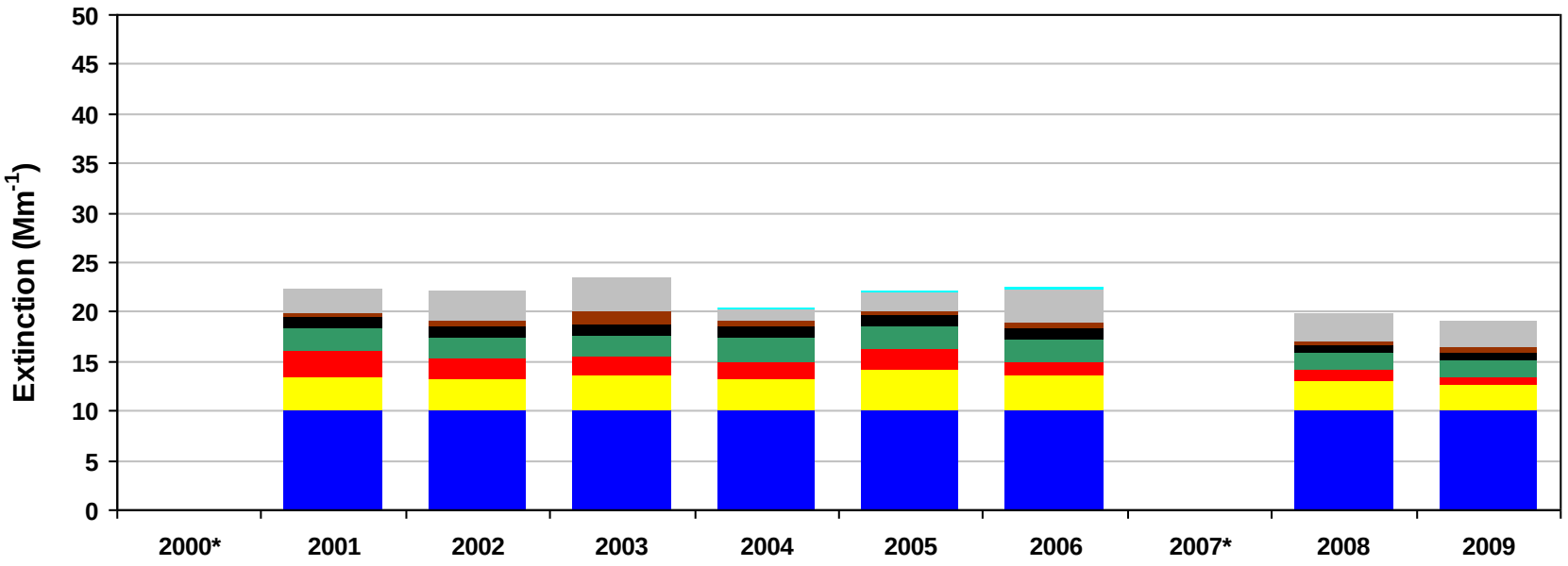
Figure I.5-3
Salt Creek WA, NM (SACR1 Site)
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

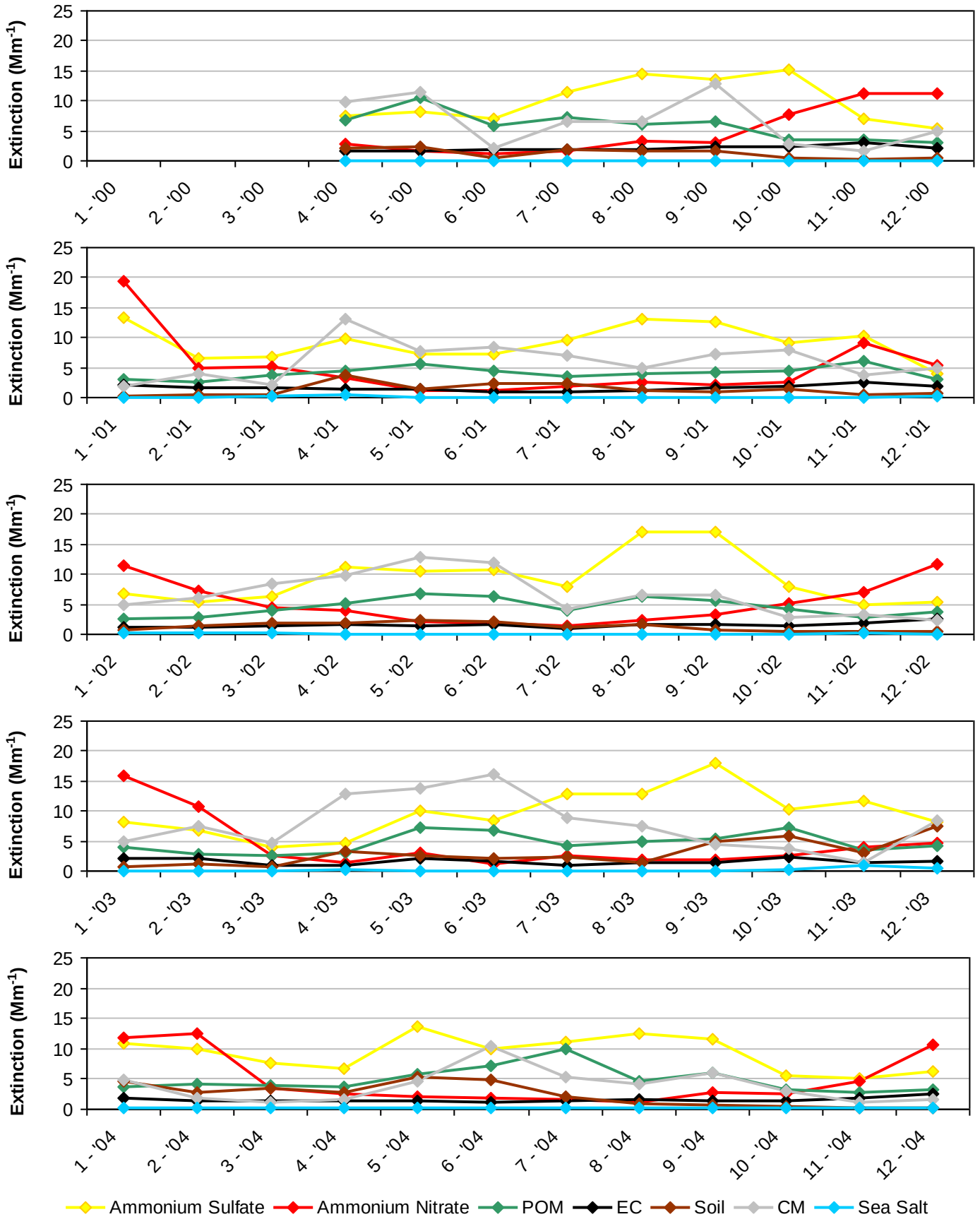
Figure I.5-4
Salt Creek WA, NM (SACR1 Site)
20% Least Impaired Visibility Days





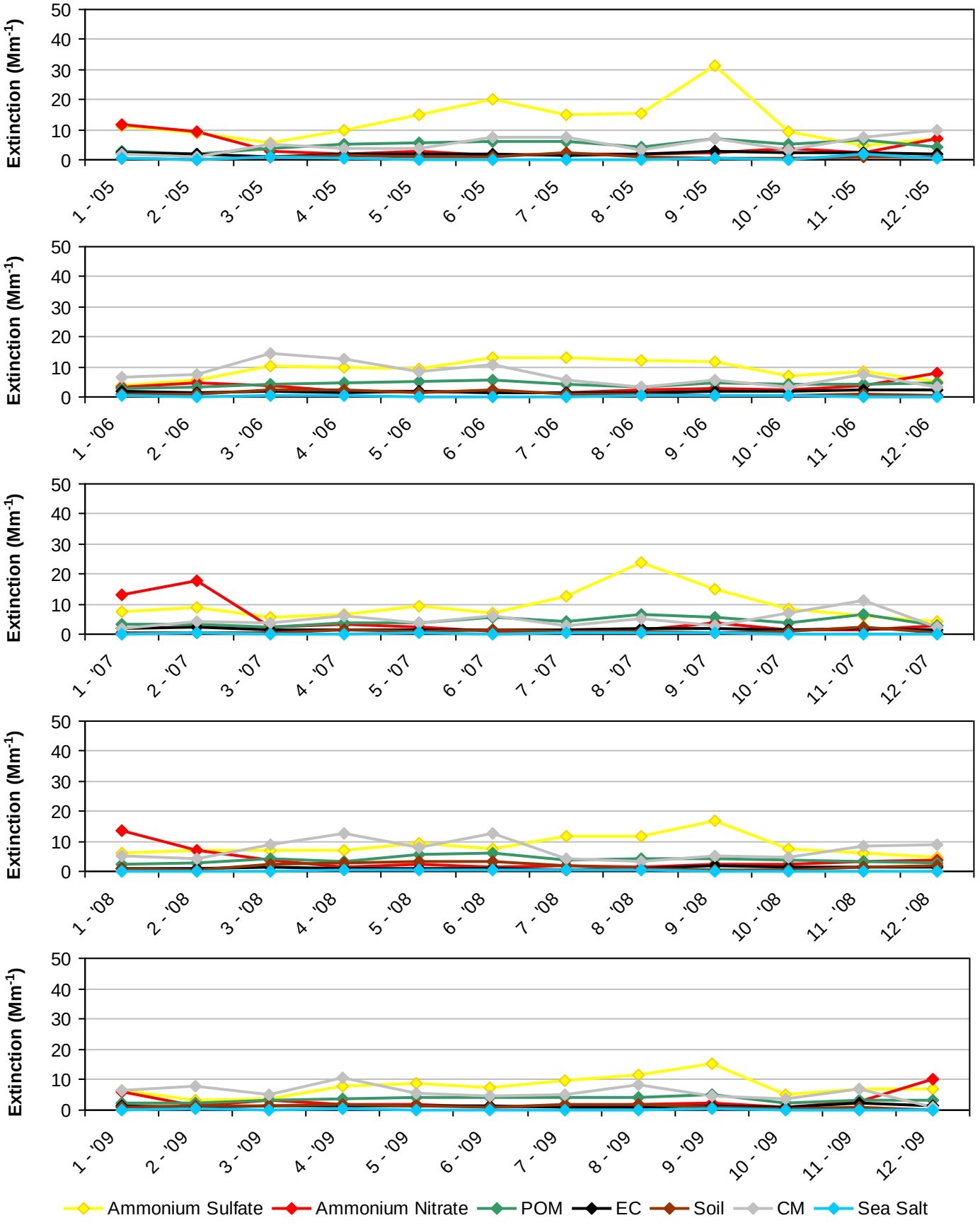
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure I.5-5
Salt Creek WA, NM (SACR1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



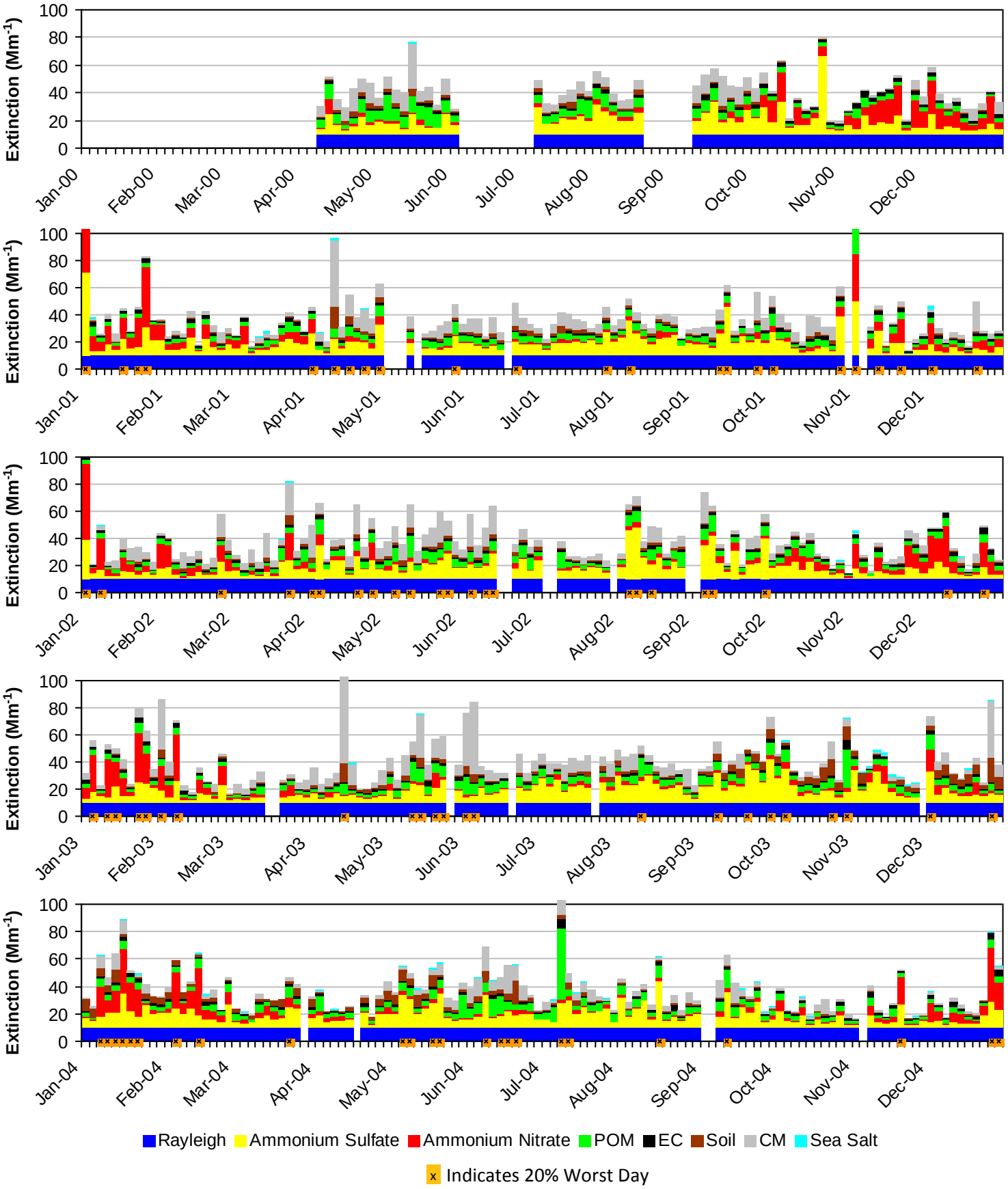
*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure I.5-6
Salt Creek WA, NM (SACR1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days



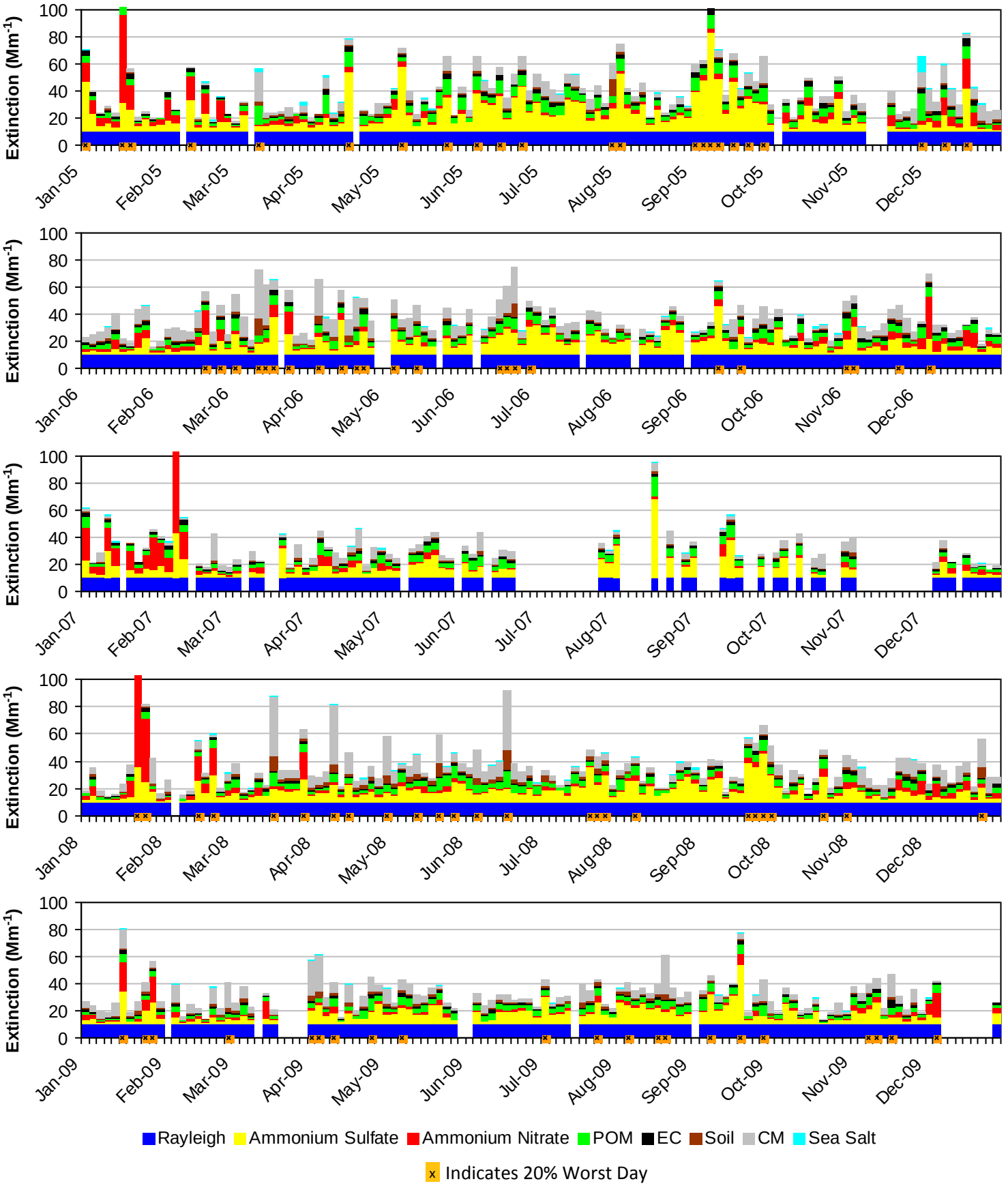
*Note that monthly averages for the year 2007 are shown here, but this year did not meet RHR data completeness criteria.

Figure I.5-7
Salt Creek WA, NM (SACR1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure I.5-8
Salt Creek WA, NM (SACR1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2007 are shown here, but this year did not meet RHR data completeness criteria.

I.6. SAN PEDRO PARKS WA (SAPE1)

The following tables and figures are presented in this section for the San Pedro Parks WA represented by the SAPE1 IMPROVE Monitor:

- **Table I.6-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure I.6-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure I.6-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure I.6-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure I.6-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure I.6-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure I.6-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure I.6-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

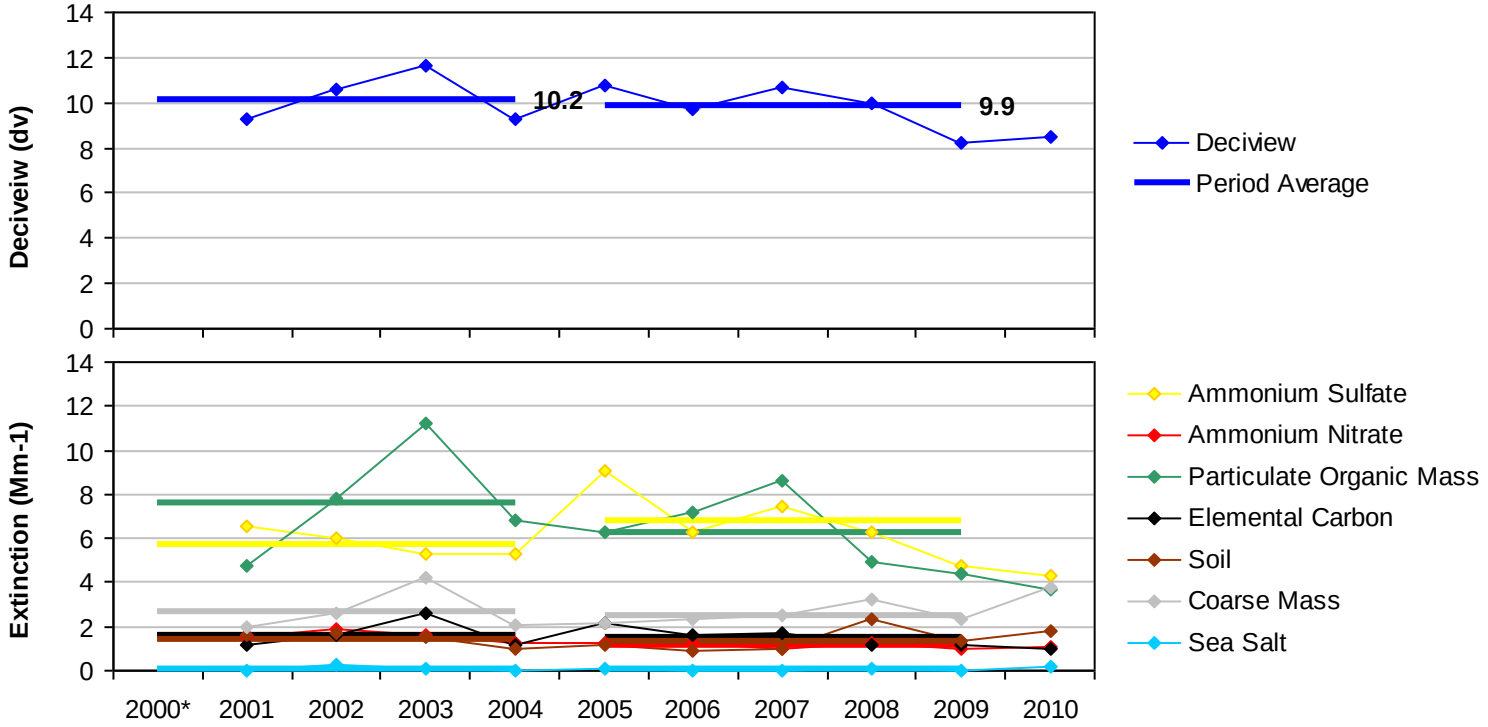
- **Figure I.6-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table I.6-1
San Pedro Parks WA, NM (SAPE1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period						2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	1.9	1.1	1.4	1.5	0.9	1.4	1.0	0.8	1.1	0.8	-0.1	0.1	1.5	1.0	-0.5	-33%
Worst 20% Days	---	9.3	10.6	11.6	9.3	10.8	9.7	10.7	10.0	8.2	8.5	-0.1	0.3	10.2	9.9	-0.3	-3%
All Days	---	5.7	5.8	6.2	5.5	5.7	5.4	5.6	5.6	4.7	4.8	-0.1	0.0	5.8	5.4	-0.4	-7%
Total Extinction (Mm-1)																	
Best 20% Days	---	12.1	11.2	11.6	11.6	11.0	11.6	11.1	10.8	11.2	10.8	-0.1	0.1	11.6	11.1	-0.5	-4%
Worst 20% Days	---	25.6	29.9	34.6	25.6	30.2	27.6	30.3	27.4	22.9	23.7	-0.4	0.4	28.9	27.7	-1.2	-4%
All Days	---	18.3	19.0	20.3	17.9	18.9	18.0	18.8	18.4	16.5	16.9	-0.1	0.1	18.9	18.1	-0.8	-4%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	1.9	1.4	1.4	1.6	1.3	1.9	1.4	1.2	1.5	1.3	0.0	0.2	1.6	1.5	-0.1	-6%
Worst 20% Days	---	6.5	6.0	5.3	5.3	9.1	6.3	7.4	6.3	4.7	4.3	0.0	0.4	5.8	6.8	1.0	17%
All Days	---	4.1	3.7	3.5	3.6	4.7	3.7	3.9	3.8	3.1	3.1	0.0	0.4	3.7	3.9	0.2	5%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.5	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.0	0.0	0.4	0.4	0.0	0%
Worst 20% Days	---	1.5	1.8	1.6	1.3	1.3	1.3	1.0	1.3	1.0	1.0	-0.1	0.0	1.6	1.2	-0.4	-25%
All Days	---	1.0	1.1	0.9	1.0	0.8	0.8	0.9	0.9	0.8	0.8	0.0	0.0	1.0	0.8	-0.2	-20%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	0.9	0.6	0.7	0.7	0.5	0.6	0.6	0.6	0.6	0.5	0.0	0.1	0.7	0.6	-0.1	-14%
Worst 20% Days	---	4.8	7.8	11.3	6.8	6.3	7.2	8.6	5.0	4.4	3.7	-0.5	0.2	7.7	6.3	-1.4	-18%
All Days	---	2.6	3.2	4.1	2.9	2.8	2.8	3.3	2.6	2.1	2.1	-0.1	0.1	3.2	2.7	-0.5	-16%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.3	0.4	0.5	0.2	0.3	0.2	0.2	0.3	0.2	0.0	0.1	0.4	0.2	-0.2	-50%
Worst 20% Days	---	1.1	1.6	2.6	1.1	2.2	1.6	1.7	1.2	1.1	1.0	0.0	0.3	1.6	1.6	0.0	0%
All Days	---	0.8	0.9	1.1	0.7	0.9	0.9	0.8	0.6	0.6	0.6	0.0	0.1	0.9	0.8	-0.1	-11%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.0	0.3	0.2	0.1	-0.1	-50%
Worst 20% Days	---	1.6	1.7	1.5	1.0	1.1	0.9	1.0	2.3	1.3	1.8	-0.1	0.2	1.5	1.3	-0.2	-13%
All Days	---	0.7	0.8	0.8	0.6	0.5	0.6	0.6	0.9	0.7	0.8	0.0	0.5	0.7	0.7	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.3	0.3	0.4	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.5	0.3	0.3	0.0	0%
Worst 20% Days	---	2.0	2.6	4.2	2.1	2.1	2.3	2.5	3.2	2.3	3.8	0.1	0.2	2.7	2.5	-0.2	-7%
All Days	---	1.0	1.3	1.8	1.1	1.1	1.2	1.3	1.6	1.3	1.5	0.0	0.1	1.3	1.3	0.0	0%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0%
Worst 20% Days	---	0.0	0.3	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.2	0.0	0.5	0.1	0.1	0.0	0%
All Days	---	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0%

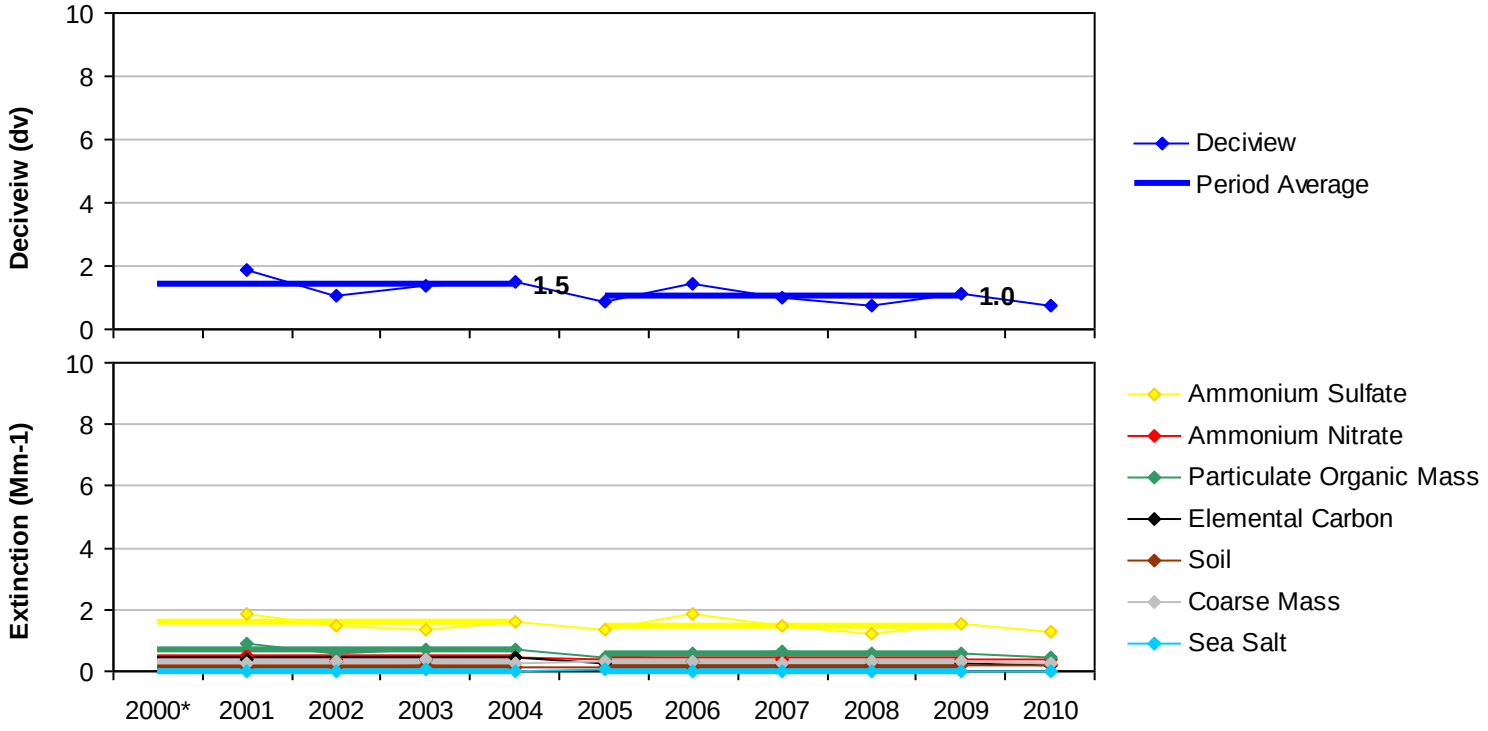
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure I.6-1
San Pedro Parks WA, NM (SAPE1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



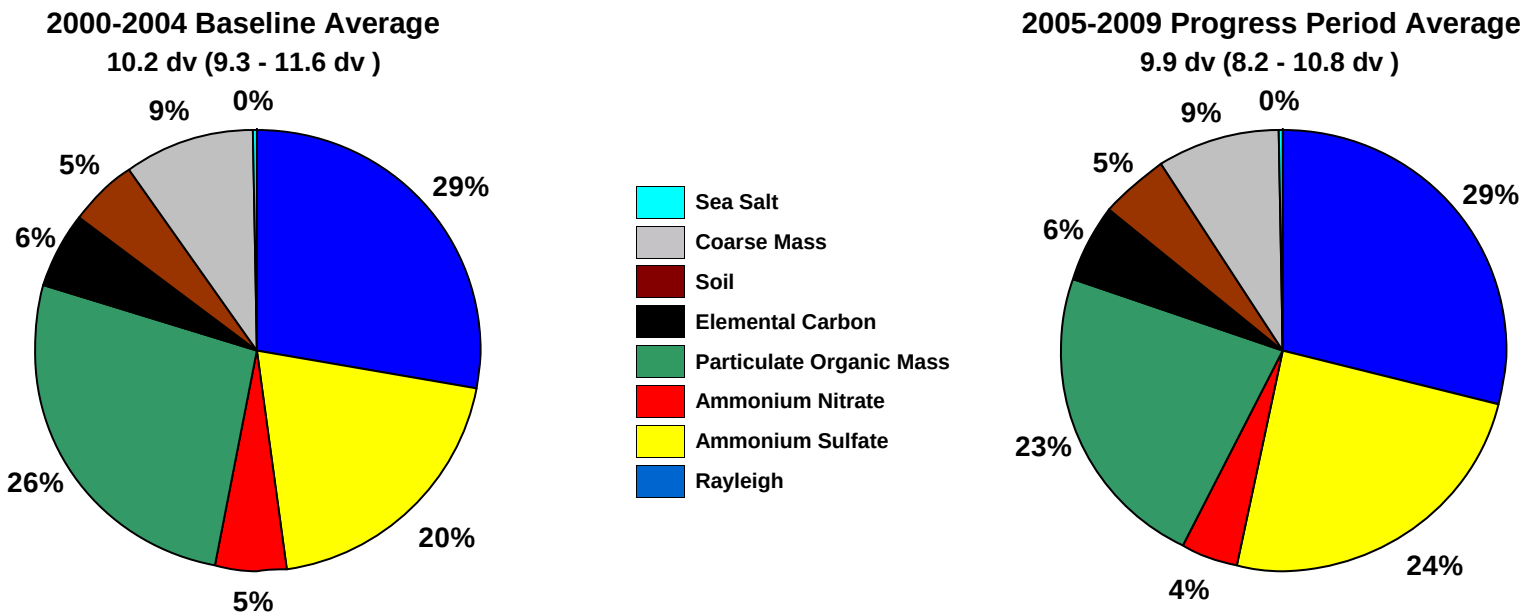
*Missing years did not meet RHR data completeness criteria.

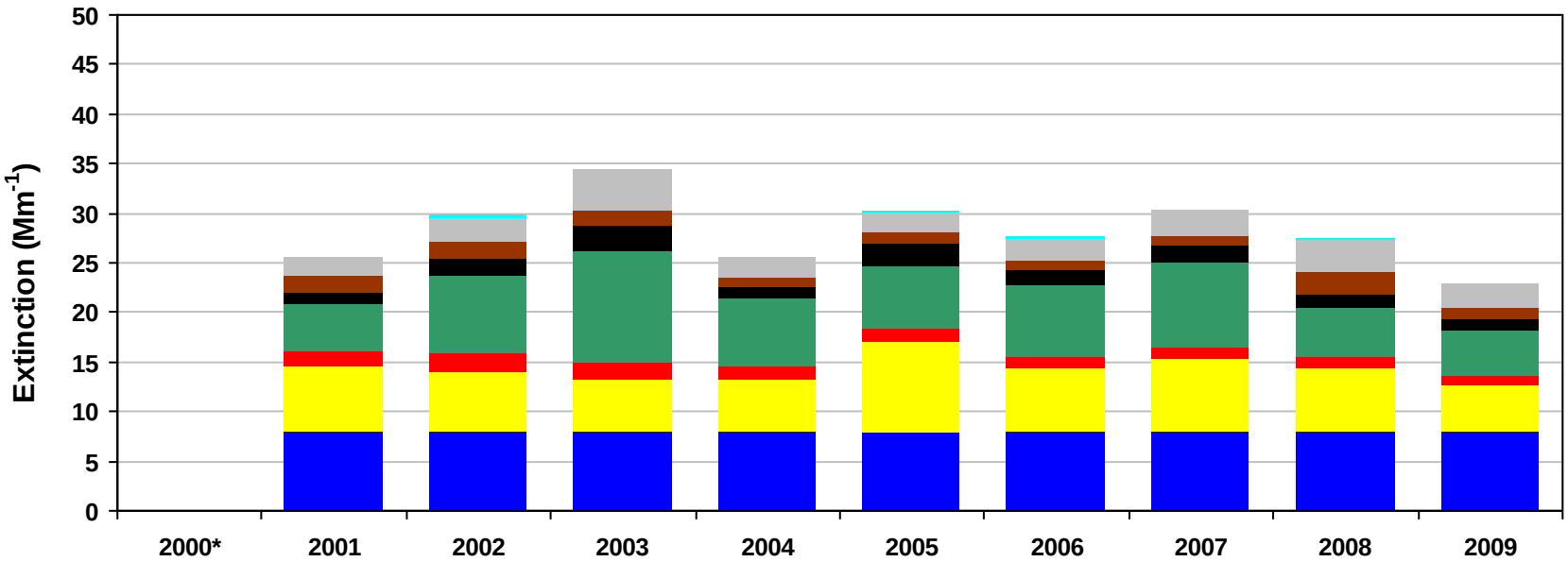
Figure I.6-2
San Pedro Parks WA, NM (SAPE1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

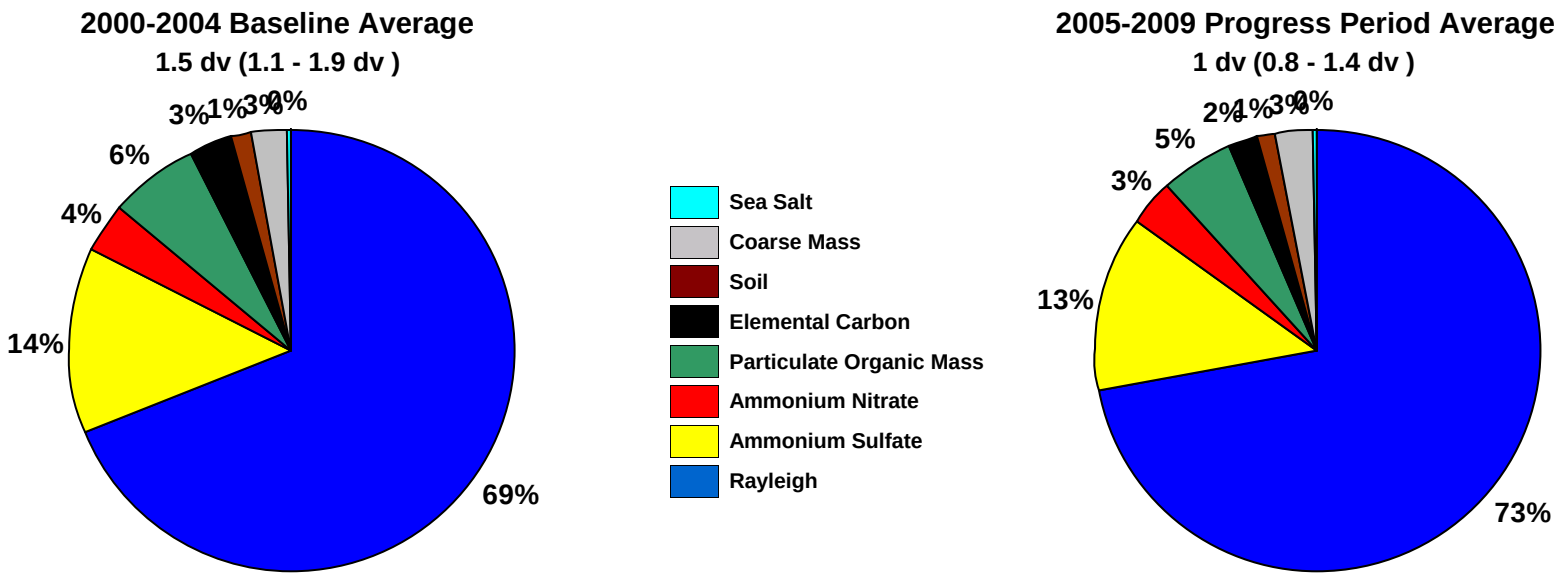
Figure I.6-3
San Pedro Parks WA, NM (SAPE1 Site)
20% Most Impaired Visibility Days

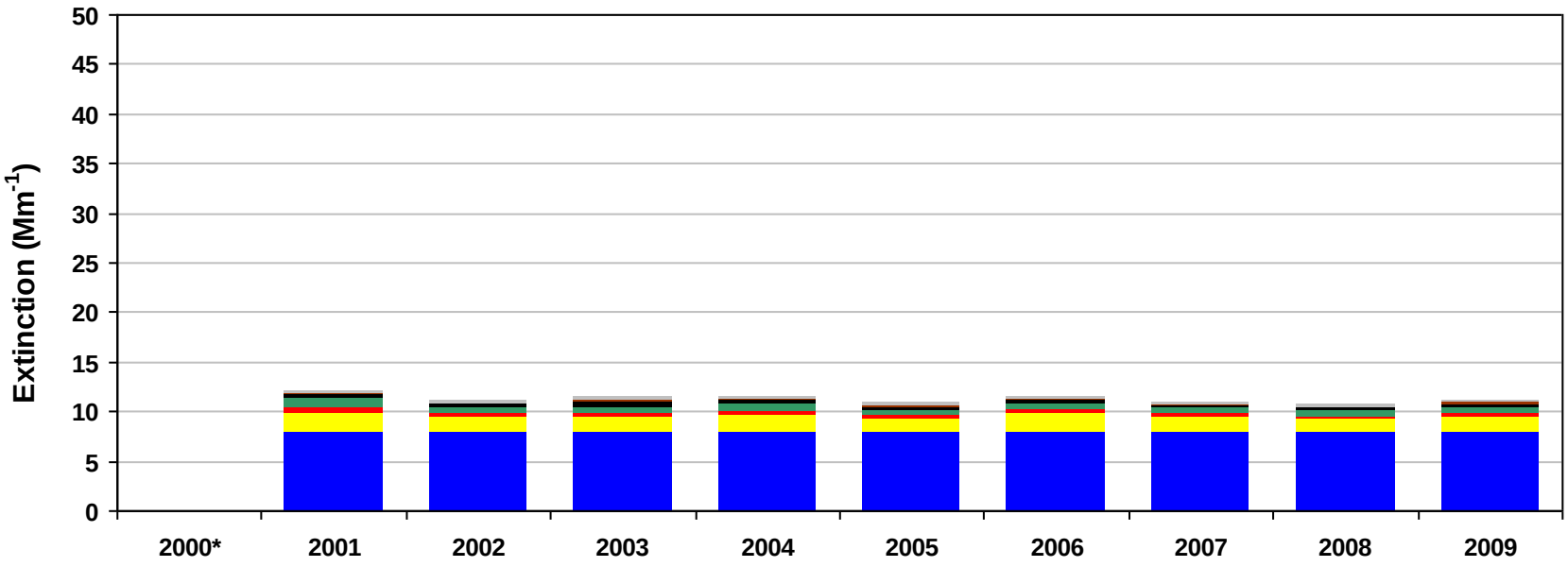




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

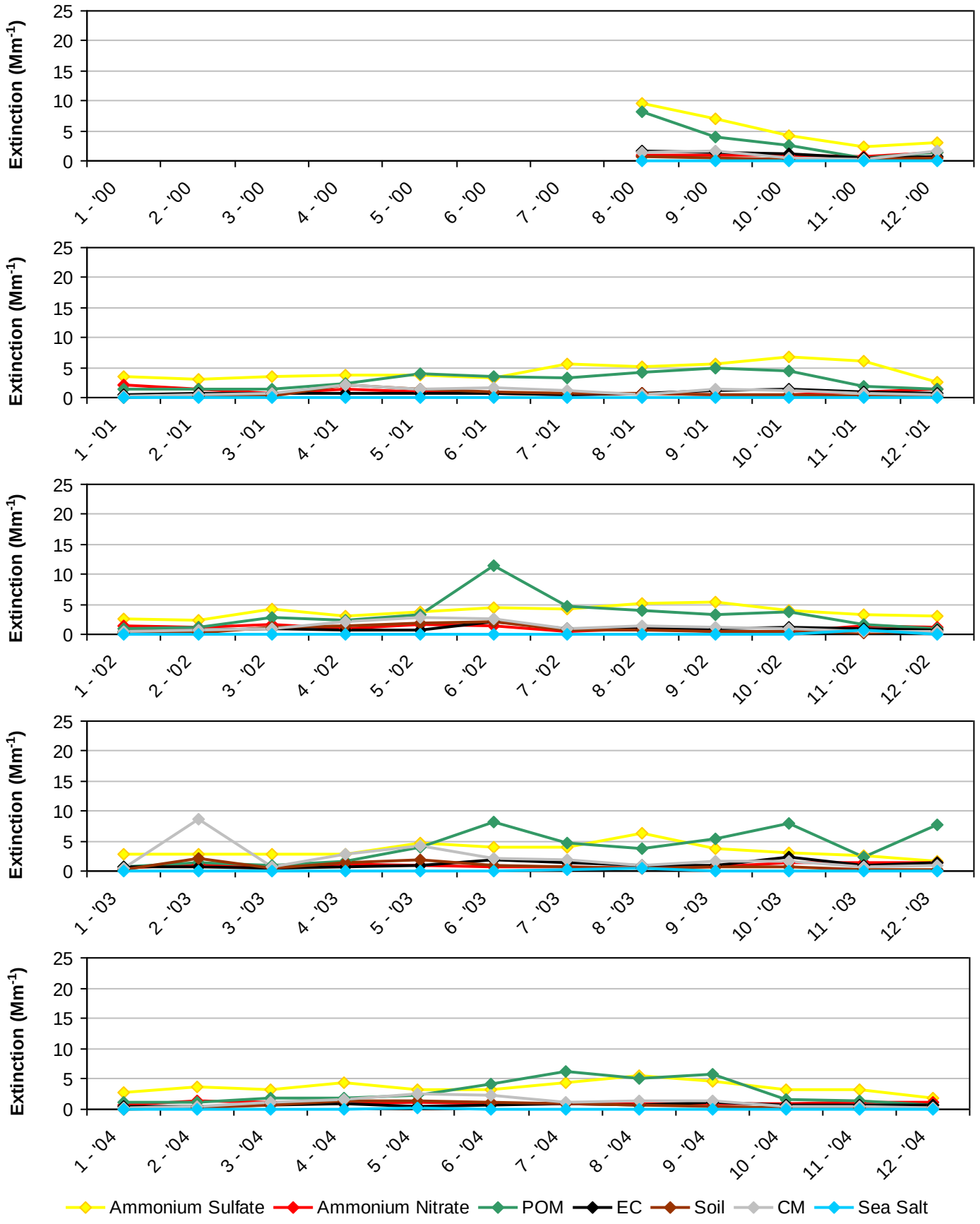
Figure I.6-4
San Pedro Parks WA, NM (SAPE1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure I.6-5
San Pedro Parks WA, NM (SAPE1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure I.6-6
San Pedro Parks WA, NM (SAPE1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

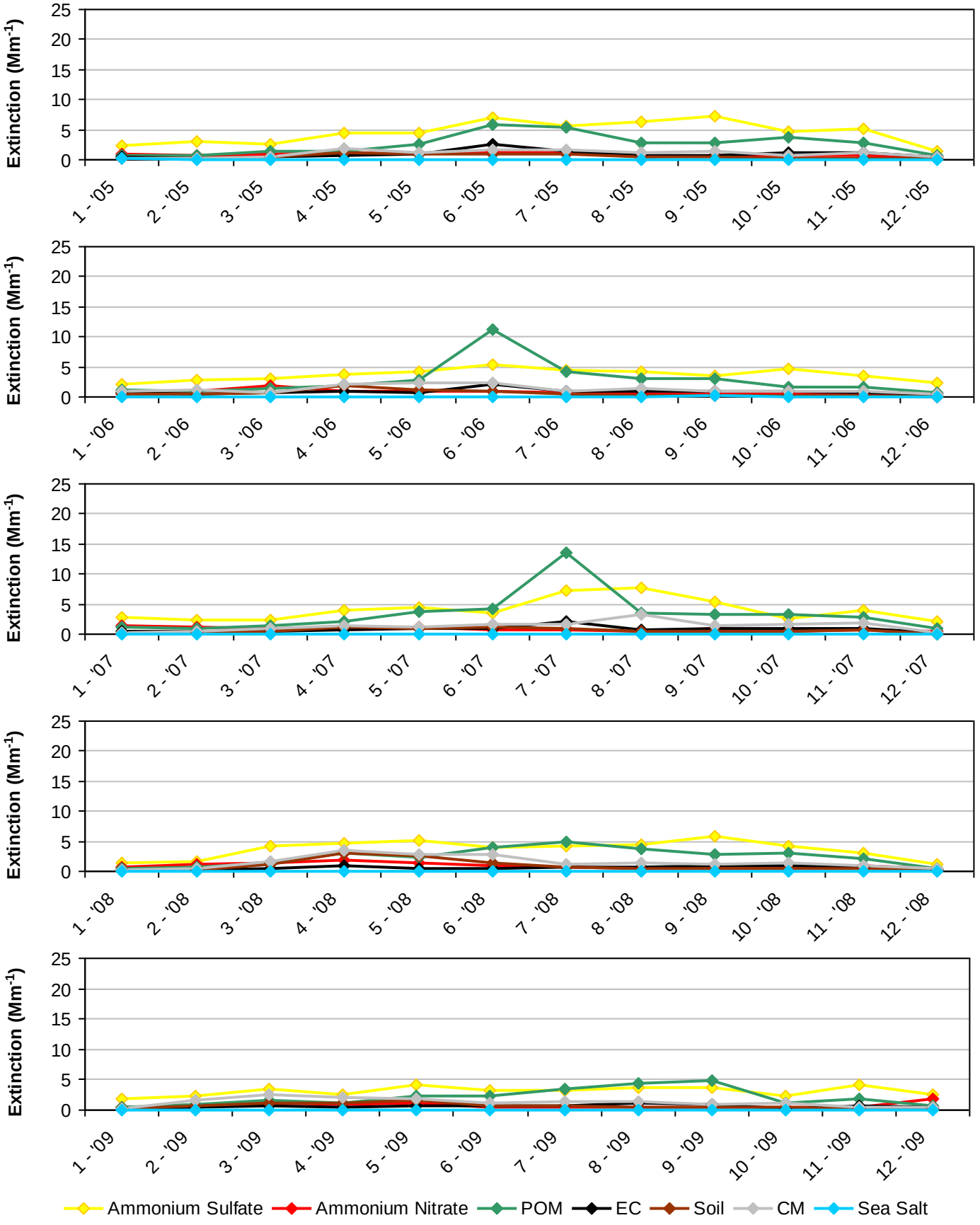
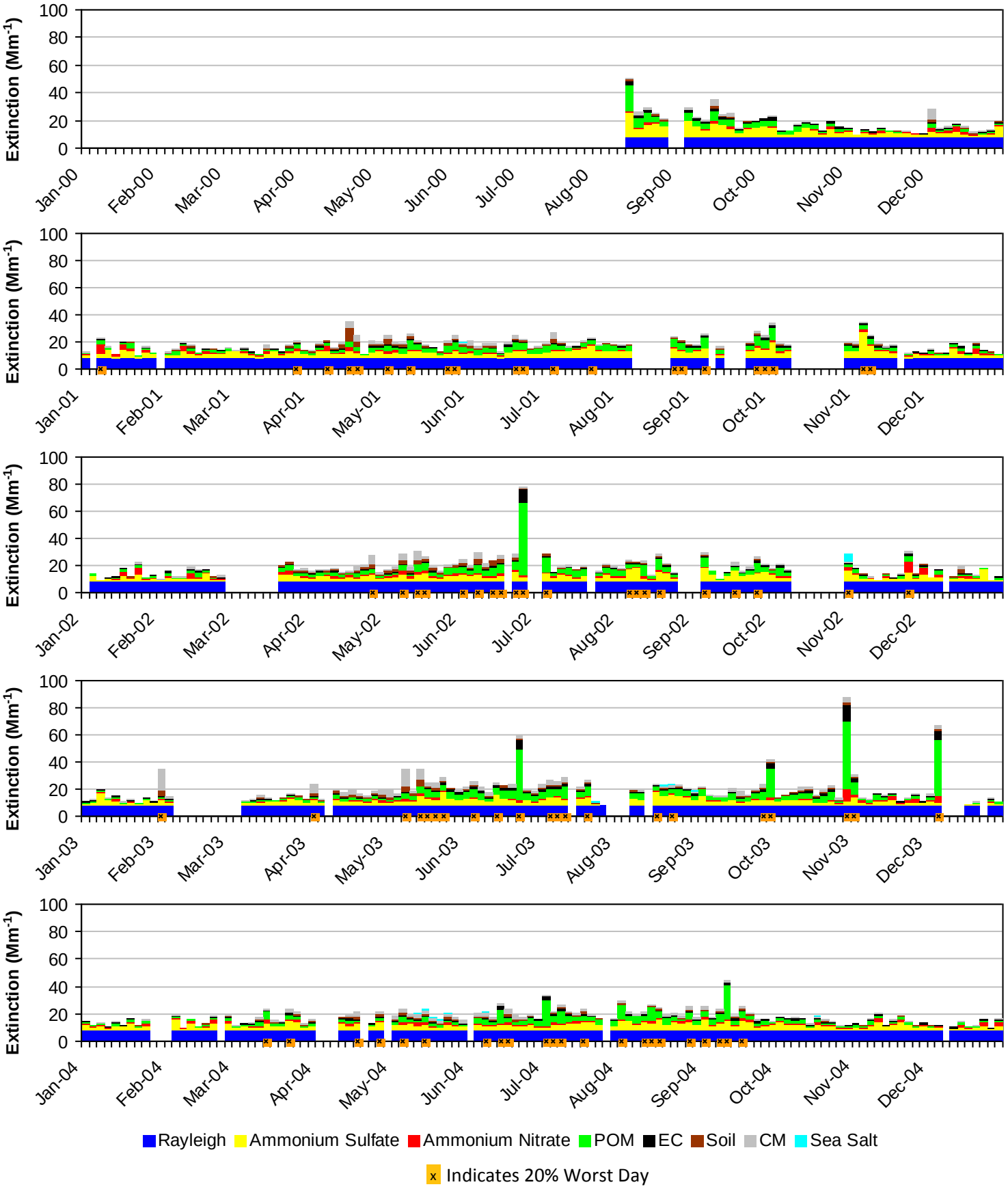
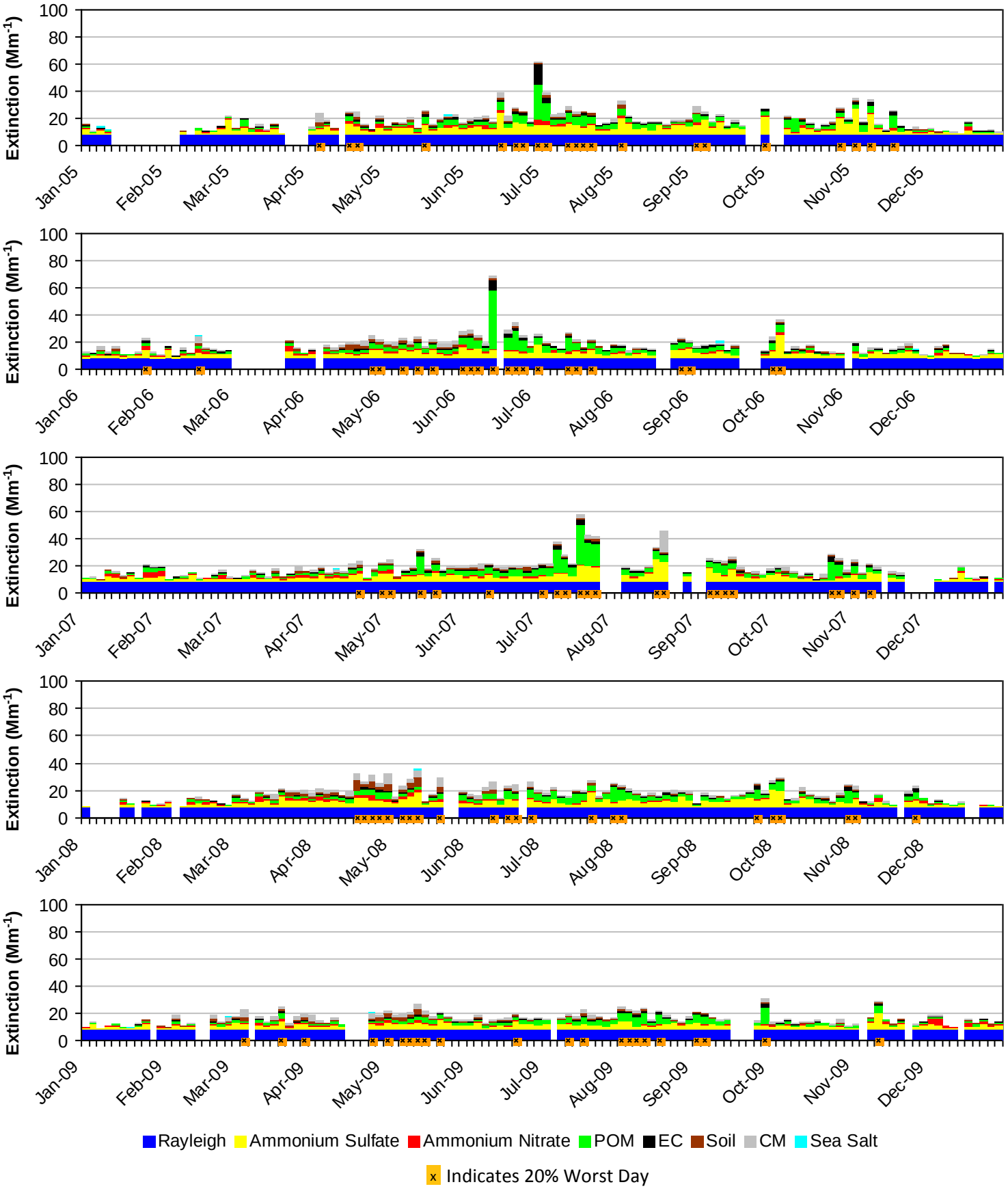


Figure I.6-7
San Pedro Parks WA, NM (SAPE1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure I.6-8
San Pedro Parks WA, NM (SAPE1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



I.7. WHITE MOUNTAIN WA (WHIT1)

The following tables and figures are presented in this section for the White Mountain WA represented by the WHIT1 IMPROVE Monitor:

- **Table I.7-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure I.7-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure I.7-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure I.7-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure I.7-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure I.7-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure I.7-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure I.7-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

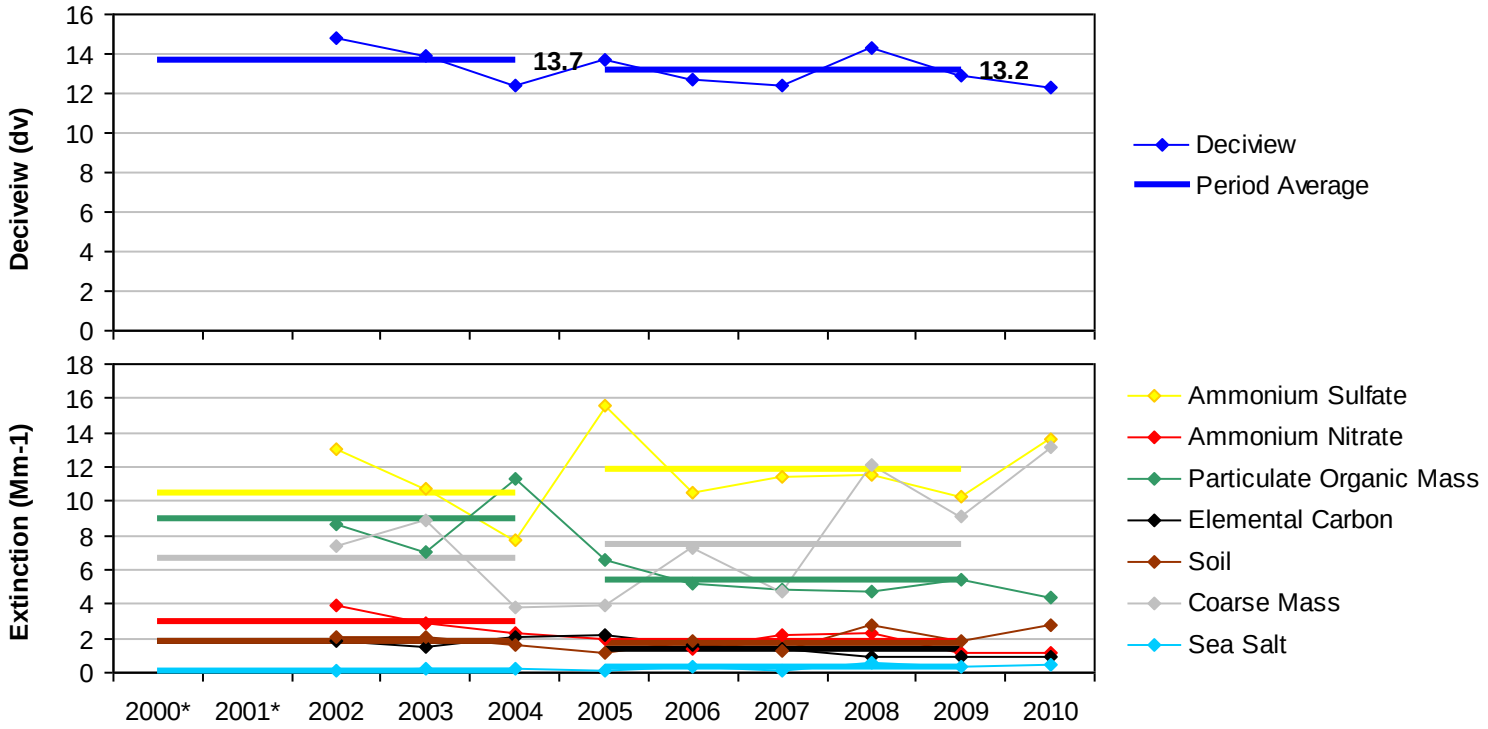
- **Figure I.7-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table I.7-1
White Mountain WA, NM (WHIT1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	---	4.1	3.5	3.0	3.0	3.4	3.9	3.0	3.2	3.1	-0.1	0.4	3.6	3.3	-0.3	-8%
Worst 20% Days	---	---	14.8	13.9	12.4	13.7	12.7	12.4	14.3	12.9	12.3	-0.2	0.3	13.7	13.2	-0.5	-4%
All Days	---	---	8.9	8.7	7.4	7.8	7.8	8.1	8.2	7.7	7.3	-0.1	0.2	8.3	7.9	-0.4	-5%
Total Extinction (Mm-1)																	
Best 20% Days	---	---	15.2	14.3	13.5	13.5	14.1	14.8	13.6	13.9	13.7	-0.1	0.4	14.3	14.0	-0.3	-2%
Worst 20% Days	---	---	46.0	42.2	38.1	40.4	37.3	35.0	44.0	38.3	45.4	-1.0	0.1	42.1	39.0	-3.1	-7%
All Days	---	---	26.5	25.8	22.9	23.7	23.4	23.5	25.0	23.4	24.0	-0.2	0.1	25.1	23.8	-1.3	-5%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	---	2.2	1.9	1.6	1.6	1.8	2.0	1.7	1.8	1.8	0.0	0.4	1.9	1.8	-0.1	-5%
Worst 20% Days	---	---	13.1	10.7	7.8	15.5	10.5	11.4	11.6	10.2	13.6	-0.1	0.4	10.5	11.9	1.4	13%
All Days	---	---	6.1	5.7	4.4	6.4	5.4	5.9	5.9	5.2	5.8	-0.1	0.4	5.4	5.8	0.4	7%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	---	0.5	0.4	0.4	0.3	0.3	0.5	0.3	0.4	0.3	0.0	0.3	0.5	0.4	-0.1	-20%
Worst 20% Days	---	---	3.9	2.9	2.3	1.9	1.4	2.2	2.3	1.2	1.2	-0.3	0.0	3.0	1.8	-1.2	-40%
All Days	---	---	1.5	1.3	1.3	1.1	0.9	1.1	1.1	0.8	0.7	-0.1	0.0	1.3	1.0	-0.3	-23%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	---	1.6	1.2	1.2	0.9	1.1	1.5	1.0	1.1	1.3	0.0	0.1	1.3	1.1	-0.2	-15%
Worst 20% Days	---	---	8.6	7.0	11.3	6.6	5.2	4.8	4.7	5.5	4.4	-0.6	0.0	9.0	5.4	-3.6	-40%
All Days	---	---	4.0	3.6	4.3	3.1	2.9	3.2	2.8	3.3	2.8	-0.1	0.1	4.0	3.1	-0.9	-23%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	---	0.7	0.6	0.5	0.6	0.5	0.5	0.4	0.3	0.2	0.0	0.0	0.6	0.4	-0.2	-33%
Worst 20% Days	---	---	1.9	1.5	2.1	2.2	1.7	1.3	1.0	1.0	0.9	-0.2	0.1	1.8	1.4	-0.4	-22%
All Days	---	---	1.1	1.0	1.1	1.2	1.0	1.0	0.7	0.7	0.6	-0.1	0.0	1.1	0.9	-0.2	-18%
Soil Extinction (Mm-1)																	
Best 20% Days	---	---	0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.3	0.3	0.0	0.2	0.2	0.2	0.0	0%
Worst 20% Days	---	---	2.0	2.1	1.6	1.1	1.8	1.3	2.7	1.9	2.8	0.0	0.6	1.9	1.8	-0.1	-5%
All Days	---	---	1.0	1.0	0.7	0.6	0.9	0.7	1.2	0.9	1.0	0.0	0.5	0.9	0.9	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	---	1.0	1.1	0.5	0.9	1.0	1.0	0.9	1.0	0.9	0.0	0.5	0.9	1.0	0.1	11%
Worst 20% Days	---	---	7.4	8.9	3.8	3.9	7.3	4.7	12.1	9.2	13.1	0.4	0.2	6.7	7.4	0.7	10%
All Days	---	---	3.6	4.1	2.0	2.3	3.2	2.6	4.1	3.4	4.0	0.1	0.4	3.2	3.1	-0.1	-3%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	---	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
Worst 20% Days	---	---	0.1	0.2	0.2	0.1	0.3	0.1	0.6	0.4	0.5	0.0	0.1	0.2	0.3	0.1	50%
All Days	---	---	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.4	0.1	0.1	0.0	0%

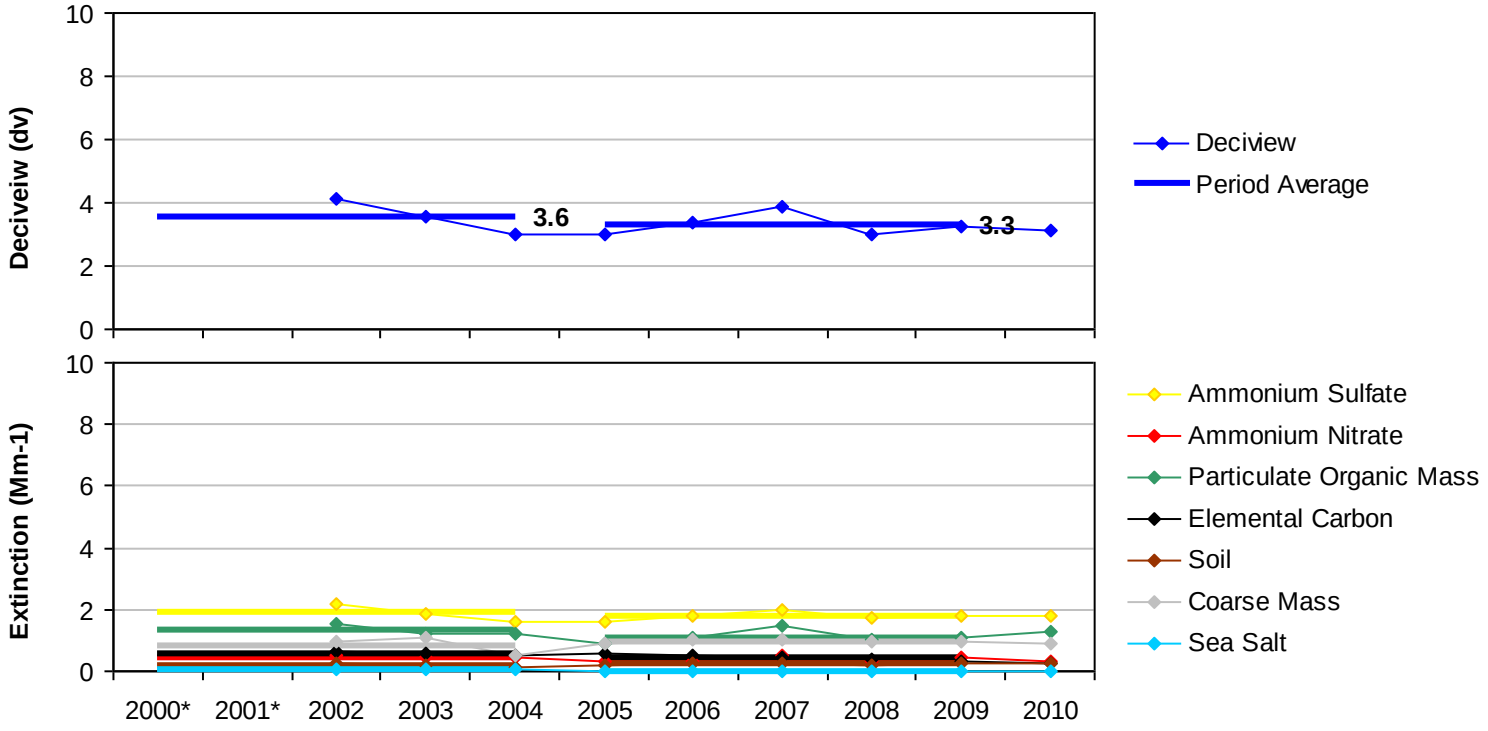
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure I.7-1
White Mountain WA, NM (WHIT1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



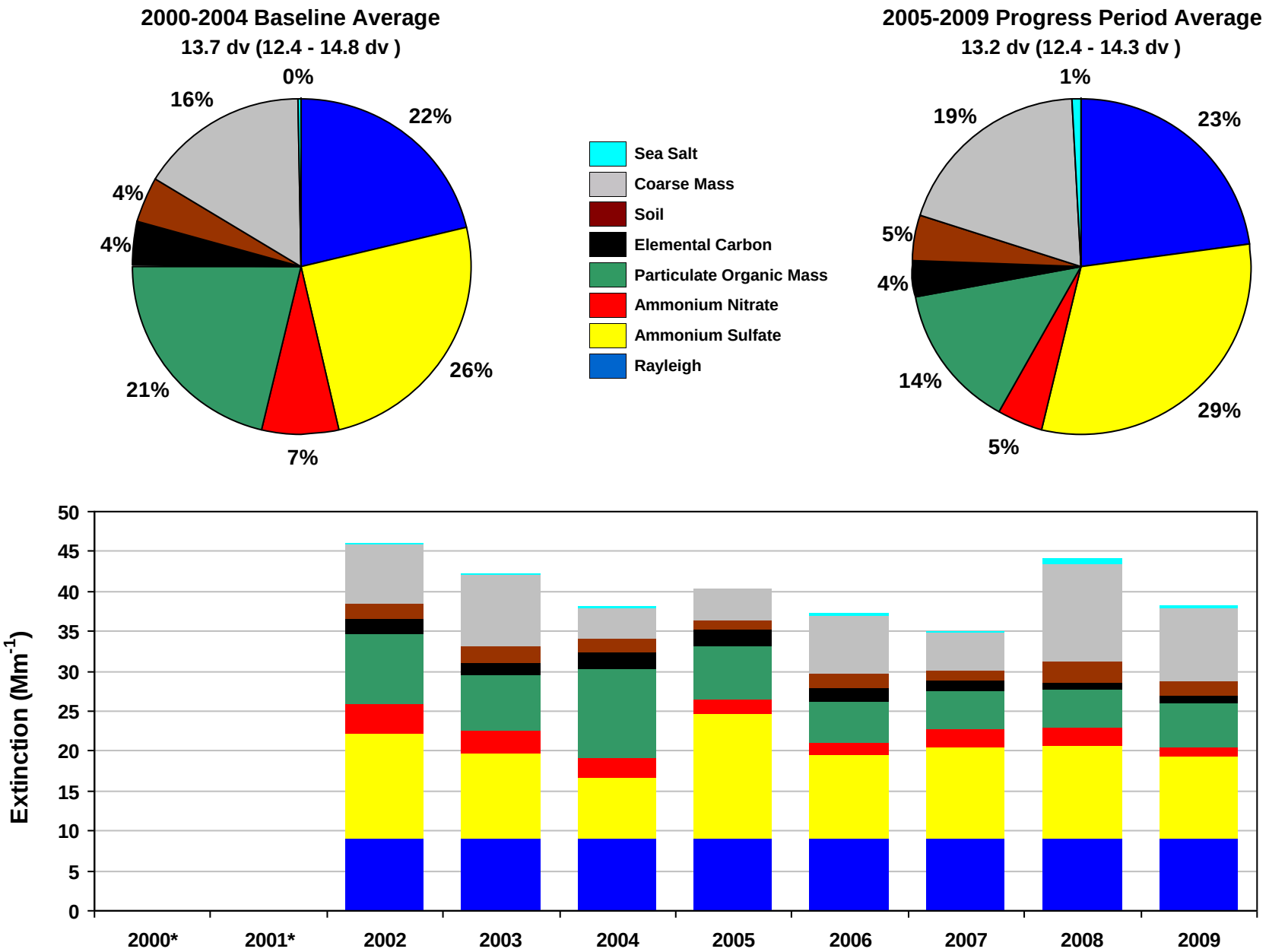
*Missing years did not meet RHR data completeness criteria.

Figure I.7-2
White Mountain WA, NM (WHIT1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



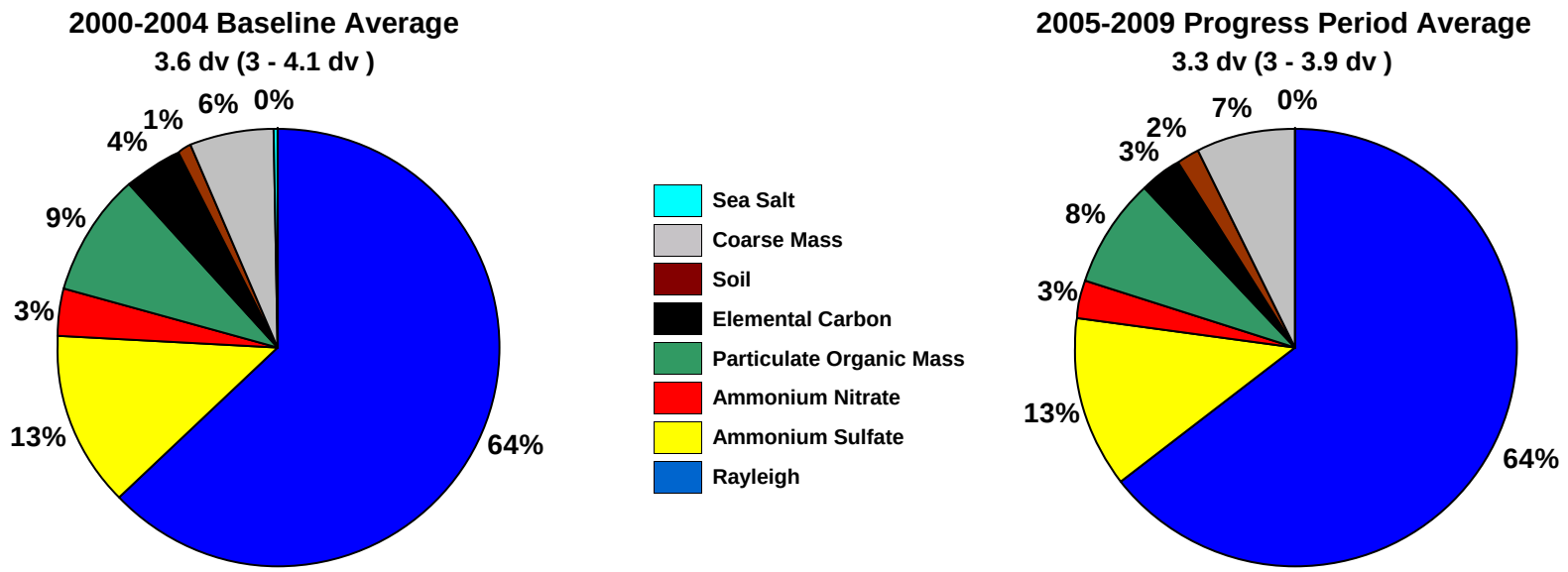
*Missing years did not meet RHR data completeness criteria.

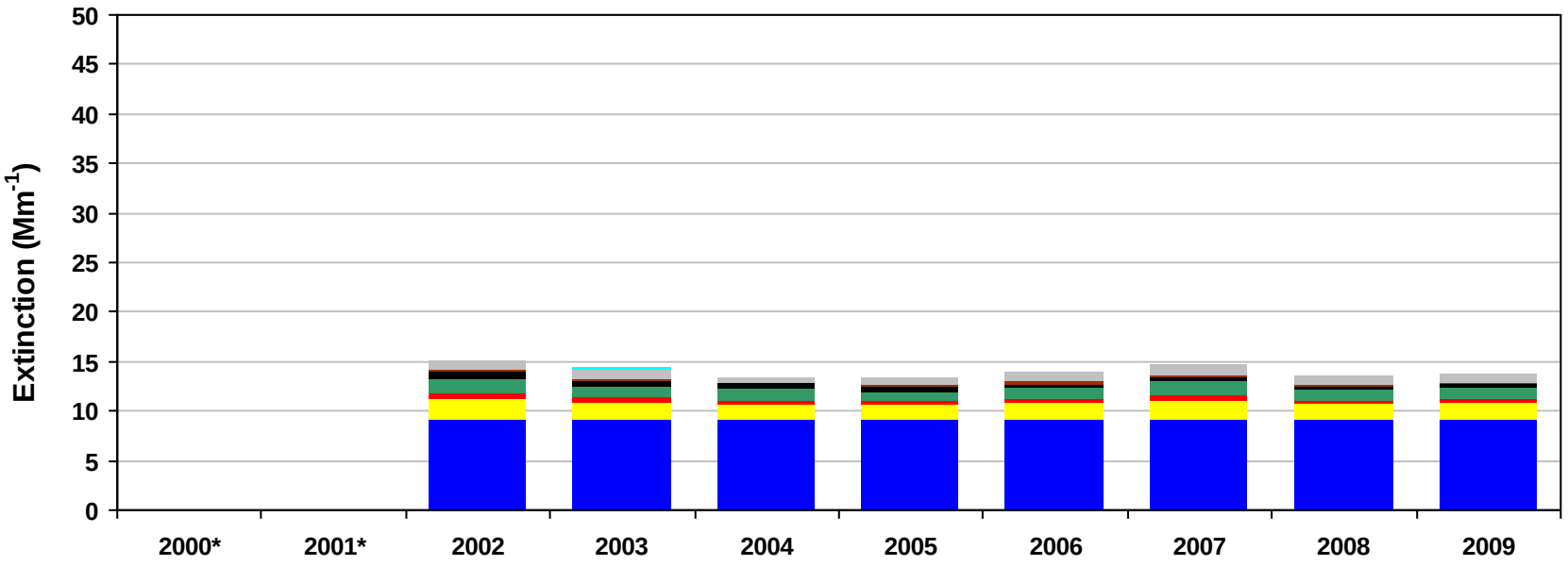
Figure I.7-3
White Mountain WA, NM (WHIT1 Site)
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

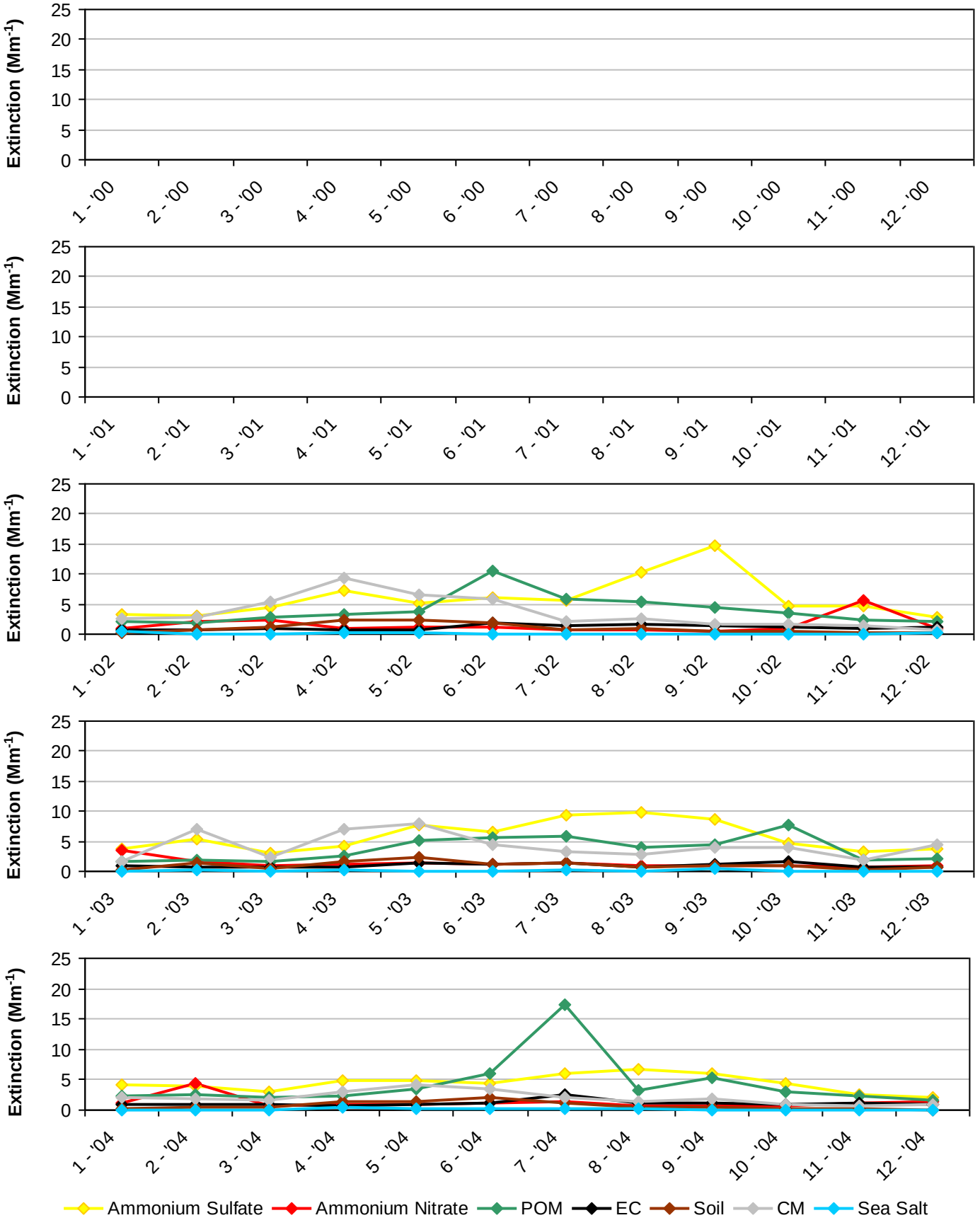
Figure I.7-4
White Mountain WA, NM (WHIT1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure I.7-5
White Mountain WA, NM (WHIT1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure I.7-6
White Mountain WA, NM (WHIT1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

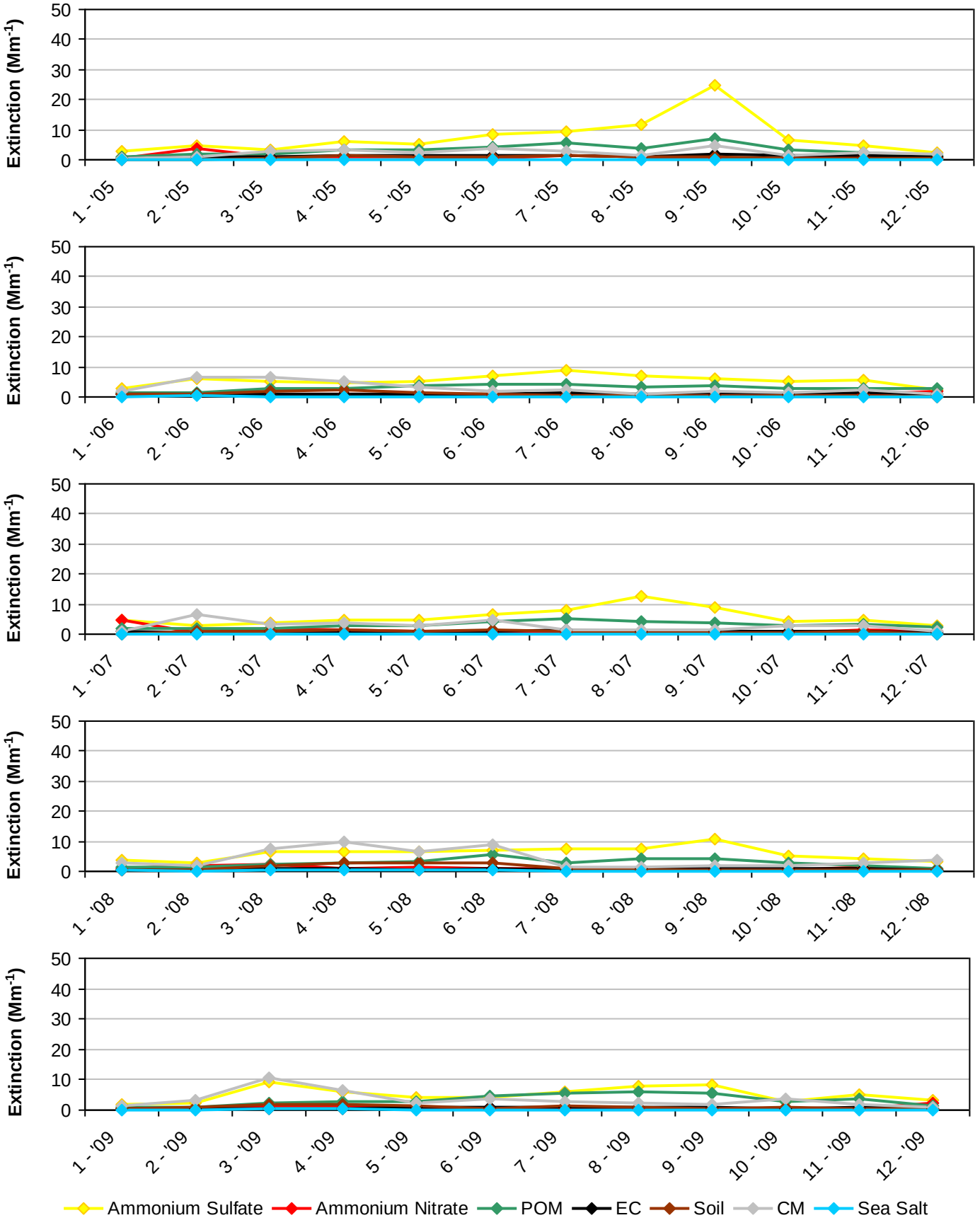
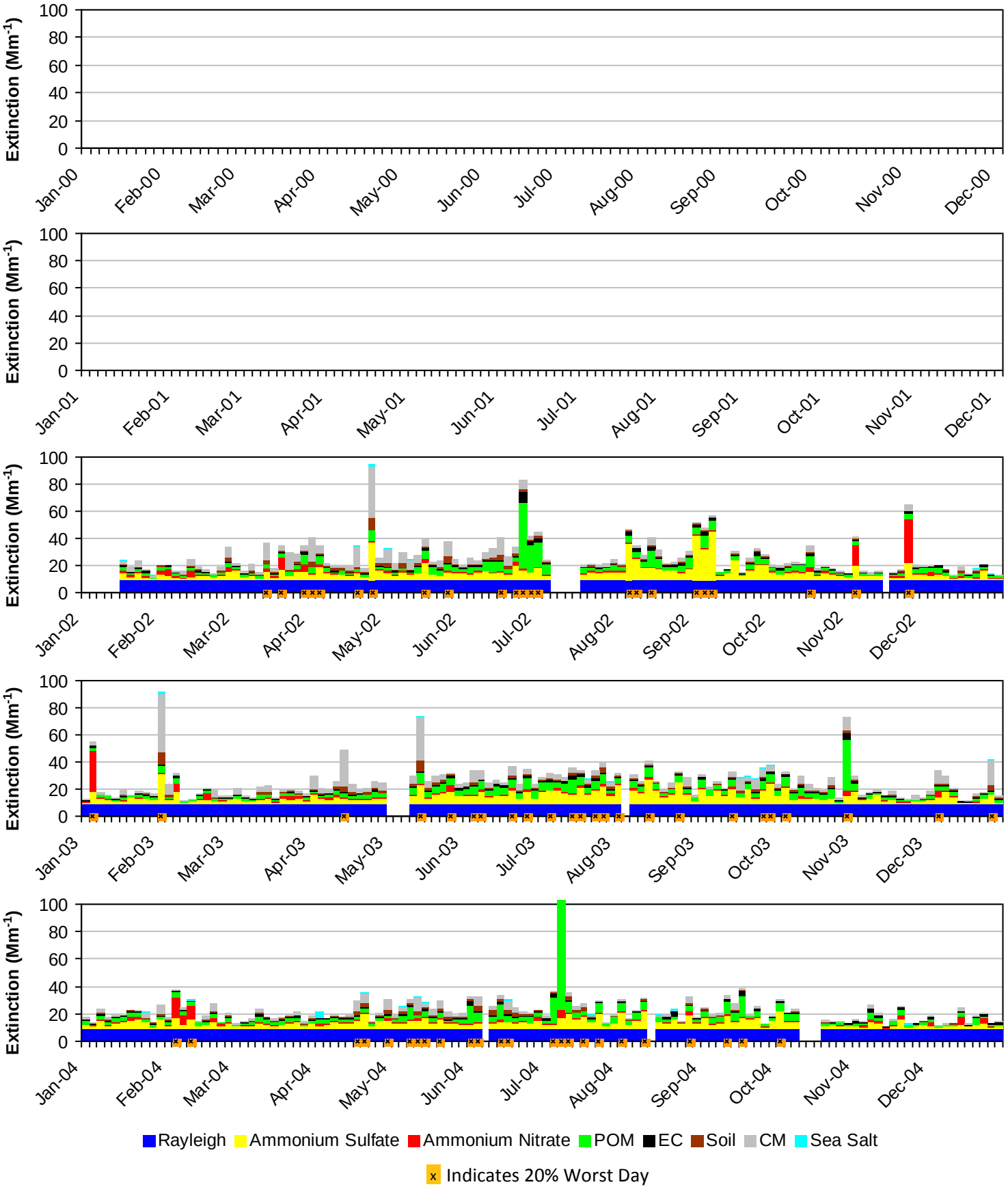
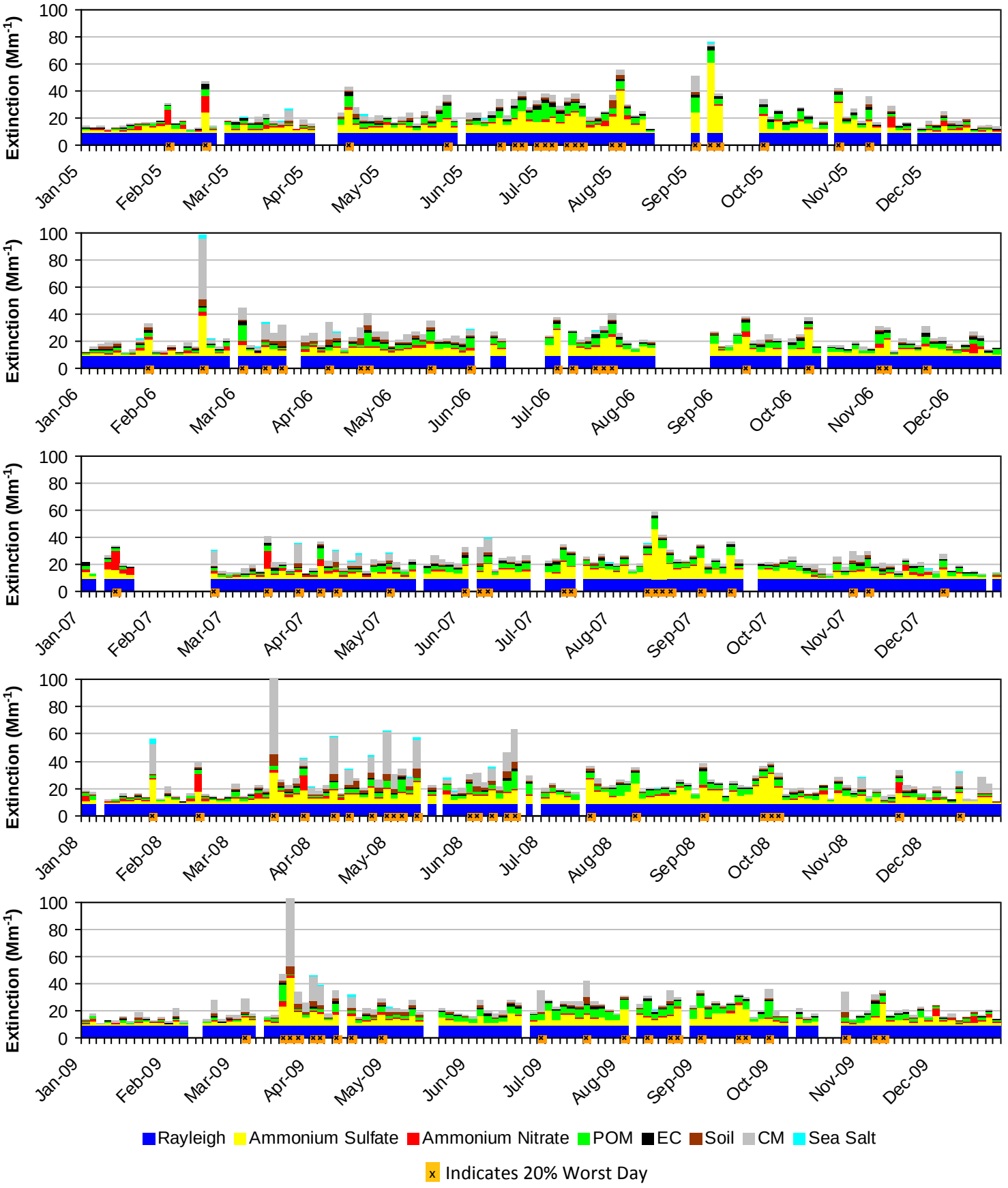


Figure I.7-7
White Mountain WA, NM (WHIT1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure I.7-8
White Mountain WA, NM (WHIT1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



I.8. WHEELER PEAK WA AND PECOS WA (WHPE1)

The following tables and figures are presented in this section for the Bandelier NM represented by the WHPE1 IMPROVE Monitor:

- **Table I.8-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure I.8-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure I.8-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure I.8-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure I.8-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure I.8-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure I.8-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure I.8-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

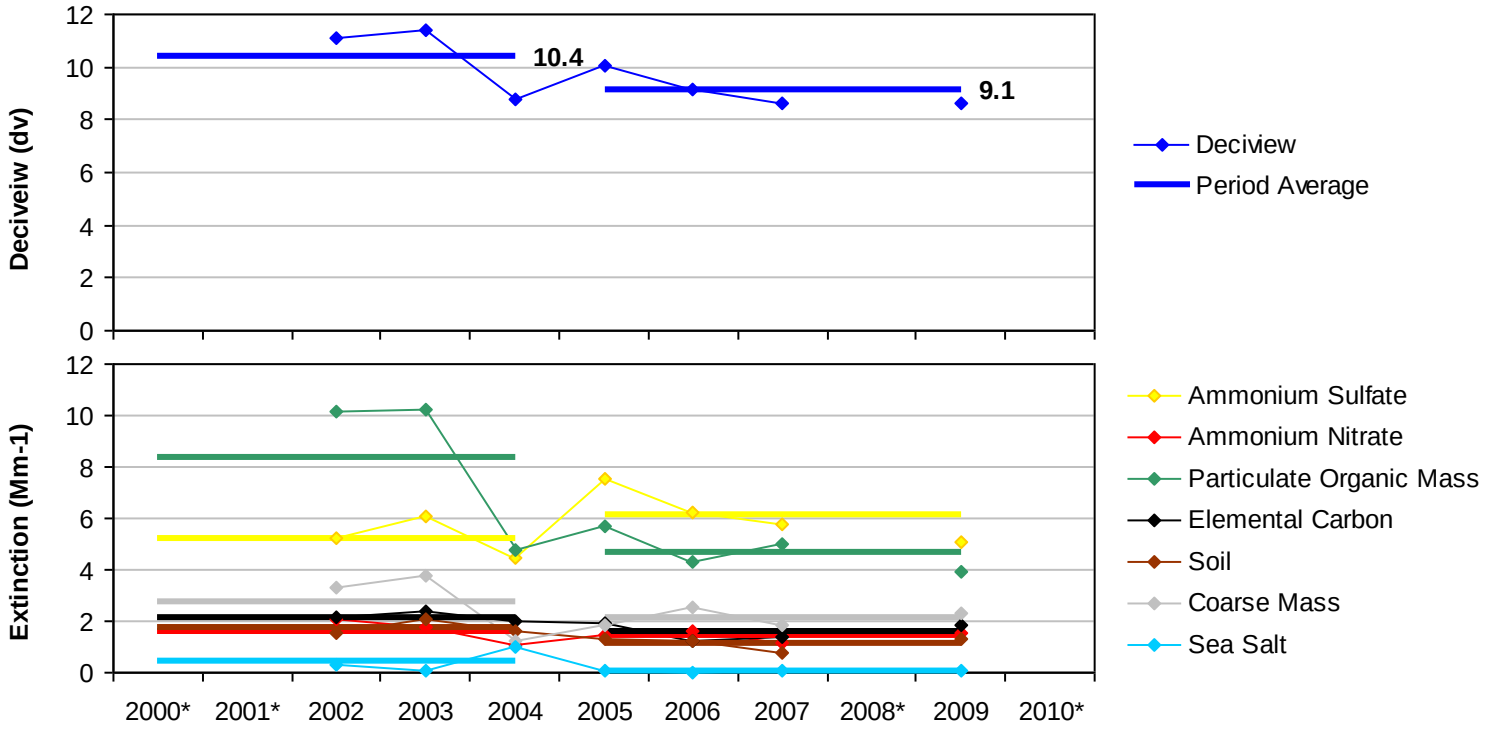
- **Figure I.8-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table I.8-1
Wheeler Peak and Pecos Was, NM (WHPE1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	---	1.1	1.5	1.0	0.6	1.3	1.2	---	0.4	---	-0.1	0.2	1.2	0.9	-0.3	-25%
Worst 20% Days	---	---	11.1	11.4	8.7	10.1	9.2	8.6	---	8.6	---	-0.5	0.0	10.4	9.1	-1.3	-13%
All Days	---	---	6.0	6.0	5.0	5.3	5.3	5.0	---	4.5	---	-0.2	0.0	5.7	5.0	-0.7	-12%
Total Extinction (Mm-1)																	
Best 20% Days	---	---	11.2	11.7	11.1	10.7	11.4	11.4	---	10.4	---	-0.1	0.2	11.3	11.0	-0.3	-3%
Worst 20% Days	---	---	32.7	34.4	24.2	27.9	25.1	23.9	---	24.0	---	-1.6	0.0	30.4	25.2	-5.2	-17%
All Days	---	---	19.8	19.9	17.2	18.0	17.7	17.1	---	16.4	---	-0.5	0.0	19.0	17.3	-1.7	-9%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	---	1.2	1.1	1.2	1.1	1.5	1.3	---	1.3	---	0.0	0.2	1.2	1.3	0.1	8%
Worst 20% Days	---	---	5.3	6.1	4.5	7.6	6.3	5.7	---	5.1	---	0.0	0.5	5.3	6.2	0.9	17%
All Days	---	---	3.4	3.4	3.1	4.0	3.6	3.4	---	3.2	---	0.0	0.4	3.3	3.6	0.3	9%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	---	0.4	0.3	0.4	0.2	0.2	0.3	---	0.2	---	0.0	0.1	0.3	0.3	0.0	0%
Worst 20% Days	---	---	2.1	1.8	1.1	1.4	1.6	1.2	---	1.5	---	-0.1	0.2	1.6	1.4	-0.2	-13%
All Days	---	---	1.1	1.0	0.9	0.8	0.9	0.9	---	0.8	---	0.0	0.0	1.0	0.8	-0.2	-20%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	---	0.6	1.0	0.8	0.6	0.9	0.8	---	0.4	---	0.0	0.3	0.8	0.7	-0.1	-13%
Worst 20% Days	---	---	10.1	10.2	4.7	5.7	4.3	5.0	---	3.9	---	-0.9	0.0	8.4	4.7	-3.7	-44%
All Days	---	---	3.7	3.9	2.5	2.5	2.5	2.5	---	1.9	---	-0.3	0.0	3.4	2.3	-1.1	-32%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	---	0.4	0.4	0.3	0.2	0.4	0.3	---	0.2	---	0.0	0.1	0.4	0.3	-0.1	-25%
Worst 20% Days	---	---	2.2	2.4	2.0	2.0	1.2	1.4	---	1.8	---	-0.1	0.0	2.2	1.6	-0.6	-27%
All Days	---	---	1.1	1.1	1.0	1.0	0.9	0.7	---	0.7	---	-0.1	0.0	1.0	0.8	-0.2	-20%
Soil Extinction (Mm-1)																	
Best 20% Days	---	---	0.1	0.1	0.1	0.1	0.1	0.1	---	0.1	---	0.0	0.2	0.1	0.1	0.0	0%
Worst 20% Days	---	---	1.6	2.1	1.6	1.3	1.2	0.7	---	1.3	---	-0.1	0.1	1.7	1.1	-0.6	-35%
All Days	---	---	0.8	0.8	0.8	0.5	0.6	0.5	---	0.6	---	0.0	0.1	0.8	0.5	-0.3	-38%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	---	0.5	0.6	0.4	0.4	0.3	0.5	---	0.2	---	0.0	0.1	0.5	0.3	-0.2	-40%
Worst 20% Days	---	---	3.3	3.8	1.2	1.9	2.5	1.9	---	2.3	---	-0.1	0.3	2.8	2.1	-0.7	-25%
All Days	---	---	1.7	1.7	0.8	1.1	1.2	1.2	---	1.1	---	-0.1	0.1	1.4	1.1	-0.3	-21%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	---	0.1	0.0	0.0	0.0	0.0	0.0	---	0.0	---	0.0	0.0	0.1	0.0	-0.1	-100%
Worst 20% Days	---	---	0.3	0.1	1.0	0.1	0.0	0.1	---	0.1	---	0.0	0.3	0.5	0.1	-0.4	-80%
All Days	---	---	0.1	0.0	0.2	0.0	0.0	0.0	---	0.0	---	0.0	0.1	0.1	0.0	-0.1	-100%

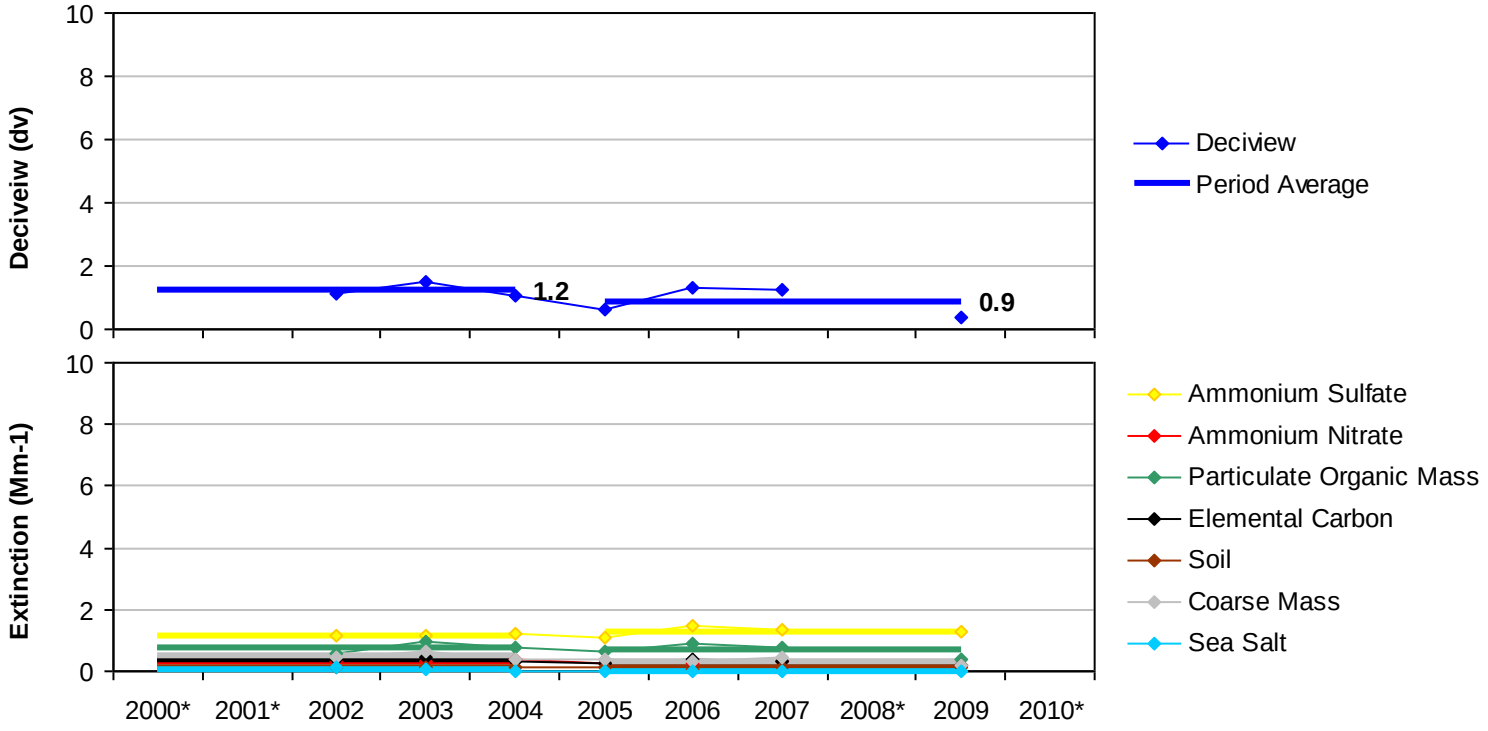
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure I.8-1
Wheeler Peak and Pecos Was, NM (WHPE1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



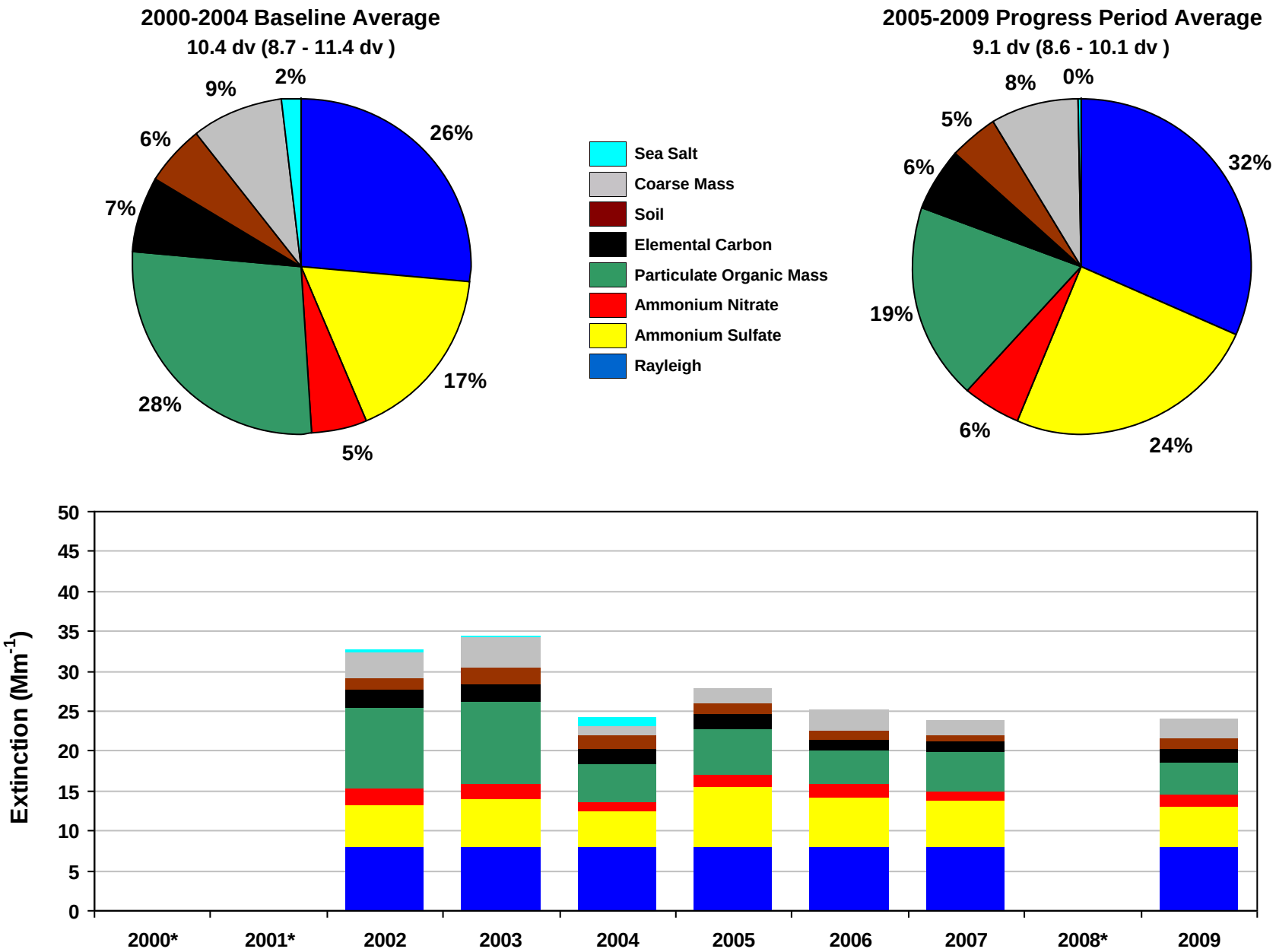
*Missing years did not meet RHR data completeness criteria.

Figure I.8-2
Wheeler Peak and Pecos Was, NM (WHPE1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



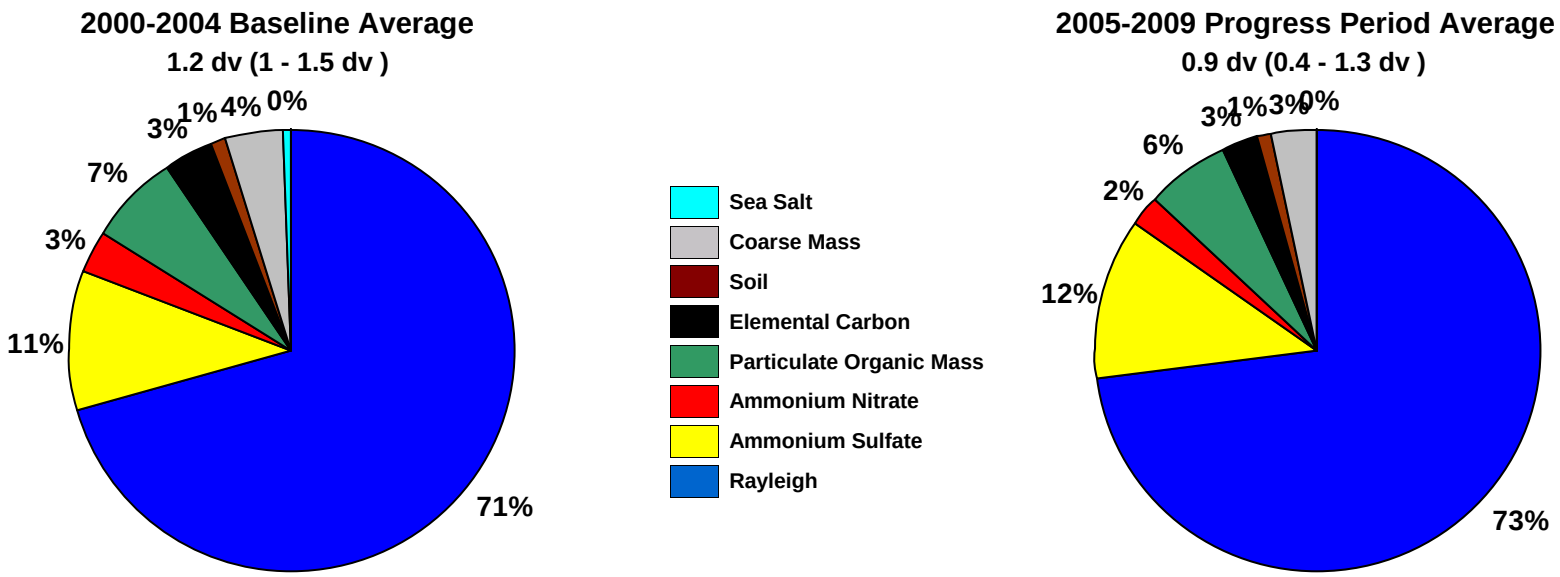
*Missing years did not meet RHR data completeness criteria.

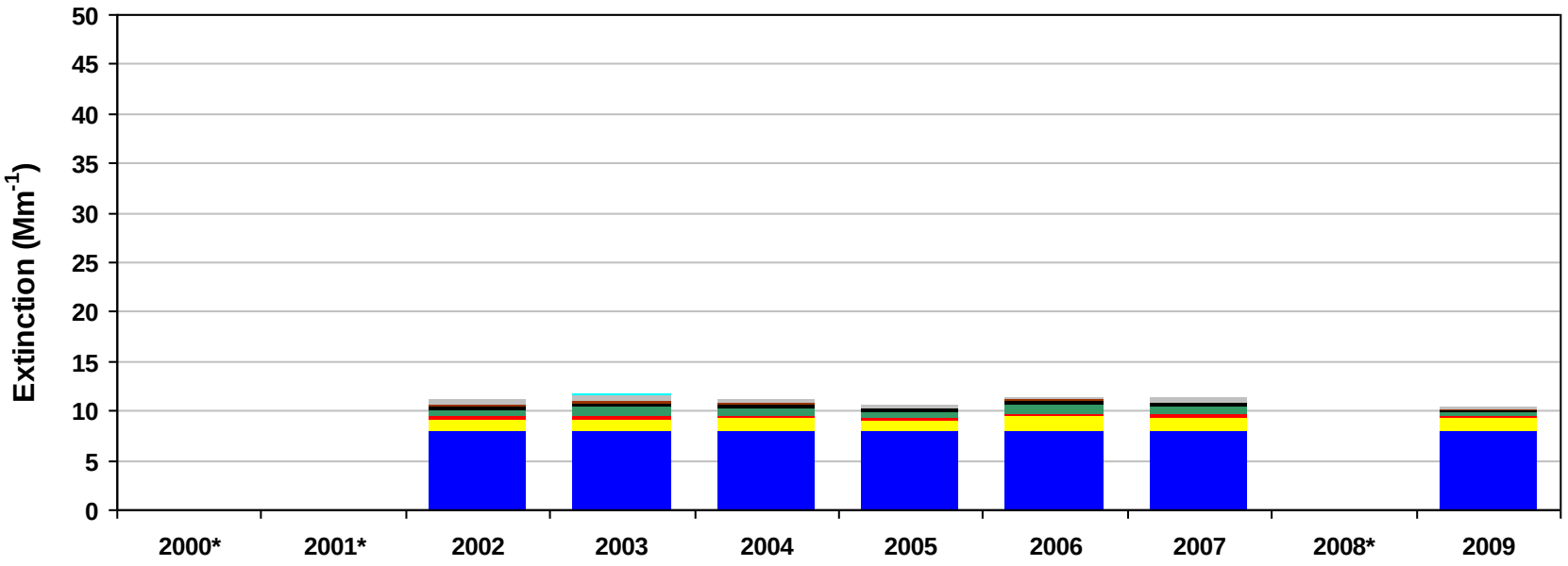
Figure I.8-3
Wheeler Peak and Pecos Was, NM (WHPE1 Site)
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

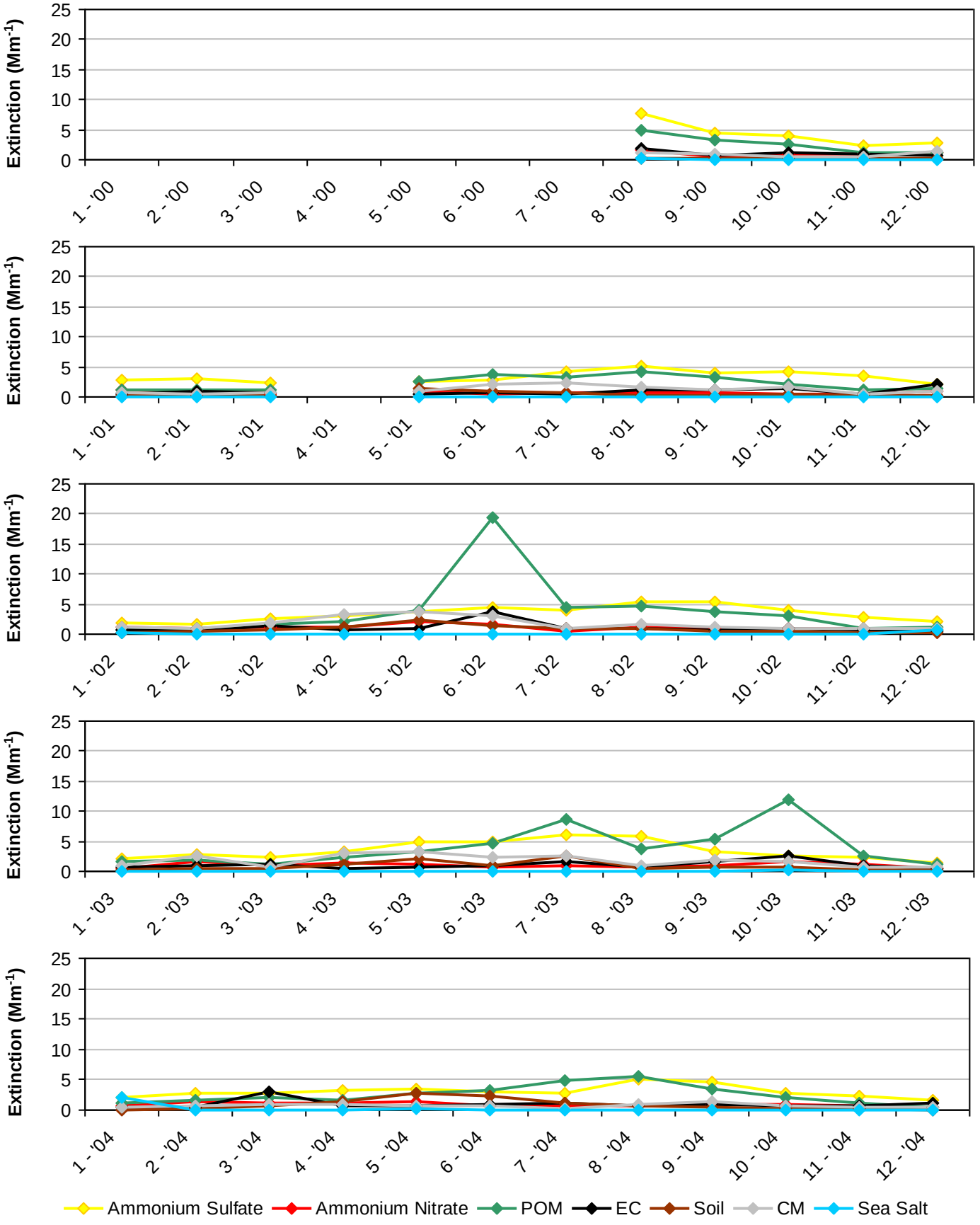
Figure I.8-4
Wheeler Peak and Pecos Was, NM (WHPE1 Site)
20% Least Impaired Visibility Days





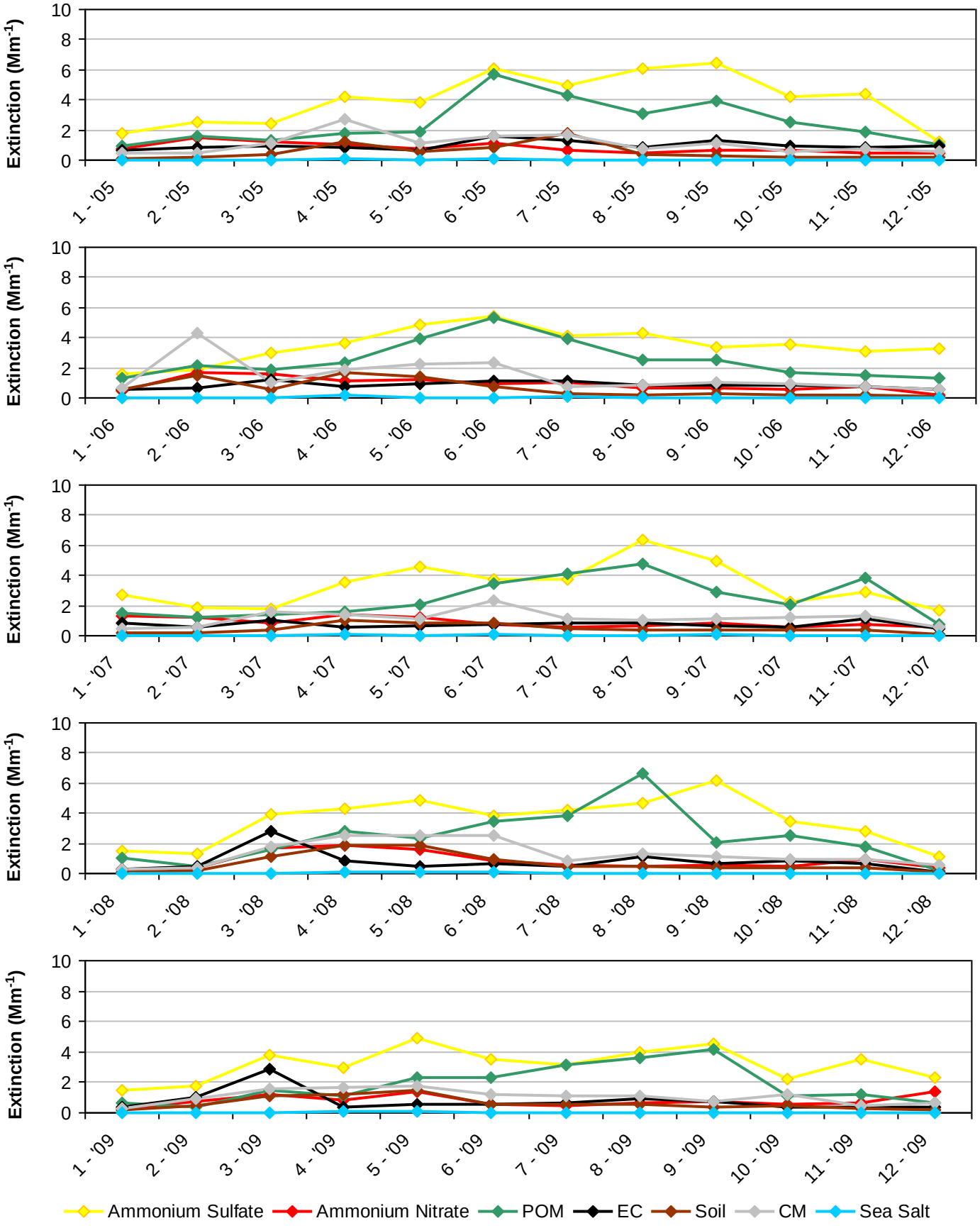
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure I.8-5
Wheeler Peak and Pecos Was, NM (WHPE1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



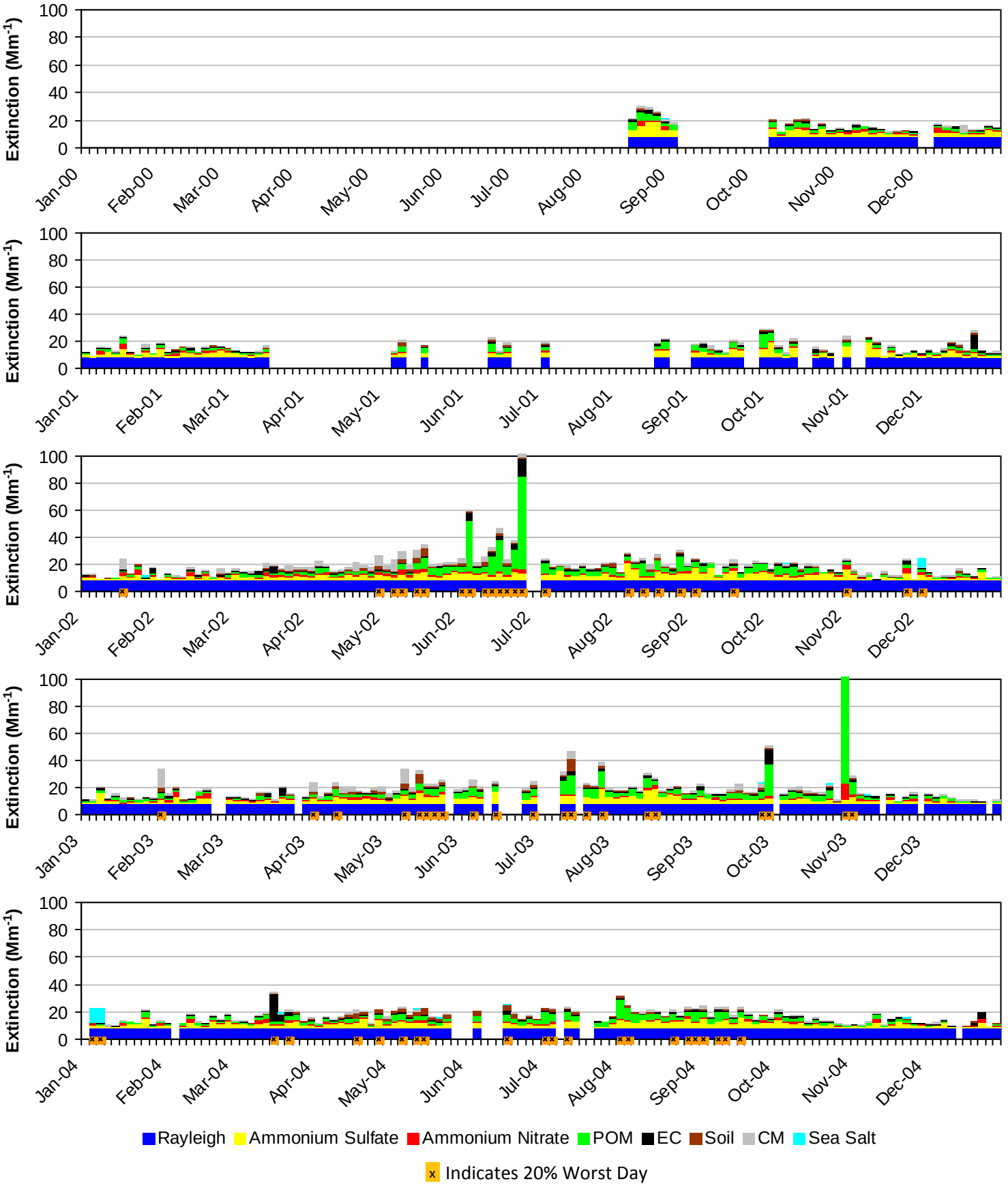
*Note that monthly averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure I.8-6
Wheeler Peak and Pecos Was, NM (WHPE1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days



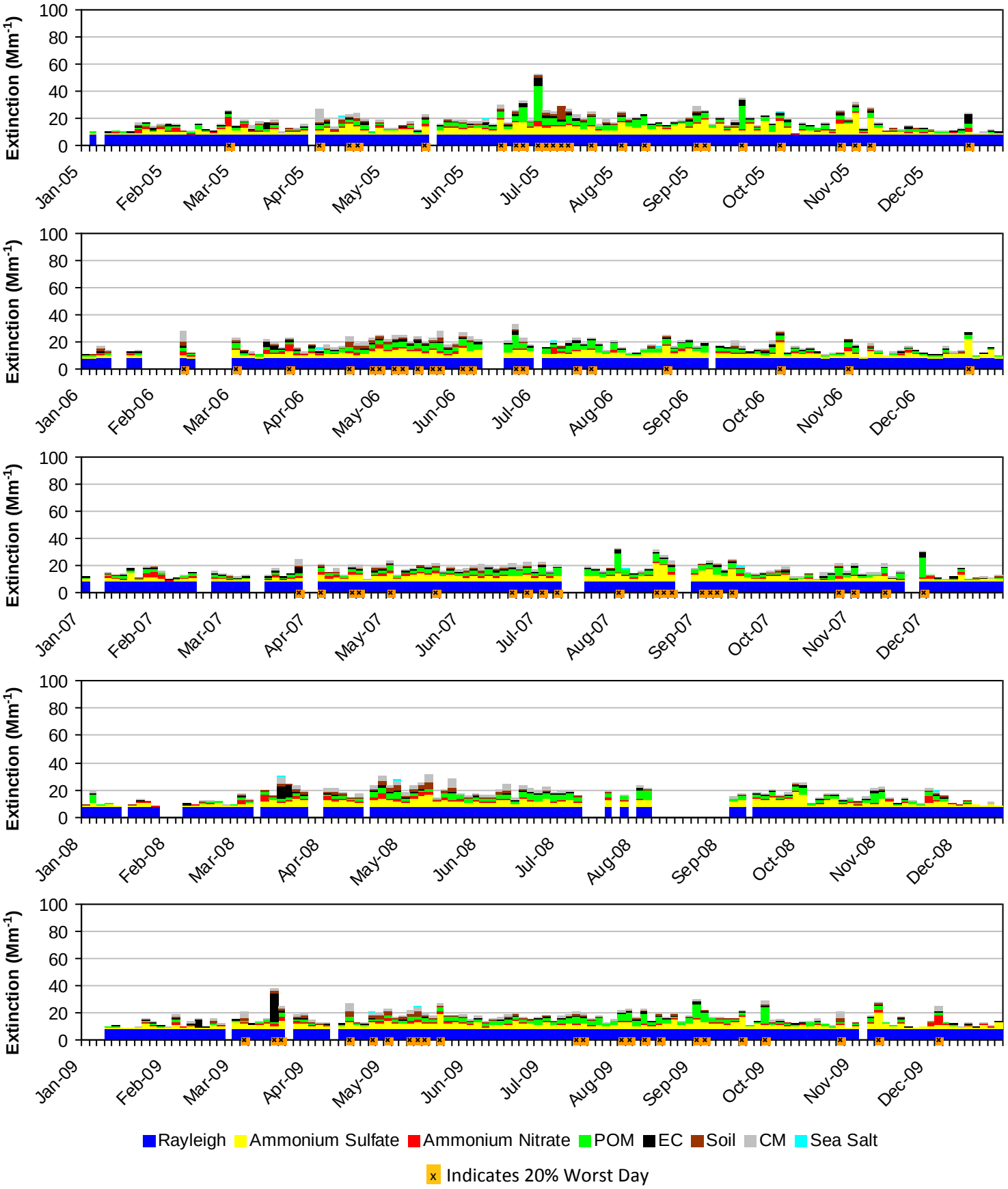
*Note that monthly averages for the year 2008 are shown here, but this year did not meet RHR data completeness criteria.

Figure I.8-7
Wheeler Peak and Pecos Was, NM (WHPE1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure I.8-8
Wheeler Peak and Pecos Was, NM (WHPE1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2008 are shown here, but this year did not meet RHR data completeness criteria.

APPENDIX J:

North Dakota Class I Area Monitoring Data Summary Tables and Charts

Includes the following subsections:

Subsection	IMPROVE Monitor	Class I Area(s) Represented
J.1	LOST1	Lostwood WA
J.2	THRO1	Theodore Roosevelt NP

J.1. LOSTWOOD WA (LOST1)

The following tables and figures are presented in this section for the Lostwood WA represented by the LOST1 IMPROVE Monitor:

- **Table J.1-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure J.1-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure J.1-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure J.1-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure J.1-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure J.1-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure J.1-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure J.1-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure J.1-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table J.1-1
Lostwood WA, ND (LOST1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	9.1	8.2	7.9	7.9	7.9	7.6	7.8	8.8	8.2	8.4	7.4	0.0	0.5	8.2	8.1	-0.1	-1%
Worst 20% Days	19.7	20.6	18.8	18.6	20.2	20.5	19.6	19.1	19.7	18.9	21.3	-0.1	0.3	19.6	19.6	0.0	0%
All Days	14.1	14.0	13.0	13.1	13.0	13.2	13.3	13.3	13.9	13.3	13.8	0.0	0.4	13.4	13.4	0.0	0%
Total Extinction (Mm-1)																	
Best 20% Days	25.0	22.8	22.2	22.2	22.2	21.6	22.2	24.3	23.0	23.4	21.2	0.0	0.5	22.9	22.9	0.0	0%
Worst 20% Days	75.3	80.2	67.6	65.6	81.7	78.9	74.8	69.3	74.5	70.0	86.3	-0.6	0.2	74.0	73.5	-0.5	-1%
All Days	44.5	44.9	39.9	40.0	41.7	42.0	41.8	40.6	43.9	41.2	45.2	-0.1	0.4	42.2	41.9	-0.3	-1%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	5.3	4.7	3.8	3.9	4.3	4.7	4.0	5.4	4.4	5.2	4.4	0.1	0.3	4.4	4.8	0.4	9%
Worst 20% Days	20.0	21.5	20.1	18.6	26.8	29.9	20.2	22.9	20.3	21.3	34.0	0.1	0.2	21.4	22.9	1.5	7%
All Days	11.4	11.5	10.8	9.7	11.4	13.3	11.3	11.7	12.0	11.9	13.8	0.1	0.1	10.9	12.1	1.2	11%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	2.4	1.6	1.8	1.7	1.8	1.7	1.8	1.5	1.1	1.7	1.1	0.0	0.1	1.9	1.5	-0.4	-21%
Worst 20% Days	16.0	29.3	23.3	19.4	26.7	19.0	21.4	20.0	21.9	26.3	23.7	0.4	0.4	22.9	21.7	-1.2	-5%
All Days	6.7	9.8	8.4	7.8	8.6	7.1	7.6	7.4	8.6	9.1	8.6	0.1	0.4	8.3	7.9	-0.4	-5%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	2.9	1.9	2.0	2.5	2.0	1.6	2.0	2.1	2.2	1.8	1.3	0.0	0.2	2.3	1.9	-0.4	-17%
Worst 20% Days	17.8	9.2	7.6	9.1	11.6	11.0	14.5	8.0	12.2	5.0	9.1	-0.4	0.3	11.1	10.1	-1.0	-9%
All Days	8.7	5.5	4.7	5.9	5.3	5.1	6.1	4.8	5.7	3.6	5.1	-0.2	0.1	6.0	5.0	-1.0	-17%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.8	0.7	0.7	0.7	0.5	0.7	0.9	0.7	0.7	0.7	0.7	0.0	0.3	0.7	0.7	0.0	0%
Worst 20% Days	4.5	2.8	2.3	2.4	2.2	3.2	2.8	2.1	2.5	2.0	2.8	-0.1	0.0	2.8	2.5	-0.3	-11%
All Days	2.1	1.6	1.4	1.6	1.2	1.7	1.7	1.3	1.4	1.4	2.0	-0.1	0.1	1.6	1.5	-0.1	-6%
Soil Extinction (Mm-1)																	
Best 20% Days	0.3	0.4	0.4	0.3	0.3	0.2	0.3	0.4	0.3	0.4	0.3	0.0	0.3	0.3	0.3	0.0	0%
Worst 20% Days	0.9	0.7	0.5	0.6	0.4	0.5	0.6	0.6	0.7	0.7	1.1	0.0	0.4	0.6	0.6	0.0	0%
All Days	0.6	0.7	0.5	0.5	0.5	0.4	0.5	0.5	0.6	0.6	0.7	0.0	0.5	0.6	0.5	-0.1	-17%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	2.2	2.5	2.4	2.2	2.2	1.6	2.1	3.1	3.1	2.5	2.2	0.0	0.2	2.3	2.5	0.2	9%
Worst 20% Days	5.2	4.7	2.6	4.3	2.7	4.1	4.2	4.4	3.9	3.5	4.6	-0.1	0.2	3.9	4.0	0.1	3%
All Days	3.9	4.5	3.0	3.4	3.6	3.2	3.5	3.7	3.8	3.4	3.8	0.0	0.4	3.7	3.5	-0.2	-5%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0%
Worst 20% Days	0.0	0.9	0.1	0.0	0.3	0.2	0.2	0.2	2.1	0.1	0.0	0.0	0.2	0.3	0.6	0.3	100%
All Days	0.2	0.3	0.1	0.0	0.2	0.2	0.2	0.2	0.7	0.3	0.1	0.0	0.0	0.1	0.3	0.2	>100%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure J.1-1
Lostwood WA, ND (LOST1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

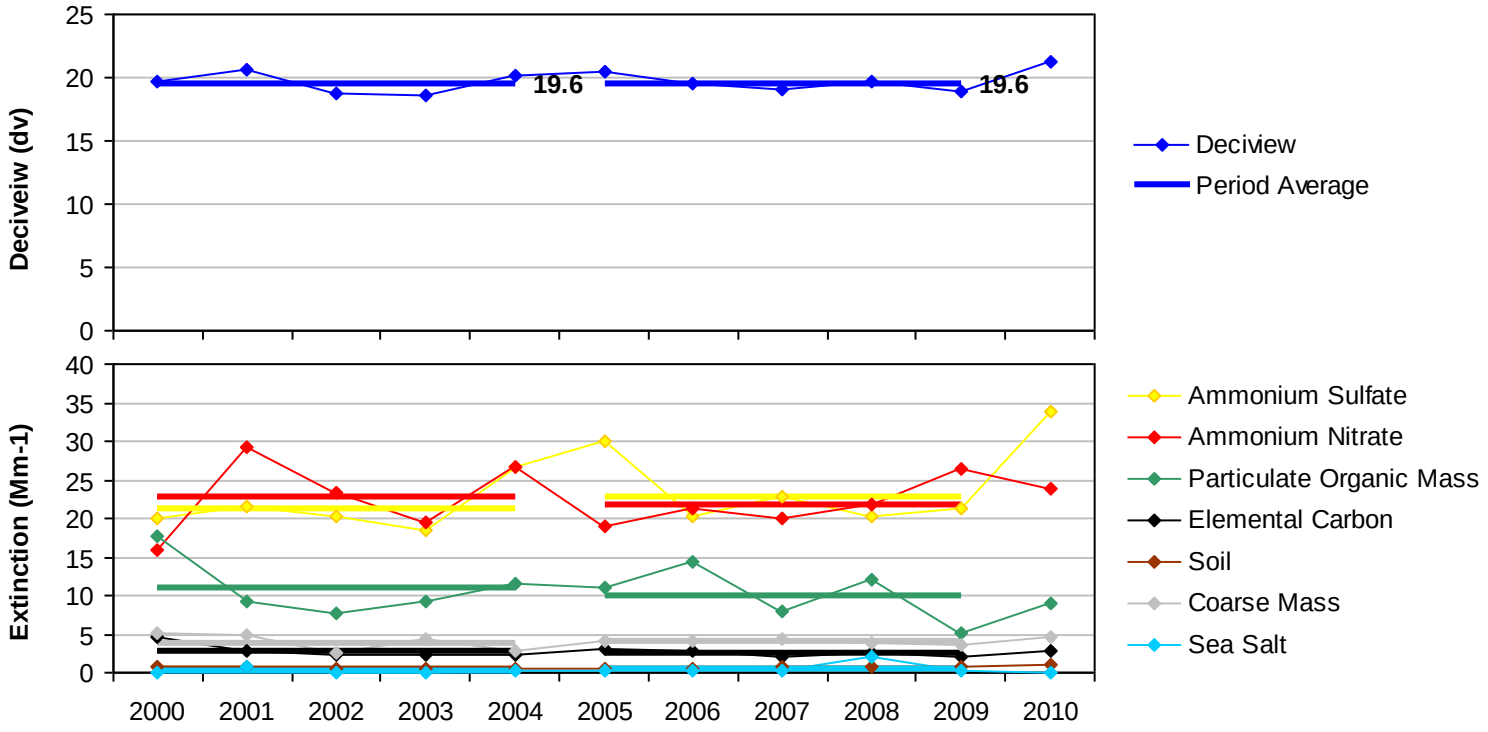


Figure J.1-2
Lostwood WA, ND (LOST1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

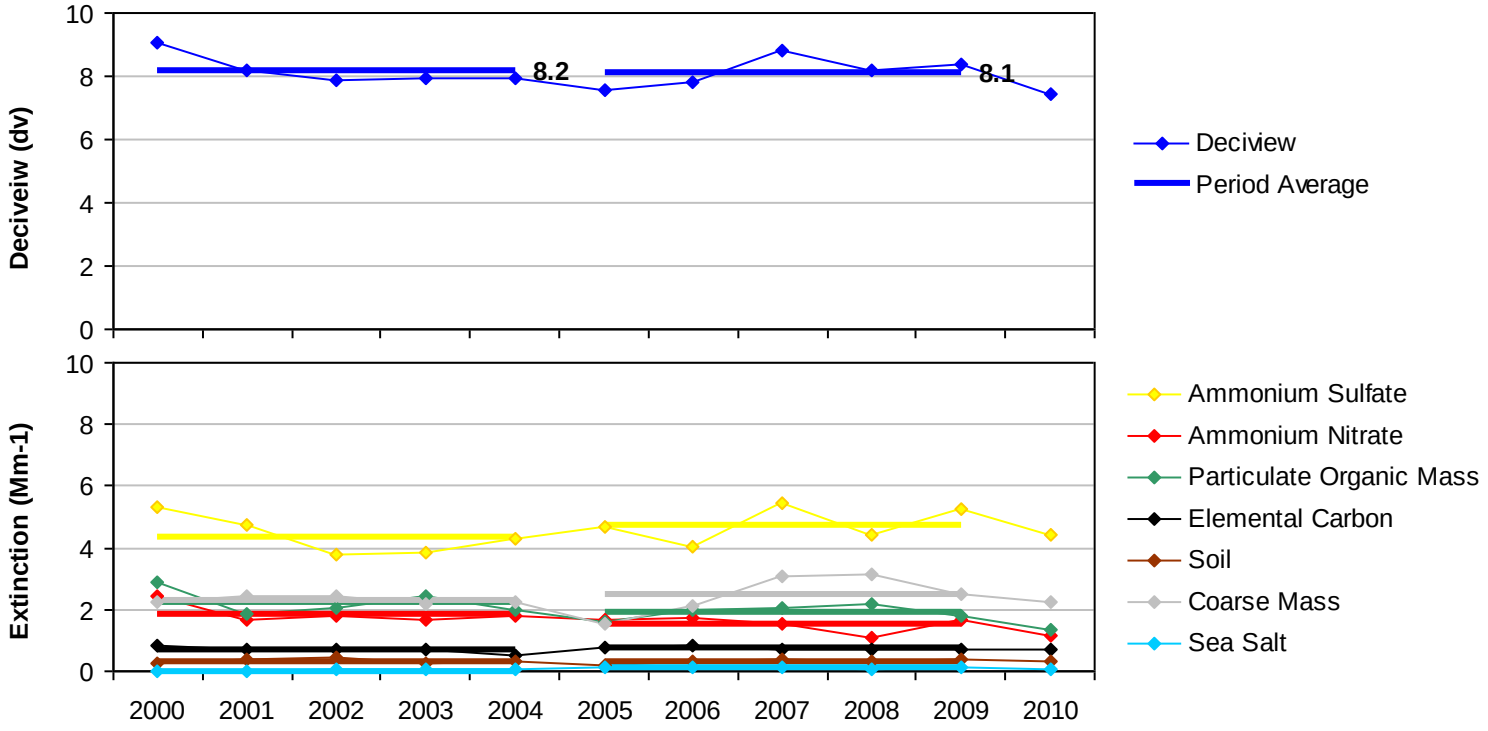


Figure J.1-3
Lostwood WA, ND (LOST1 Site)
20% Most Impaired Visibility Days

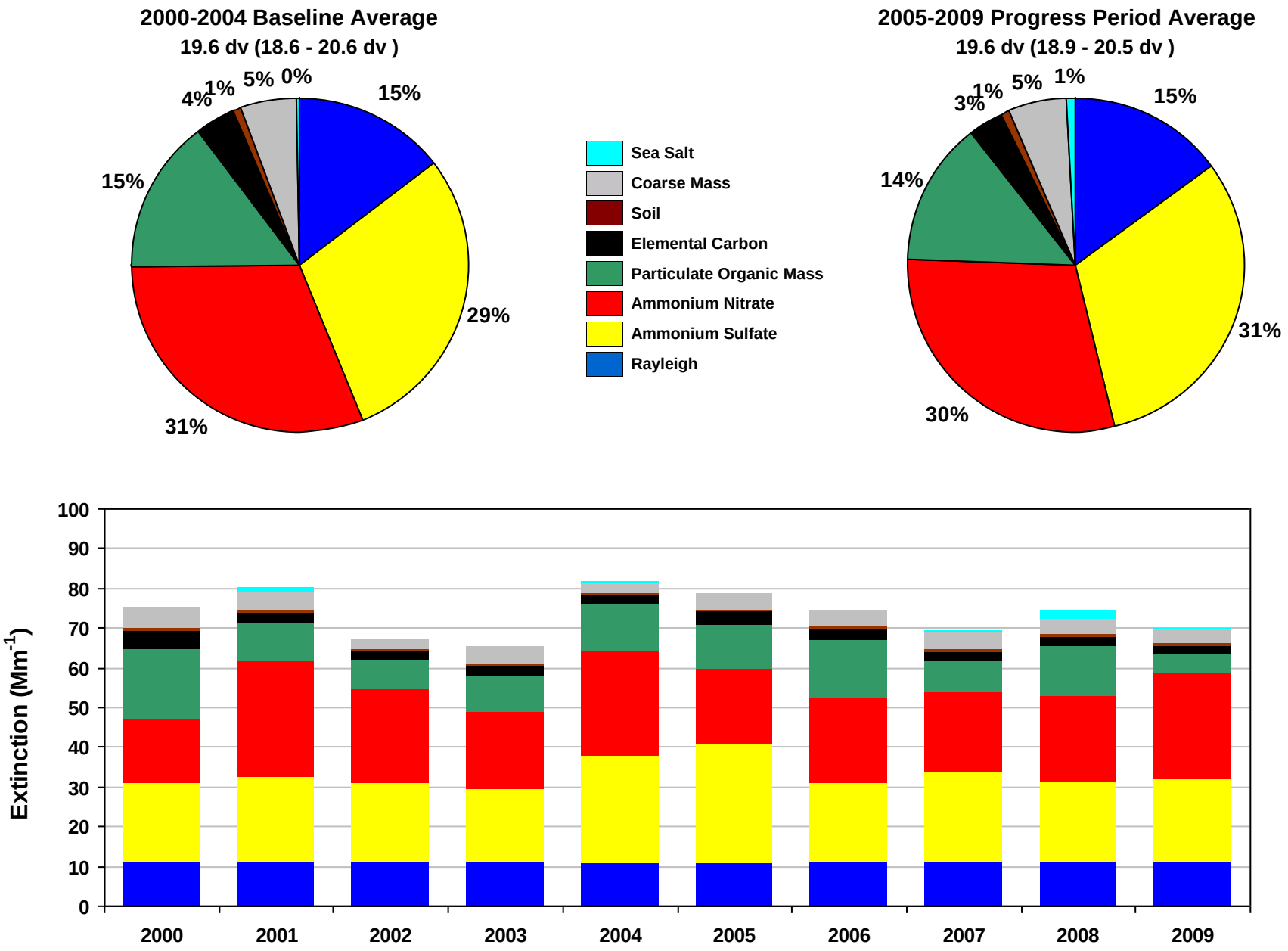
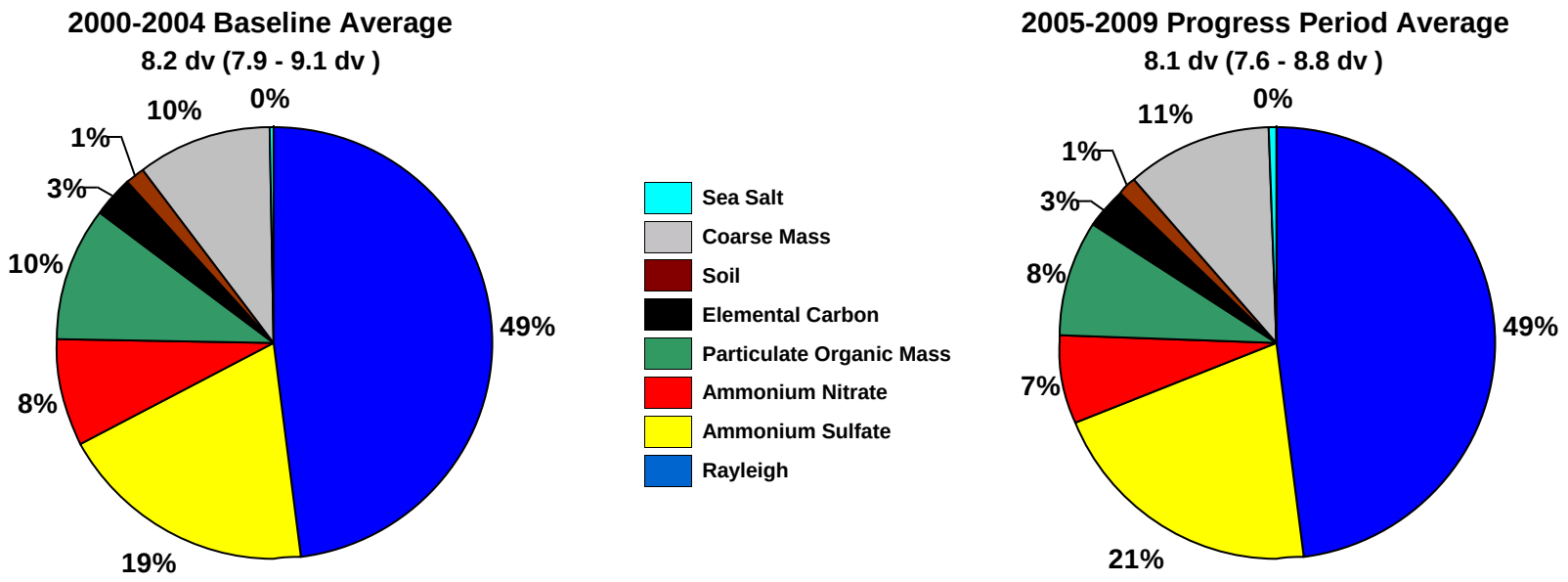


Figure J.1-4
Lostwood WA, ND (LOST1 Site)
20% Least Impaired Visibility Days



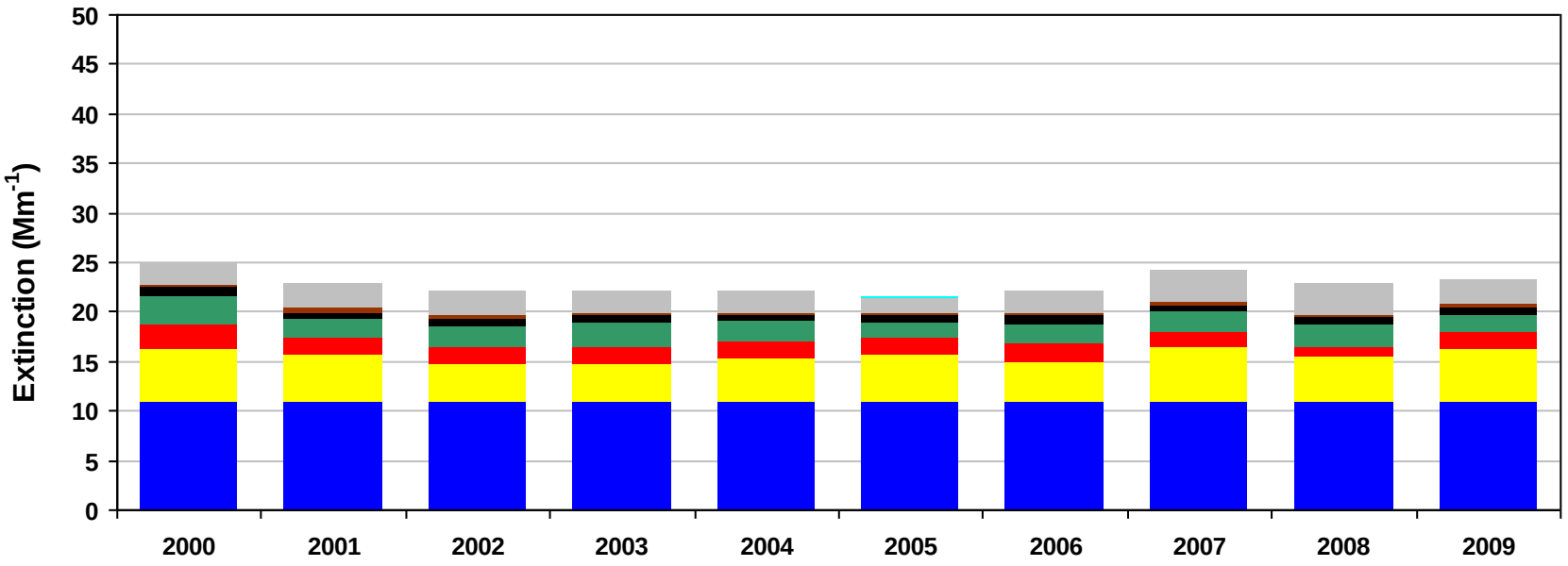


Figure J.1-5
Lostwood WA, ND (LOST1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

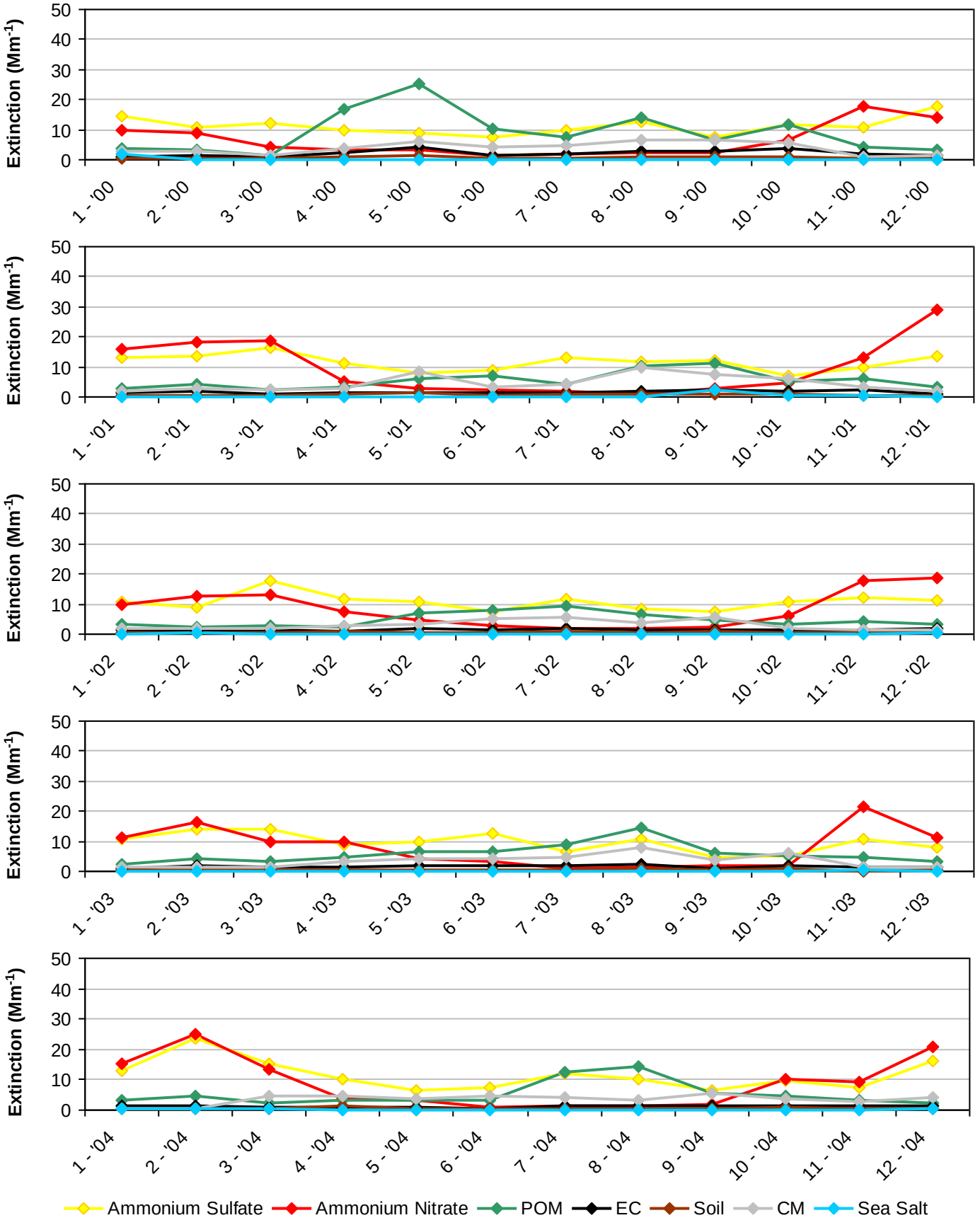


Figure J.1-6
Lostwood WA, ND (LOST1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

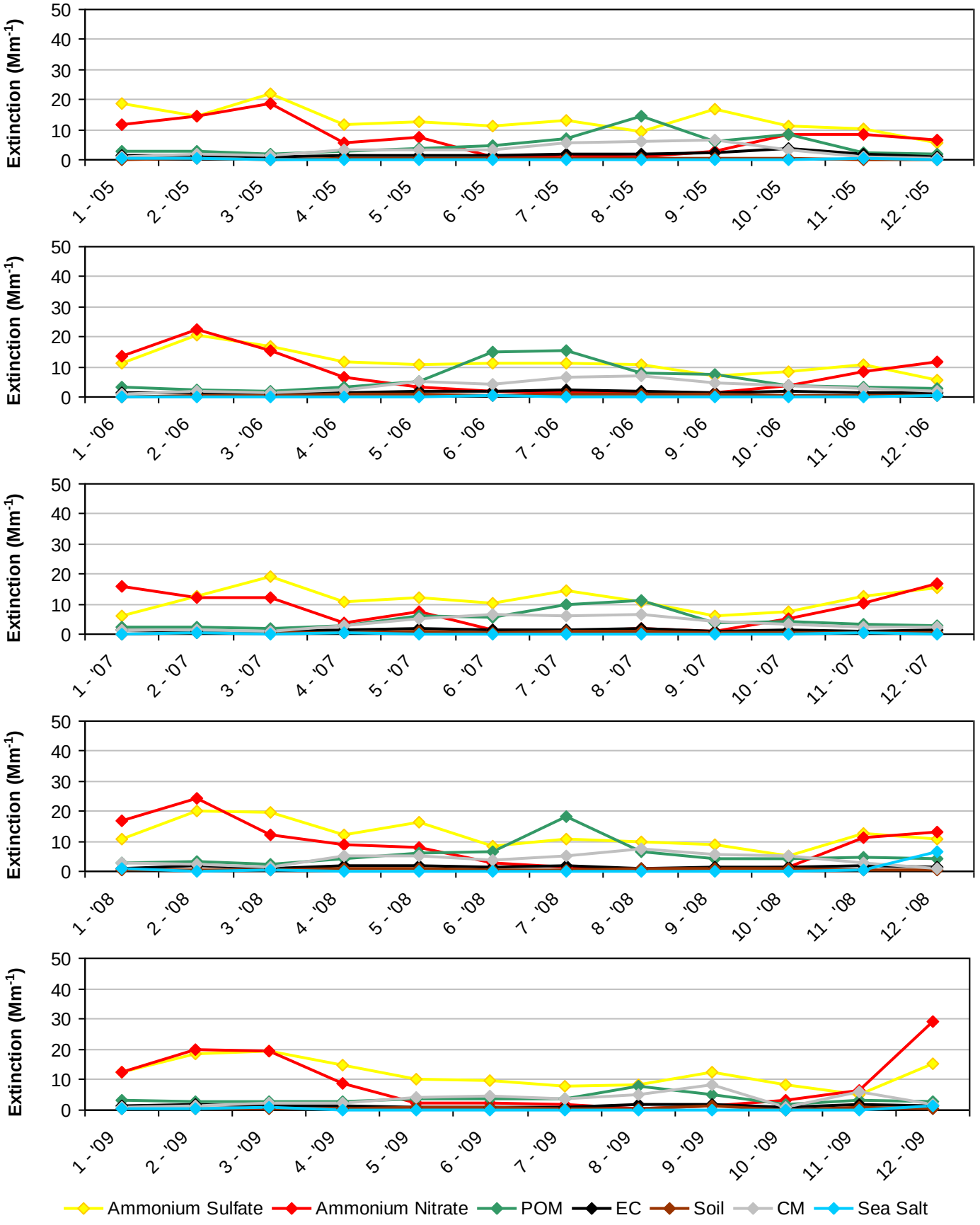


Figure J.1-7
Lostwood WA, ND (LOST1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

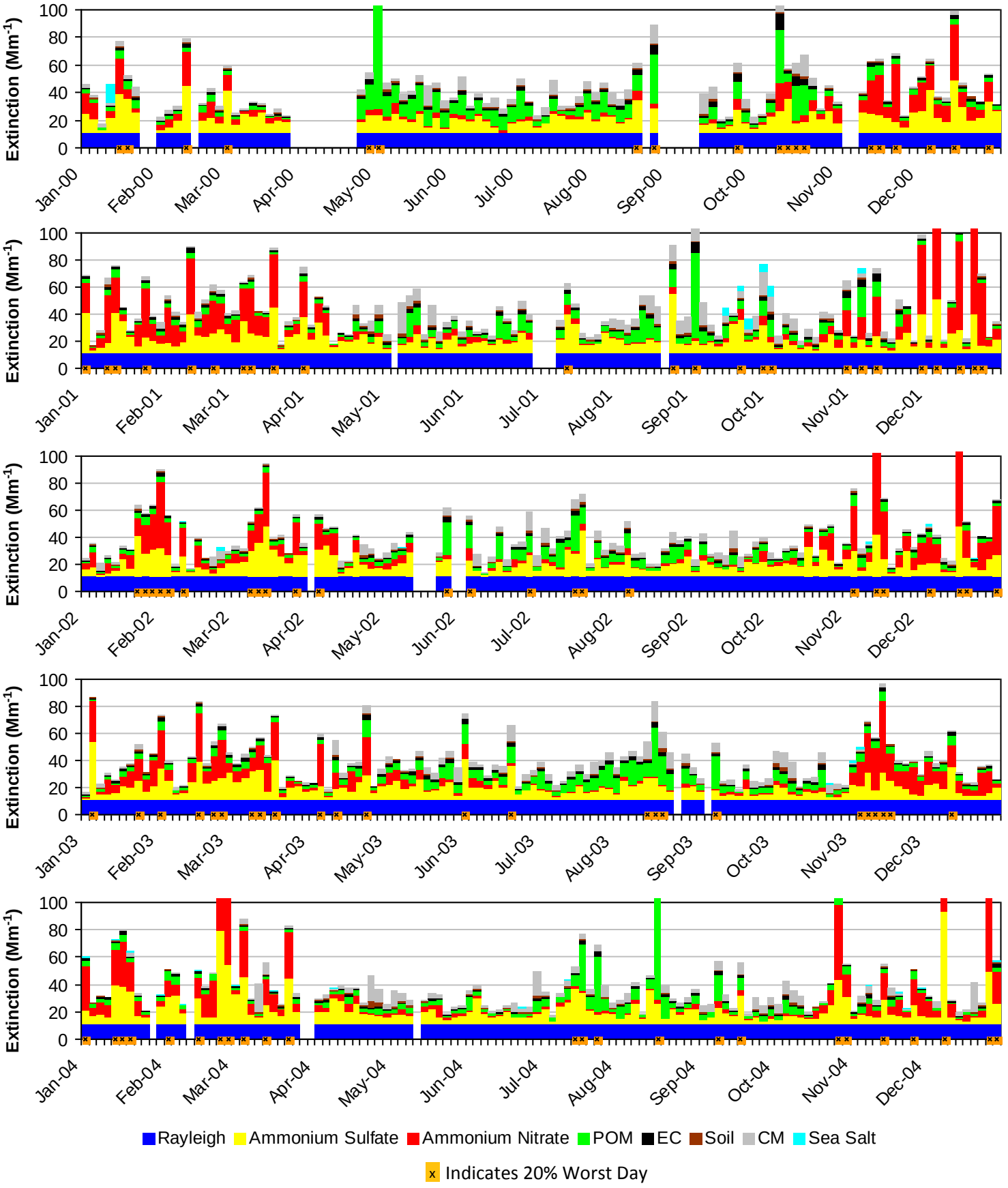
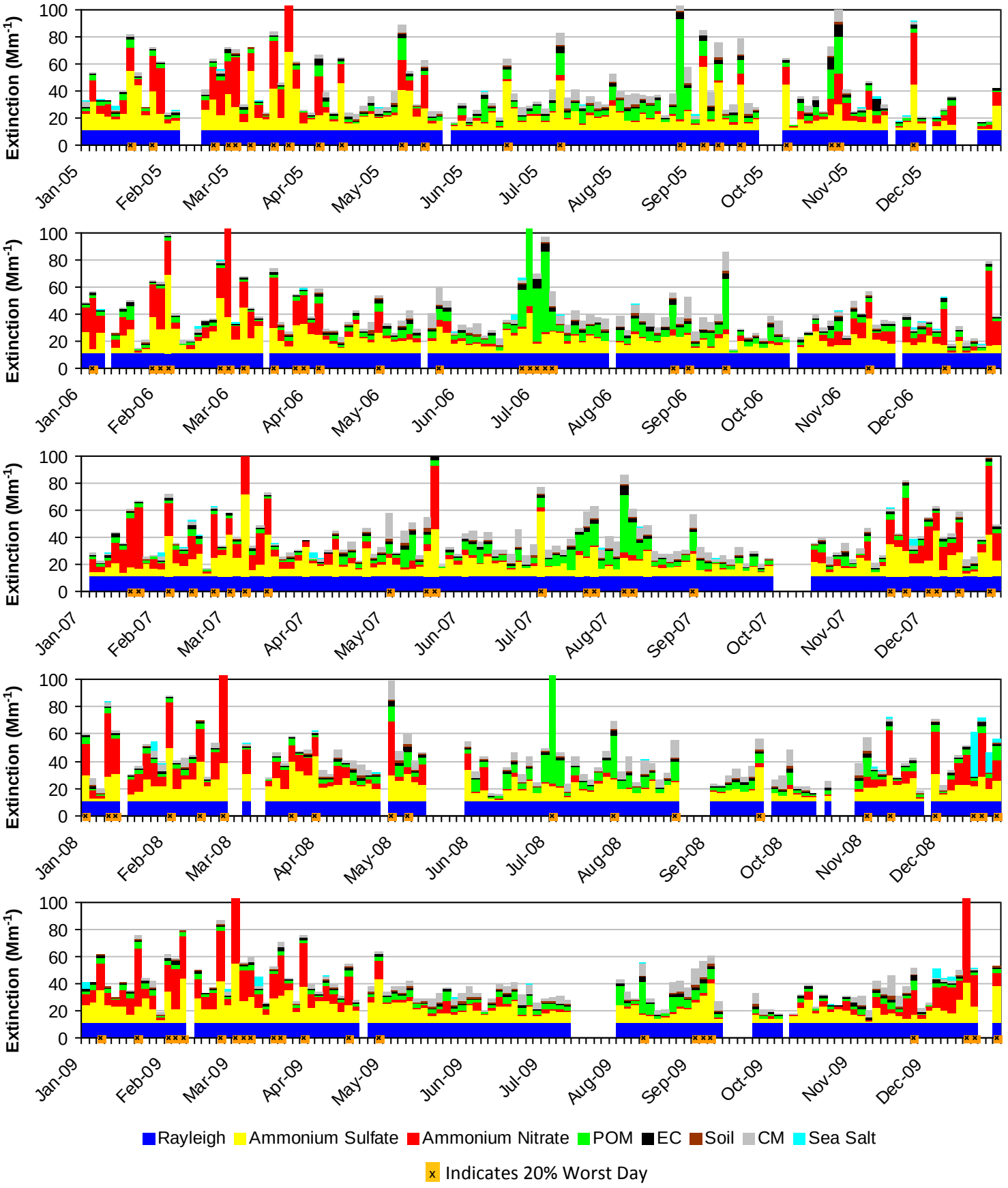


Figure J.1-8
Lostwood WA, ND (LOST1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



J.2. THEODORE ROOSEVELT NP (THRO1)

The following tables and figures are presented in this section for the Theodore Roosevelt NP represented by the THRO1 IMPROVE Monitor:

- **Table J.2-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure J.2-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure J.2-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure J.2-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure J.2-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure J.2-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure J.2-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure J.2-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

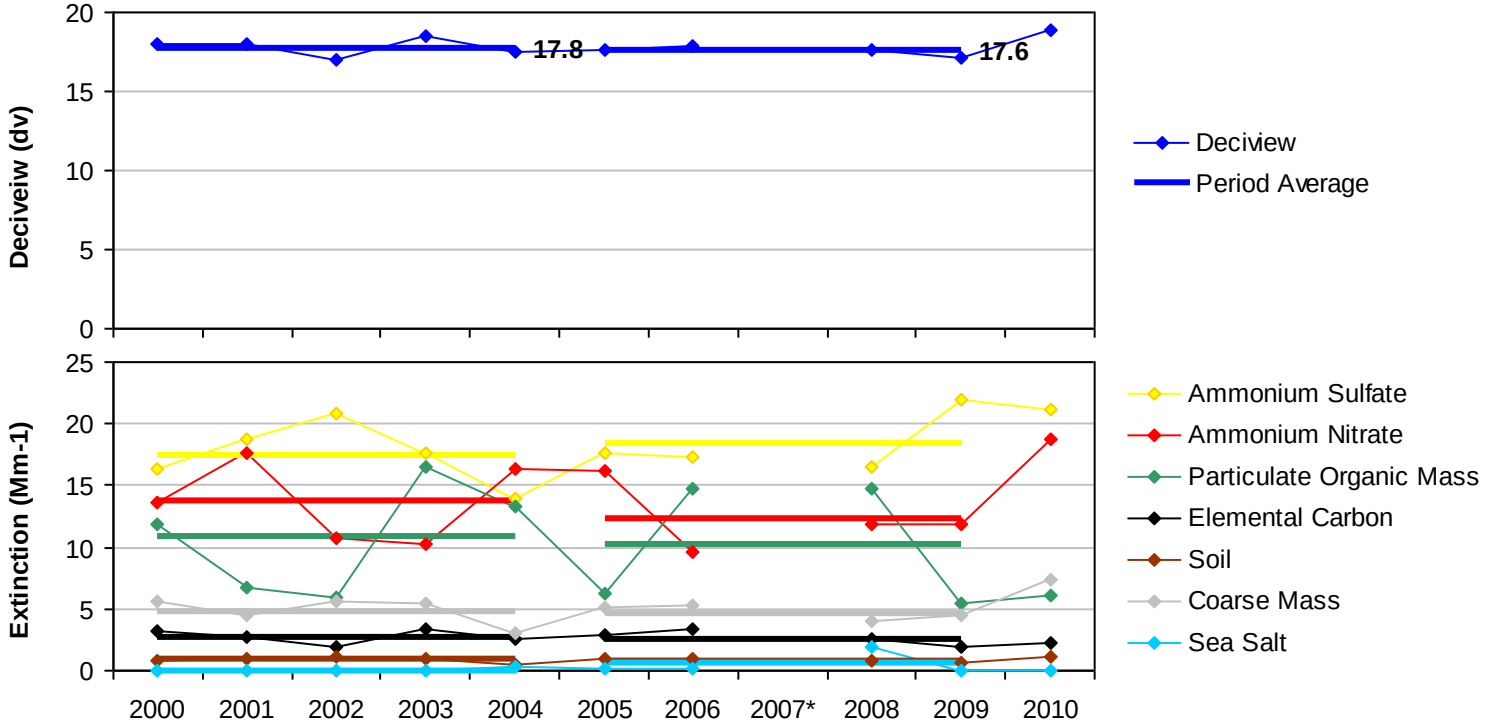
- **Figure J.2-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table J.2-1
Theodore Roosevelt NP, ND (THRO1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	8.2	7.8	7.8	7.5	7.5	6.8	6.5	---	6.6	7.0	6.3	-0.2	0.0	7.8	6.7	-1.1	-14%
Worst 20% Days	18.1	18.0	17.0	18.4	17.5	17.6	17.9	---	17.6	17.2	18.8	-0.1	0.1	17.8	17.6	-0.2	-1%
All Days	12.8	12.5	11.9	12.5	11.9	11.9	12.1	---	12.0	11.6	12.1	-0.1	0.0	12.3	11.9	-0.4	-3%
Total Extinction (Mm-1)																	
Best 20% Days	23.0	21.9	21.9	21.3	21.2	19.9	19.3	---	19.4	20.3	18.9	-0.4	0.0	21.9	19.7	-2.2	-10%
Worst 20% Days	62.4	62.4	57.1	65.2	61.1	60.1	62.3	---	63.4	57.3	67.7	-0.2	0.3	61.6	60.8	-0.8	-1%
All Days	38.3	37.7	35.3	37.9	35.5	35.5	36.6	---	36.7	34.4	37.3	-0.2	0.1	36.9	35.8	-1.1	-3%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	4.9	3.6	3.8	3.5	3.2	3.6	2.5	---	3.3	4.1	3.2	-0.1	0.1	3.8	3.4	-0.4	-11%
Worst 20% Days	16.4	18.8	20.8	17.7	14.0	17.7	17.3	---	16.6	22.0	21.1	0.0	0.5	17.5	18.4	0.9	5%
All Days	9.7	9.9	9.8	9.1	8.0	9.4	9.5	---	9.3	10.7	9.8	0.0	0.5	9.3	9.7	0.4	4%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	1.6	1.4	1.9	1.6	1.2	1.0	0.9	---	0.7	1.0	0.6	-0.1	0.0	1.5	0.9	-0.6	-40%
Worst 20% Days	13.6	17.7	10.7	10.3	16.4	16.1	9.5	---	11.8	11.9	18.7	-0.3	0.2	13.7	12.3	-1.4	-10%
All Days	5.3	6.1	5.1	5.3	5.6	4.9	4.2	---	4.9	4.6	6.4	-0.1	0.0	5.5	4.7	-0.8	-15%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.9	1.8	2.2	1.8	2.1	1.6	1.4	---	1.5	1.5	1.4	-0.1	0.0	2.0	1.5	-0.5	-25%
Worst 20% Days	11.8	6.7	5.9	16.4	13.4	6.3	14.7	---	14.7	5.4	6.1	0.0	0.5	10.8	10.3	-0.5	-5%
All Days	5.6	4.1	3.8	6.5	5.2	4.0	5.6	---	5.4	3.3	3.9	-0.1	0.3	5.0	4.6	-0.4	-8%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	1.2	0.8	0.8	0.9	0.9	1.0	1.1	---	0.7	0.6	0.7	0.0	0.2	0.9	0.9	0.0	0%
Worst 20% Days	3.3	2.7	1.9	3.4	2.5	2.8	3.3	---	2.5	1.9	2.3	-0.1	0.2	2.7	2.6	-0.1	-4%
All Days	2.1	1.7	1.4	1.9	1.5	1.9	1.9	---	1.5	1.2	1.5	-0.1	0.1	1.7	1.6	-0.1	-6%
Soil Extinction (Mm-1)																	
Best 20% Days	0.3	0.5	0.4	0.3	0.4	0.3	0.3	---	0.3	0.3	0.3	0.0	0.0	0.4	0.3	-0.1	-25%
Worst 20% Days	0.8	1.0	1.2	1.0	0.5	0.9	1.0	---	0.8	0.7	1.1	0.0	0.1	0.9	0.8	-0.1	-11%
All Days	0.6	0.8	0.8	0.6	0.7	0.7	0.7	---	0.6	0.5	0.7	0.0	0.2	0.7	0.6	-0.1	-14%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	2.1	2.7	1.7	2.1	2.4	1.3	1.9	---	1.8	1.8	1.7	0.0	0.1	2.2	1.7	-0.5	-23%
Worst 20% Days	5.6	4.5	5.6	5.4	3.0	5.1	5.3	---	4.1	4.4	7.3	-0.1	0.1	4.8	4.7	-0.1	-2%
All Days	4.0	4.0	3.3	3.4	3.4	3.5	3.6	---	3.4	3.0	3.9	-0.1	0.2	3.6	3.4	-0.2	-6%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.0	0.0	0.0	0.1	0.1	0.1	0.1	---	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0%
Worst 20% Days	0.0	0.0	0.0	0.0	0.3	0.2	0.1	---	2.0	0.1	0.1	0.0	0.0	0.1	0.6	0.5	>100%
All Days	0.0	0.2	0.0	0.0	0.1	0.1	0.1	---	0.5	0.1	0.0	0.0	0.1	0.1	0.2	0.1	100%

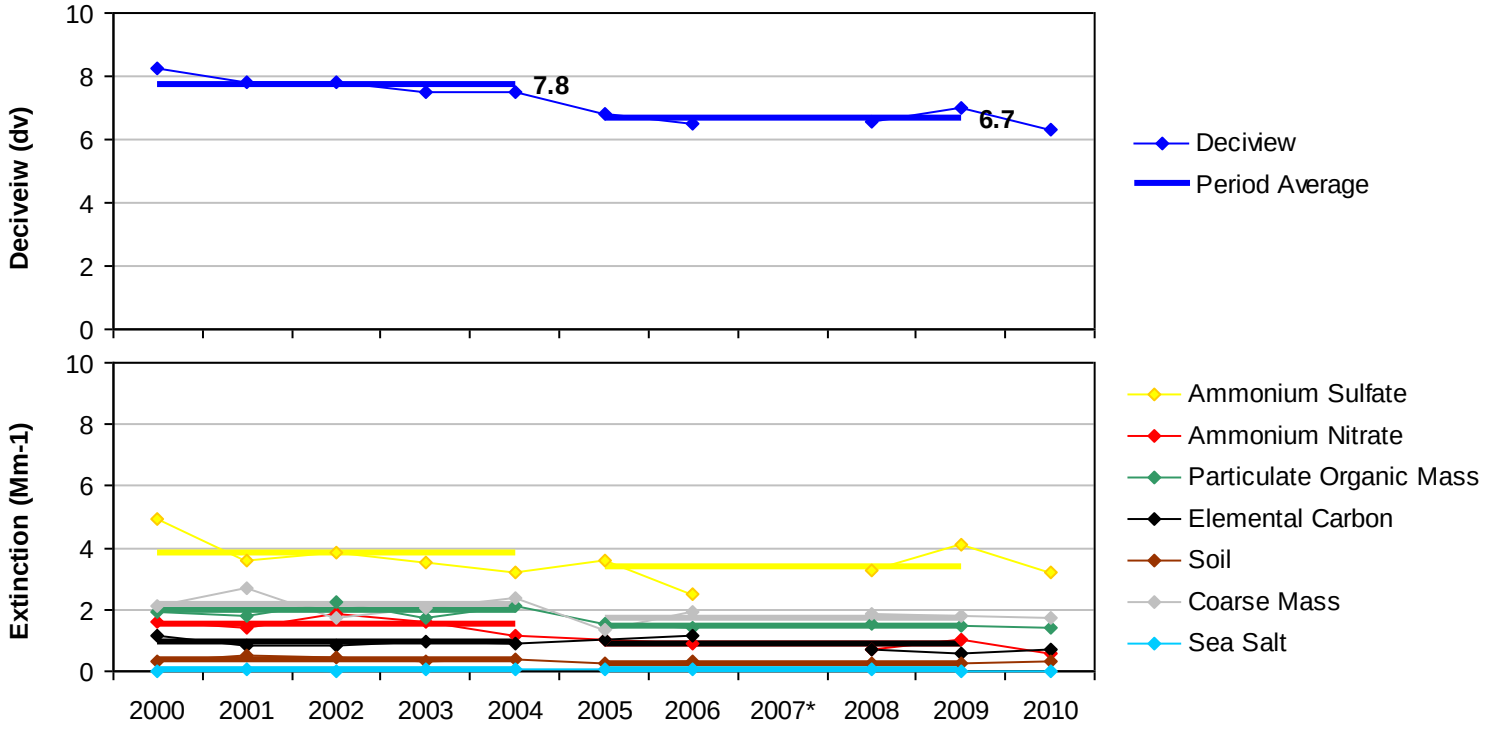
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure J.2-1
Theodore Roosevelt NP, ND (THRO1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



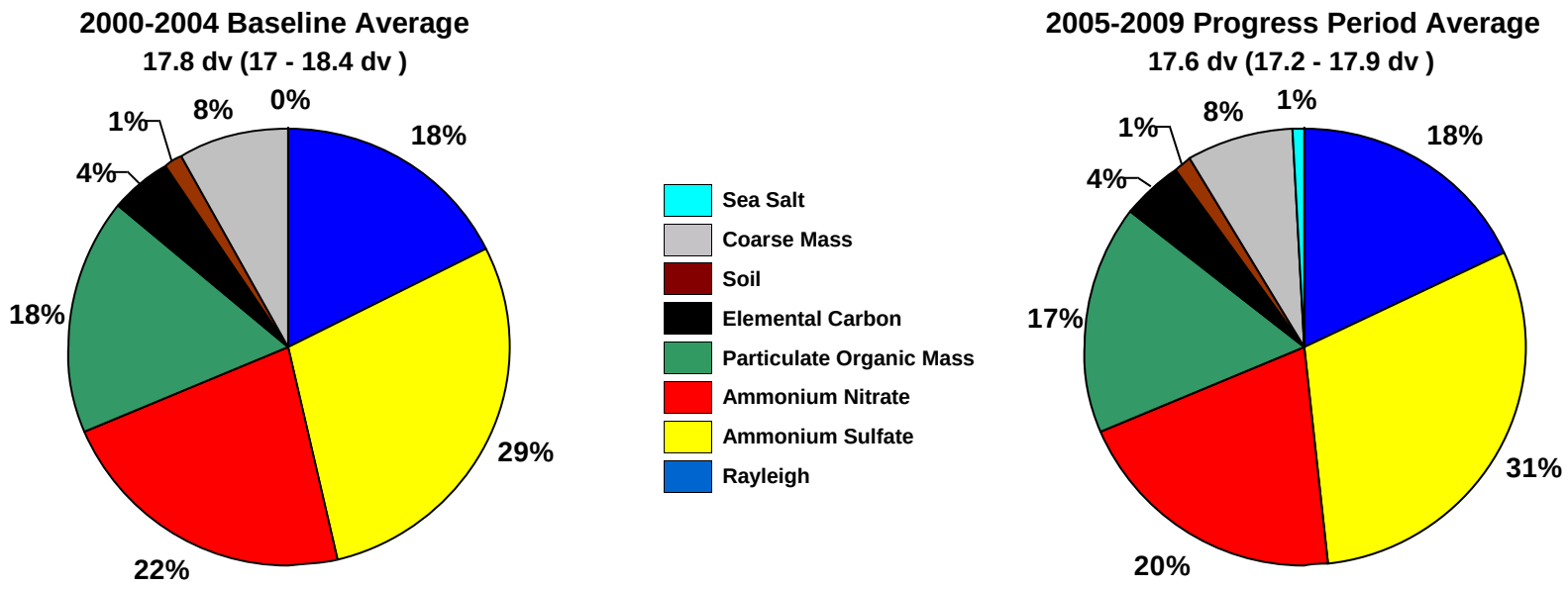
*Missing years did not meet RHR data completeness criteria.

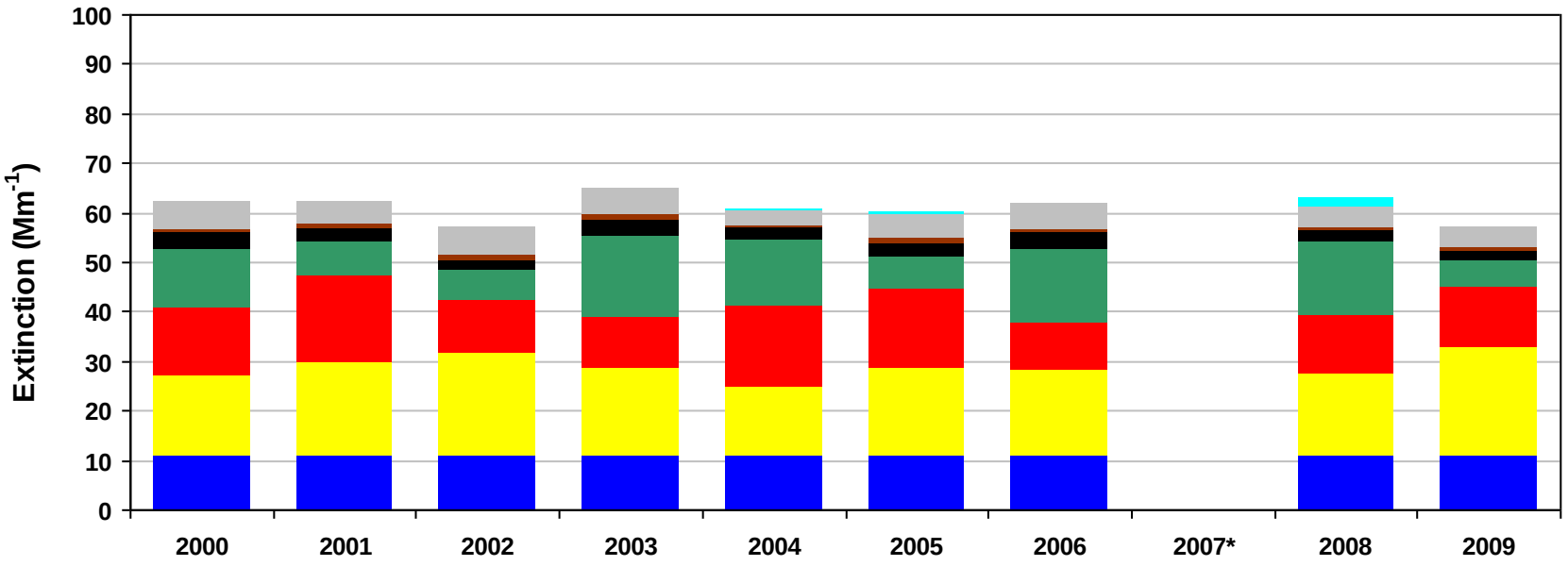
Figure J.2-2
Theodore Roosevelt NP, ND (THRO1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

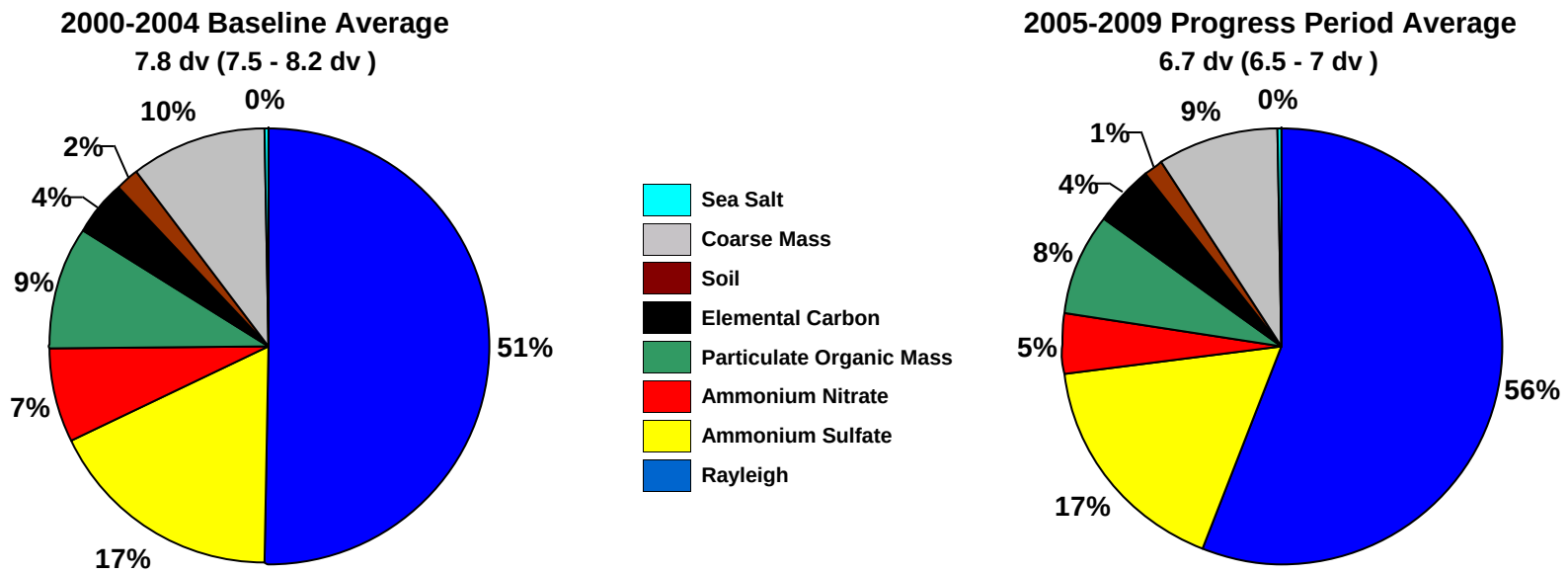
Figure J.2-3
Theodore Roosevelt NP, ND (THRO1 Site)
20% Most Impaired Visibility Days

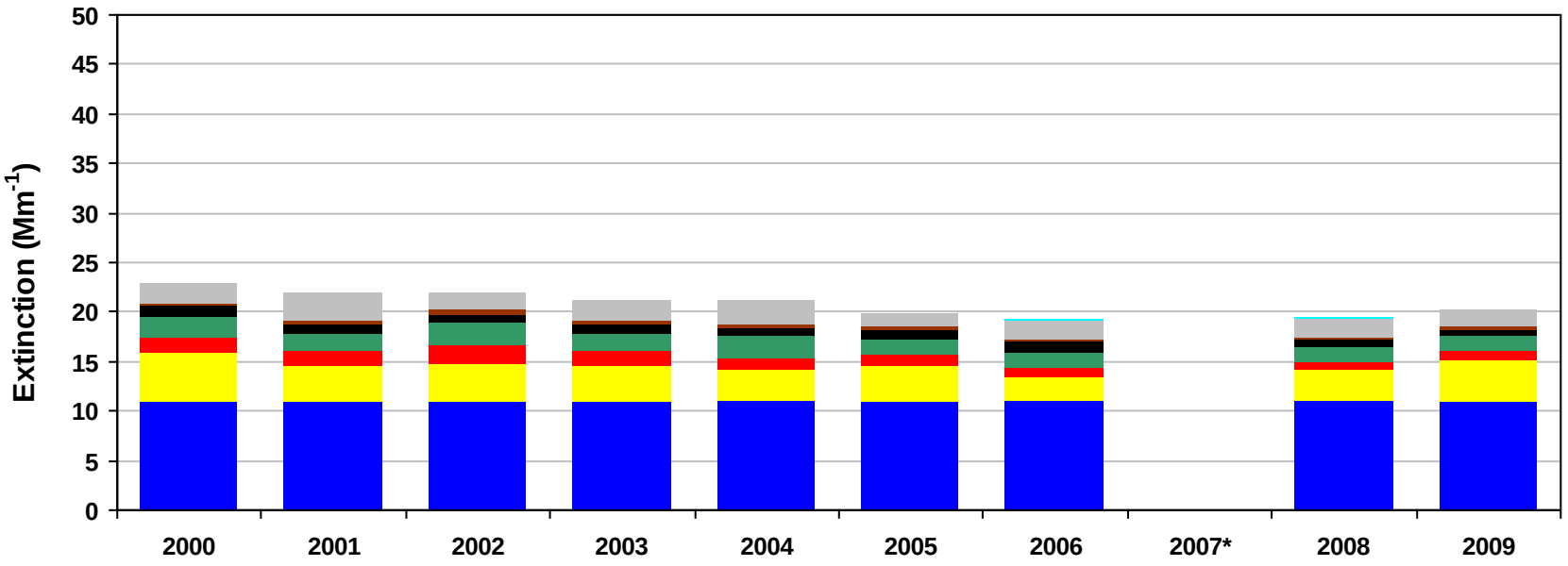




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure J.2-4
Theodore Roosevelt NP, ND (THRO1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure J.2-5
Theodore Roosevelt NP, ND (THRO1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

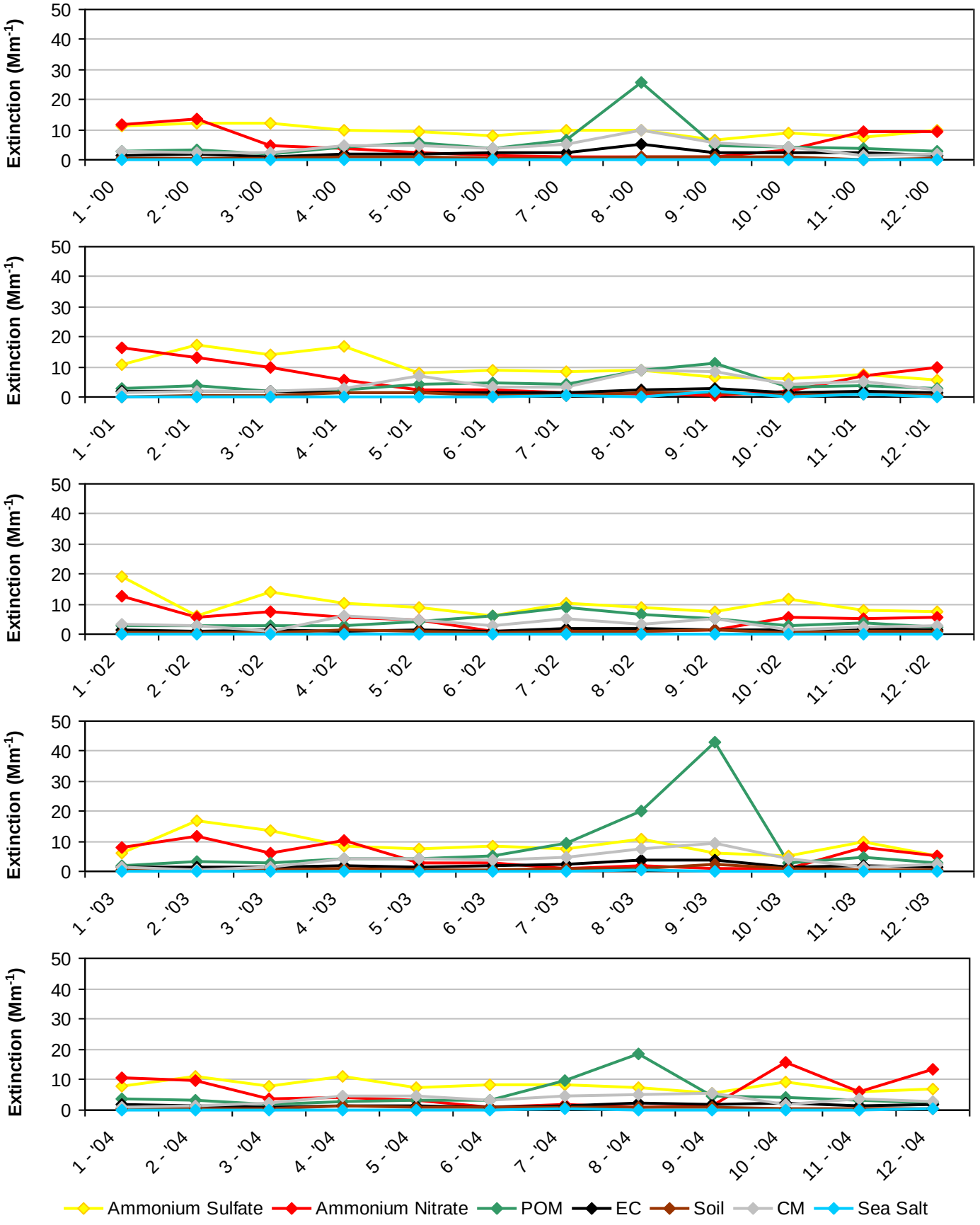
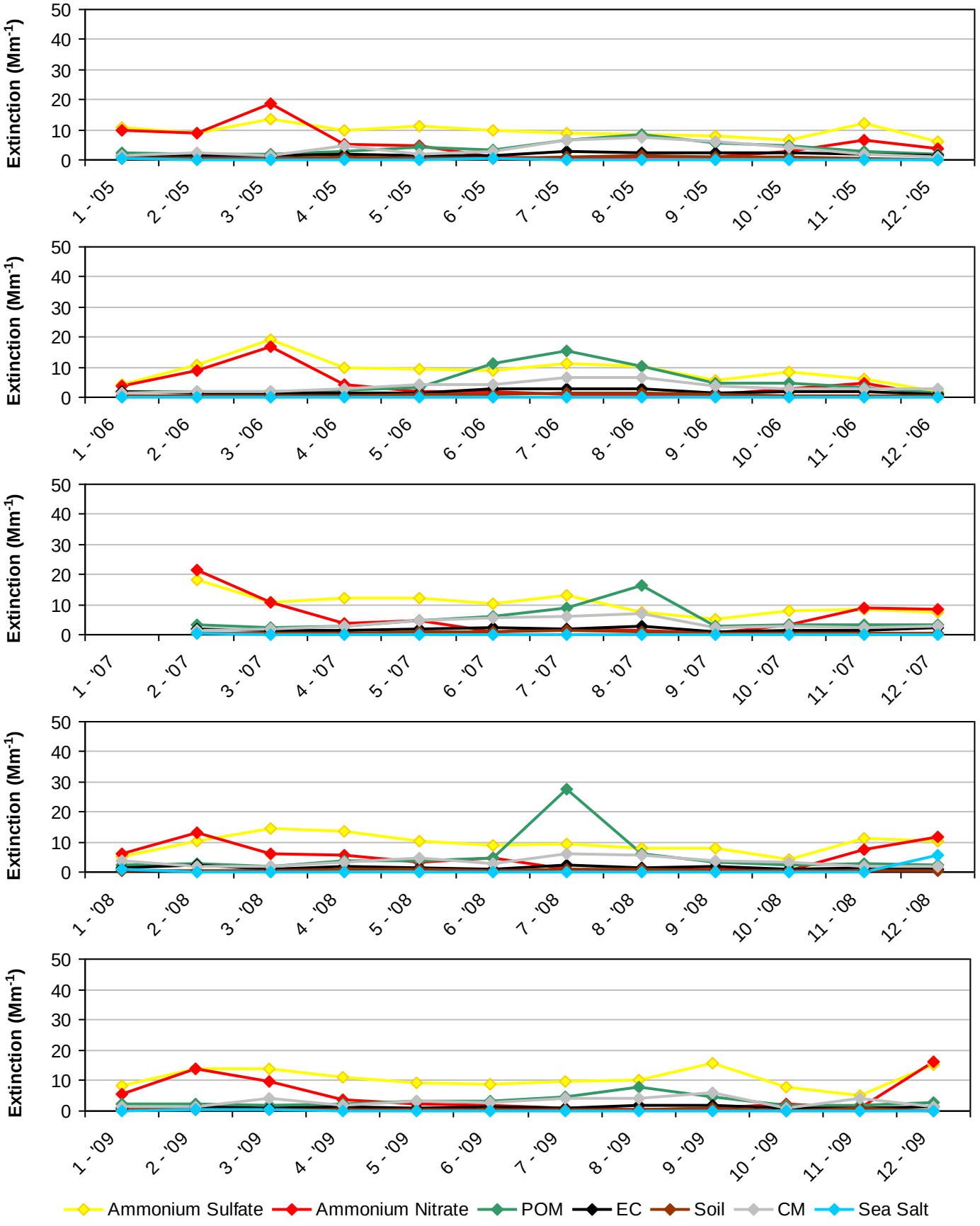


Figure J.2-6
Theodore Roosevelt NP, ND (THRO1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2007 are shown here, but this year did not meet RHR data completeness criteria.

Figure J.2-7
Theodore Roosevelt NP, ND (THRO1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

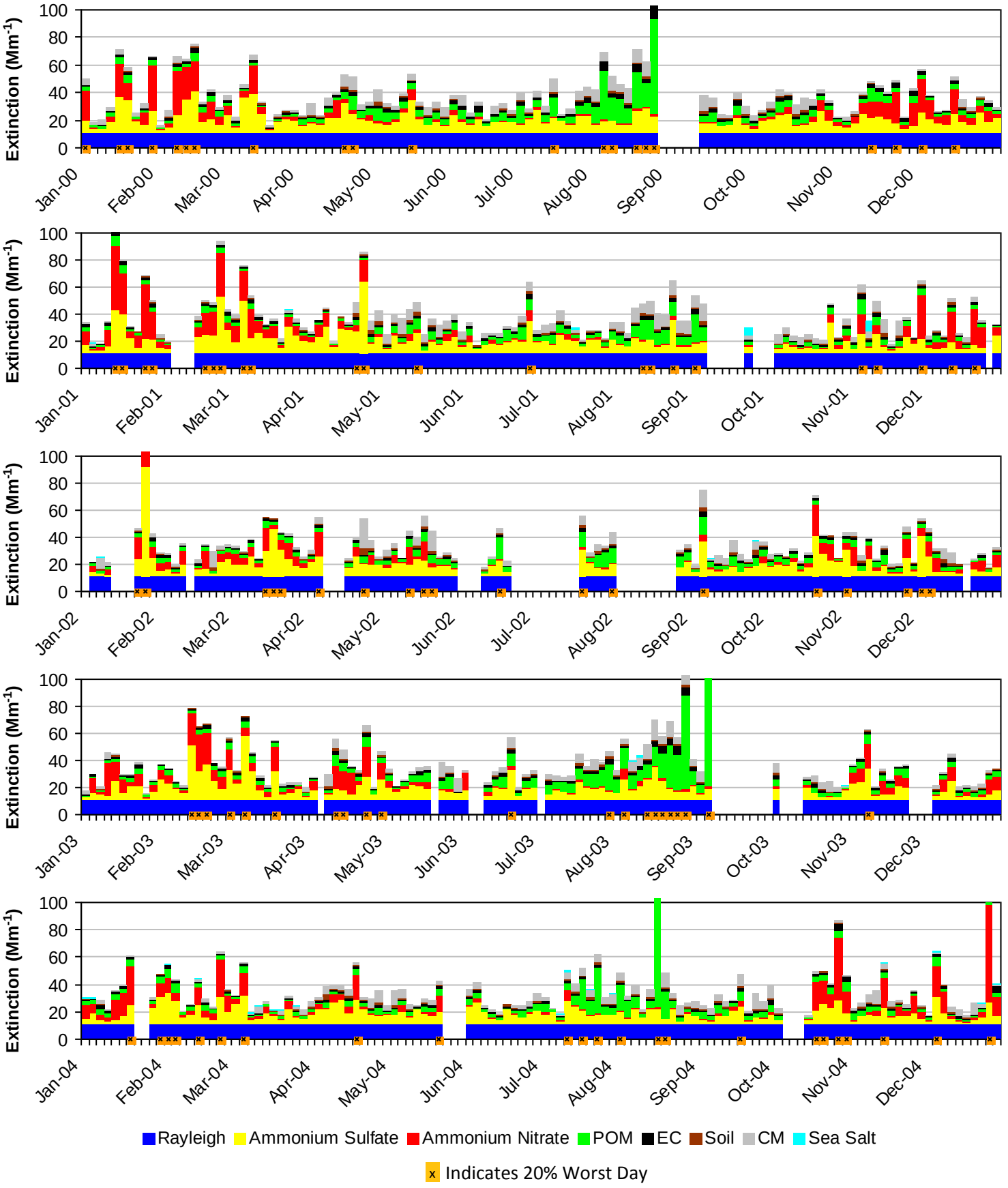
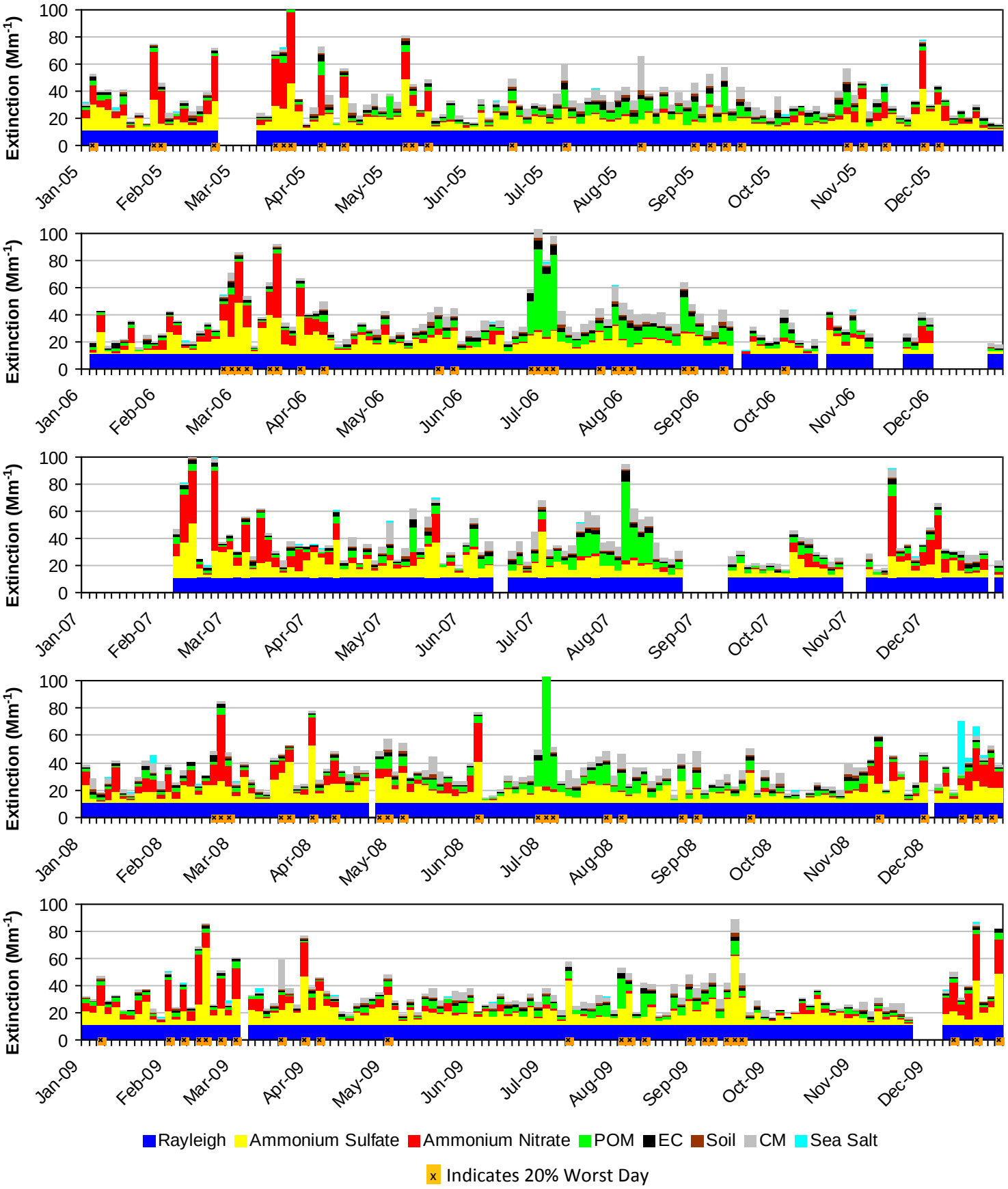


Figure J.2-8
Theodore Roosevelt NP, ND (THRO1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2007 are shown here, but this year did not meet RHR data completeness criteria.

APPENDIX K:

Oregon Class I Area Monitoring Data Summary Tables and Charts

Includes the following subsections:

Subsection	IMPROVE Monitor	Class I Area(s) Represented
K.1	COGO1	Columbia River Gorge*
K.2	CORI1	Columbia River Gorge*
K.3	CRLA1	Crater Lake NP, Diamond Peak WA, Gearhart Mountain WA, and Mountain Lakes WA
K.4	HECA1	Hells Canyon WA
K.5	KALM1	Kalmiopsis WA
K.6	MOHO1	Mount Hood WA
K.7	STAR1	Eagle Cap WA and Strawberry Mountain WA
K.8	THSI1	Three Sisters WA, Mount Jefferson WA, and Mount Washington WA

*Not a Federal CIA

K.1. COLUMBIA RIVER GORGE (COGO1)

The following tables and figures are presented in this section for the Columbia River Gorge represented by the COGO1 IMPROVE Monitor:

- **Table K.1-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure K.1-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure K.1-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure K.1-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure K.1-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure K.1-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure K.1-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure K.1-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

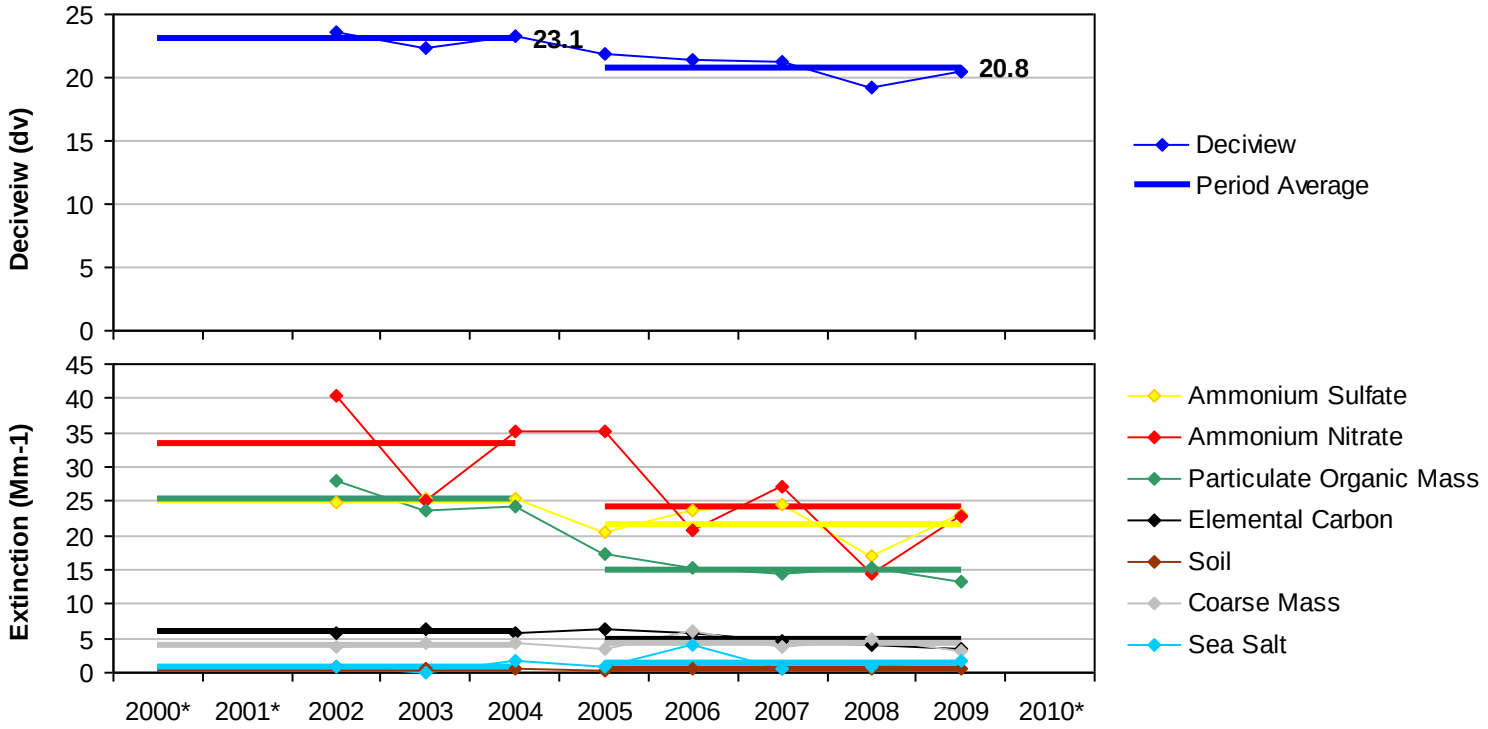
- **Figure K.1-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table K.1-1
Columbia River Gorge, WA (COGO1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	---	9.5	8.4	9.9	9.6	8.6	9.0	9.5	9.4	---	0.0	0.5	9.3	9.2	-0.1	-1%
Worst 20% Days	---	---	23.6	22.4	23.3	21.9	21.4	21.2	19.2	20.5	---	-0.5	0.0	23.1	20.8	-2.3	-10%
All Days	---	---	16.0	15.4	16.4	15.5	14.8	14.6	14.1	15.1	---	-0.3	0.0	16.0	14.8	-1.2	-8%
Total Extinction (Mm-1)																	
Best 20% Days	---	---	26.3	23.4	27.4	26.4	23.8	24.9	25.9	26.0	---	0.0	0.6	25.7	25.4	-0.3	-1%
Worst 20% Days	---	---	116.3	97.5	109.1	96.1	88.2	87.5	69.3	80.1	---	-5.7	0.0	107.6	84.3	-23.3	-22%
All Days	---	---	57.9	53.0	58.7	52.9	49.2	48.1	43.7	49.1	---	-1.9	0.0	56.5	48.6	-7.9	-14%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	---	4.7	3.0	4.7	4.5	3.1	3.5	4.1	4.4	---	-0.1	0.4	4.1	3.9	-0.2	-5%
Worst 20% Days	---	---	24.9	25.3	25.4	20.4	23.5	24.5	17.1	23.2	---	-0.3	0.1	25.2	21.8	-3.4	-14%
All Days	---	---	13.8	12.8	13.5	12.0	11.9	11.4	10.2	13.0	---	-0.4	0.0	13.4	11.7	-1.7	-13%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	---	2.5	2.5	2.8	2.5	1.9	2.2	1.9	2.2	---	-0.1	0.0	2.6	2.1	-0.5	-19%
Worst 20% Days	---	---	40.5	25.1	35.2	35.2	20.9	27.2	14.5	22.9	---	-2.6	0.0	33.6	24.1	-9.5	-28%
All Days	---	---	13.4	9.9	13.0	11.6	8.1	9.1	6.0	9.1	---	-0.8	0.0	12.1	8.8	-3.3	-27%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	---	3.4	3.2	3.5	3.3	2.6	3.3	4.3	3.4	---	0.0	0.4	3.3	3.4	0.1	3%
Worst 20% Days	---	---	27.9	23.8	24.3	17.4	15.2	14.3	15.2	13.2	---	-2.1	0.0	25.3	15.1	-10.2	-40%
All Days	---	---	10.7	10.4	11.4	8.8	7.7	7.6	8.2	7.8	---	-0.4	0.0	10.9	8.0	-2.9	-27%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	---	1.6	1.4	1.5	1.6	1.4	1.5	1.4	1.2	---	0.0	0.1	1.5	1.4	-0.1	-7%
Worst 20% Days	---	---	5.8	6.3	5.8	6.5	5.9	4.7	4.2	3.3	---	-0.4	0.0	5.9	4.9	-1.0	-17%
All Days	---	---	3.2	3.4	3.4	4.0	3.3	2.9	2.5	2.3	---	-0.2	0.1	3.3	3.0	-0.3	-9%
Soil Extinction (Mm-1)																	
Best 20% Days	---	---	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	---	0.0	0.1	0.1	0.1	0.0	0%
Worst 20% Days	---	---	0.7	0.6	0.5	0.3	0.6	0.5	0.7	0.6	---	0.0	0.5	0.6	0.6	0.0	0%
All Days	---	---	0.5	0.4	0.4	0.3	0.4	0.4	0.4	0.4	---	0.0	0.6	0.4	0.4	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	---	0.9	0.7	1.2	1.0	0.8	1.0	1.0	1.3	---	0.0	0.1	0.9	1.0	0.1	11%
Worst 20% Days	---	---	3.8	4.3	4.3	3.6	6.2	3.8	4.9	3.1	---	0.0	0.5	4.1	4.3	0.2	5%
All Days	---	---	3.2	3.1	3.2	2.9	3.3	3.0	2.8	2.8	---	-0.1	0.1	3.2	3.0	-0.2	-6%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	---	1.0	0.6	1.7	1.4	1.7	1.1	1.1	1.4	---	0.0	0.3	1.1	1.3	0.2	18%
Worst 20% Days	---	---	0.8	0.1	1.7	0.7	3.9	0.5	0.8	1.8	---	0.1	0.2	0.9	1.6	0.7	78%
All Days	---	---	1.1	1.0	1.8	1.3	2.5	1.7	1.6	1.7	---	0.1	0.2	1.3	1.8	0.5	39%

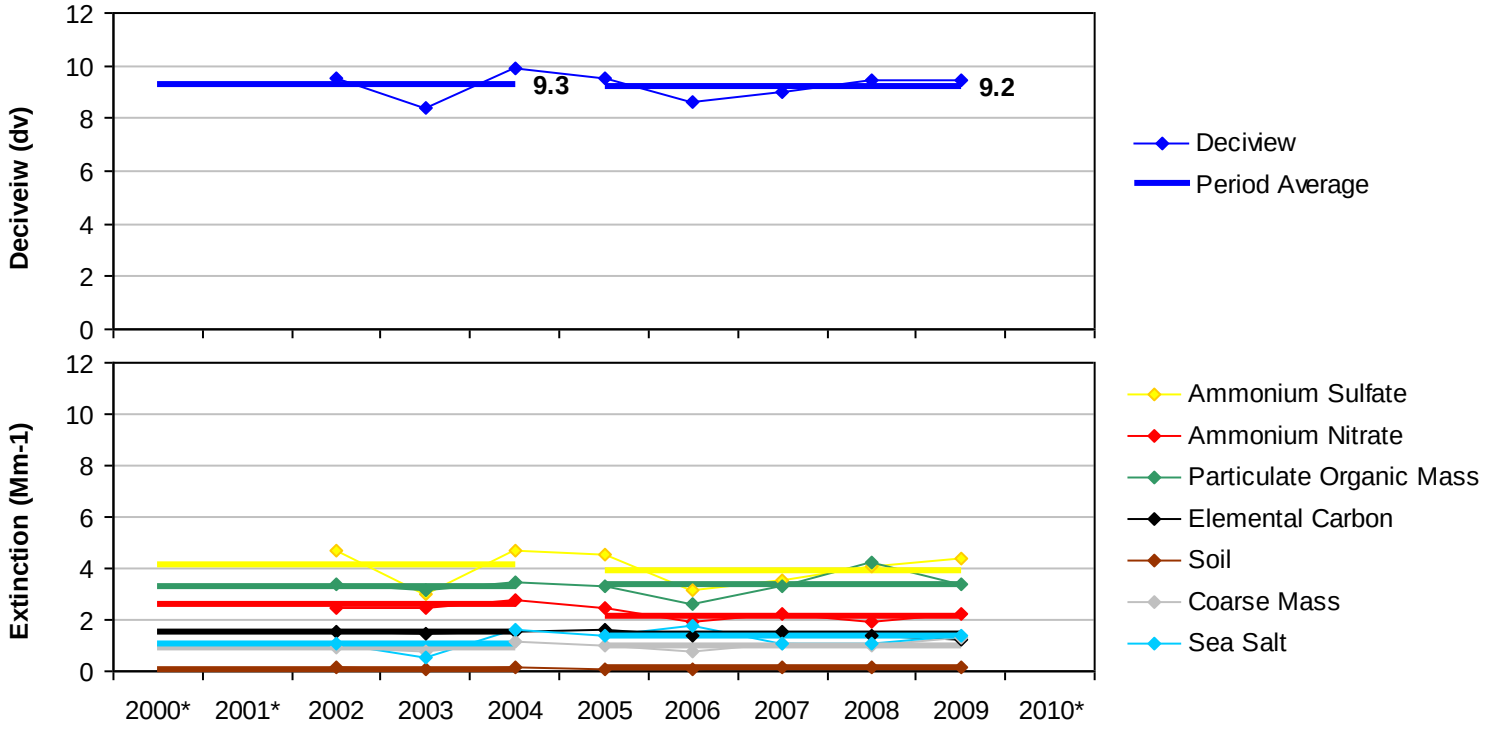
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure K.1-1
Columbia River Gorge, WA (COGO1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



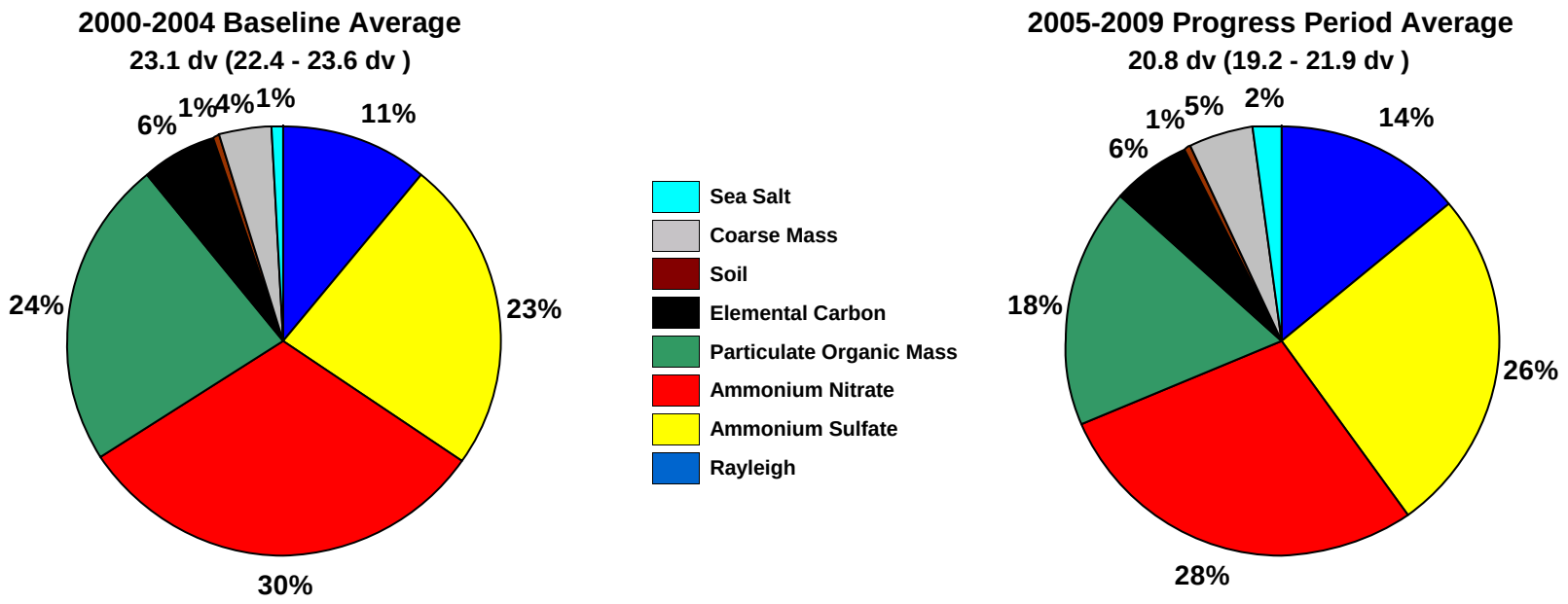
*Missing years did not meet RHR data completeness criteria.

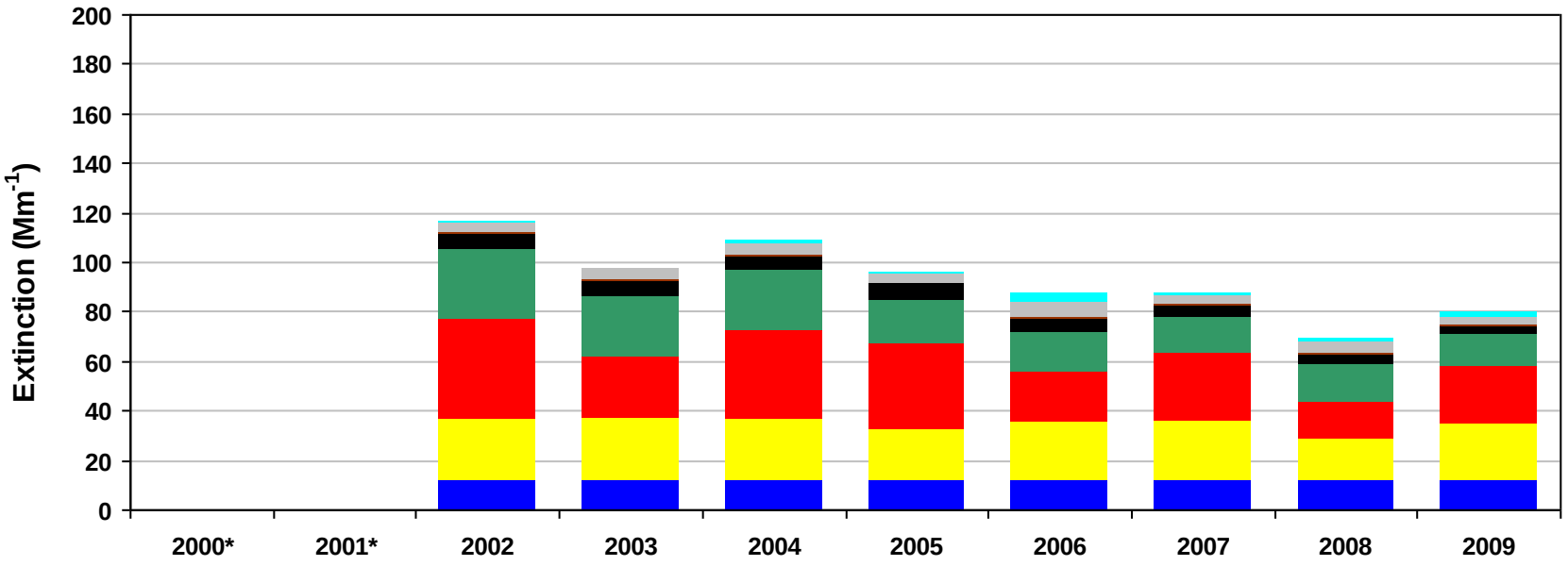
Figure K.1-2
Columbia River Gorge, WA (COGO1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

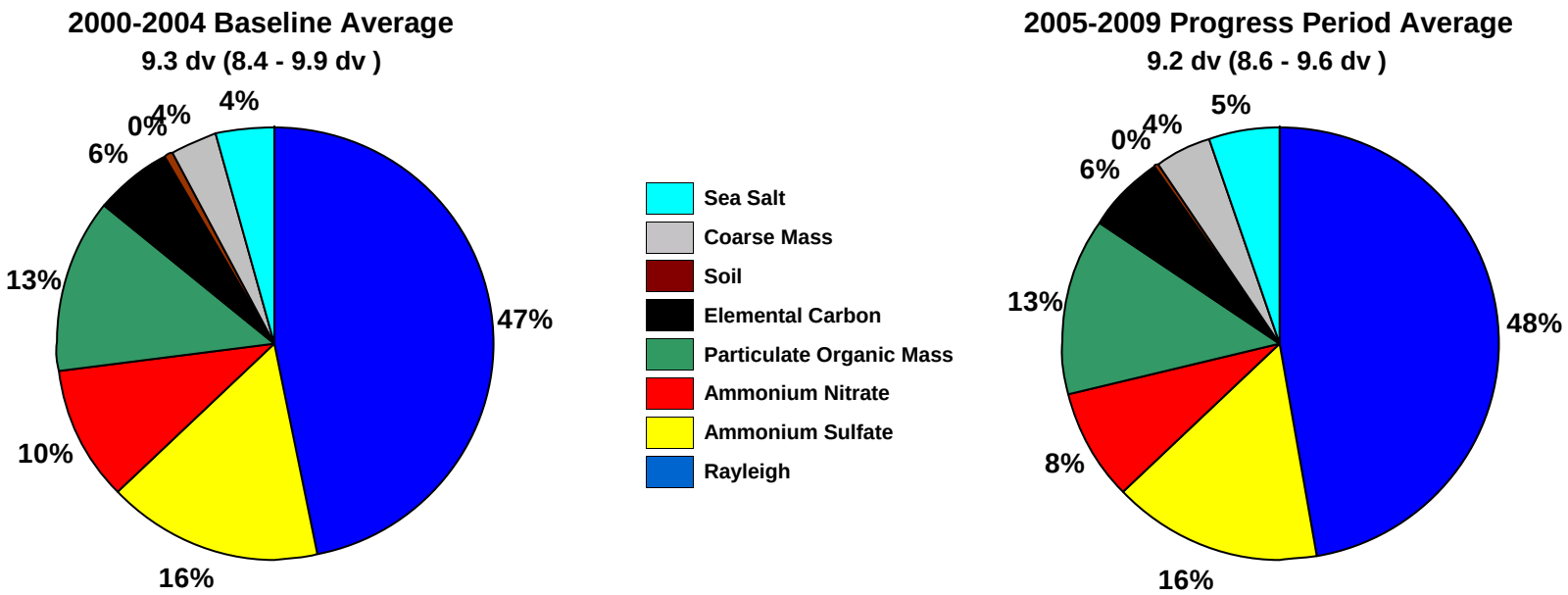
Figure K.1-3
Columbia River Gorge, WA (COGO1 Site)
20% Most Impaired Visibility Days

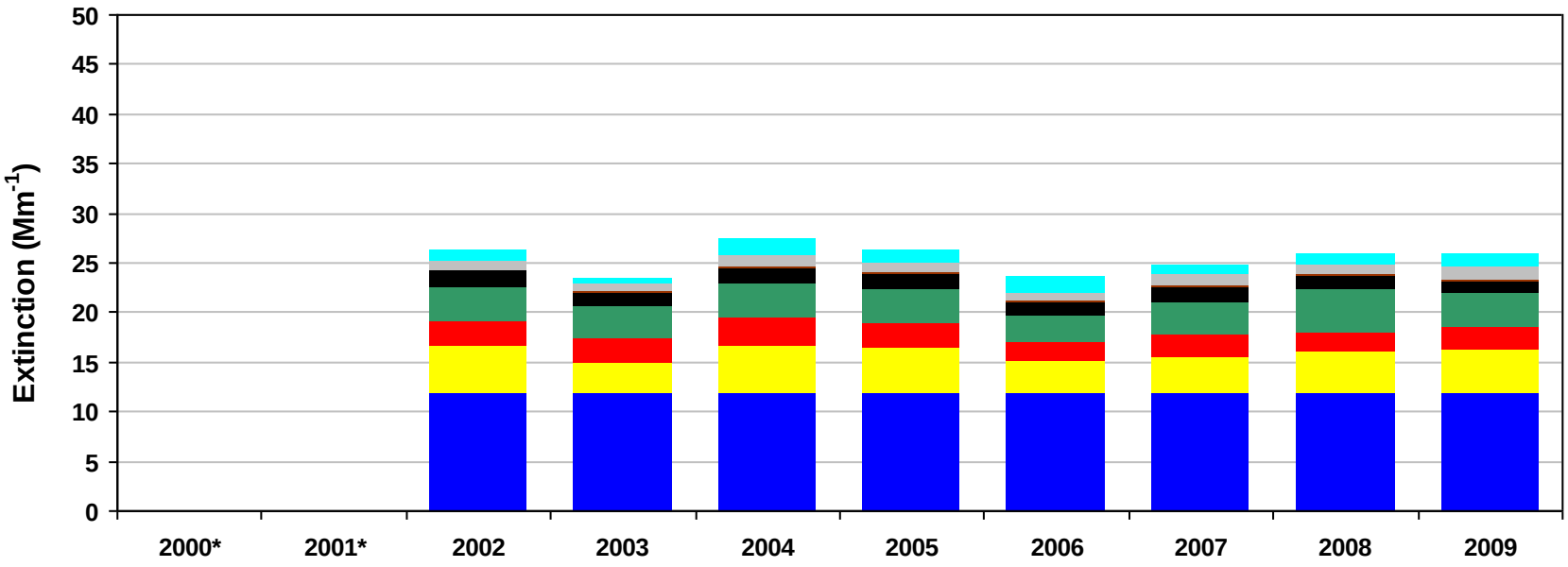




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

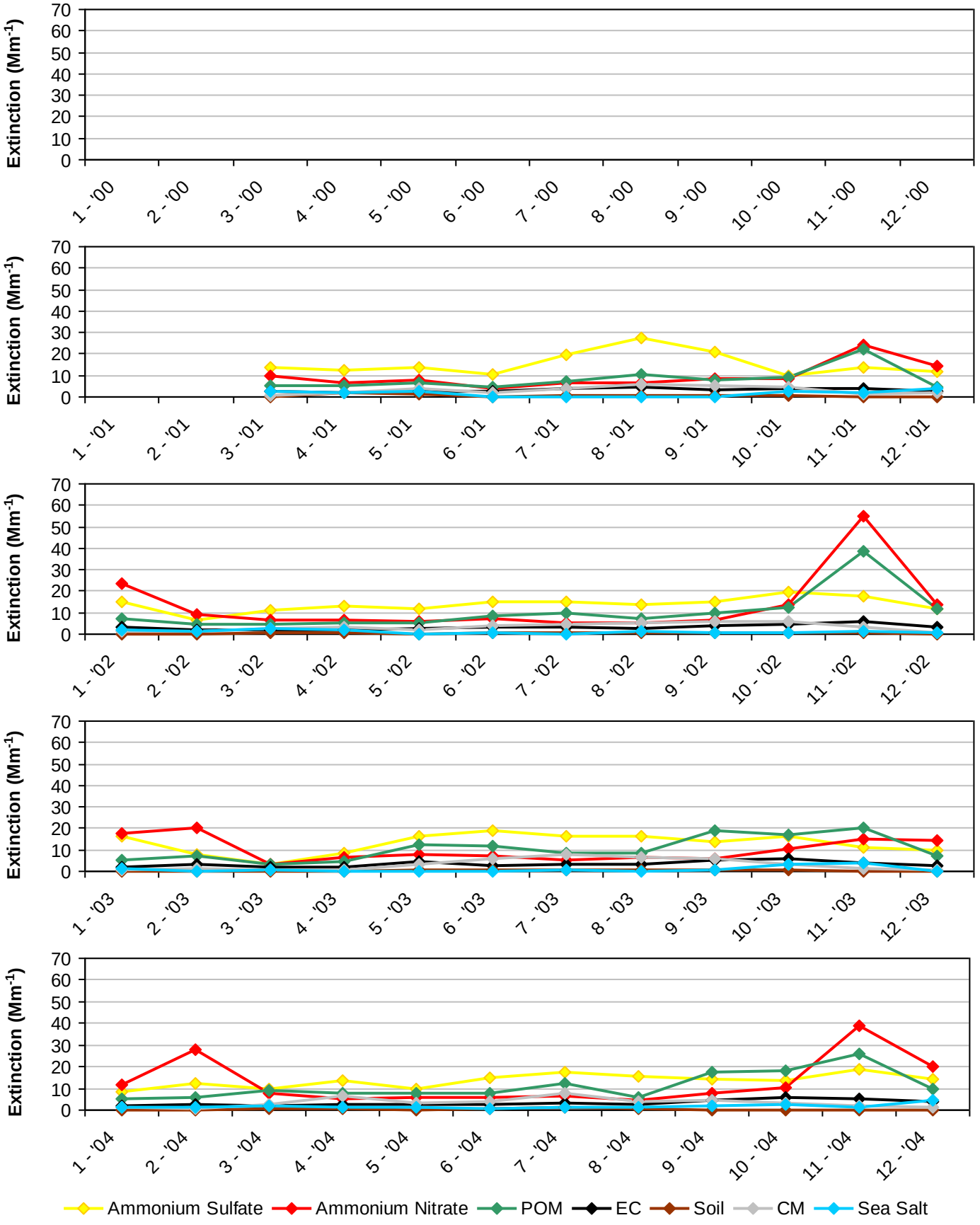
Figure K.1-4
Columbia River Gorge, WA (COGO1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure K.1-5
Columbia River Gorge, WA (COGO1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure K.1-6
Columbia River Gorge, WA (COGO1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

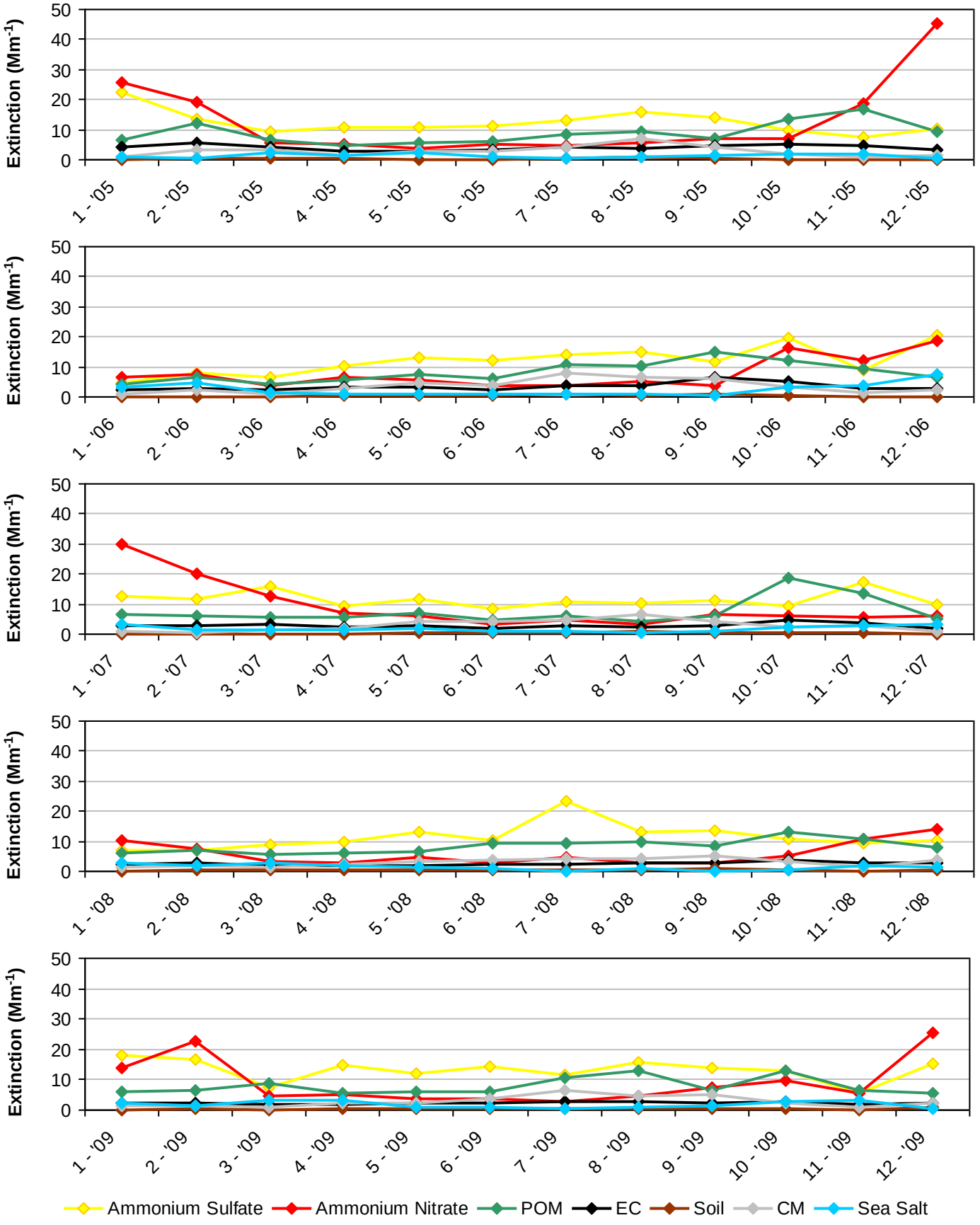
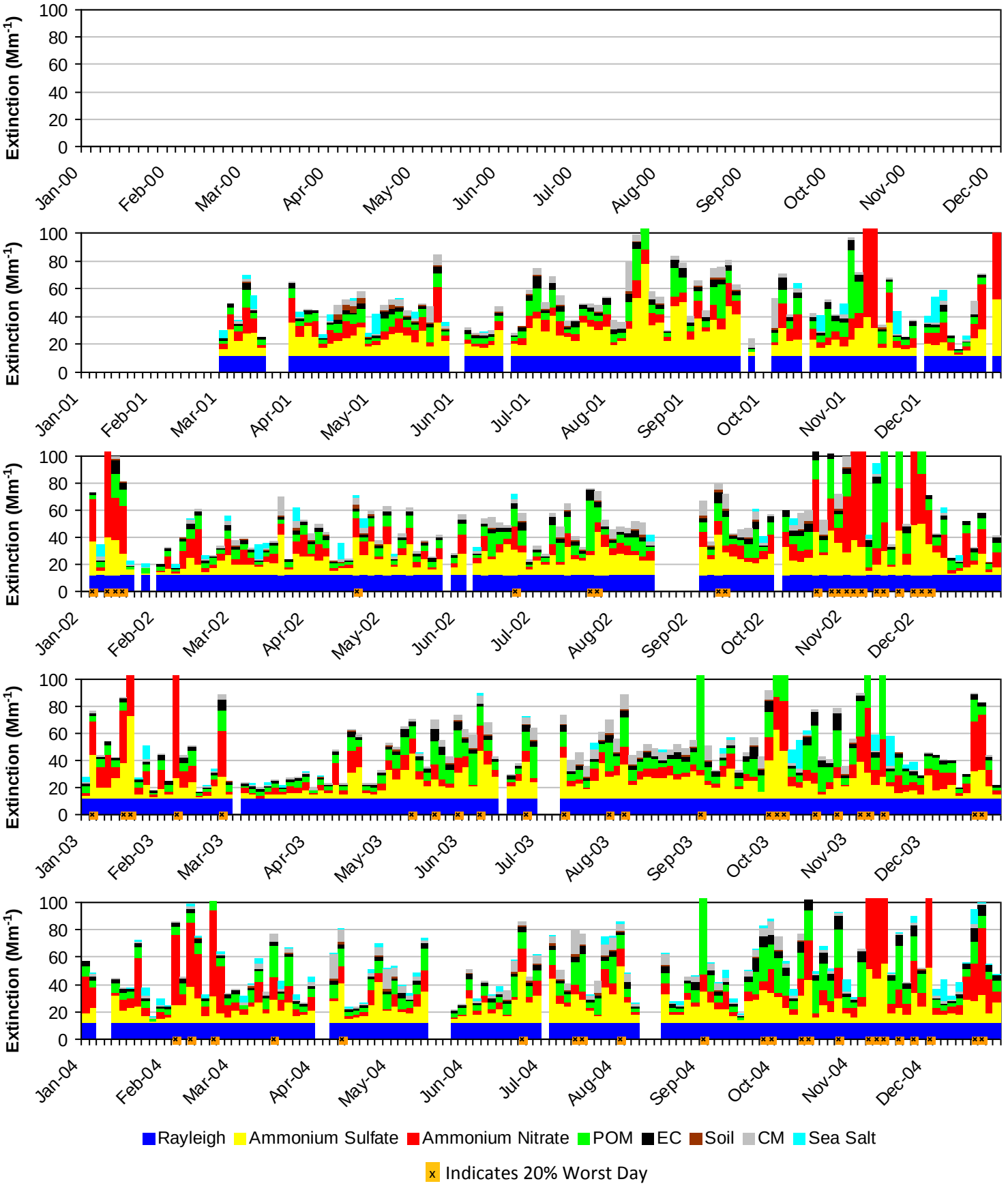
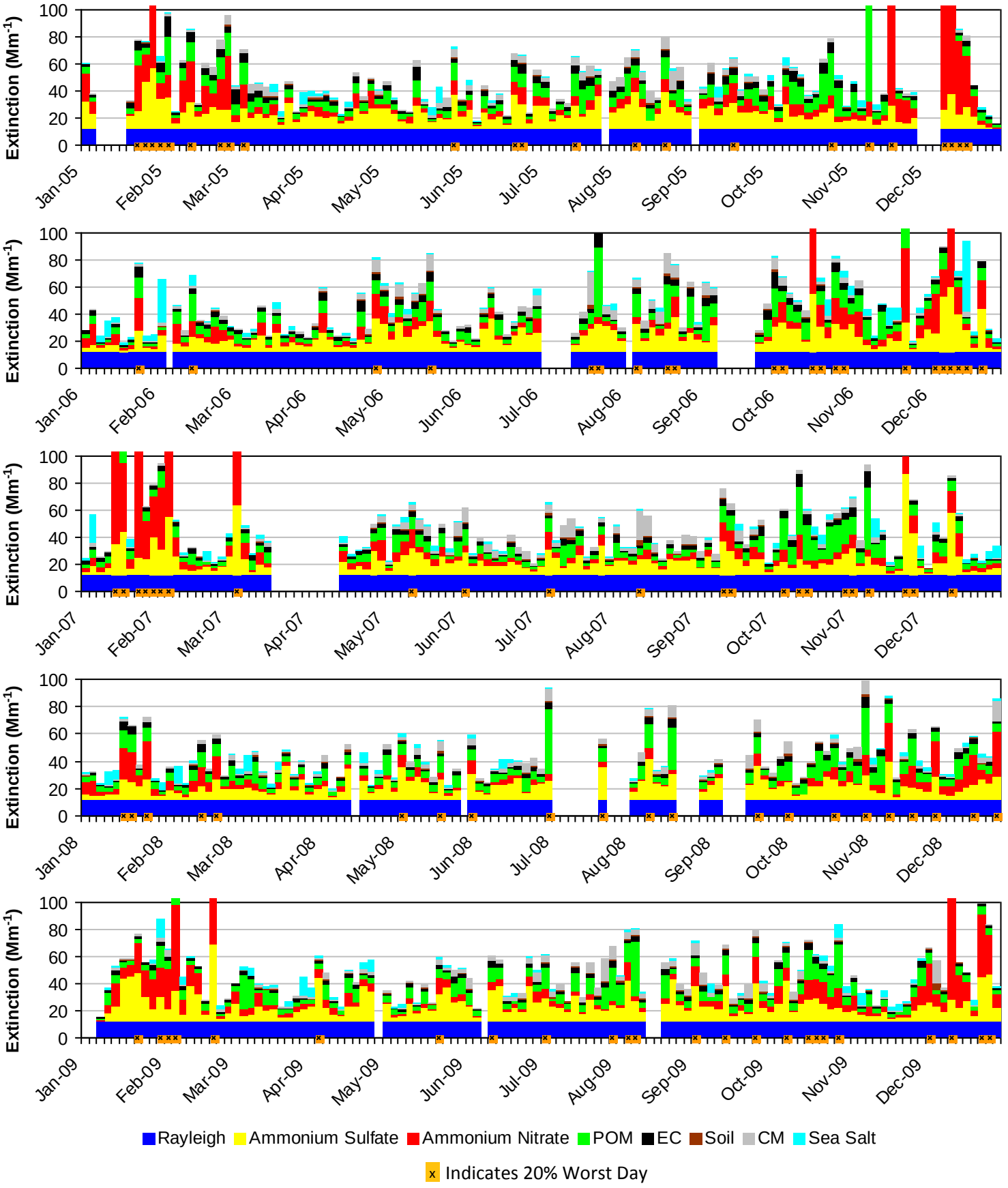


Figure K.1-7
Columbia River Gorge, WA (COGO1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure K.1-8
Columbia River Gorge, WA (COGO1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



K.2. COLUMBIA RIVER GORGE (CORI1)

The following tables and figures are presented in this section for the Columbia River Gorge represented by the COGO1 IMPROVE Monitor:

- **Table K.2-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure K.2-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure K.2-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure K.2-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure K.2-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure K.2-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure K.2-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure K.2-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

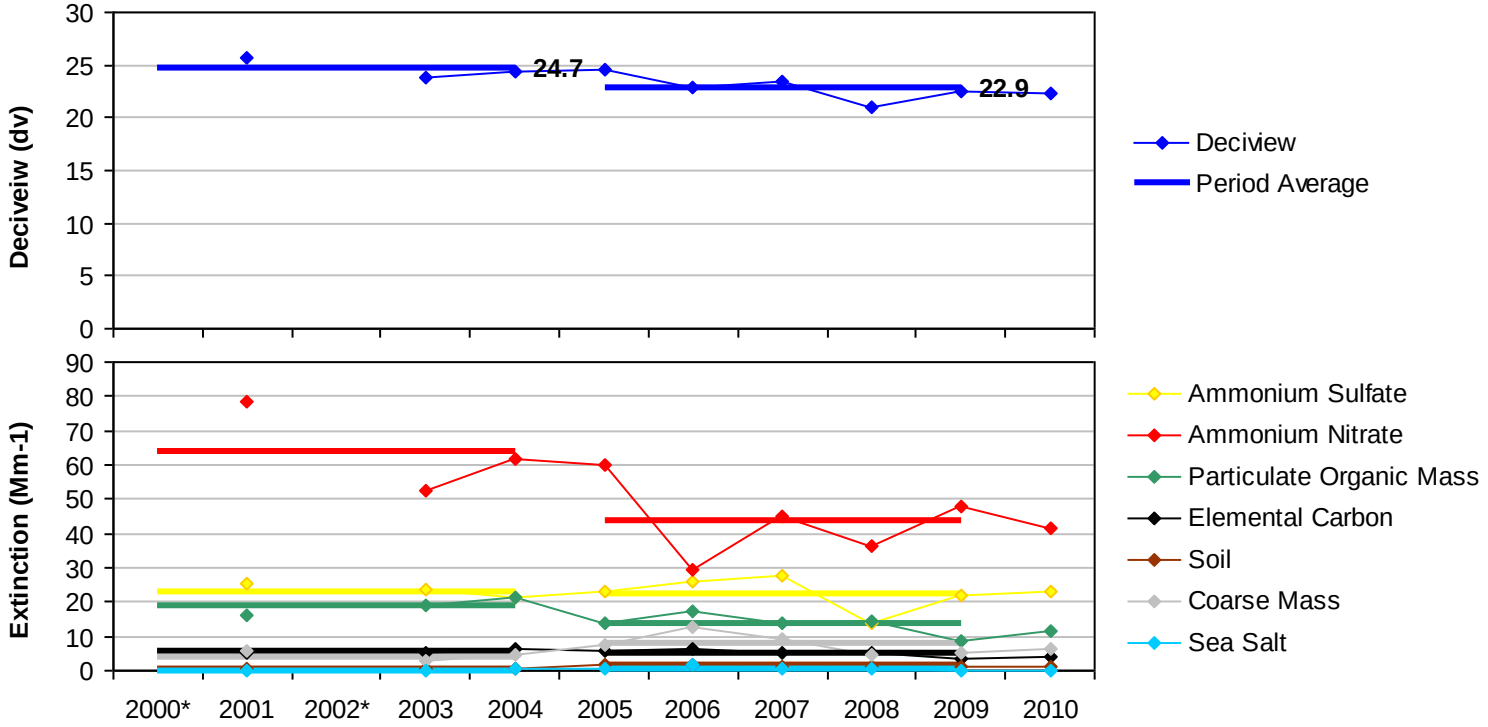
- **Figure K.2-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table K.2-1
Columbia River Gorge, WA (CORI1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	10.7	---	8.6	9.7	10.7	10.8	10.2	8.7	9.2	9.1	-0.1	0.5	9.6	9.9	0.3	3%
Worst 20% Days	---	25.8	---	23.9	24.4	24.6	22.9	23.4	21.0	22.6	22.3	-0.4	0.0	24.7	22.9	-1.8	-7%
All Days	---	16.6	---	15.3	16.4	16.8	16.1	15.6	14.2	15.1	14.7	-0.2	0.1	16.1	15.5	-0.6	-4%
Total Extinction (Mm-1)																	
Best 20% Days	---	29.2	---	23.7	26.5	29.4	29.5	27.9	24.0	25.4	24.9	-0.2	0.5	26.5	27.3	0.8	3%
Worst 20% Days	---	142.7	---	115.8	129.0	124.7	106.5	114.7	88.3	99.9	99.6	-5.2	0.0	129.2	106.8	-22.4	-17%
All Days	---	63.7	---	54.8	61.5	62.1	56.5	55.3	46.6	51.4	49.8	-1.7	0.0	60.0	54.4	-5.6	-9%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	6.3	---	3.6	3.6	5.2	4.1	4.0	3.8	3.9	3.2	-0.1	0.3	4.5	4.2	-0.3	-7%
Worst 20% Days	---	25.1	---	23.5	21.2	23.2	25.8	27.6	14.0	21.9	23.0	-0.3	0.4	23.3	22.5	-0.8	-3%
All Days	---	13.9	---	11.4	11.5	11.3	11.8	10.9	8.8	11.1	9.7	-0.2	0.0	12.3	10.8	-1.5	-12%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	2.4	---	2.3	2.2	2.7	2.5	3.2	1.8	2.3	2.2	0.0	0.5	2.3	2.5	0.2	9%
Worst 20% Days	---	78.6	---	52.4	61.7	59.9	29.4	45.2	36.1	47.6	41.4	-4.3	0.1	64.2	43.6	-20.6	-32%
All Days	---	20.0	---	13.8	17.2	16.9	10.1	13.1	11.0	13.2	11.8	-0.9	0.1	17.0	12.9	-4.1	-24%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	2.6	---	2.5	2.9	3.0	2.8	2.6	2.7	2.4	2.1	0.0	0.3	2.7	2.7	0.0	0%
Worst 20% Days	---	15.9	---	19.1	21.6	14.0	17.1	13.9	14.5	8.4	11.7	-1.1	0.1	18.9	13.6	-5.3	-28%
All Days	---	8.0	---	10.1	10.5	8.1	8.2	6.8	6.9	6.3	5.8	-0.6	0.1	9.5	7.3	-2.2	-23%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	1.4	---	1.5	1.6	1.6	1.8	1.4	1.3	1.3	1.2	0.0	0.3	1.5	1.5	0.0	0%
Worst 20% Days	---	5.0	---	5.2	6.6	5.8	6.1	5.1	5.1	3.5	3.8	-0.2	0.2	5.6	5.1	-0.5	-9%
All Days	---	3.0	---	3.3	3.6	3.5	3.5	2.9	2.8	2.3	2.3	-0.1	0.1	3.3	3.0	-0.3	-9%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.4	---	0.2	0.3	0.8	0.7	0.3	0.5	0.5	0.4	0.0	0.3	0.3	0.6	0.3	100%
Worst 20% Days	---	0.7	---	0.8	0.6	1.8	1.9	1.2	1.4	1.2	1.1	0.1	0.2	0.7	1.5	0.8	>100%
All Days	---	0.9	---	0.6	0.7	1.7	1.4	0.9	1.2	1.2	0.9	0.1	0.1	0.7	1.3	0.6	86%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	3.1	---	1.4	2.6	3.1	4.0	2.9	1.4	2.1	2.8	-0.1	0.4	2.4	2.7	0.3	13%
Worst 20% Days	---	5.5	---	2.9	4.6	7.6	12.5	9.2	4.6	5.2	6.4	0.4	0.4	4.3	7.8	3.5	81%
All Days	---	5.4	---	2.8	4.7	7.7	7.9	7.7	3.3	4.4	6.4	0.0	0.6	4.3	6.2	1.9	44%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.9	---	0.2	1.3	1.0	1.6	1.6	0.4	1.1	1.0	0.0	0.2	0.8	1.1	0.3	38%
Worst 20% Days	---	0.0	---	0.0	0.7	0.5	1.7	0.3	0.6	0.1	0.1	0.0	0.3	0.2	0.6	0.4	>100%
All Days	---	0.7	---	0.7	1.2	0.9	1.7	1.1	0.7	0.9	0.9	0.0	0.3	0.8	1.0	0.2	25%

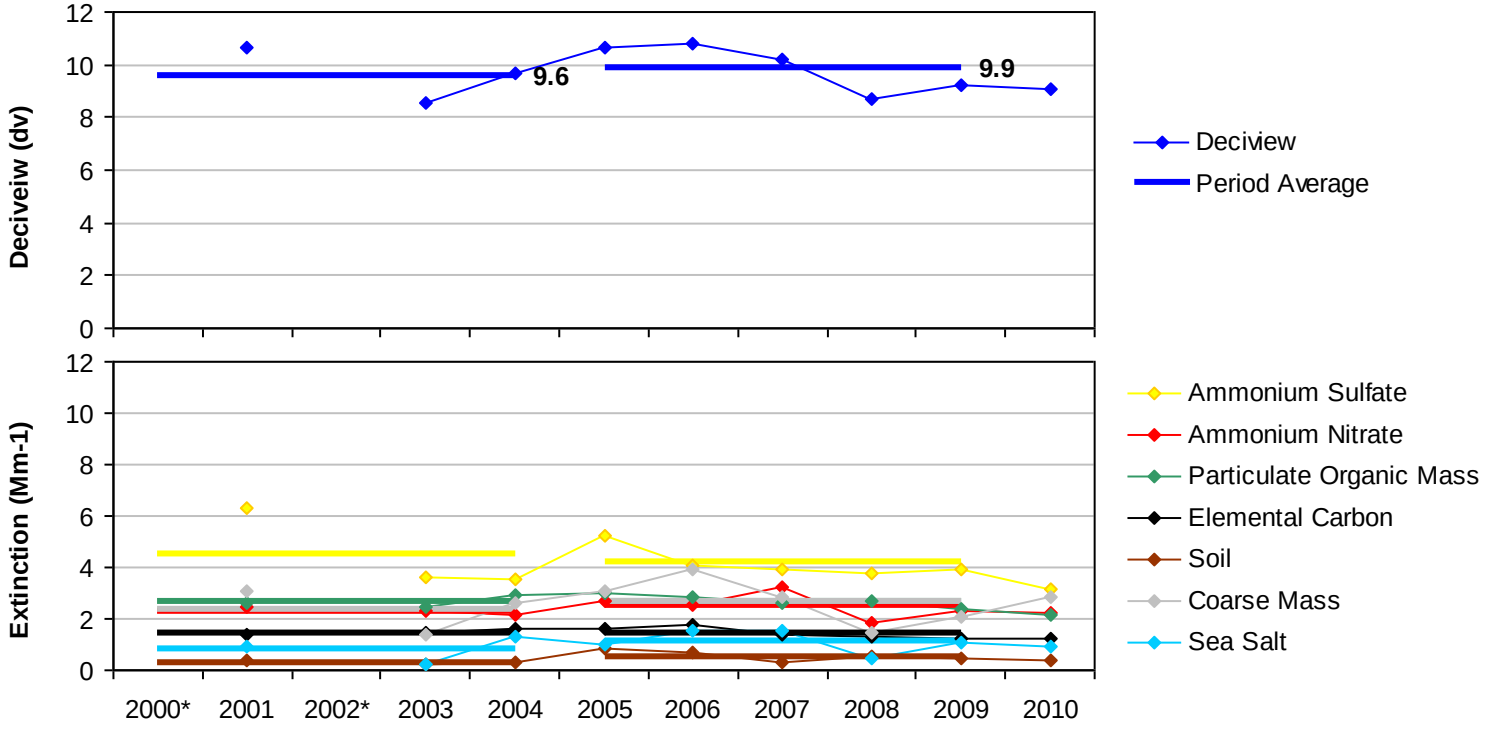
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure K.2-1
Columbia River Gorge, WA (CORI1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



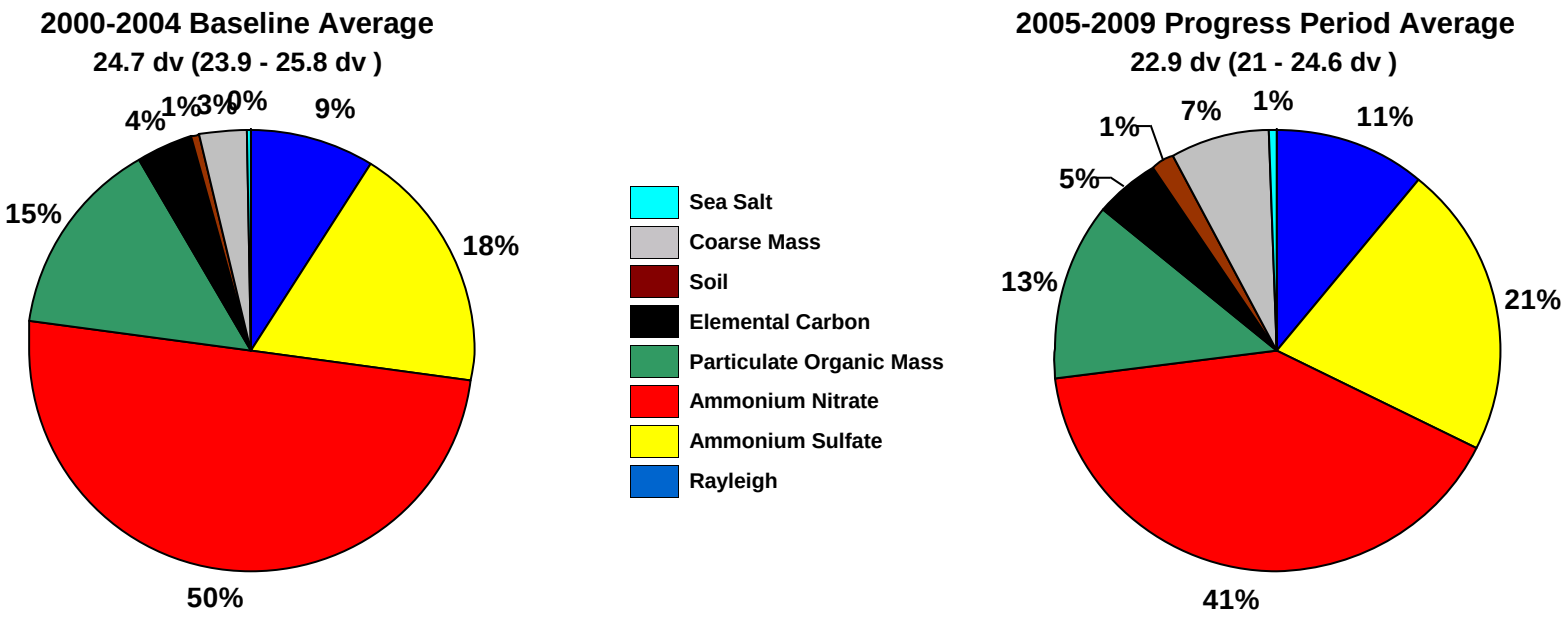
*Missing years did not meet RHR data completeness criteria.

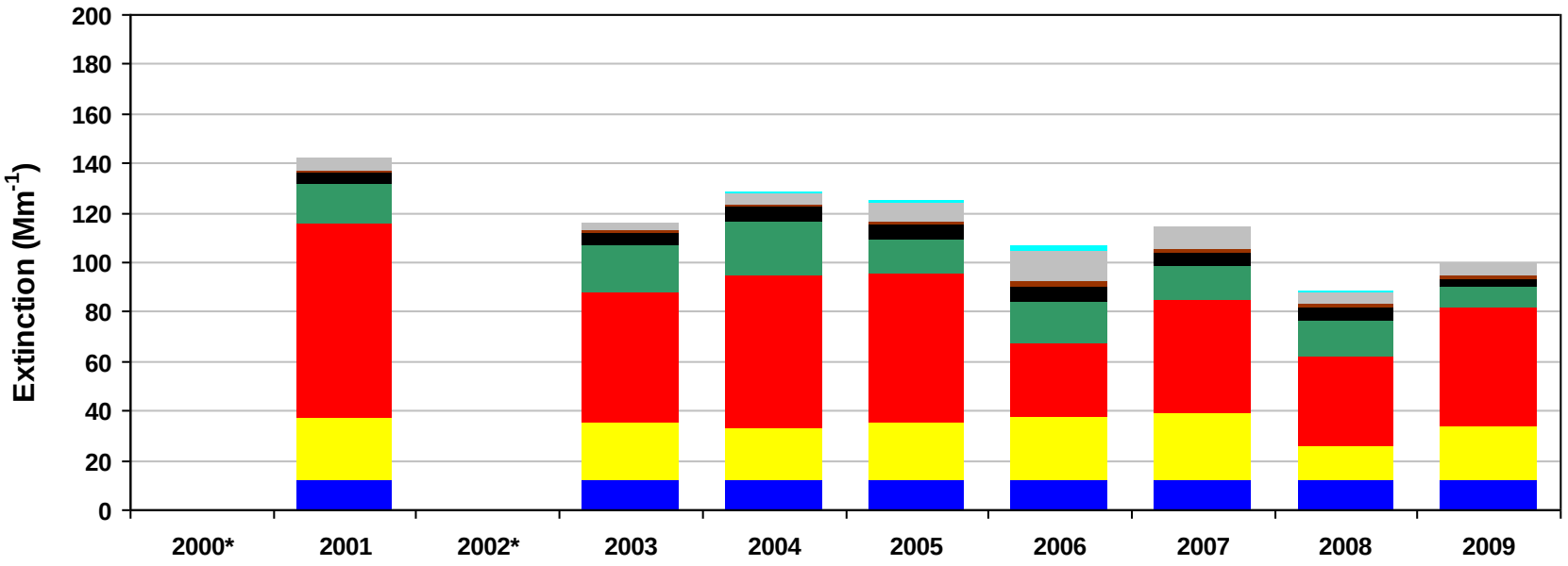
Figure K.2-2
Columbia River Gorge, WA (CORI1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

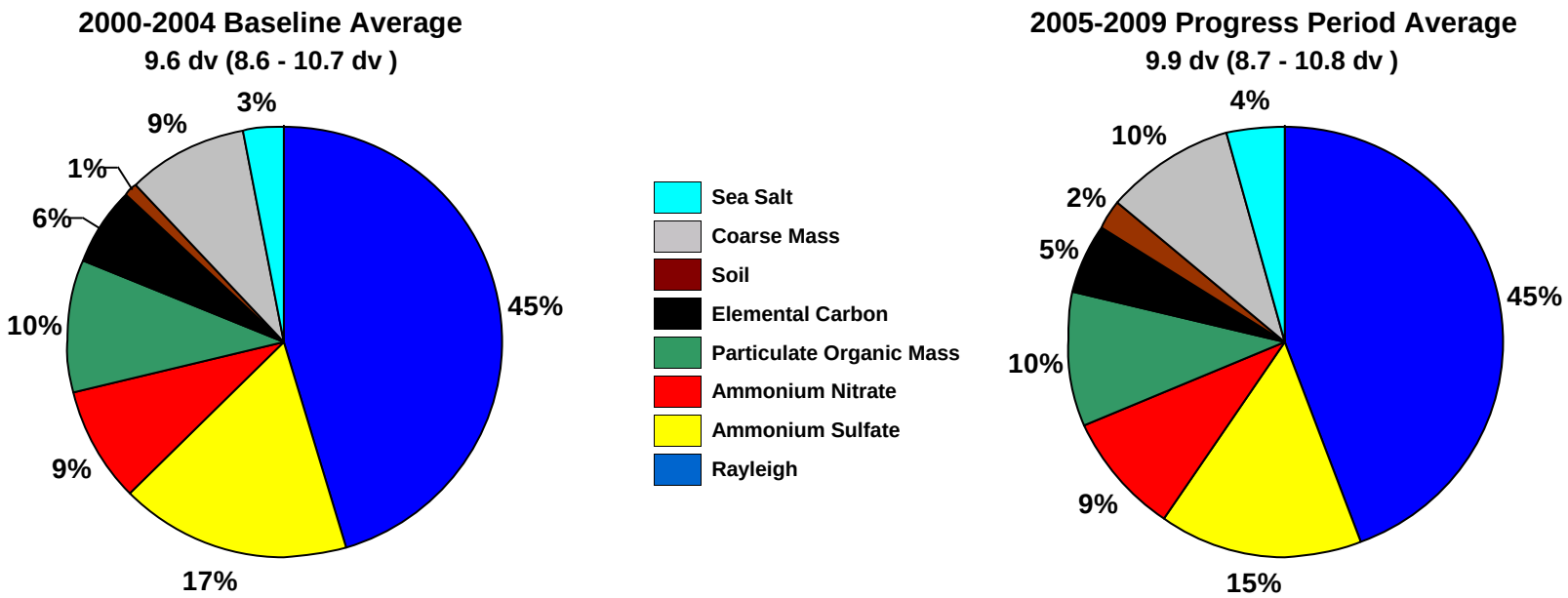
Figure K.2-3
Columbia River Gorge, WA (CORI1 Site)
20% Most Impaired Visibility Days

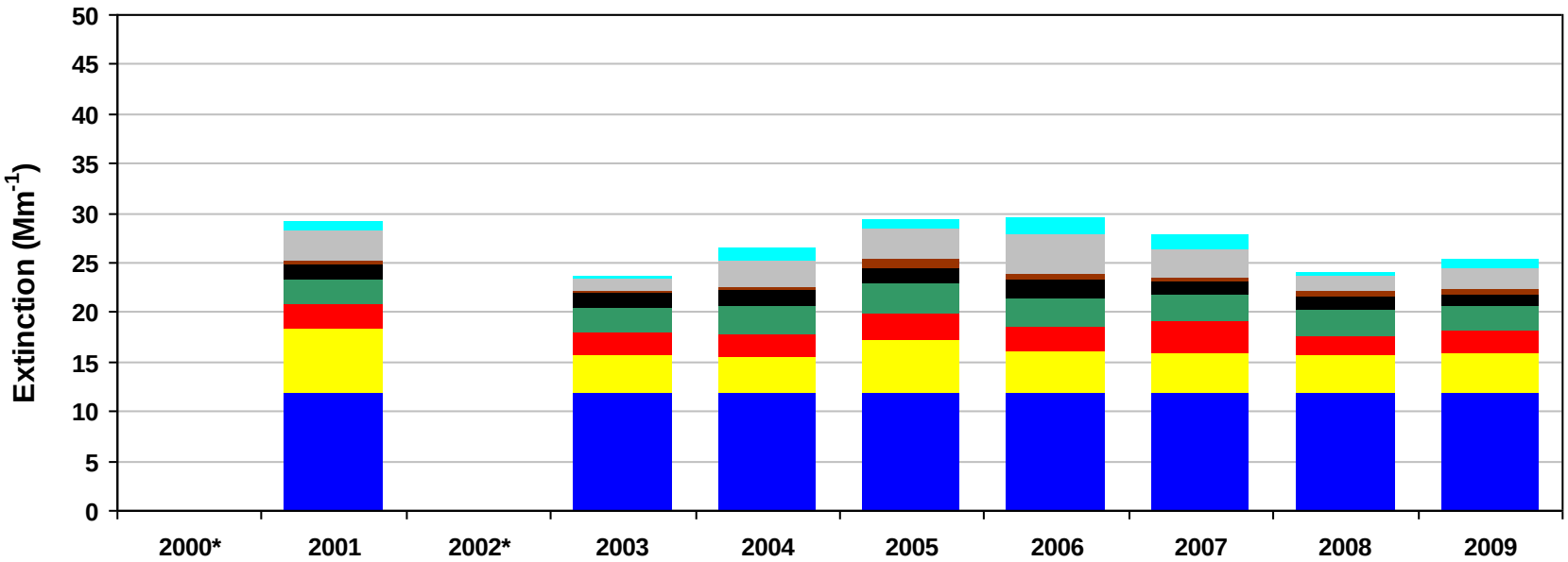




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

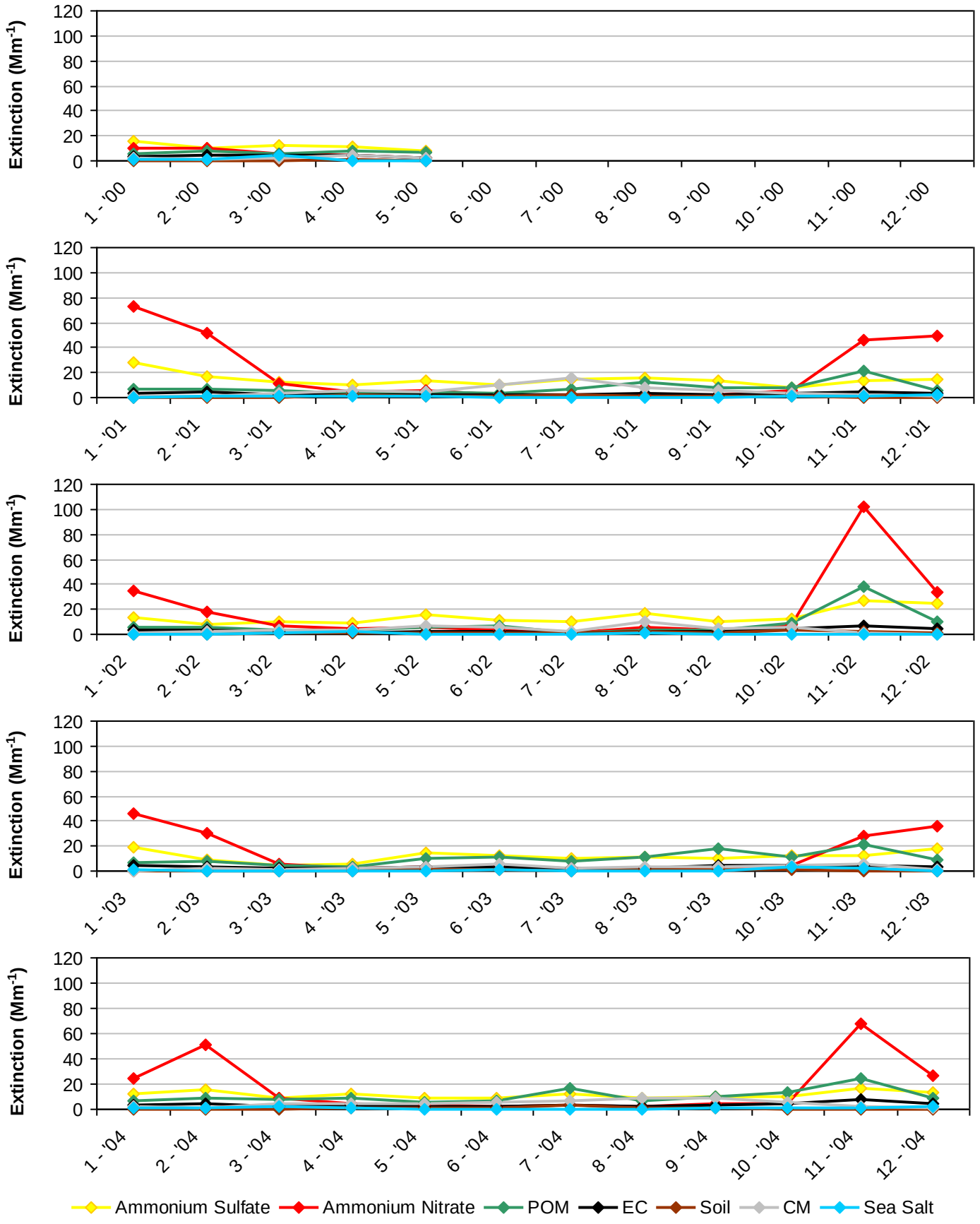
Figure K.2-4
Columbia River Gorge, WA (CORI1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure K.2-5
Columbia River Gorge, WA (CORI1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the years 2000 and 2002 are shown here, but these years did not meet RHR data completeness criteria.

Figure K.2-6
Columbia River Gorge, WA (CORI1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

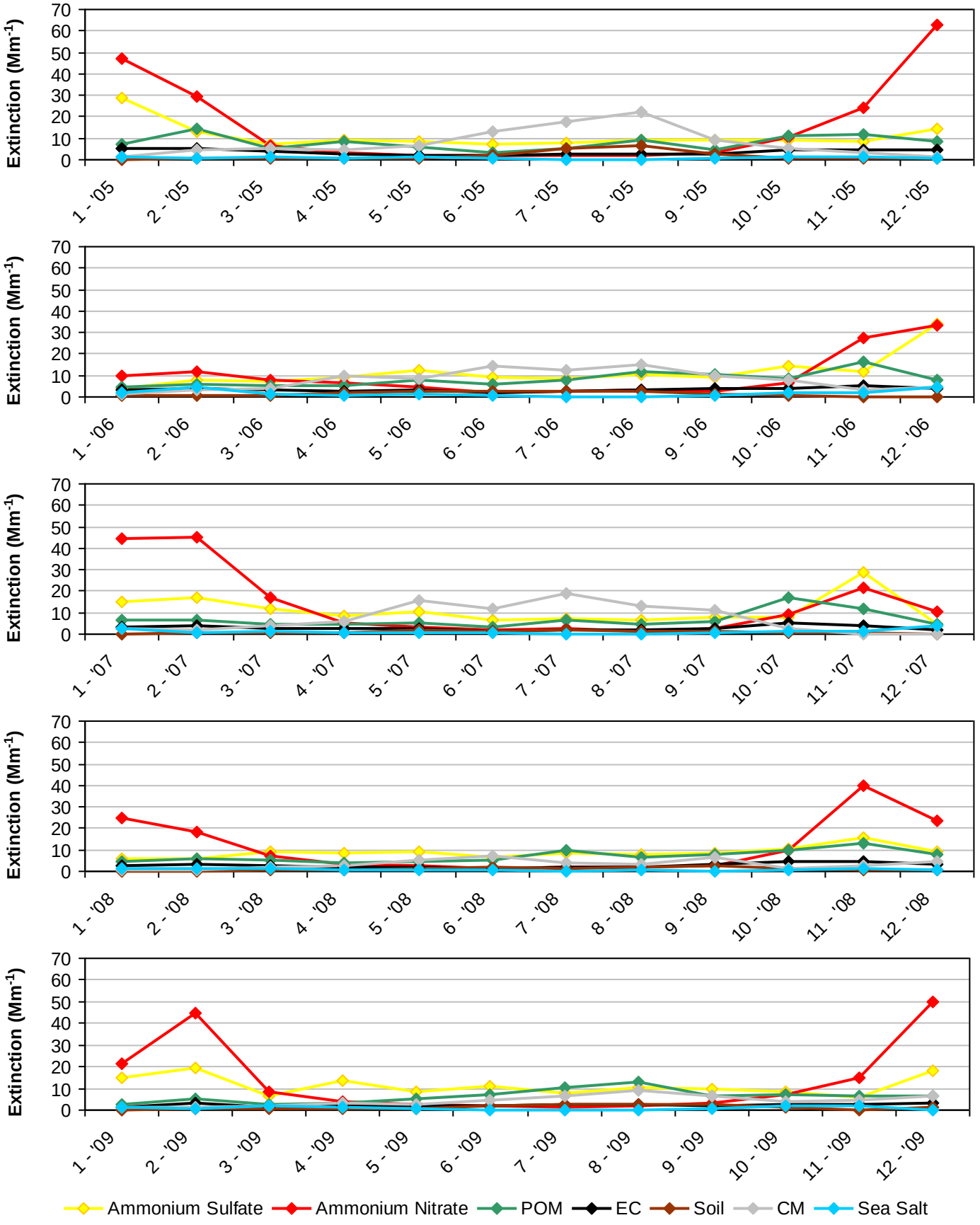
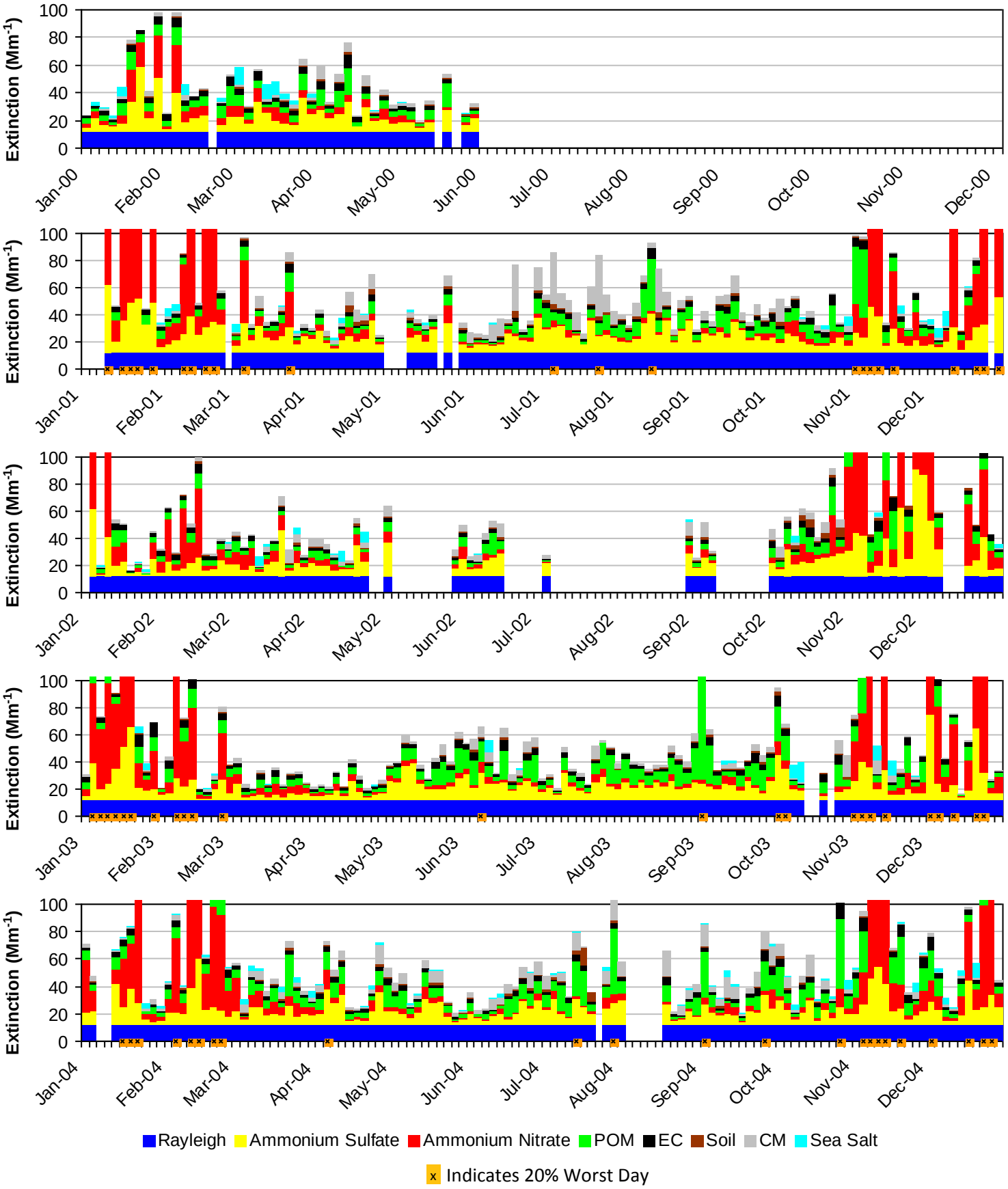
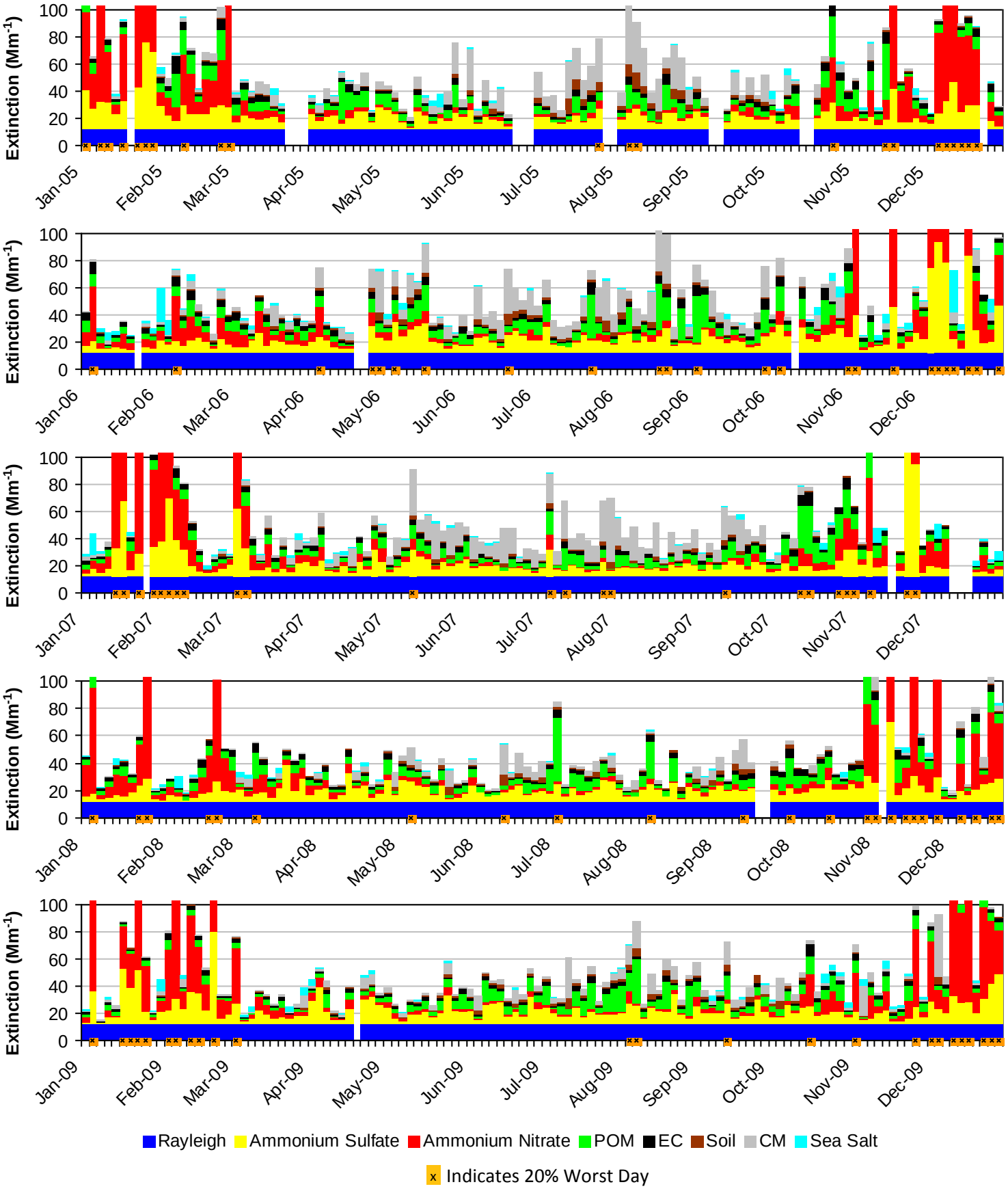


Figure K.2-7
Columbia River Gorge, WA (CORI1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2000 and 2002 are shown here, but these years did not meet RHR data completeness criteria.

Figure K.2-8
Columbia River Gorge, WA (CORI1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



K.3. CRATER LAKE NP, DIAMOND PEAK WA, GEARHART MOUNTAIN WA, AND MOUNTAIN LAKES WA (CRLA1)

The following tables and figures are presented in this section for the Crater Lake NP, Diamond Peak WA, Gearhart Mountain WA, and Mountain Lakes WA represented by the CRLA1 IMPROVE Monitor:

- **Table K.3-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure K.3-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure K.3-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure K.3-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure K.3-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure K.3-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure K.3-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure K.3-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

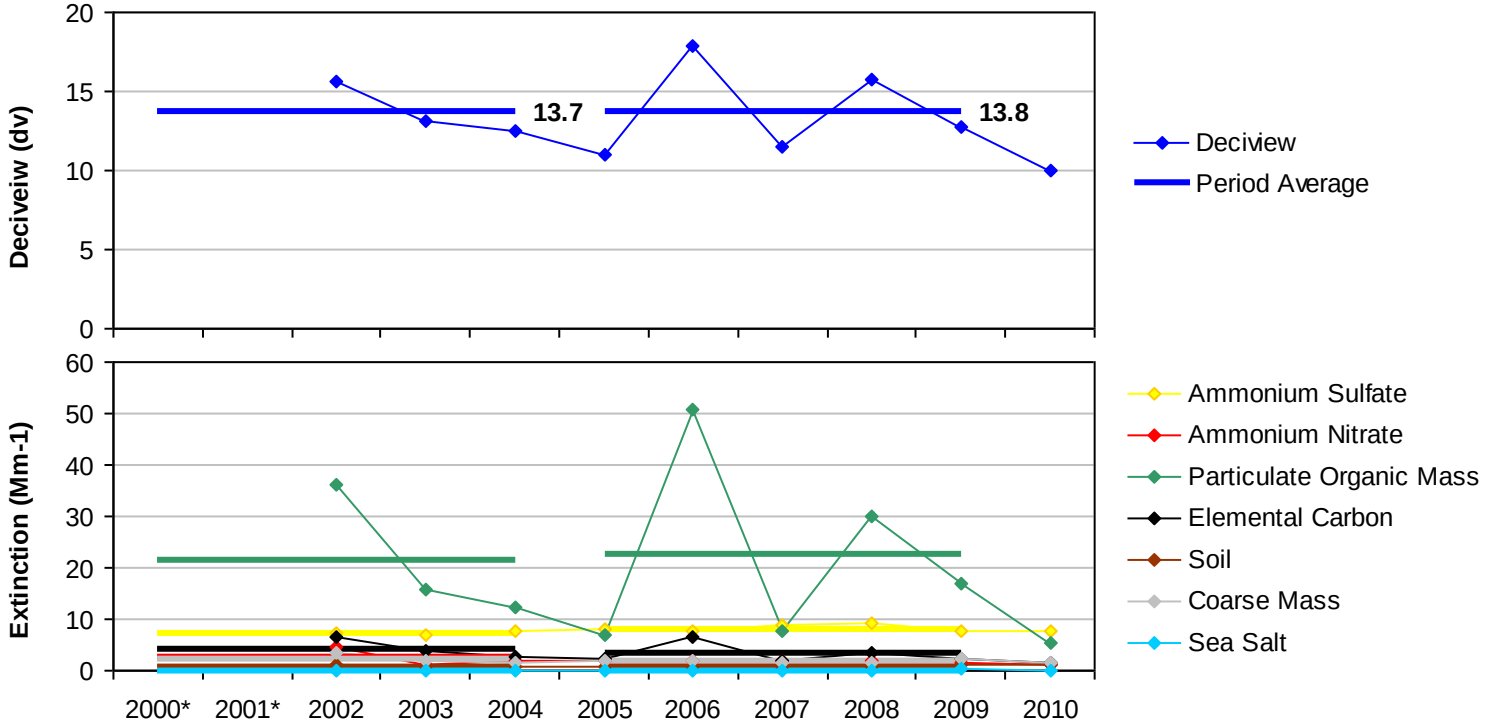
- **Figure K.3-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table K.3-1
Crater Lake NP and Diamond Peak, Gearhart Mountain and Mountain Lakes Was, OR (CRLA1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period						2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	---	1.8	1.7	1.6	1.7	1.5	1.4	1.7	1.6	0.9	0.0	0.1	1.7	1.6	-0.1	-6%
Worst 20% Days	---	---	15.6	13.1	12.5	11.1	17.9	11.5	15.8	12.7	9.9	-0.2	0.5	13.7	13.8	0.1	1%
All Days	---	---	7.4	6.8	6.6	6.1	7.8	5.9	7.2	6.4	5.0	-0.1	0.2	6.9	6.7	-0.2	-3%
Total Extinction (Mm-1)																	
Best 20% Days	---	---	12.1	11.8	11.7	12.0	11.7	11.5	11.9	11.8	11.0	0.0	0.1	11.9	11.8	-0.1	-1%
Worst 20% Days	---	---	68.5	39.3	35.9	30.6	78.5	32.1	55.9	41.2	27.6	-1.5	0.5	47.9	47.7	-0.2	0%
All Days	---	---	28.0	21.9	21.0	19.5	30.2	19.3	25.1	21.6	17.4	-0.5	0.3	23.6	23.1	-0.5	-2%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	---	1.0	0.9	1.0	1.3	1.2	1.2	1.2	1.0	0.8	0.0	0.5	0.9	1.2	0.3	33%
Worst 20% Days	---	---	7.3	7.0	7.8	8.1	7.6	8.9	9.1	7.5	7.6	0.3	0.1	7.3	8.2	0.9	12%
All Days	---	---	4.0	3.6	3.9	4.3	4.3	4.1	4.8	4.0	3.4	0.1	0.2	3.8	4.3	0.5	13%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	---	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.0	0.3	0.3	0.2	-0.1	-33%
Worst 20% Days	---	---	4.5	1.3	2.0	1.7	1.9	1.8	1.8	1.4	1.2	-0.1	0.2	2.6	1.7	-0.9	-35%
All Days	---	---	1.6	0.9	1.0	0.8	0.9	0.8	0.8	0.7	0.6	-0.1	0.0	1.2	0.8	-0.4	-33%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	---	0.7	0.6	0.5	0.6	0.3	0.3	0.4	0.5	0.3	0.0	0.1	0.6	0.4	-0.2	-33%
Worst 20% Days	---	---	36.3	15.7	12.3	6.9	50.9	7.8	30.1	17.0	5.3	-1.3	0.5	21.4	22.5	1.1	5%
All Days	---	---	9.2	5.2	4.3	2.7	12.2	3.0	8.0	5.0	2.2	-0.3	0.4	6.2	6.2	0.0	0%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	---	0.7	0.7	0.5	0.4	0.6	0.3	0.5	0.5	0.5	0.0	0.1	0.7	0.5	-0.2	-29%
Worst 20% Days	---	---	6.7	3.7	2.6	2.4	6.4	2.0	3.6	2.5	1.5	-0.2	0.1	4.3	3.4	-0.9	-21%
All Days	---	---	2.2	1.7	1.4	1.3	2.2	1.1	1.3	1.2	0.9	-0.1	0.0	1.8	1.4	-0.4	-22%
Soil Extinction (Mm-1)																	
Best 20% Days	---	---	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.4	0.1	0.1	0.0	0%
Worst 20% Days	---	---	1.0	0.7	0.8	0.6	0.8	0.8	0.7	1.3	1.1	0.0	0.4	0.8	0.9	0.1	13%
All Days	---	---	0.5	0.4	0.4	0.4	0.5	0.3	0.4	0.5	0.5	0.0	0.4	0.4	0.4	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	---	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.2	0.1	0.0	0.5	0.2	0.2	0.0	0%
Worst 20% Days	---	---	3.6	1.9	1.4	1.8	1.9	1.7	1.5	2.2	1.6	0.0	0.3	2.3	1.8	-0.5	-22%
All Days	---	---	1.3	0.9	0.8	0.9	1.0	0.8	0.8	0.9	0.8	0.0	0.1	1.0	0.8	-0.2	-20%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	---	0.3	0.1	0.2	0.2	0.3	0.2	0.2	0.3	0.1	0.0	0.1	0.2	0.2	0.0	0%
Worst 20% Days	---	---	0.1	0.0	0.0	0.1	0.1	0.2	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.0	0%
All Days	---	---	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.0	0.1	0.2	0.2	0.0	0%

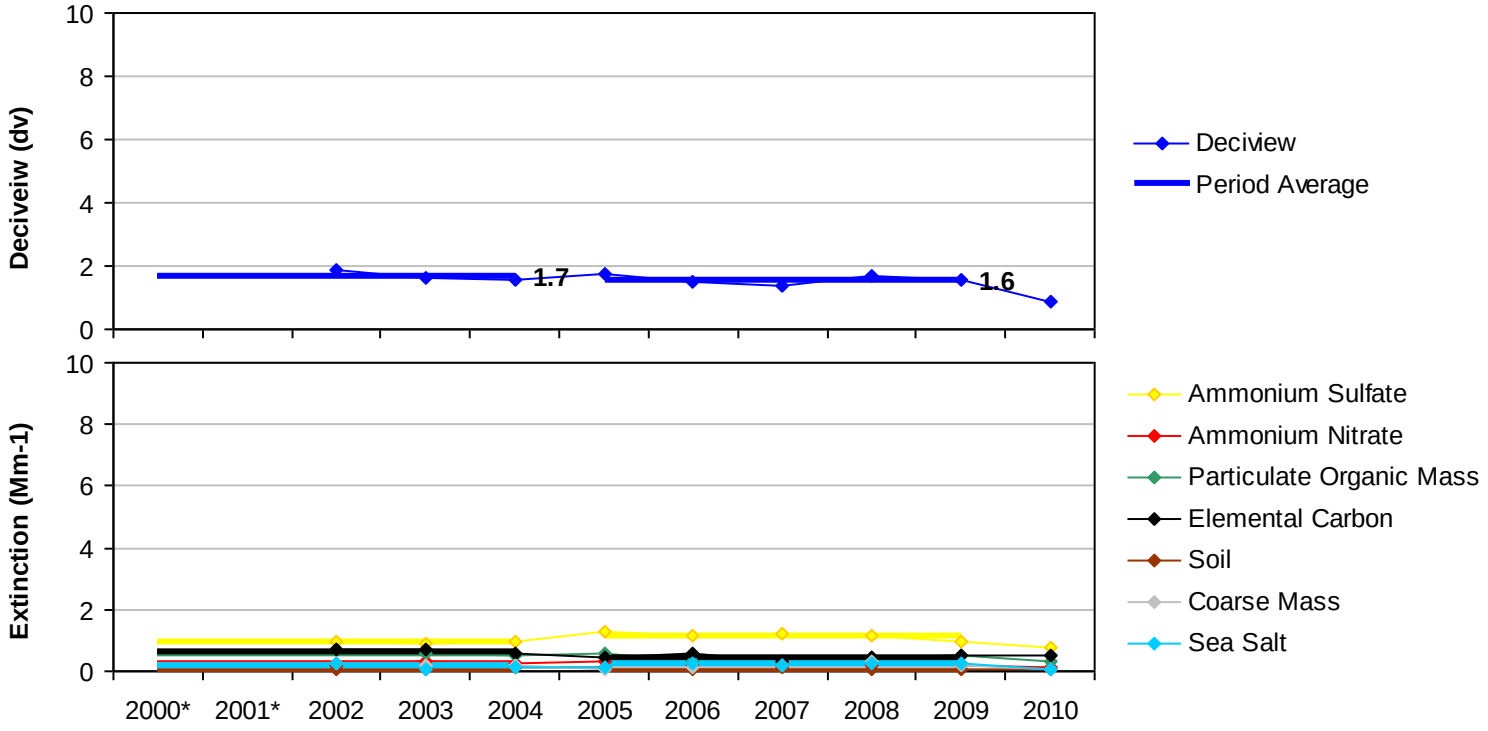
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure K.3-1
Crater Lake NP and Diamond Peak, Gearhart Mountain and Mountain Lakes Was, OR (CRLA1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure K.3-2
Crater Lake NP and Diamond Peak, Gearhart Mountain and Mountain Lakes Was, OR (CRLA1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

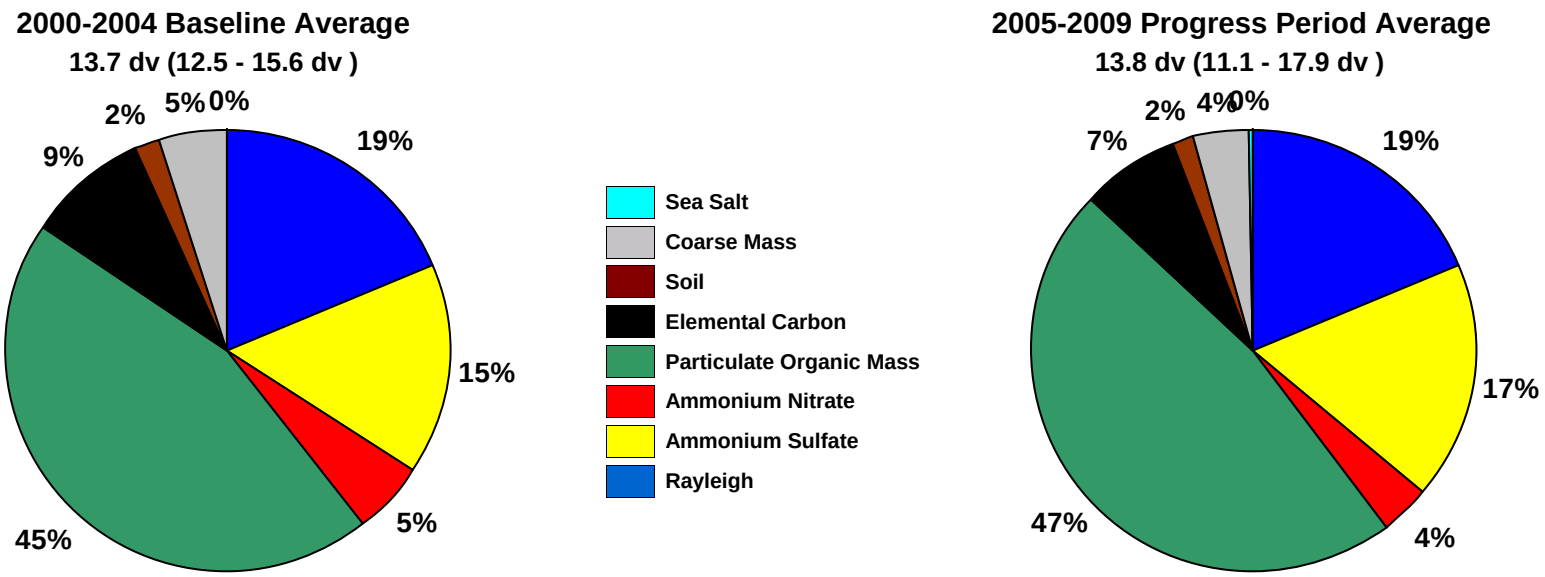


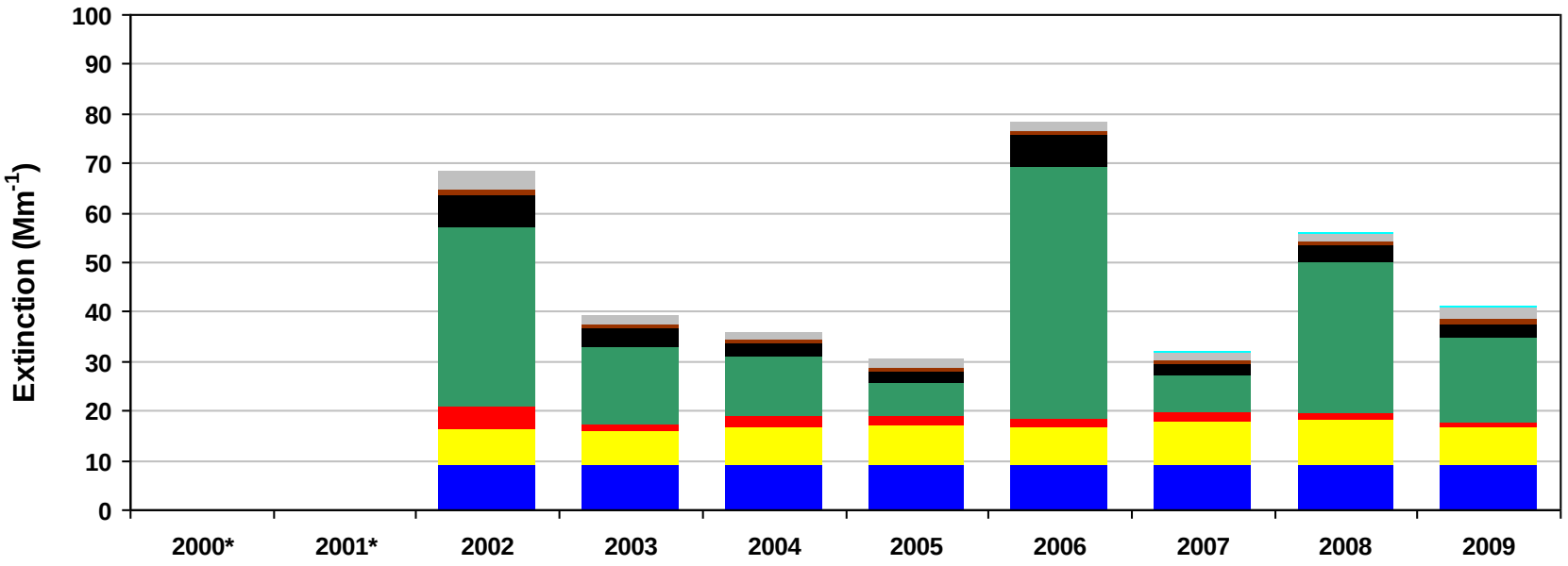
*Missing years did not meet RHR data completeness criteria.

Figure K.3-3

Crater Lake NP and Diamond Peak, Gearhart Mountain and Mountain Lakes Was, OR (CRLA1 Site)

20% Most Impaired Visibility Days



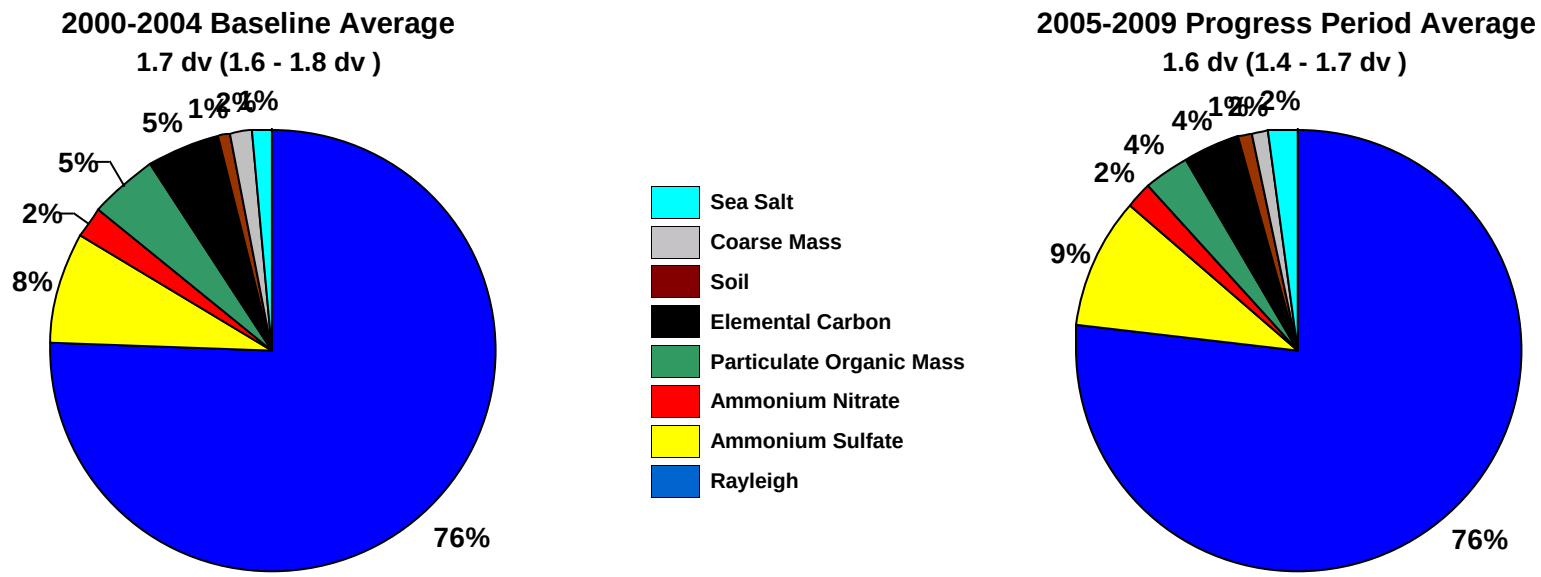


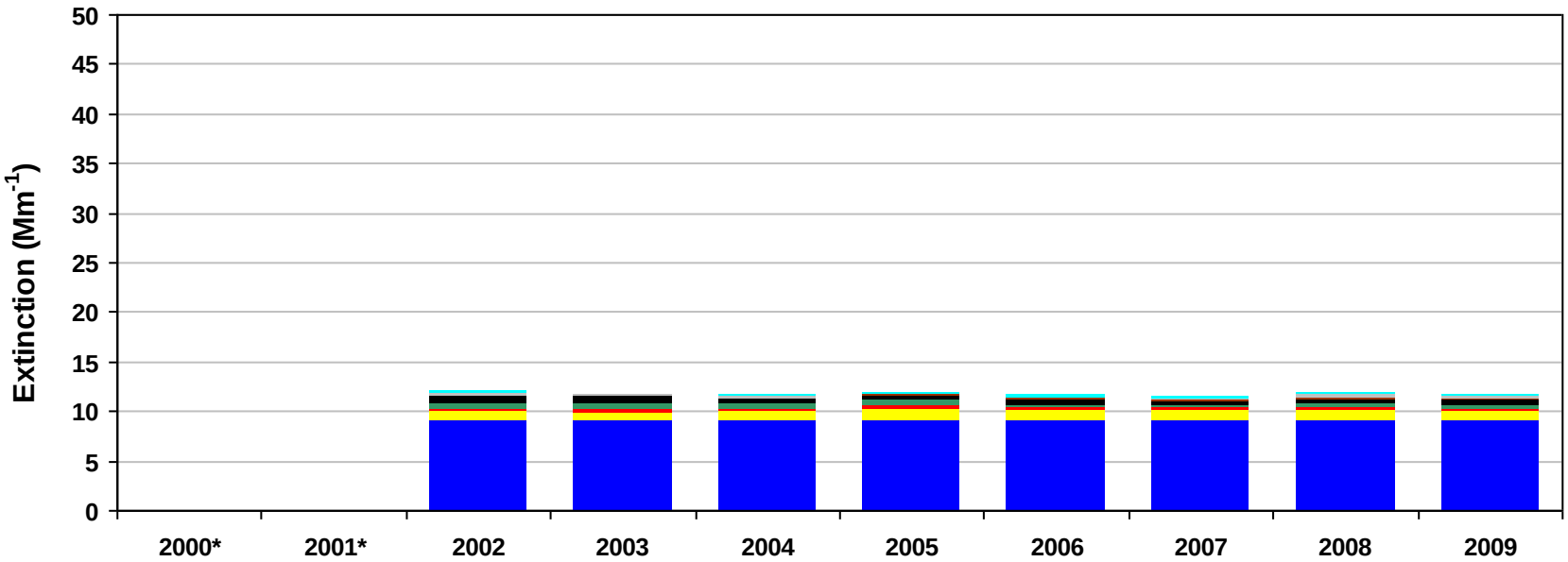
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure K.3-4

Crater Lake NP and Diamond Peak, Gearhart Mountain and Mountain Lakes Was, OR (CRLA1 Site)

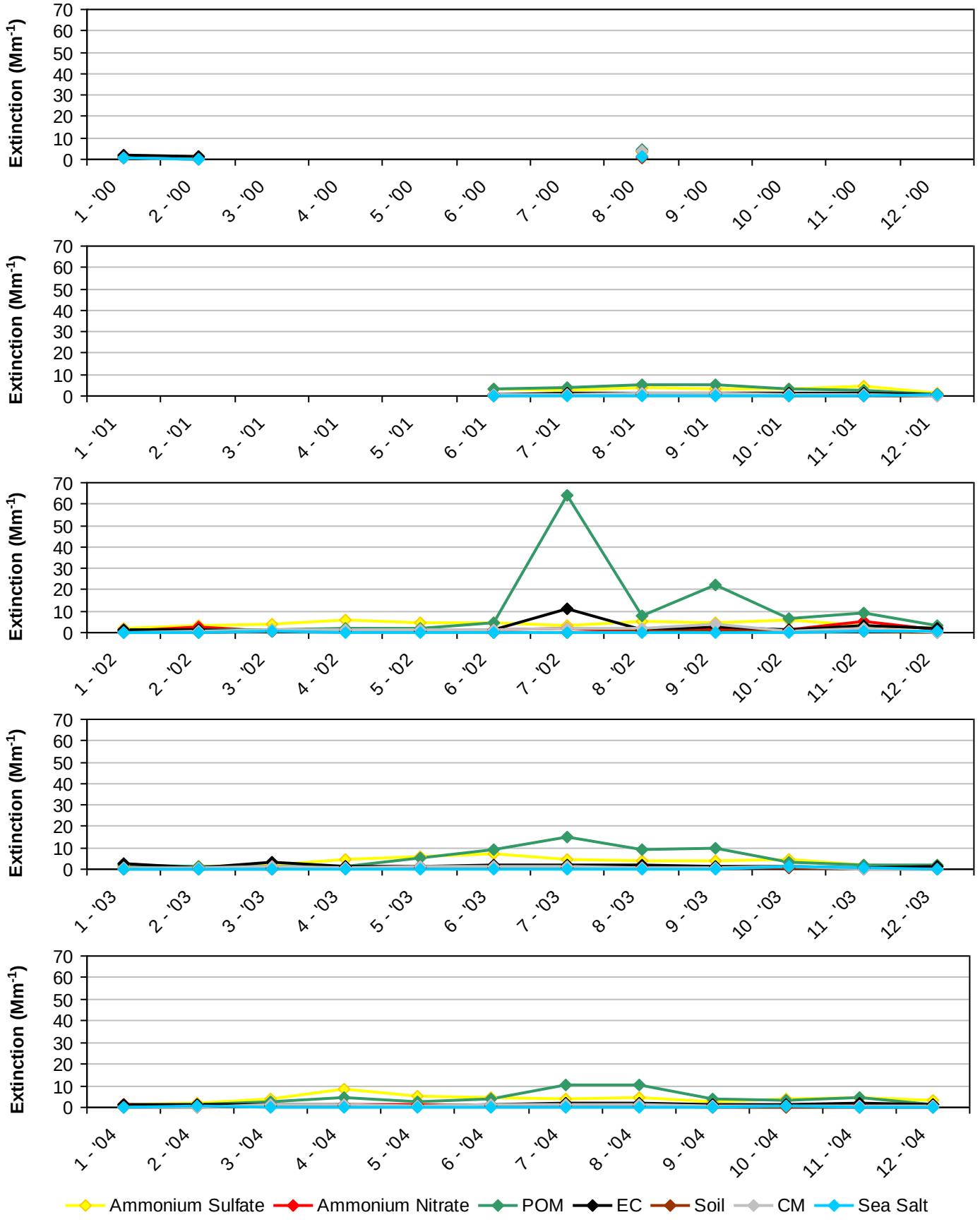
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure K.3-5
Crater Lake NP and Diamond Peak, Gearhart Mountain and Mountain Lakes Was, OR (CRLA1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure K.3-6
Crater Lake NP and Diamond Peak, Gearhart Mountain and Mountain Lakes Was, OR (CRLA1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

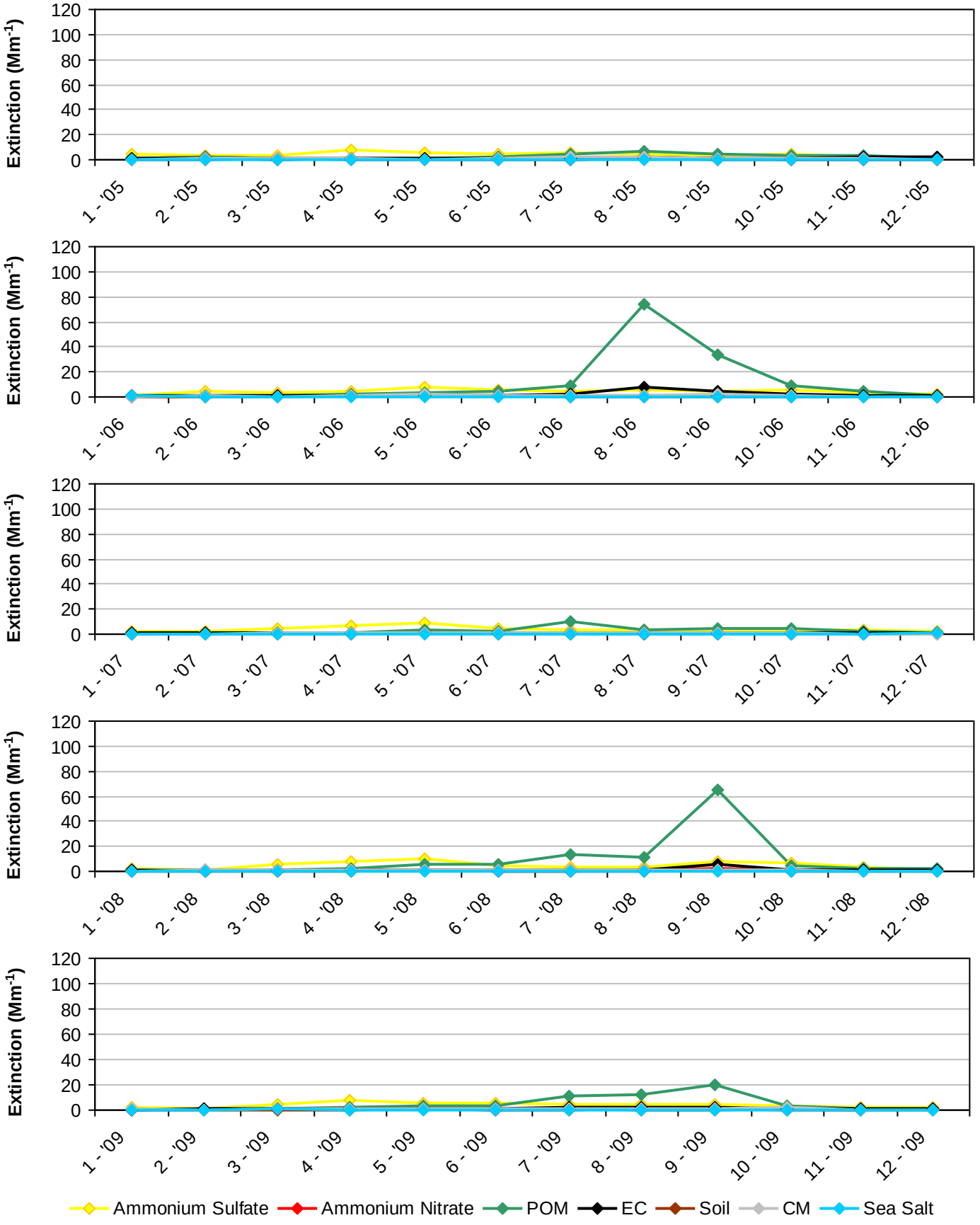
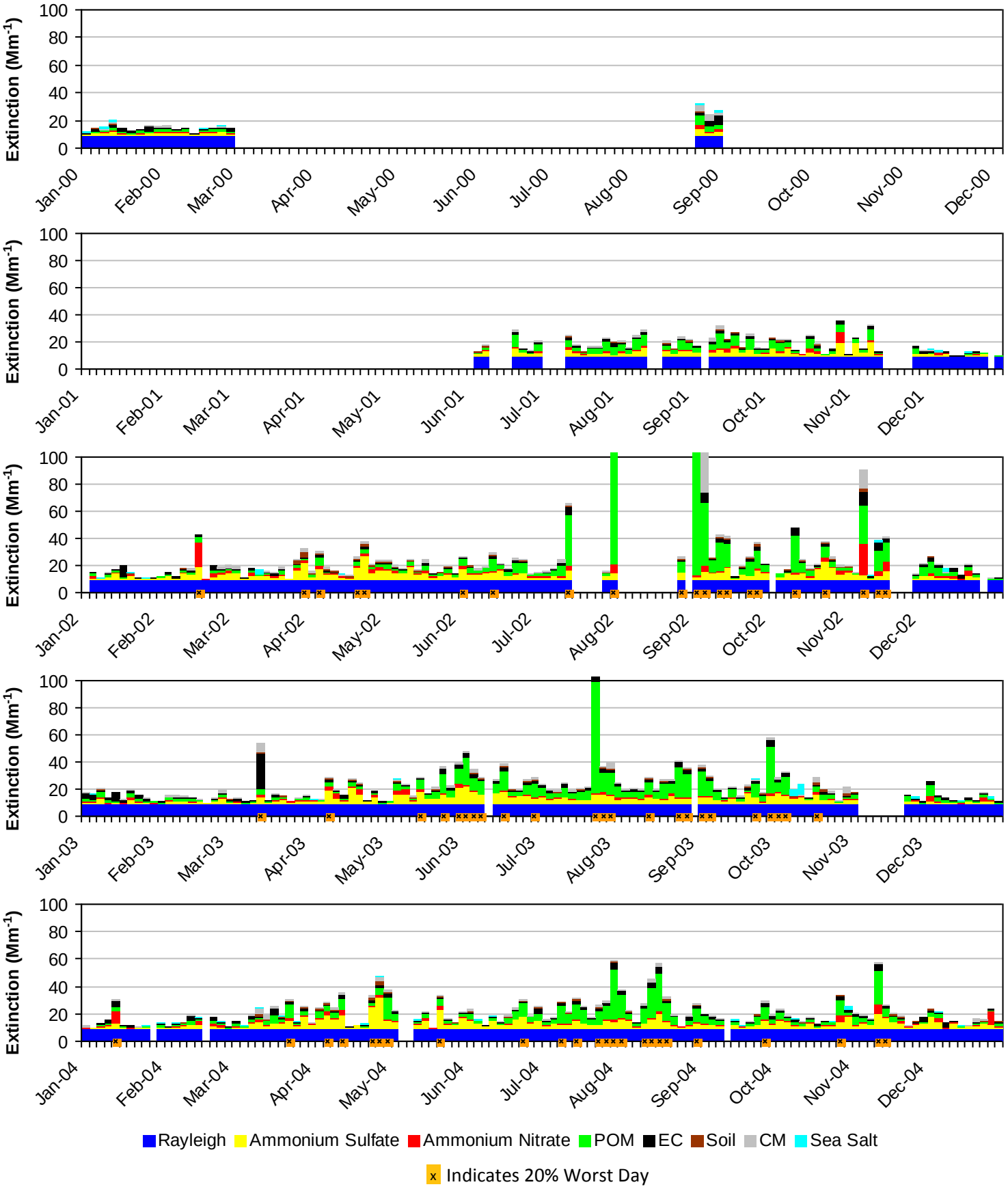
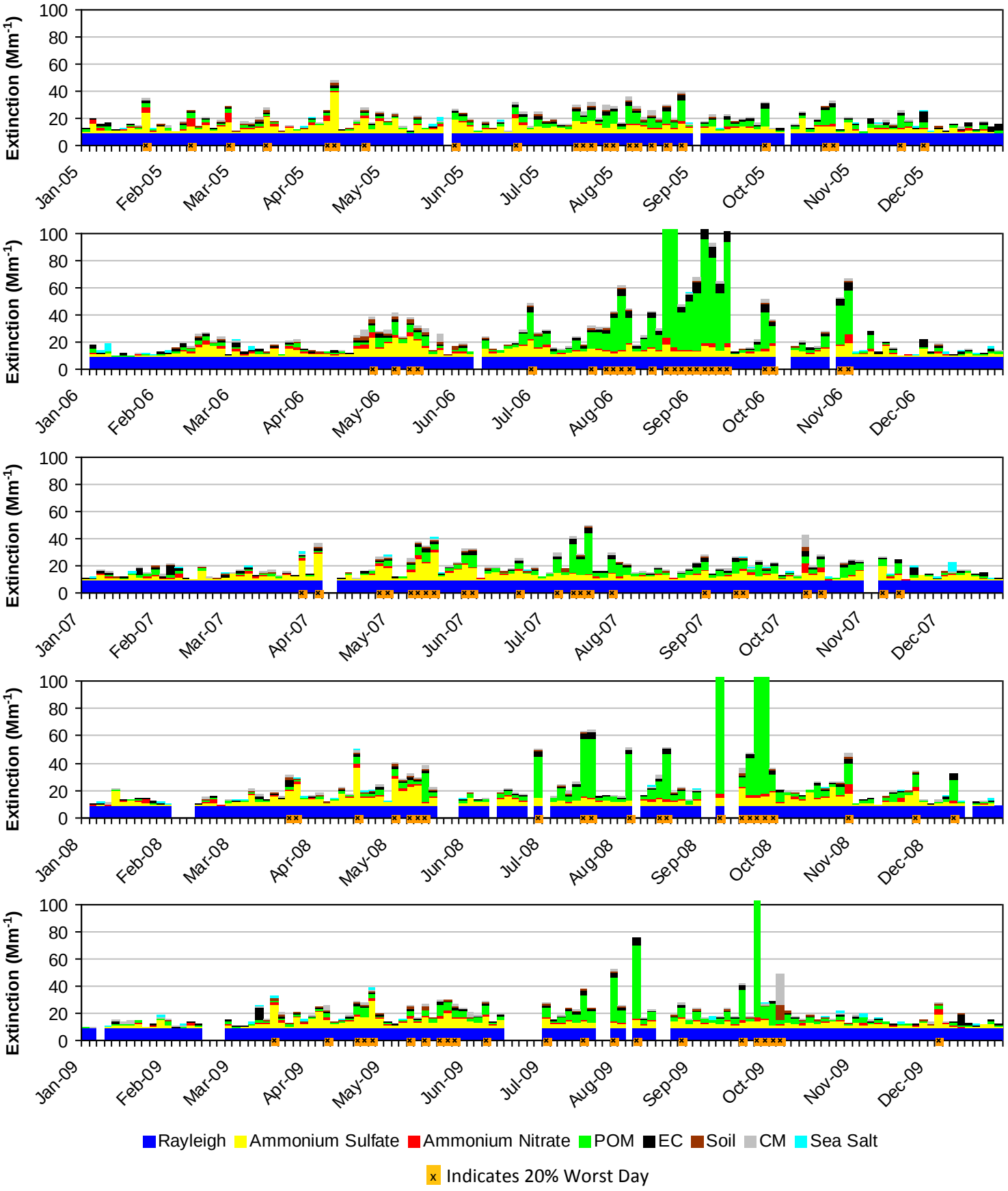


Figure K.3-7
Crater Lake NP and Diamond Peak, Gearhart Mountain and Mountain Lakes Was, OR (CRLA1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure K.3-8
Crater Lake NP and Diamond Peak, Gearhart Mountain and Mountain Lakes Was, OR (CRLA1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



K.4. HELLS CANYON WA (HECA1)

The following tables and figures are presented in this section for the Hells Canyon WA represented by the HECA1 IMPROVE Monitor:

- **Table K.4-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure K.4-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure K.4-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure K.4-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure K.4-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure K.4-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure K.4-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure K.4-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

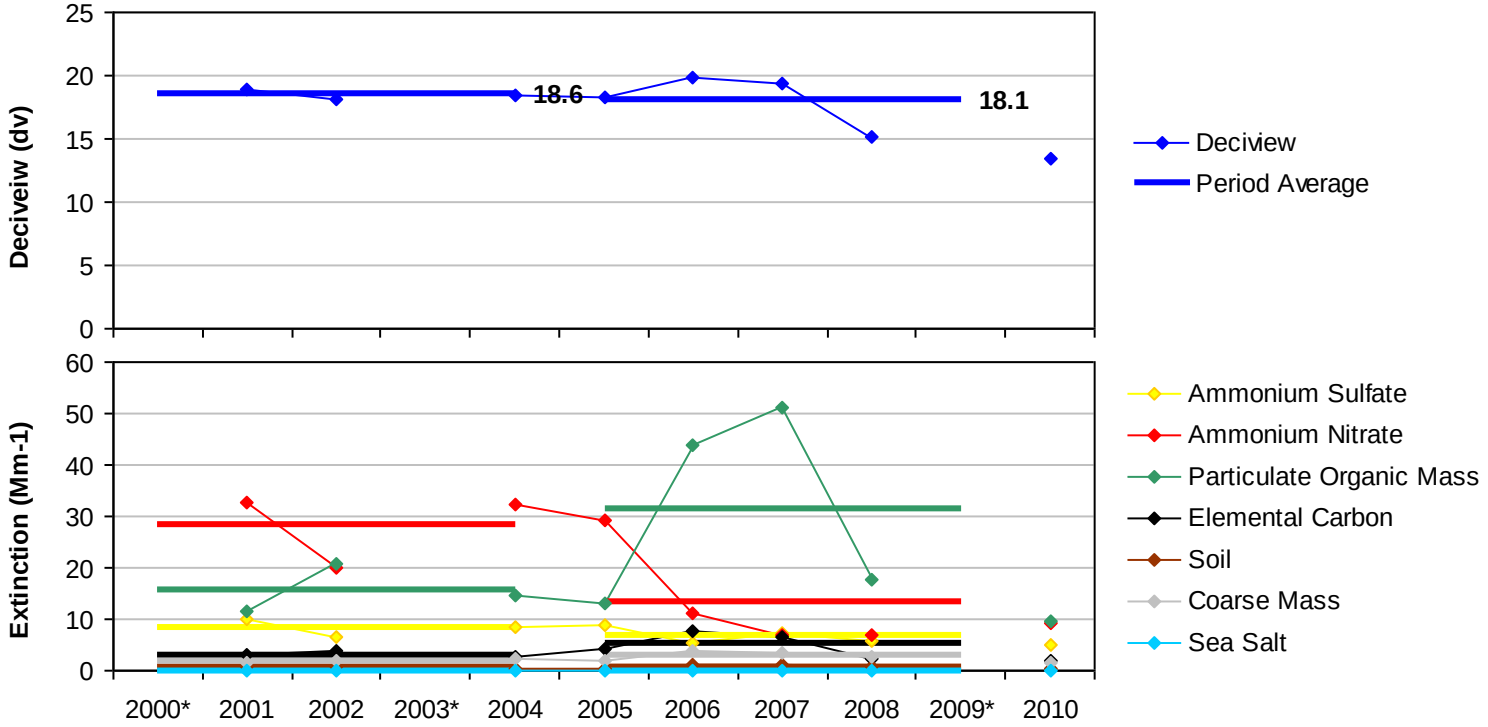
- **Figure K.4-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table K.4-1
Hells Canyon WA, OR (HECA1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	5.5	5.8	---	5.2	4.7	4.7	5.2	4.6	---	4.0	-0.1	0.1	5.5	4.8	-0.7	-13%
Worst 20% Days	---	19.0	18.2	---	18.5	18.3	19.8	19.4	15.1	---	13.5	-0.1	0.5	18.6	18.1	-0.5	-3%
All Days	---	10.9	11.0	---	10.7	10.0	10.8	10.8	9.4	---	8.5	-0.1	0.1	10.9	10.3	-0.6	-6%
Total Extinction (Mm-1)																	
Best 20% Days	---	17.4	18.0	---	16.9	16.1	16.1	17.0	15.9	---	15.0	-0.2	0.0	17.4	16.3	-1.1	-6%
Worst 20% Days	---	70.2	64.8	---	72.5	68.7	84.1	87.5	47.2	---	39.1	1.3	0.4	69.1	71.9	2.8	4%
All Days	---	34.3	33.9	---	34.6	32.0	36.7	37.4	27.7	---	24.8	0.1	0.5	34.2	33.4	-0.8	-2%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	2.2	1.9	---	1.7	2.0	1.7	2.2	1.8	---	1.3	0.0	0.4	1.9	1.9	0.0	0%
Worst 20% Days	---	9.9	6.6	---	8.6	8.8	5.4	7.3	5.7	---	5.2	-0.4	0.1	8.4	6.8	-1.6	-19%
All Days	---	4.9	3.8	---	4.5	4.5	3.8	4.4	3.9	---	3.5	-0.1	0.3	4.4	4.2	-0.2	-5%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	1.0	0.8	---	0.5	0.5	0.7	0.6	0.7	---	0.3	0.0	0.2	0.8	0.6	-0.2	-25%
Worst 20% Days	---	32.9	20.0	---	32.5	29.1	11.2	6.8	6.9	---	9.3	-3.7	0.0	28.5	13.5	-15.0	-53%
All Days	---	8.3	5.7	---	8.2	6.7	3.5	3.0	2.7	---	2.8	-0.8	0.0	7.4	4.0	-3.4	-46%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	1.6	2.3	---	2.1	1.4	1.5	1.7	1.4	---	1.1	-0.1	0.1	2.0	1.5	-0.5	-25%
Worst 20% Days	---	11.4	20.7	---	14.7	13.1	43.9	51.0	17.8	---	9.7	1.6	0.1	15.6	31.4	15.8	>100%
All Days	---	6.0	8.9	---	7.1	5.8	13.0	14.1	6.7	---	4.5	0.4	0.3	7.4	9.9	2.5	34%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.6	0.7	---	0.5	0.5	0.4	0.5	0.3	---	0.3	0.0	0.1	0.6	0.4	-0.2	-33%
Worst 20% Days	---	2.9	3.7	---	2.5	4.3	7.6	6.6	2.5	---	1.9	0.3	0.4	3.1	5.3	2.2	71%
All Days	---	1.5	1.8	---	1.4	1.9	2.5	2.3	1.2	---	1.0	0.1	0.4	1.6	2.0	0.4	25%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.3	---	0.2	0.1	0.2	0.2	0.2	---	0.2	0.0	0.1	0.3	0.2	-0.1	-33%
Worst 20% Days	---	0.7	0.7	---	0.6	0.4	1.1	1.2	0.7	---	0.5	0.1	0.3	0.7	0.8	0.1	14%
All Days	---	0.7	0.7	---	0.5	0.4	0.7	0.5	0.5	---	0.4	0.0	0.4	0.6	0.5	-0.1	-17%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.7	0.9	---	0.8	0.5	0.4	0.6	0.5	---	0.7	-0.1	0.1	0.8	0.5	-0.3	-38%
Worst 20% Days	---	1.4	2.0	---	2.5	1.8	3.8	3.6	2.6	---	1.5	0.3	0.1	1.9	2.9	1.0	53%
All Days	---	1.8	2.0	---	1.8	1.6	2.0	1.9	1.7	---	1.6	0.0	0.3	1.9	1.8	-0.1	-5%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.0	---	0.1	0.1	0.2	0.1	0.1	---	0.0	0.0	0.3	0.1	0.1	0.0	0%
Worst 20% Days	---	0.0	0.0	---	0.1	0.2	0.2	0.1	0.0	---	0.0	0.0	0.2	0.0	0.1	0.1	0%
All Days	---	0.0	0.1	---	0.1	0.1	0.1	0.1	0.1	---	0.0	0.0	0.5	0.1	0.1	0.0	0%

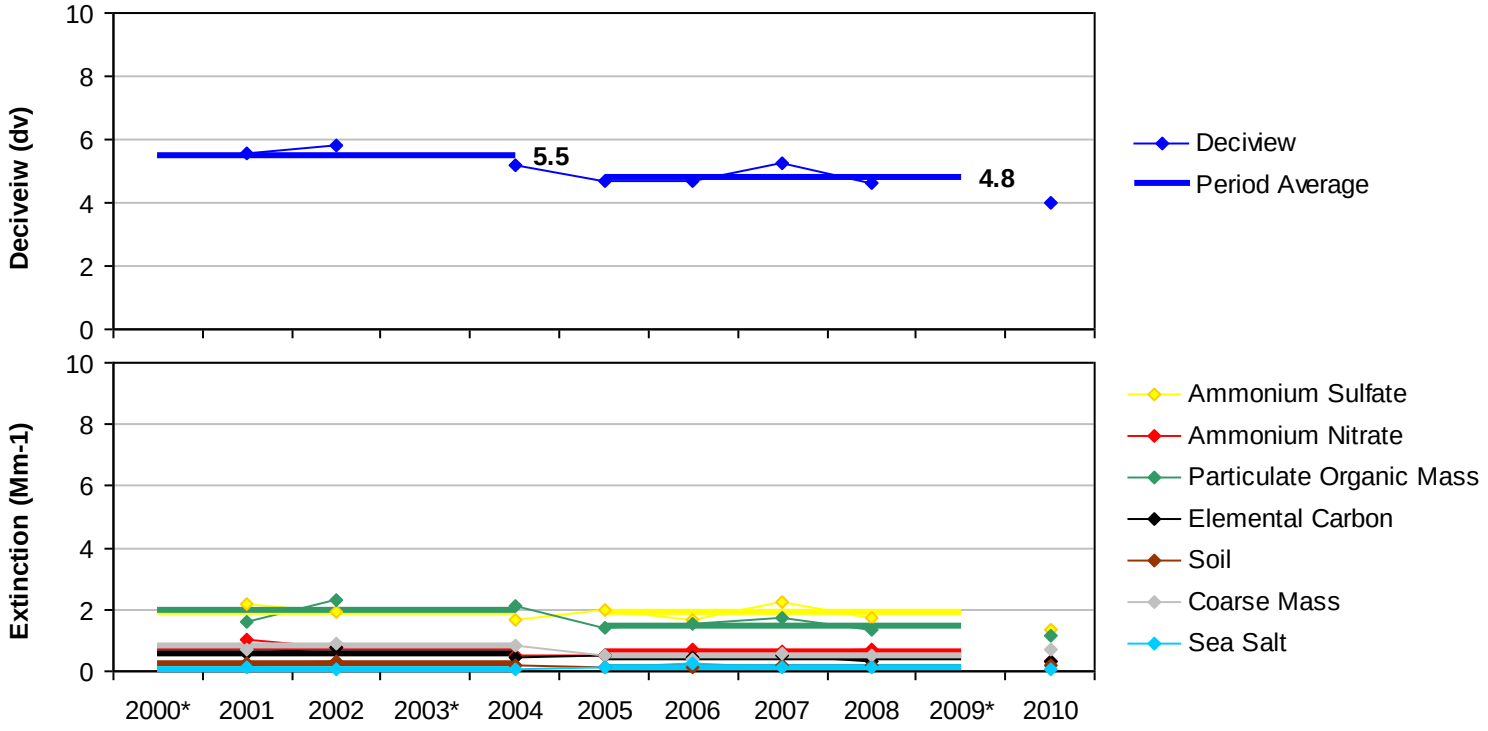
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure K.4-1
Hells Canyon WA, OR (HECA1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



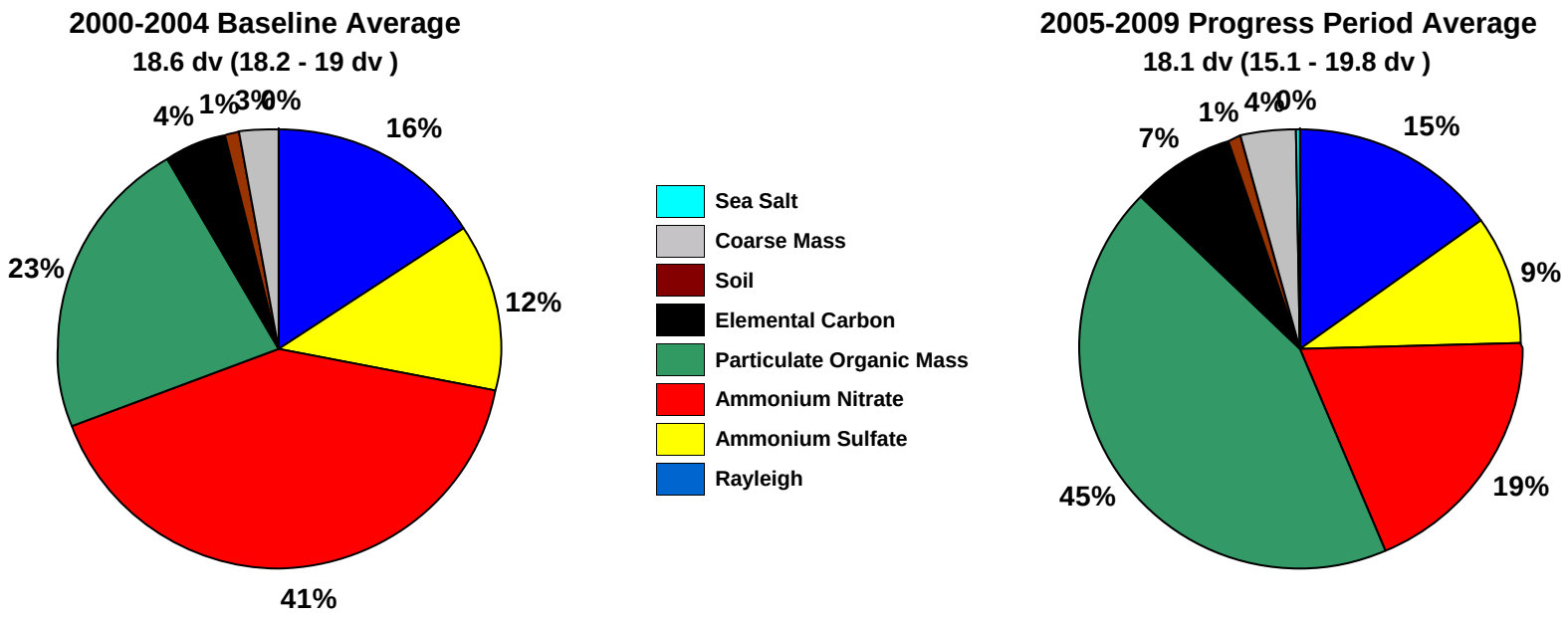
*Missing years did not meet RHR data completeness criteria.

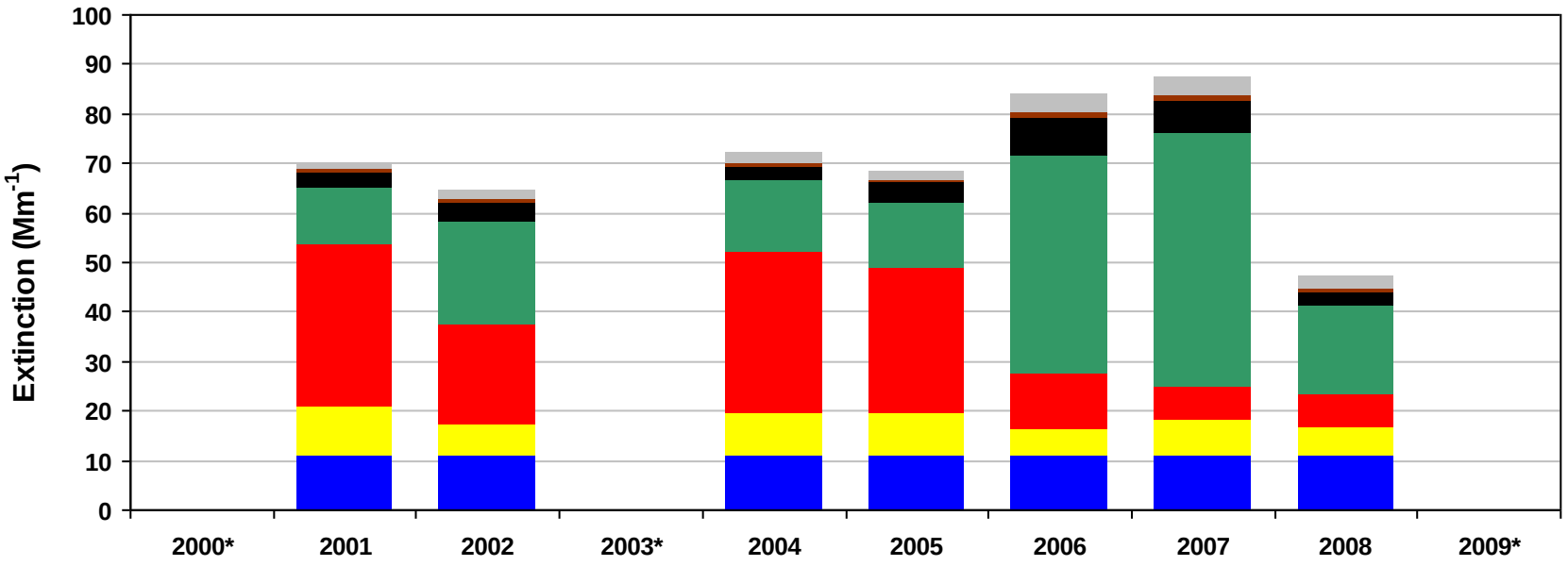
Figure K.4-2
Hells Canyon WA, OR (HECA1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

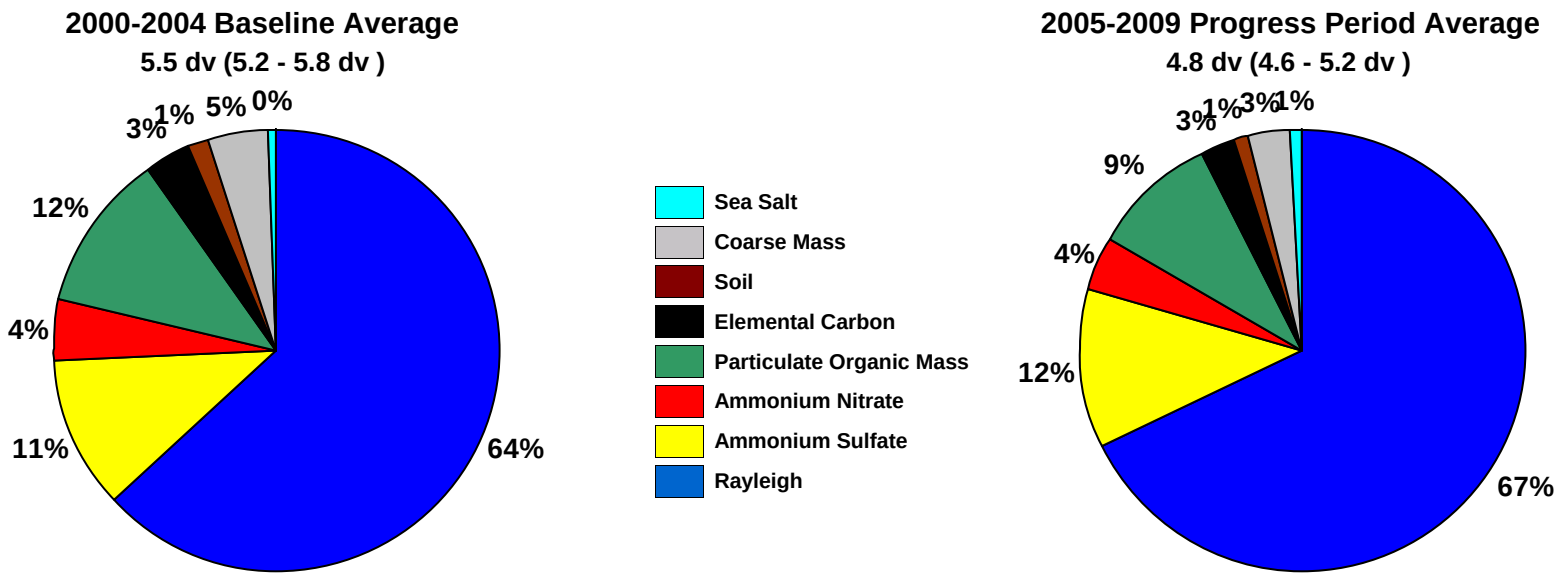
Figure K.4-3
Hells Canyon WA, OR (HECA1 Site)
20% Most Impaired Visibility Days

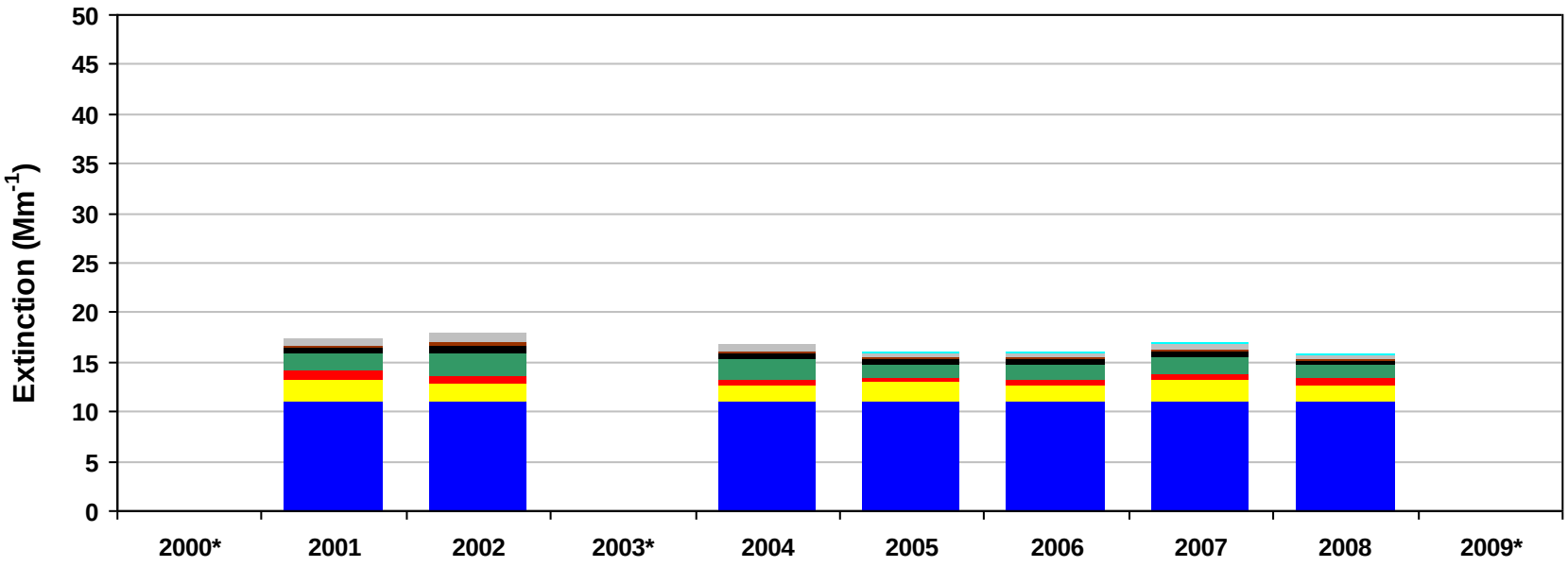




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

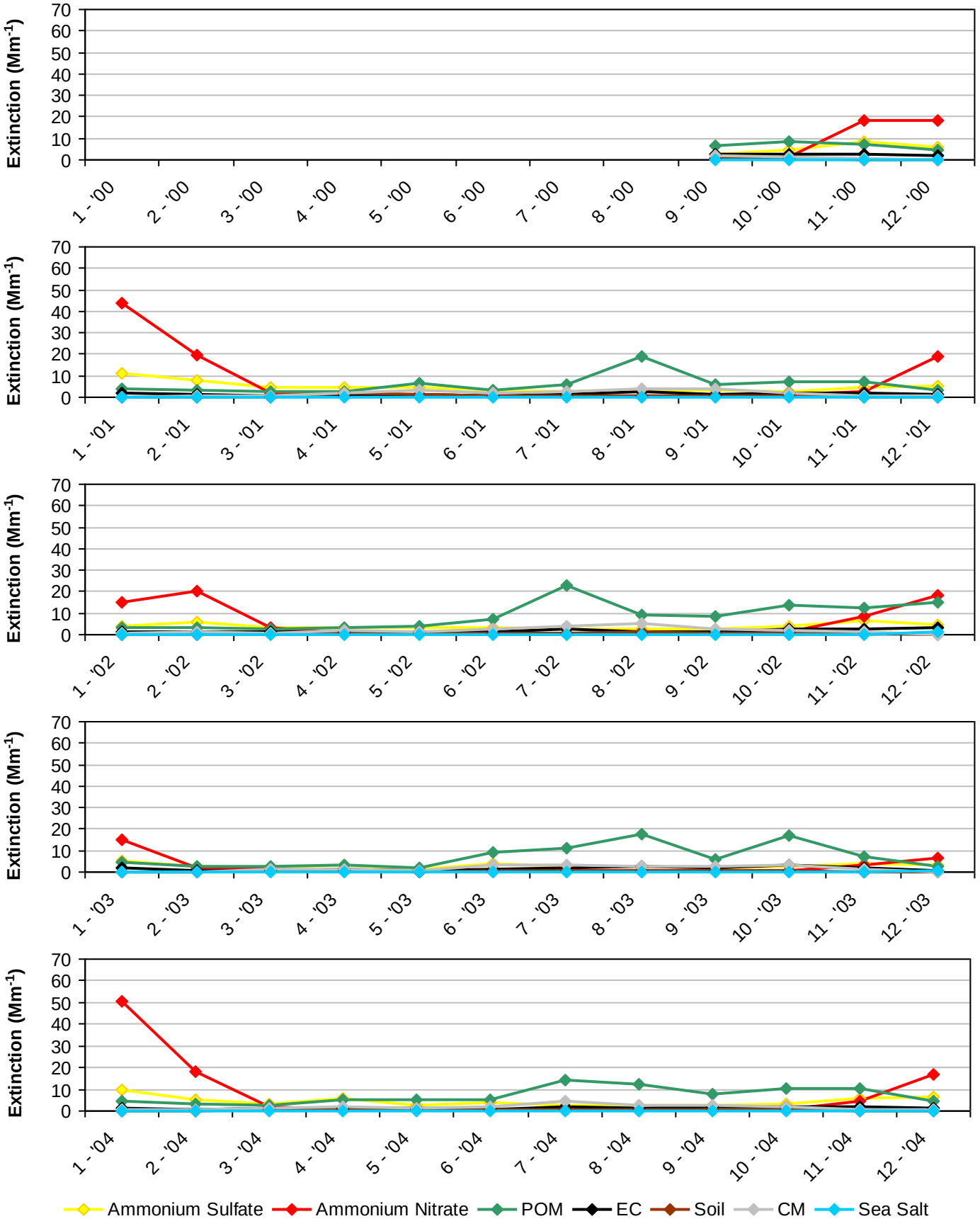
Figure K.4-4
Hells Canyon WA, OR (HECA1 Site)
20% Least Impaired Visibility Days





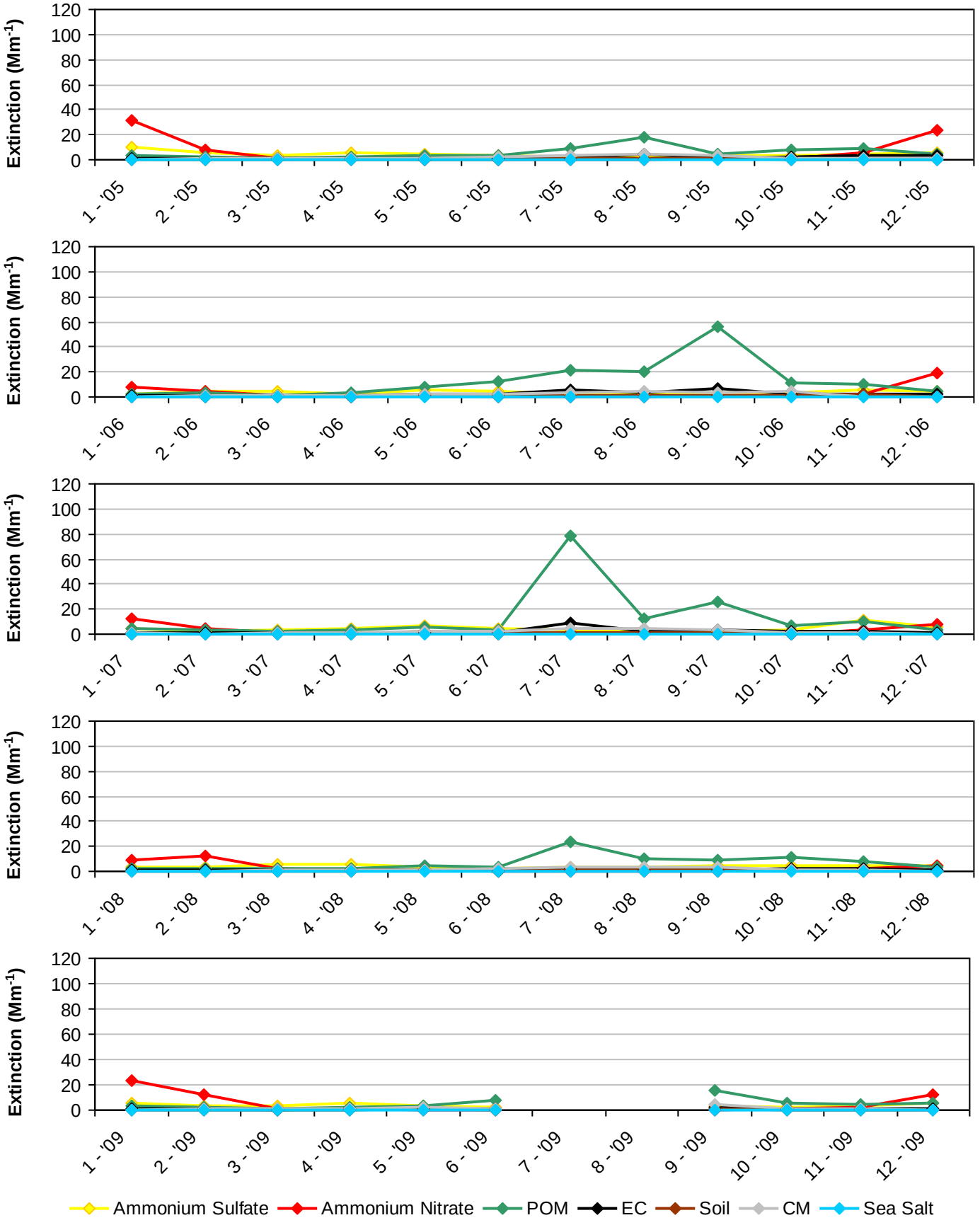
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure K.4-5
Hells Canyon WA, OR (HECA1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



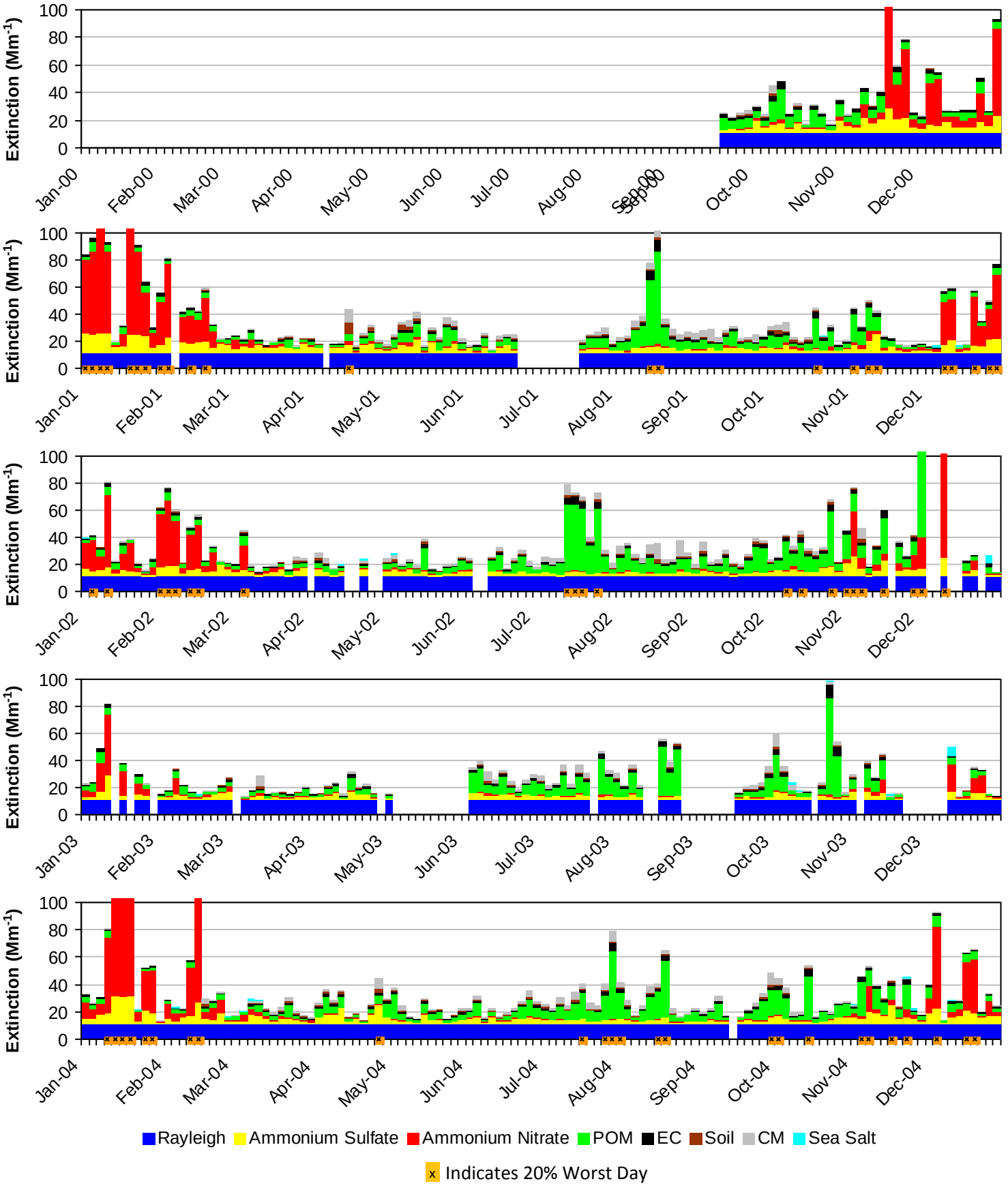
*Note that monthly averages for the years 2000 and 2003 are shown here, but these years did not meet RHR data completeness criteria.

Figure K.4-6
Hells Canyon WA, OR (HECA1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days



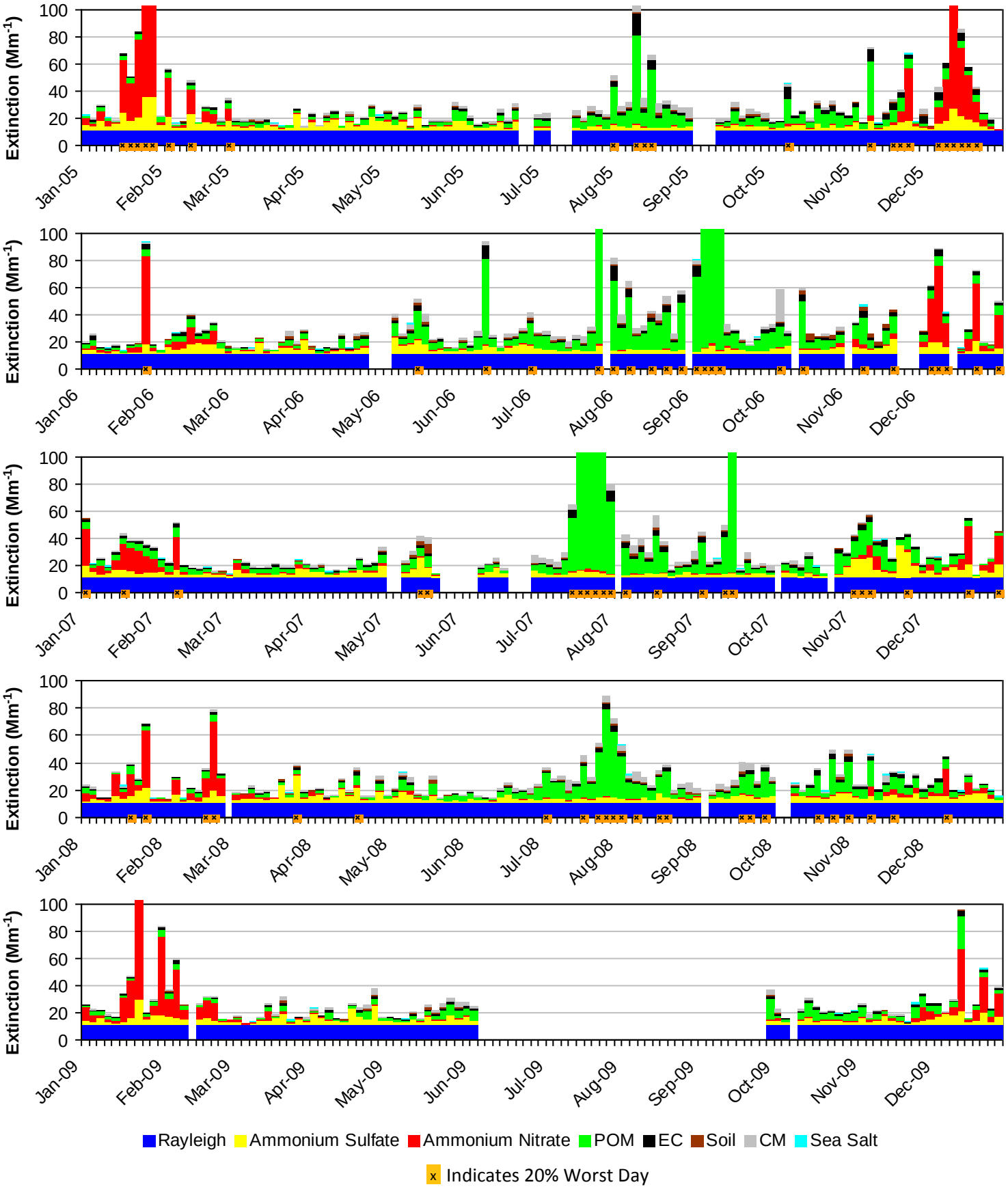
*Note that monthly averages for the year 2009 are shown here, but this year did not meet RHR data completeness criteria.

Figure K.4-7
Hells Canyon WA, OR (HECA1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2000 and 2003 are shown here, but these years did not meet RHR data completeness criteria.

Figure K.4-8
Hells Canyon WA, OR (HECA1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2009 are shown here, but this year did not meet RHR data completeness criteria.

K.5. KALMIOPSIS WA (KALM1)

The following tables and figures are presented in this section for the Kalmiopsis WA represented by the KALM1 IMPROVE Monitor:

- **Table K.5-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure K.5-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure K.5-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure K.5-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure K.5-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure K.5-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure K.5-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure K.5-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

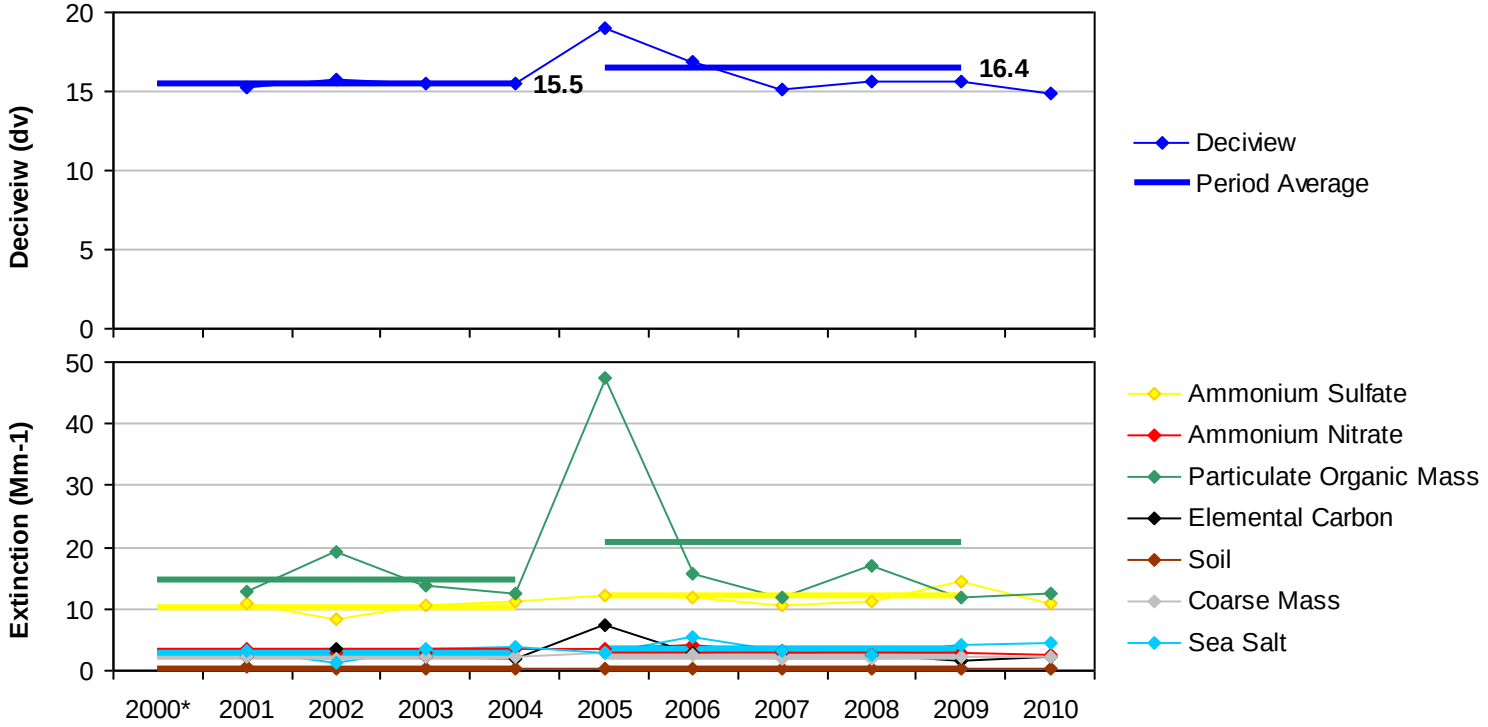
- **Figure K.5-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table K.5-1
Kalmiopsis WA, OR (KALM1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	6.3	5.8	6.2	6.7	6.9	5.8	6.3	6.7	6.1	5.8	0.0	0.4	6.3	6.4	0.1	2%
Worst 20% Days	---	15.3	15.8	15.5	15.5	19.0	16.9	15.1	15.6	15.7	14.8	0.0	0.4	15.5	16.4	0.9	6%
All Days	---	10.4	10.8	10.7	11.0	12.0	10.9	10.5	10.8	10.4	9.8	0.0	0.4	10.7	10.9	0.2	2%
Total Extinction (Mm-1)																	
Best 20% Days	---	18.9	17.9	18.7	19.8	20.1	18.0	18.8	19.8	18.4	17.8	0.0	0.5	18.8	19.0	0.2	1%
Worst 20% Days	---	47.5	49.8	47.7	47.4	88.5	54.9	46.0	50.2	49.7	46.9	0.1	0.5	48.1	57.9	9.8	20%
All Days	---	30.2	31.7	30.7	31.7	40.7	32.2	30.1	31.3	30.4	28.7	0.0	0.5	31.0	32.9	1.9	6%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	1.9	1.6	1.3	1.5	1.7	1.4	1.9	2.7	1.5	1.2	0.0	0.5	1.6	1.8	0.2	13%
Worst 20% Days	---	11.0	8.4	10.6	11.3	12.1	12.0	10.6	11.2	14.4	10.8	0.4	0.1	10.3	12.1	1.8	18%
All Days	---	6.5	5.5	5.8	6.2	6.8	6.6	6.1	6.4	6.7	5.3	0.1	0.1	6.0	6.5	0.5	8%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.5	0.4	0.4	0.3	0.4	0.3	0.4	0.4	0.3	0.3	0.0	0.2	0.4	0.4	0.0	0%
Worst 20% Days	---	3.4	2.9	2.9	3.5	3.5	4.1	2.8	2.7	2.7	2.7	0.0	0.2	3.2	3.2	0.0	0%
All Days	---	1.7	1.7	1.5	1.6	1.7	1.8	1.6	1.3	1.2	1.2	-0.1	0.1	1.6	1.5	-0.1	-6%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	2.4	2.2	3.0	3.5	3.5	2.2	2.3	2.6	2.5	2.5	0.0	0.4	2.7	2.6	-0.1	-4%
Worst 20% Days	---	12.7	19.4	13.8	12.4	47.4	15.7	12.0	17.0	11.8	12.5	-0.1	0.2	14.6	20.8	6.2	43%
All Days	---	5.4	7.9	6.9	6.8	13.8	6.2	5.3	6.9	5.6	5.5	-0.2	0.3	6.8	7.6	0.8	12%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.8	0.6	0.9	1.1	1.1	0.7	0.7	0.6	0.7	0.6	0.0	0.3	0.8	0.8	0.0	0%
Worst 20% Days	---	2.3	3.5	2.4	1.8	7.3	2.9	3.2	2.4	1.7	2.1	-0.1	0.4	2.5	3.5	1.0	40%
All Days	---	1.3	1.8	1.6	1.4	2.8	1.5	1.4	1.3	1.1	1.1	-0.1	0.1	1.5	1.6	0.1	7%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0%
Worst 20% Days	---	0.5	0.4	0.3	0.3	0.4	0.4	0.2	0.4	0.4	0.4	0.0	0.4	0.4	0.3	-0.1	-25%
All Days	---	0.3	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.0	0.4	0.2	0.2	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.7	0.5	0.5	0.5	0.6	0.5	0.6	0.5	0.5	0.4	0.0	0.1	0.6	0.6	0.0	0%
Worst 20% Days	---	2.3	1.9	2.2	2.2	3.0	2.5	2.0	2.0	2.3	2.1	0.0	0.4	2.1	2.4	0.3	14%
All Days	---	1.5	1.3	1.3	1.3	1.6	1.5	1.4	1.2	1.4	1.2	0.0	0.5	1.3	1.4	0.1	8%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.6	0.7	0.6	0.9	0.7	0.9	0.9	0.9	0.8	0.8	0.0	0.0	0.7	0.8	0.1	14%
Worst 20% Days	---	3.2	1.3	3.5	3.8	2.8	5.3	3.2	2.4	4.3	4.4	0.1	0.2	2.9	3.6	0.7	24%
All Days	---	1.4	1.3	1.5	2.2	1.8	2.5	2.2	2.0	2.1	2.2	0.1	0.1	1.6	2.1	0.5	31%

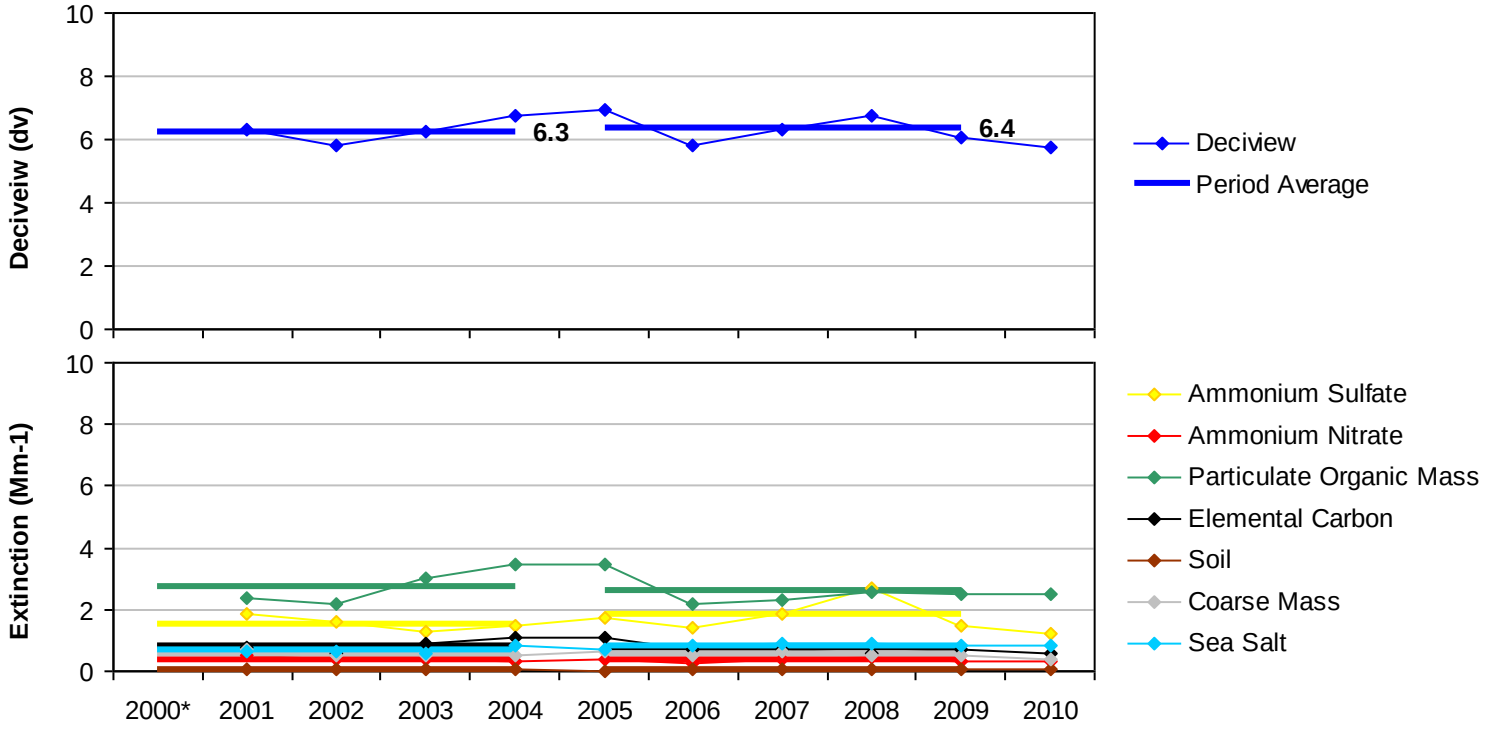
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure K.5-1
Kalmiopsis WA, OR (KALM1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



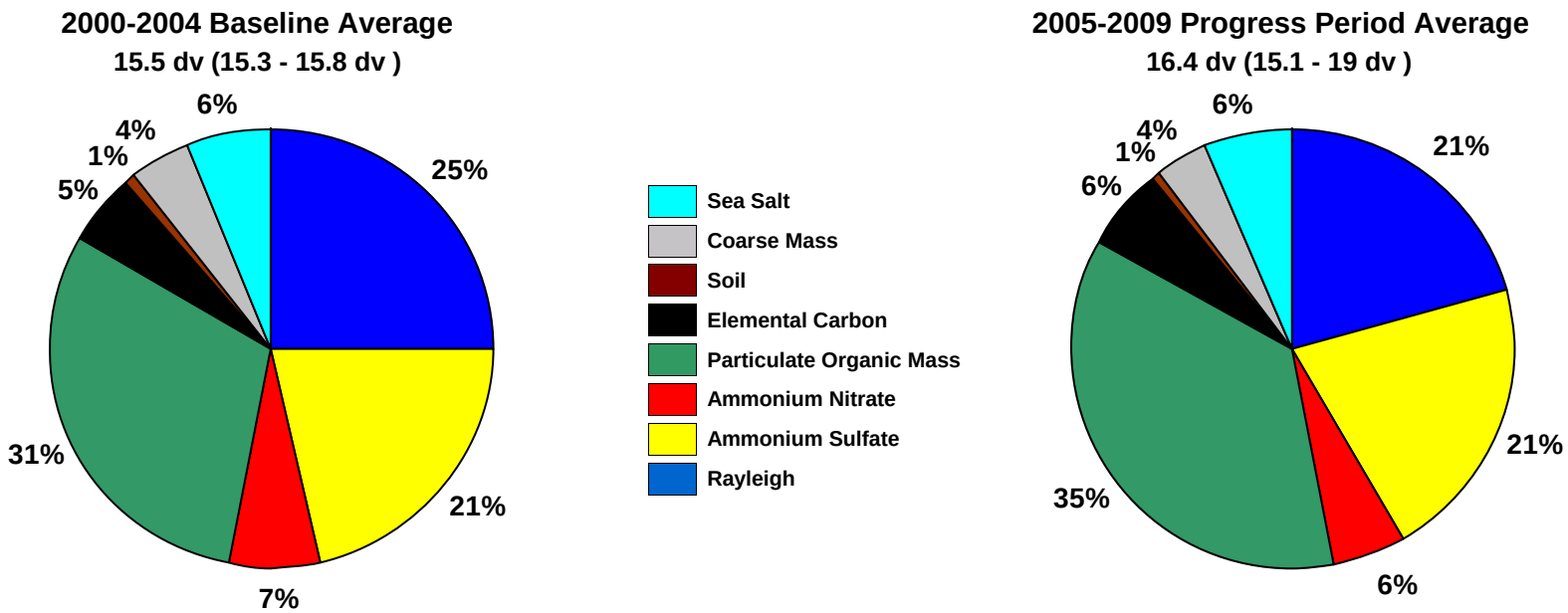
*Missing years did not meet RHR data completeness criteria.

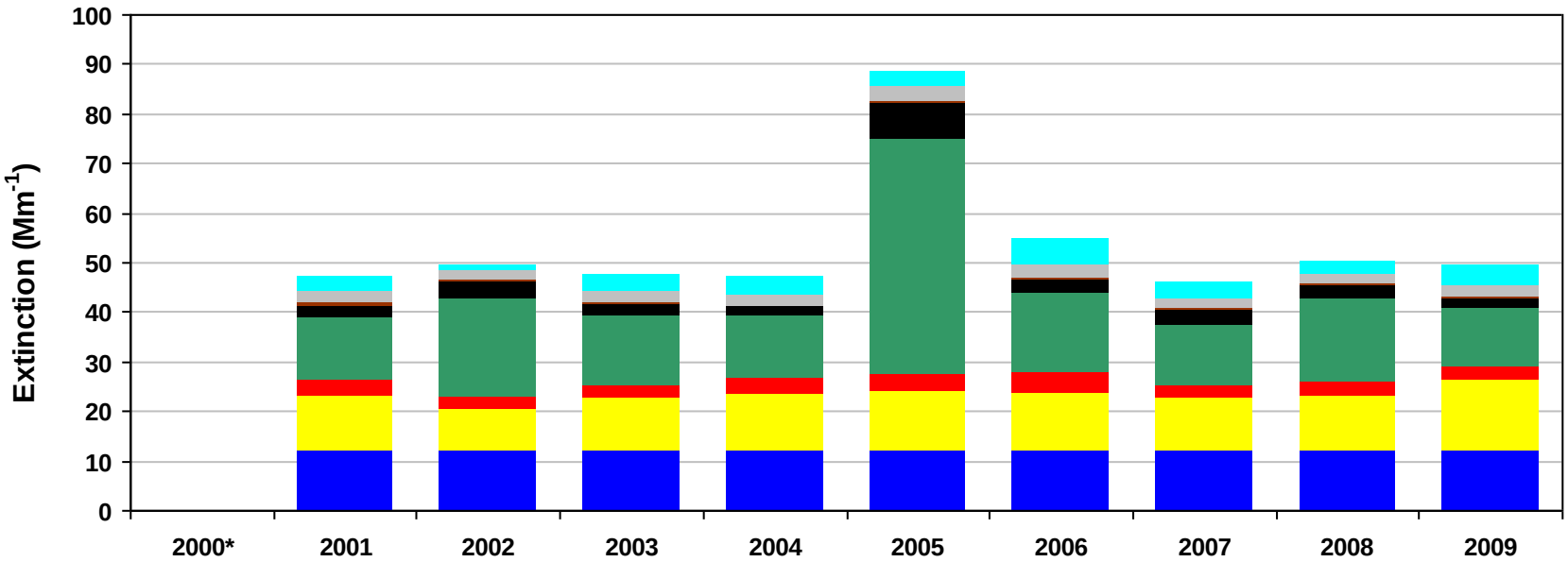
Figure K.5-2
Kalmiopsis WA, OR (KALM1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

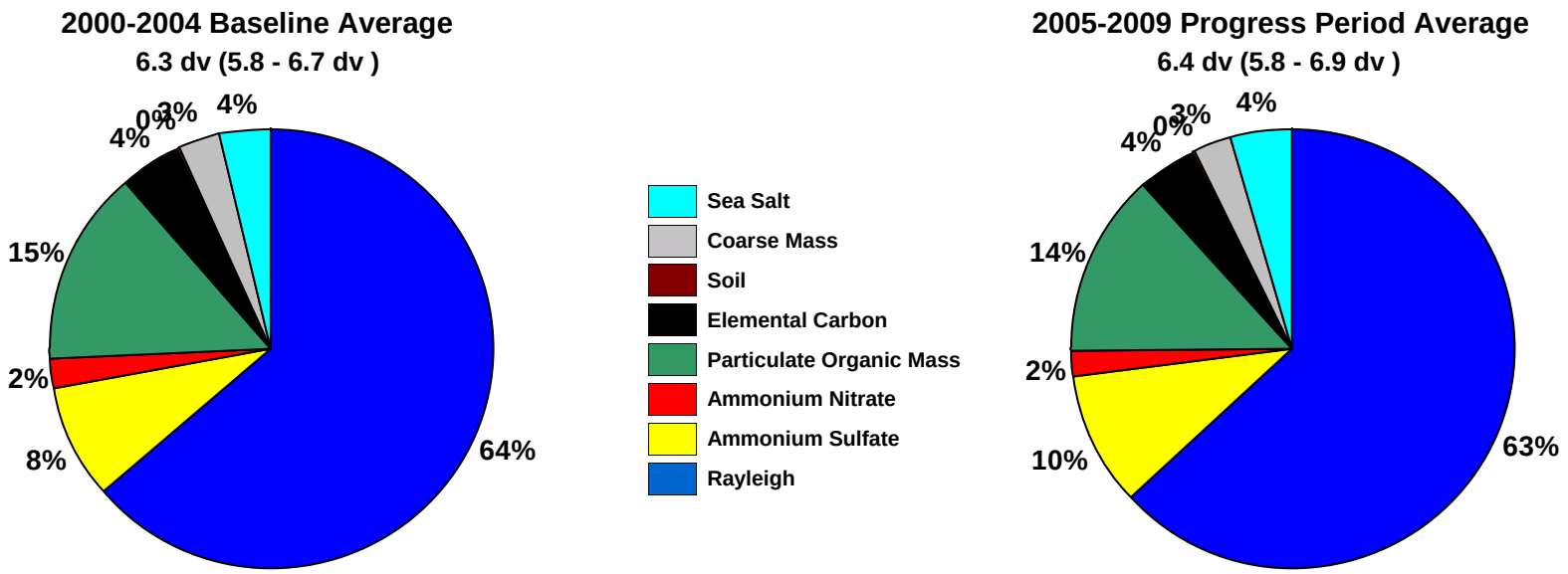
Figure K.5-3
Kalmiopsis WA, OR (KALM1 Site)
20% Most Impaired Visibility Days

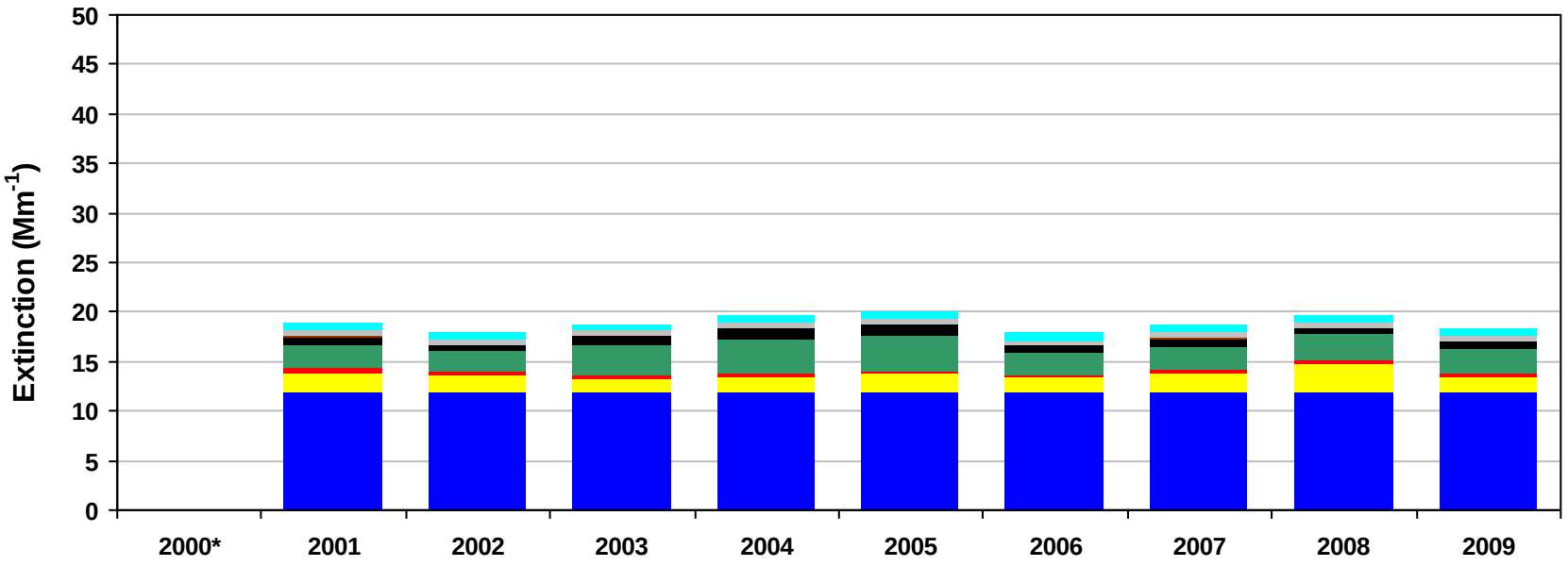




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

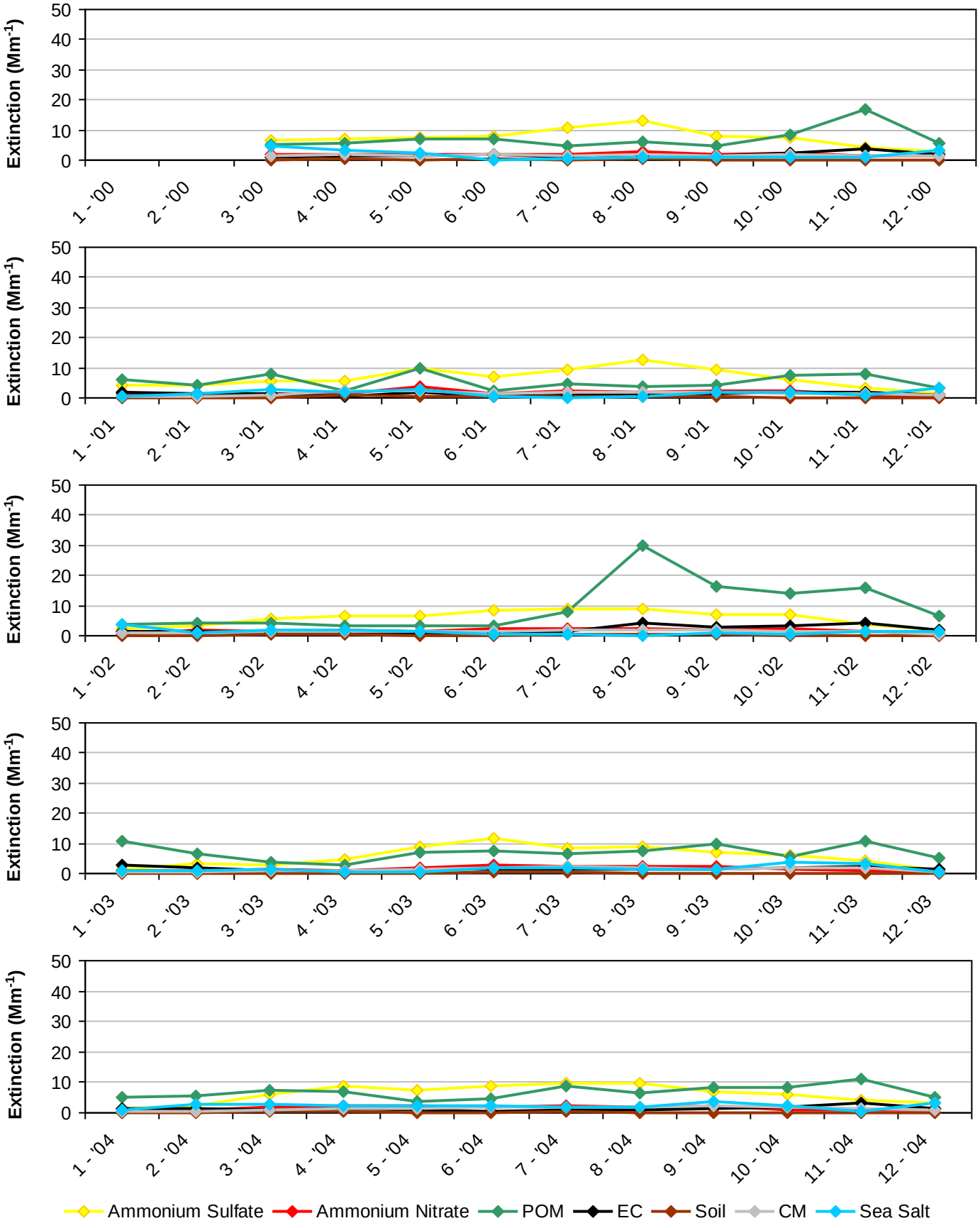
Figure K.5-4
Kalmiopsis WA, OR (KALM1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure K.5-5
Kalmiopsis WA, OR (KALM1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure K.5-6
Kalmiopsis WA, OR (KALM1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

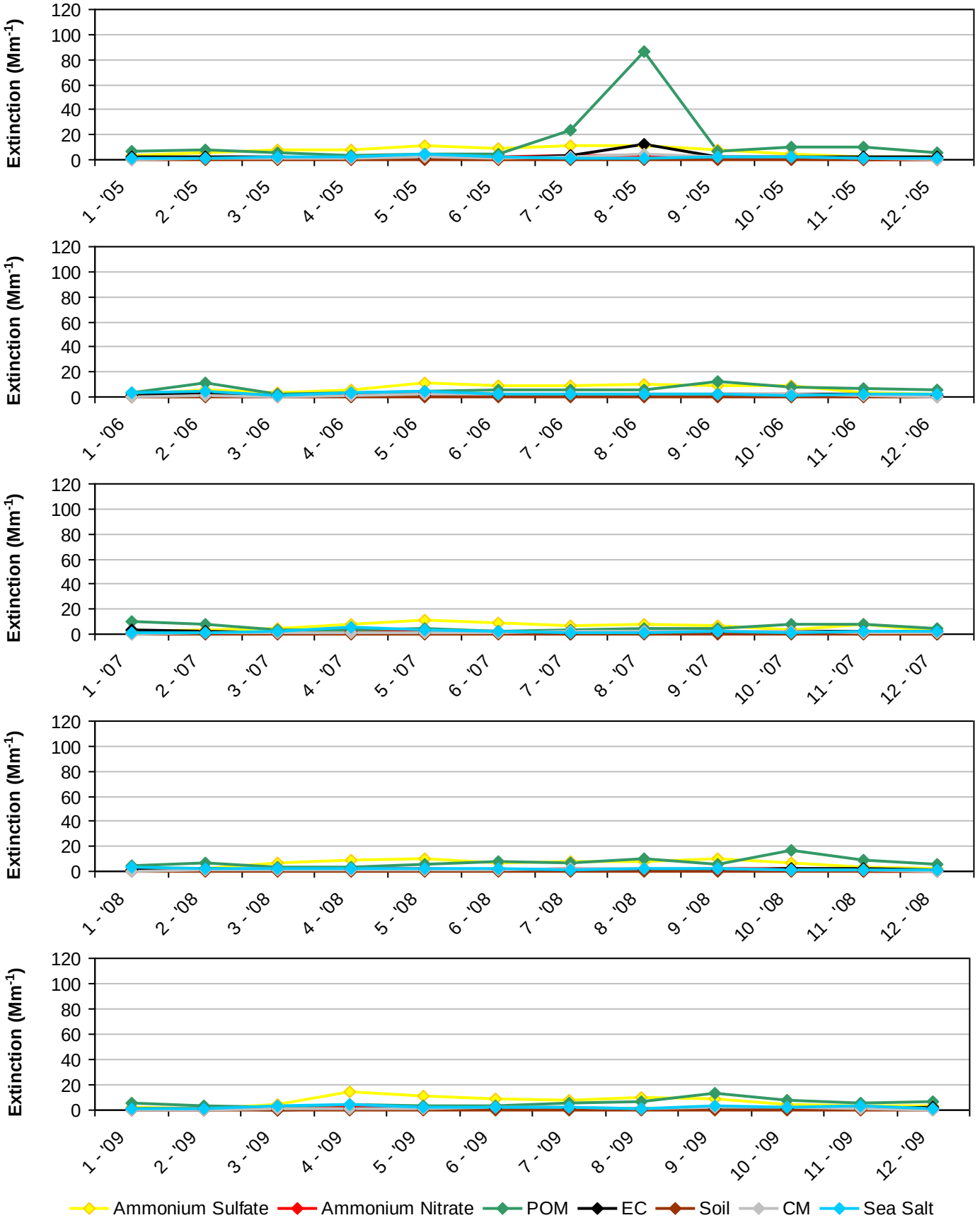
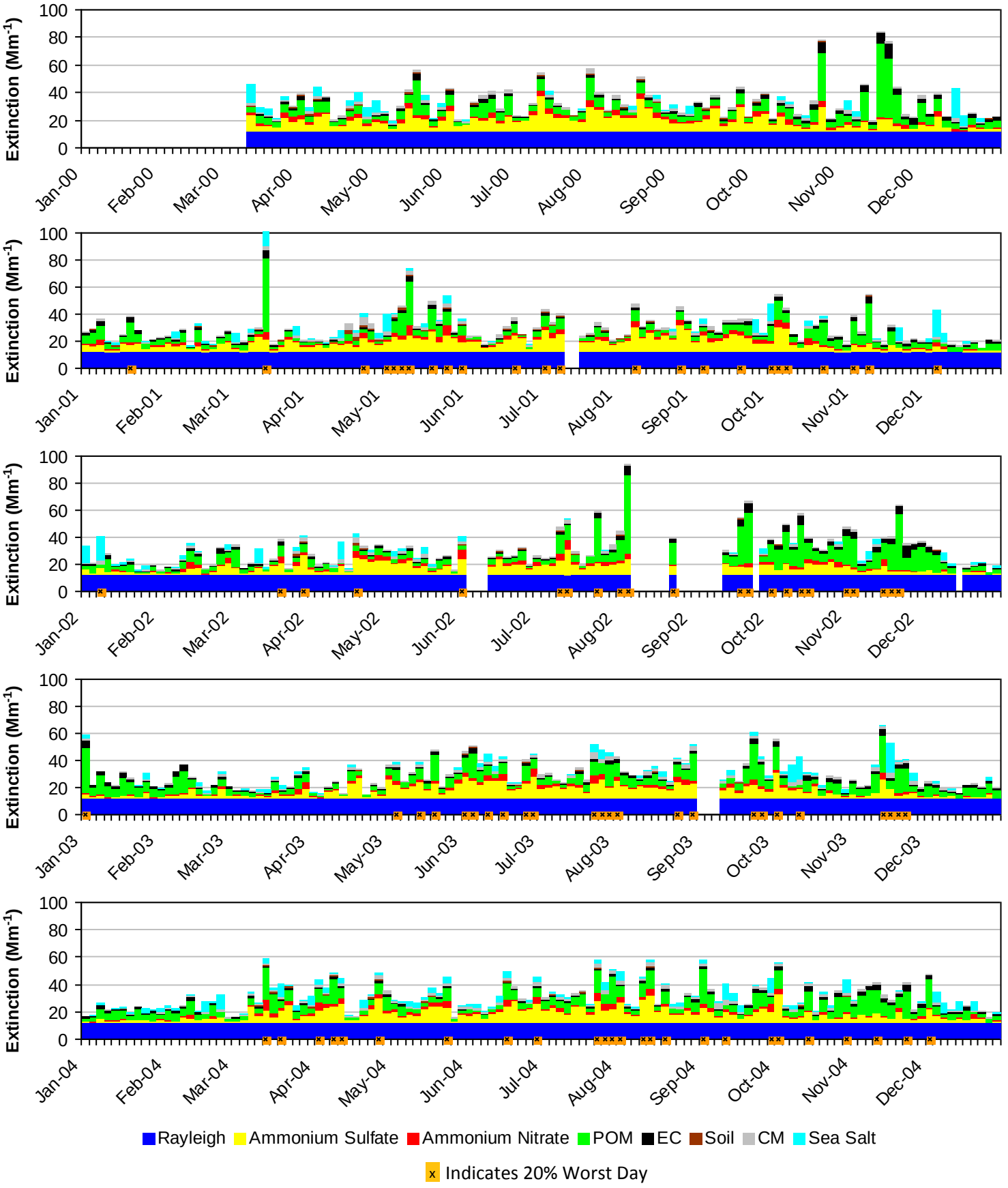
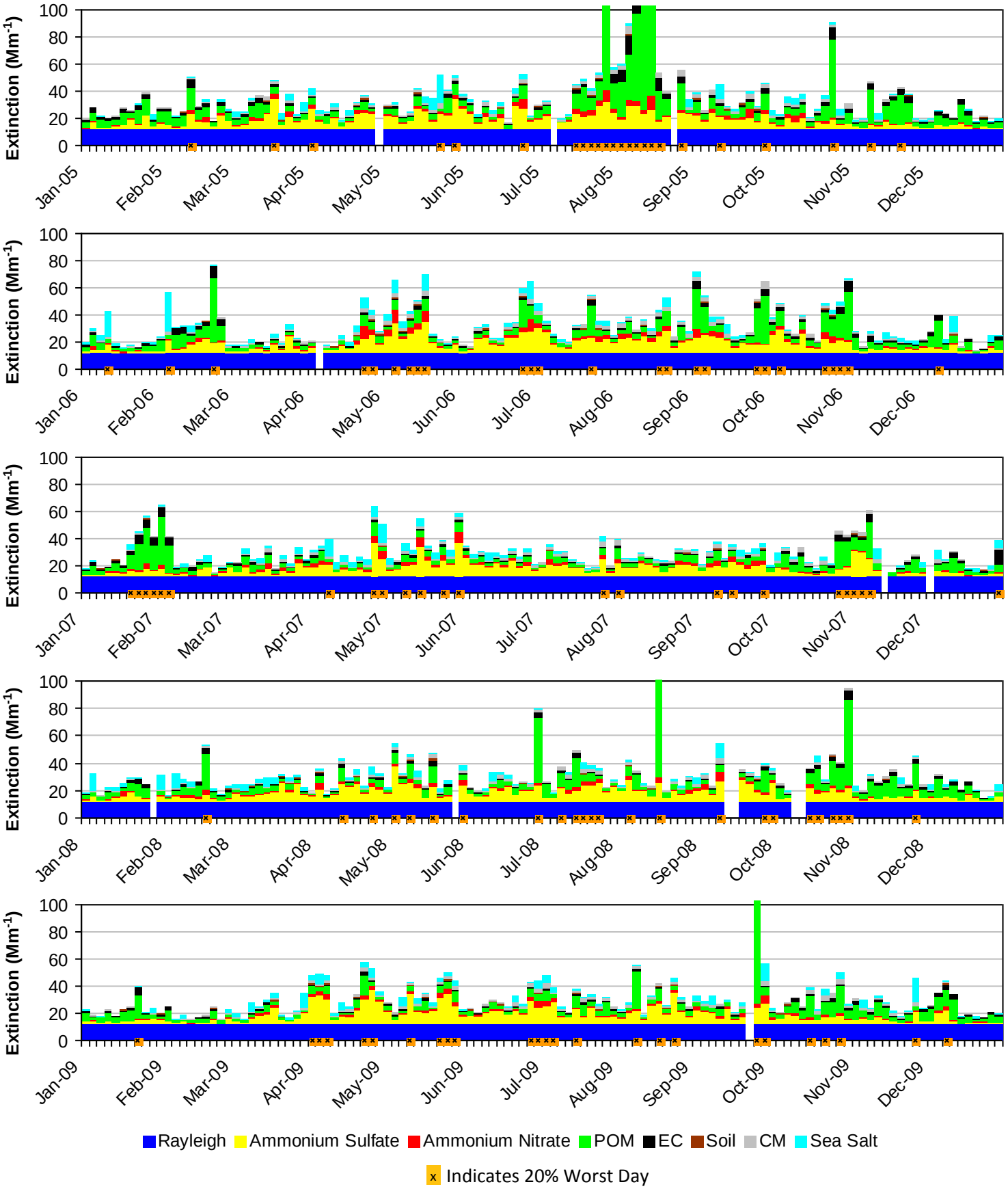


Figure K.5-7
Kalmiopsis WA, OR (KALM1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure K.5-8
Kalmiopsis WA, OR (KALM1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



K.6. MOUNT HOOD WA (MOHO1)

The following tables and figures are presented in this section for the Mount Hood WA represented by the MOHO1 IMPROVE Monitor:

- **Table K.6-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure K.6-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure K.6-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure K.6-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure K.6-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure K.6-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure K.6-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure K.6-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

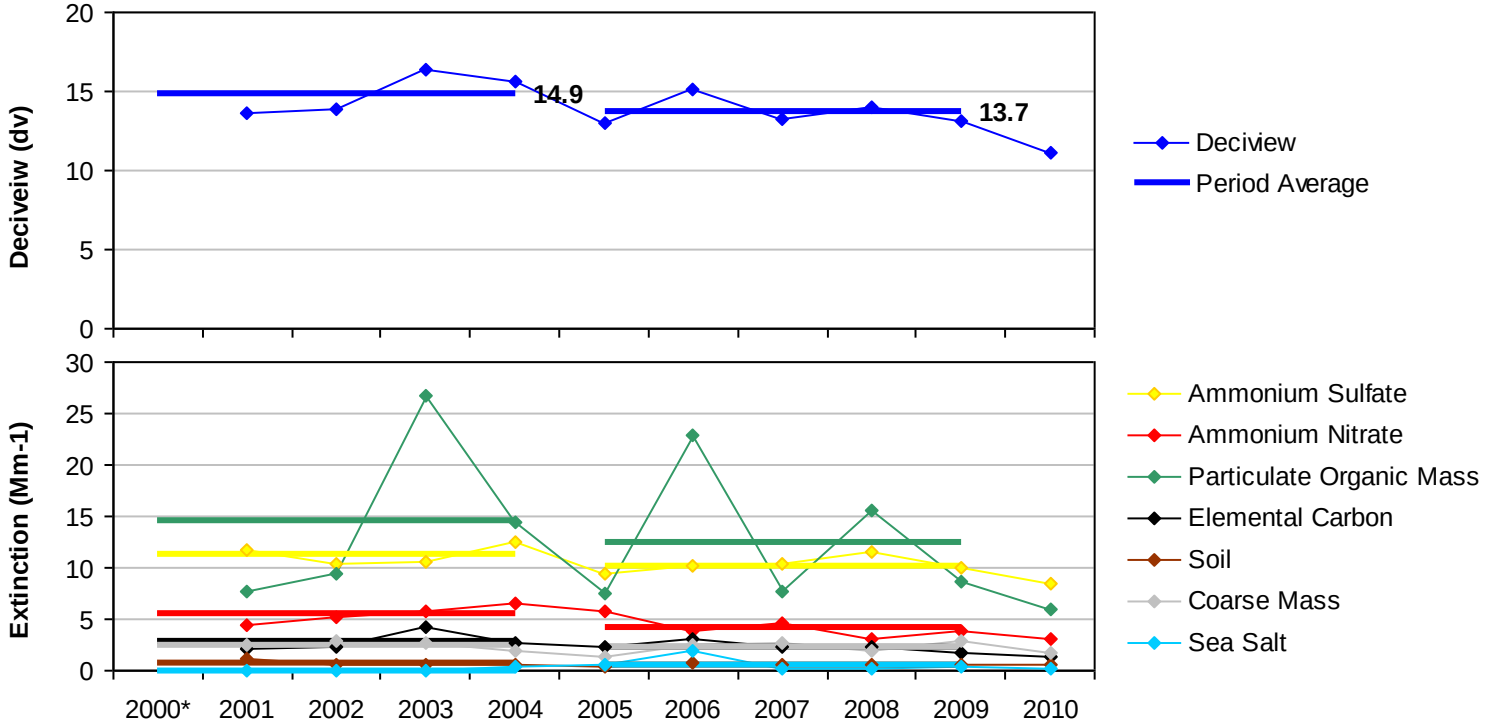
- **Figure K.6-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table K.6-1
Mount Hood WA, OR (MOHO1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	3.1	2.3	1.5	1.7	2.0	1.8	1.7	1.7	1.5	0.9	-0.1	0.0	2.2	1.7	-0.5	-23%
Worst 20% Days	---	13.6	13.9	16.4	15.6	12.9	15.2	13.3	14.0	13.2	11.2	-0.1	0.2	14.9	13.7	-1.2	-8%
All Days	---	7.9	7.9	7.8	7.9	7.3	7.5	7.0	7.0	6.8	5.6	-0.2	0.0	7.9	7.1	-0.8	-10%
Total Extinction (Mm-1)																	
Best 20% Days	---	13.7	12.7	11.7	11.9	12.3	12.1	11.9	11.8	11.6	11.0	-0.2	0.0	12.5	11.9	-0.6	-5%
Worst 20% Days	---	39.6	40.7	60.6	49.1	37.2	55.3	38.3	45.4	37.9	31.4	-0.3	0.3	47.5	42.8	-4.7	-10%
All Days	---	23.8	24.1	27.0	25.3	22.5	25.7	22.1	23.2	21.7	18.9	-0.3	0.1	25.1	23.0	-2.1	-8%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	1.8	1.2	0.7	0.9	1.2	1.0	0.8	1.0	0.8	0.5	-0.1	0.1	1.2	1.0	-0.2	-17%
Worst 20% Days	---	11.6	10.4	10.7	12.5	9.5	10.1	10.3	11.6	9.9	8.5	-0.1	0.2	11.3	10.3	-1.0	-9%
All Days	---	5.9	5.5	4.8	5.5	5.4	5.1	4.9	5.2	4.8	3.9	-0.1	0.0	5.4	5.1	-0.3	-6%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.8	0.4	0.3	0.4	0.3	0.2	0.3	0.2	0.2	0.2	0.0	0.0	0.4	0.3	-0.1	-25%
Worst 20% Days	---	4.5	5.2	5.8	6.6	5.7	3.8	4.6	3.1	3.8	3.0	-0.3	0.1	5.5	4.2	-1.3	-24%
All Days	---	2.3	2.3	2.3	2.6	2.2	1.8	2.0	1.4	1.7	1.2	-0.1	0.0	2.4	1.8	-0.6	-25%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.2	0.2	0.0	0%
Worst 20% Days	---	7.7	9.5	26.7	14.4	7.5	22.9	7.6	15.6	8.6	5.9	0.0	0.5	14.6	12.4	-2.2	-15%
All Days	---	2.9	3.6	7.0	4.6	2.7	5.7	2.7	4.4	2.8	1.9	0.0	0.4	4.5	3.7	-0.8	-18%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.1	-0.1	-50%
Worst 20% Days	---	2.2	2.3	4.3	2.8	2.3	3.2	2.2	2.3	1.8	1.4	0.0	0.3	2.9	2.3	-0.6	-21%
All Days	---	1.0	1.1	1.4	1.1	1.0	1.1	0.9	0.8	0.7	0.5	-0.1	0.0	1.1	0.9	-0.2	-18%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.4	0.1	0.0	-0.1	-100%
Worst 20% Days	---	1.2	0.6	0.5	0.6	0.3	0.7	0.6	0.7	0.7	0.6	0.0	0.4	0.7	0.6	-0.1	-14%
All Days	---	0.4	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.0	0.5	0.3	0.2	-0.1	-33%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.2	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.0	0%
Worst 20% Days	---	2.4	2.8	2.7	2.0	1.3	2.6	2.6	2.0	2.9	1.6	0.0	0.5	2.5	2.3	-0.2	-8%
All Days	---	1.0	1.0	1.0	0.8	0.6	0.8	0.9	0.8	1.0	0.7	0.0	0.3	0.9	0.8	-0.1	-11%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.4	0.2	0.2	0.3	0.4	0.3	0.2	0.2	0.1	0.0	0.1	0.3	0.3	0.0	0%
Worst 20% Days	---	0.0	0.0	0.0	0.3	0.6	2.0	0.2	0.1	0.4	0.3	0.0	0.1	0.1	0.7	0.6	>100%
All Days	---	0.3	0.4	0.3	0.5	0.5	0.9	0.5	0.3	0.4	0.4	0.0	0.3	0.4	0.5	0.1	25%

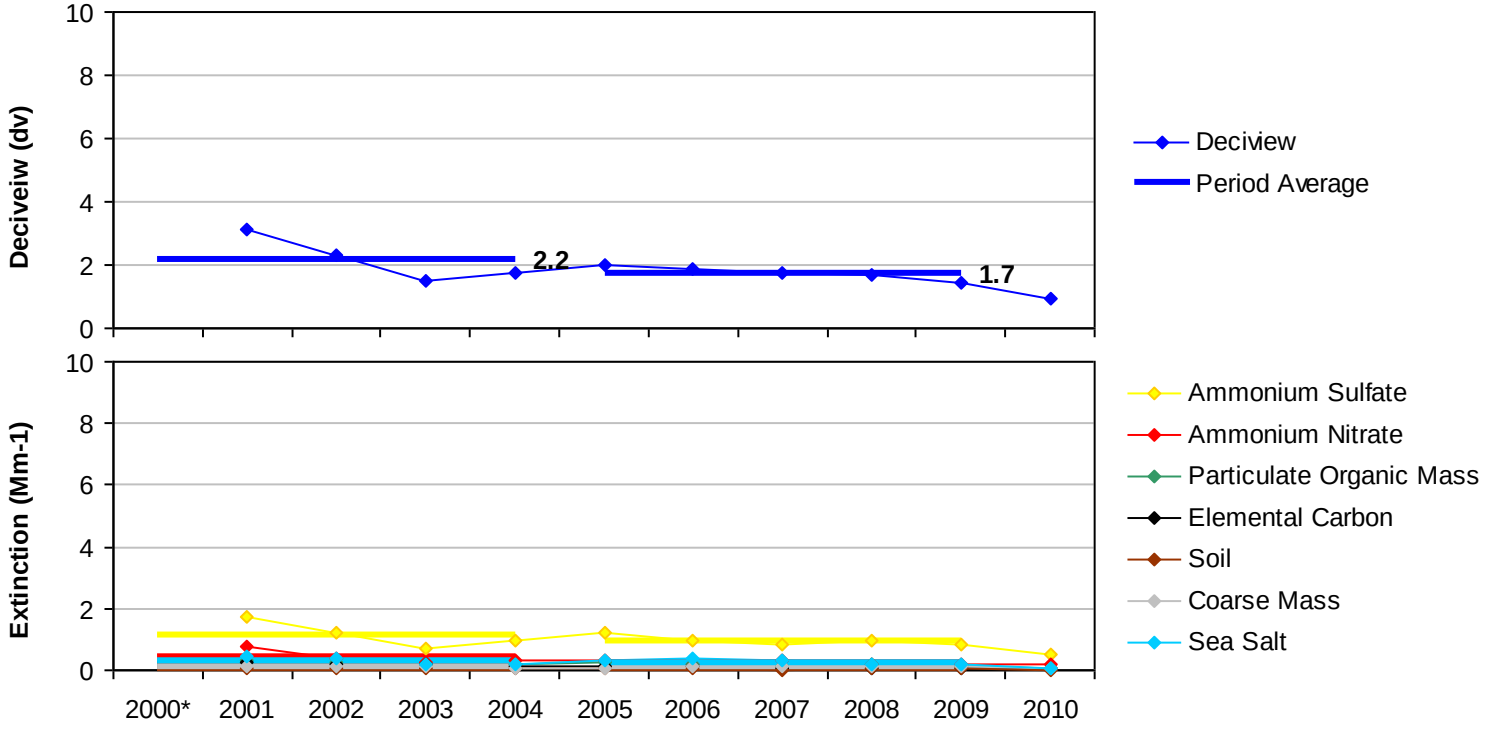
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure K.6-1
Mount Hood WA, OR (MOHO1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



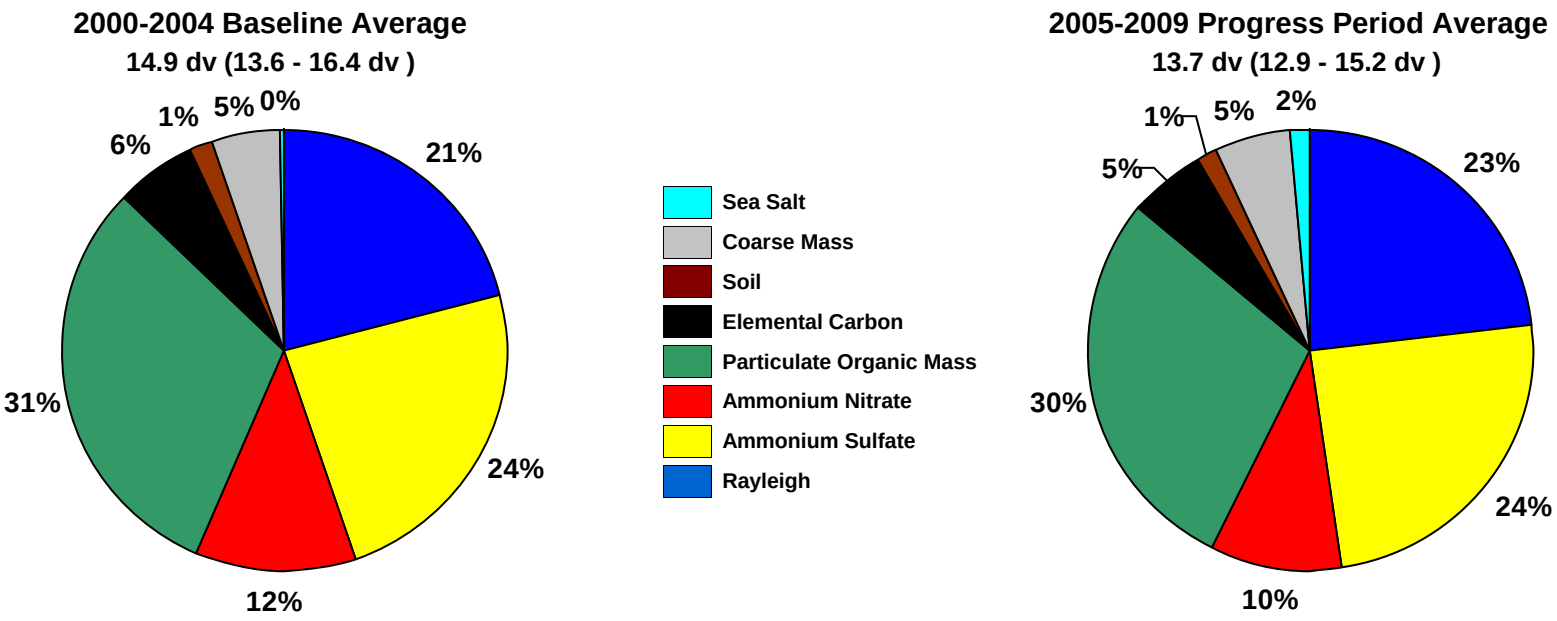
*Missing years did not meet RHR data completeness criteria.

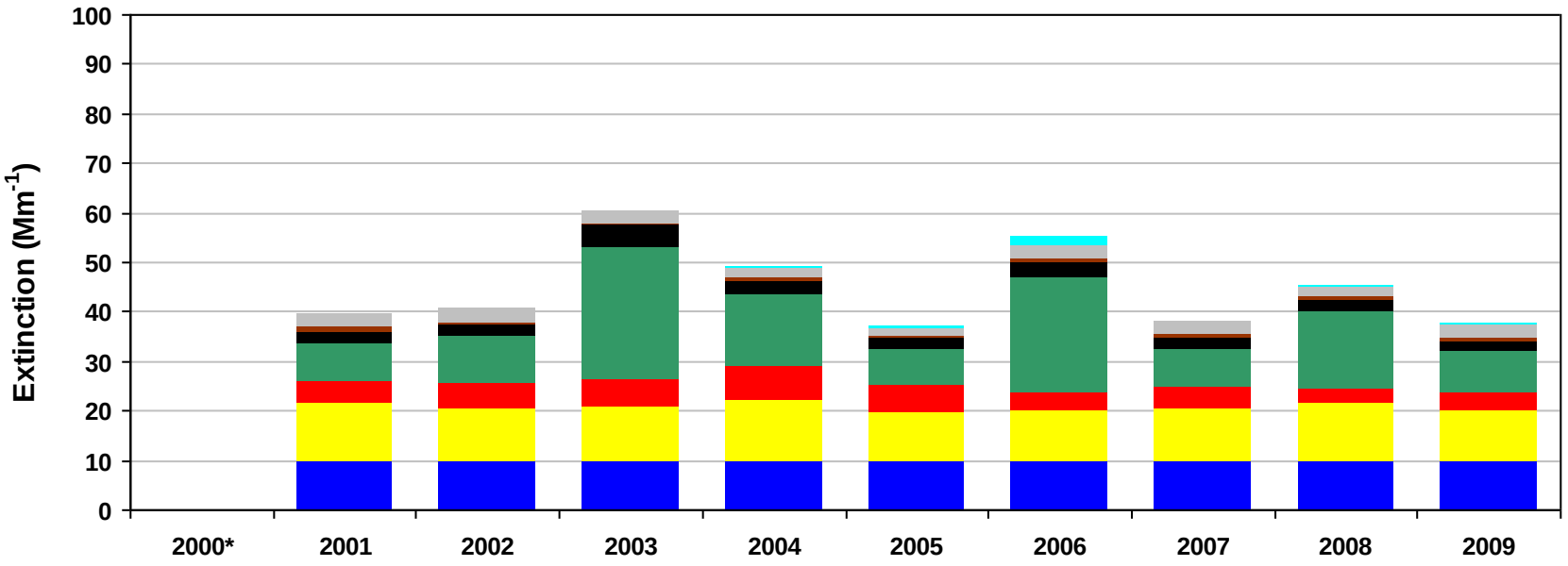
Figure K.6-2
Mount Hood WA, OR (MOHO1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

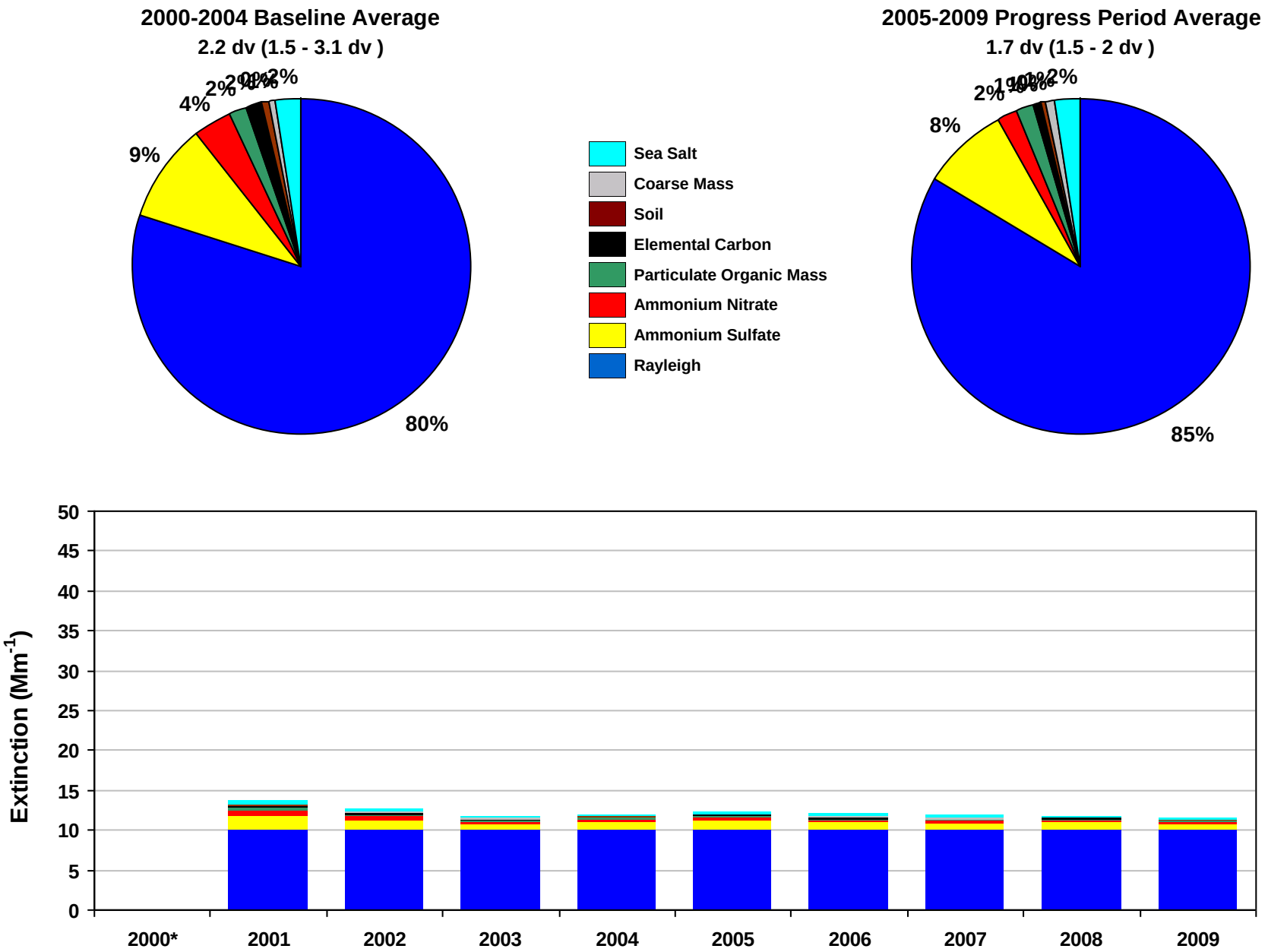
Figure K.6-3
Mount Hood WA, OR (MOHO1 Site)
20% Most Impaired Visibility Days





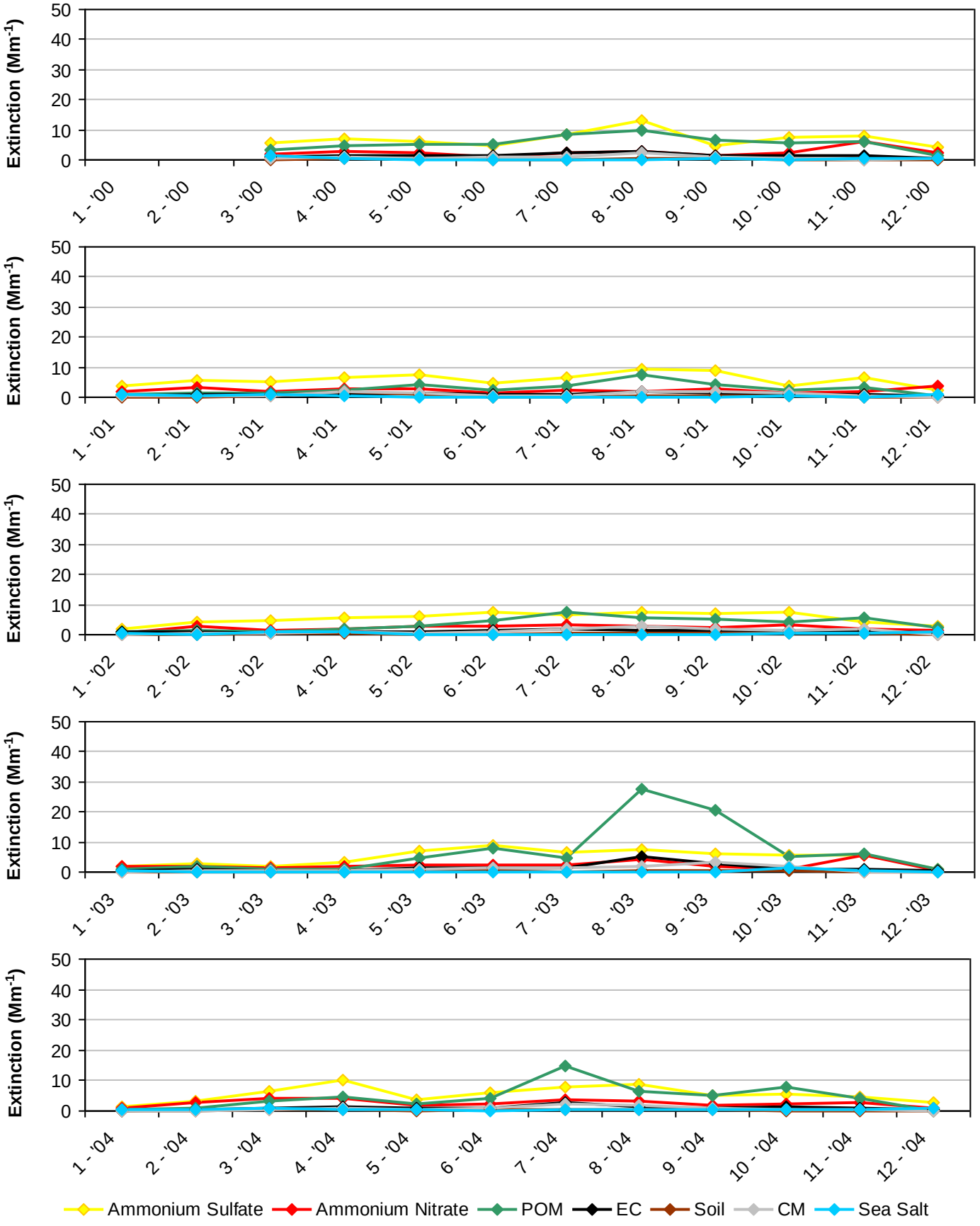
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure K.6-4
Mount Hood WA, OR (MOHO1 Site)
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure K.6-5
Mount Hood WA, OR (MOHO1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure K.6-6
Mount Hood WA, OR (MOHO1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

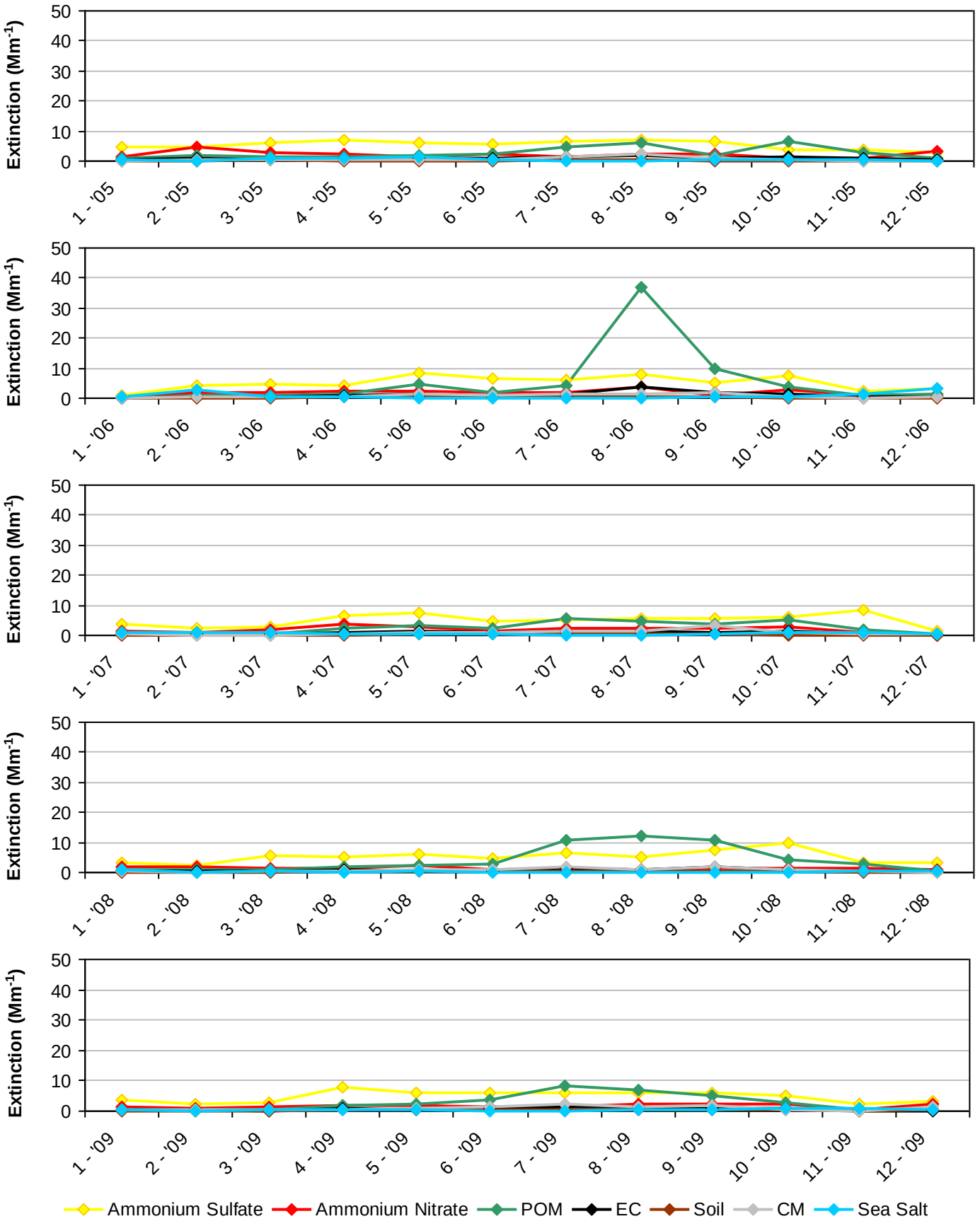
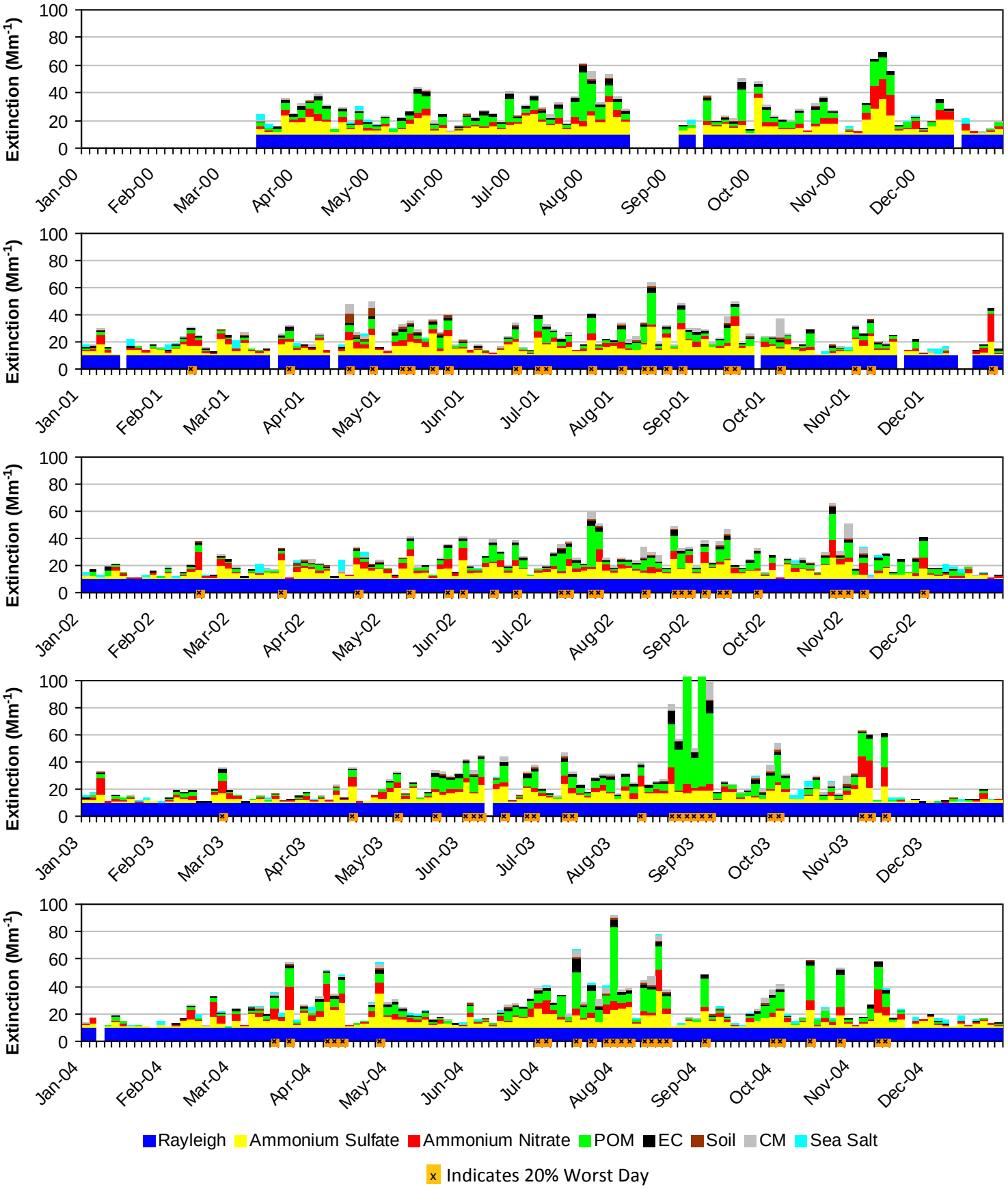
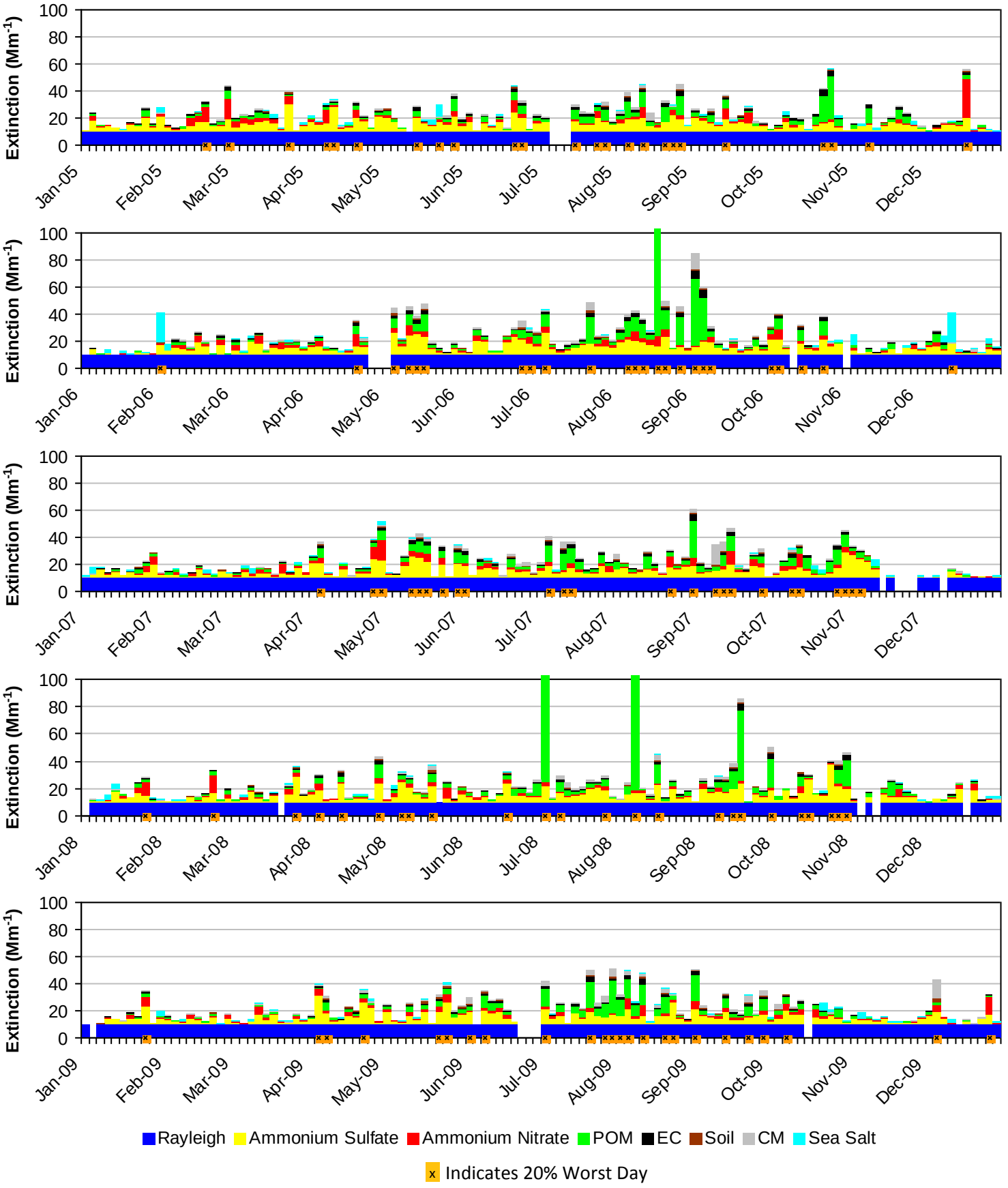


Figure K.6-7
Mount Hood WA, OR (MOHO1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure K.6-8
Mount Hood WA, OR (MOHO1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



K.7. EAGLE CAP WA AND STRAWBERRY MOUNTAIN WA (STAR1)

The following tables and figures are presented in this section for the Eagle Cap WA and Strawberry Mountain WA represented by the STAR1 IMPROVE Monitor:

- **Table K.7-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure K.7-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure K.7-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure K.7-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure K.7-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure K.7-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure K.7-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure K.7-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

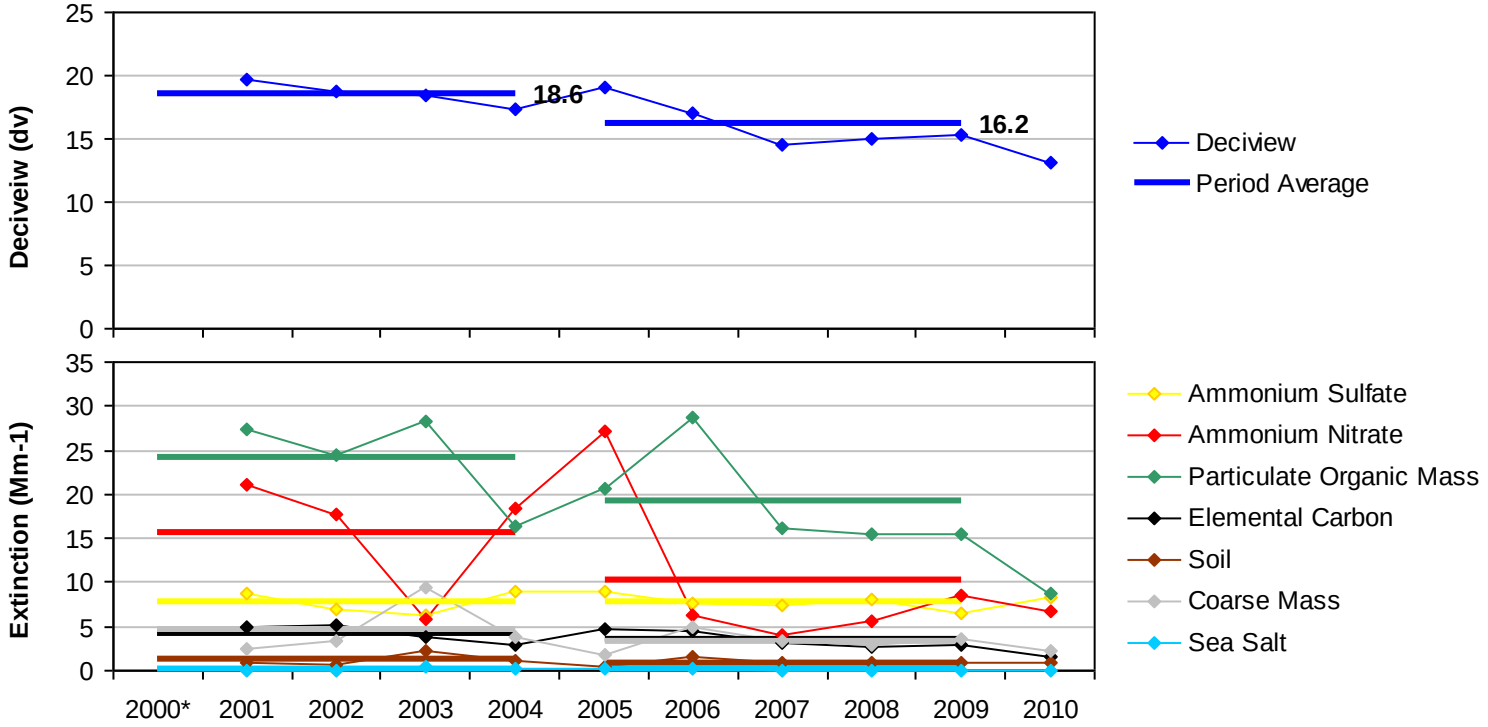
- **Figure K.7-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table K.7-1
Eagle Cap and Strawberry Mountain Was, OR (STAR1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	5.4	5.5	3.1	3.9	4.0	3.2	3.6	3.7	3.5	2.9	-0.1	0.1	4.5	3.6	-0.9	-20%
Worst 20% Days	---	19.7	18.7	18.5	17.4	19.1	17.1	14.6	15.0	15.3	13.1	-0.6	0.0	18.6	16.2	-2.4	-13%
All Days	---	11.9	11.3	10.1	9.9	10.2	9.3	8.7	8.9	9.1	7.8	-0.4	0.0	10.8	9.2	-1.6	-15%
Total Extinction (Mm-1)																	
Best 20% Days	---	17.3	17.5	13.7	14.9	15.0	13.9	14.4	14.5	14.3	13.5	-0.2	0.1	15.9	14.4	-1.5	-9%
Worst 20% Days	---	75.6	68.4	66.5	61.8	74.2	63.6	45.3	45.6	48.0	38.5	-3.9	0.0	68.1	55.3	-12.8	-19%
All Days	---	38.1	35.1	32.2	31.3	33.3	30.3	26.2	26.6	27.3	23.6	-1.4	0.0	34.2	28.7	-5.5	-16%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	2.6	2.4	1.2	1.8	2.0	1.7	1.9	1.9	2.0	1.6	0.0	0.5	2.0	1.9	-0.1	-5%
Worst 20% Days	---	8.7	7.0	6.4	8.9	9.0	7.5	7.5	8.1	6.6	8.3	-0.1	0.4	7.7	7.8	0.1	1%
All Days	---	5.8	5.0	4.1	5.3	5.3	4.9	4.7	5.2	4.9	4.5	0.0	0.2	5.0	5.0	0.0	0%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.8	0.8	0.5	0.6	0.4	0.5	0.7	0.5	0.6	0.4	0.0	0.3	0.7	0.6	-0.1	-14%
Worst 20% Days	---	21.1	17.7	5.9	18.4	27.1	6.2	4.1	5.7	8.5	6.7	-1.8	0.1	15.8	10.3	-5.5	-35%
All Days	---	5.8	5.4	2.7	5.2	6.8	2.7	2.1	2.3	3.1	2.6	-0.4	0.1	4.8	3.4	-1.4	-29%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	2.1	2.3	1.2	1.4	1.2	0.6	0.8	1.1	0.9	0.6	-0.2	0.0	1.7	0.9	-0.8	-47%
Worst 20% Days	---	27.4	24.5	28.3	16.3	20.7	28.7	16.1	15.4	15.5	8.8	-1.5	0.0	24.1	19.3	-4.8	-20%
All Days	---	10.6	9.3	9.5	6.8	7.0	8.0	5.5	5.6	5.7	3.6	-0.6	0.0	9.0	6.4	-2.6	-29%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.8	0.8	0.3	0.4	0.4	0.3	0.3	0.3	0.2	0.2	-0.1	0.1	0.5	0.3	-0.2	-40%
Worst 20% Days	---	4.8	5.2	3.8	3.0	4.8	4.5	3.2	2.6	2.8	1.7	-0.3	0.0	4.2	3.6	-0.6	-14%
All Days	---	2.5	2.2	1.7	1.5	1.8	1.6	1.3	1.1	1.1	0.8	-0.2	0.0	2.0	1.4	-0.6	-30%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0%
Worst 20% Days	---	1.0	0.7	2.3	1.1	0.5	1.5	0.9	0.8	1.0	0.8	0.0	0.5	1.3	0.9	-0.4	-31%
All Days	---	0.6	0.6	0.7	0.5	0.4	0.6	0.5	0.5	0.5	0.4	0.0	0.2	0.6	0.5	-0.1	-17%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.7	0.8	0.3	0.4	0.6	0.3	0.3	0.4	0.3	0.4	0.0	0.0	0.5	0.4	-0.1	-20%
Worst 20% Days	---	2.6	3.3	9.4	3.8	1.8	5.0	3.5	2.9	3.5	2.2	0.0	0.5	4.8	3.3	-1.5	-31%
All Days	---	2.3	2.5	3.3	1.8	1.8	2.2	1.9	1.7	1.7	1.5	-0.1	0.0	2.5	1.9	-0.6	-24%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.3	0.2	0.1	0.3	0.2	0.4	0.4	0.2	0.3	0.2	0.0	0.4	0.2	0.3	0.1	50%
Worst 20% Days	---	0.0	0.0	0.4	0.2	0.3	0.1	0.1	0.0	0.1	0.1	0.0	0.5	0.1	0.1	0.0	0%
All Days	---	0.6	0.1	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.0	0.4	0.3	0.2	-0.1	-33%

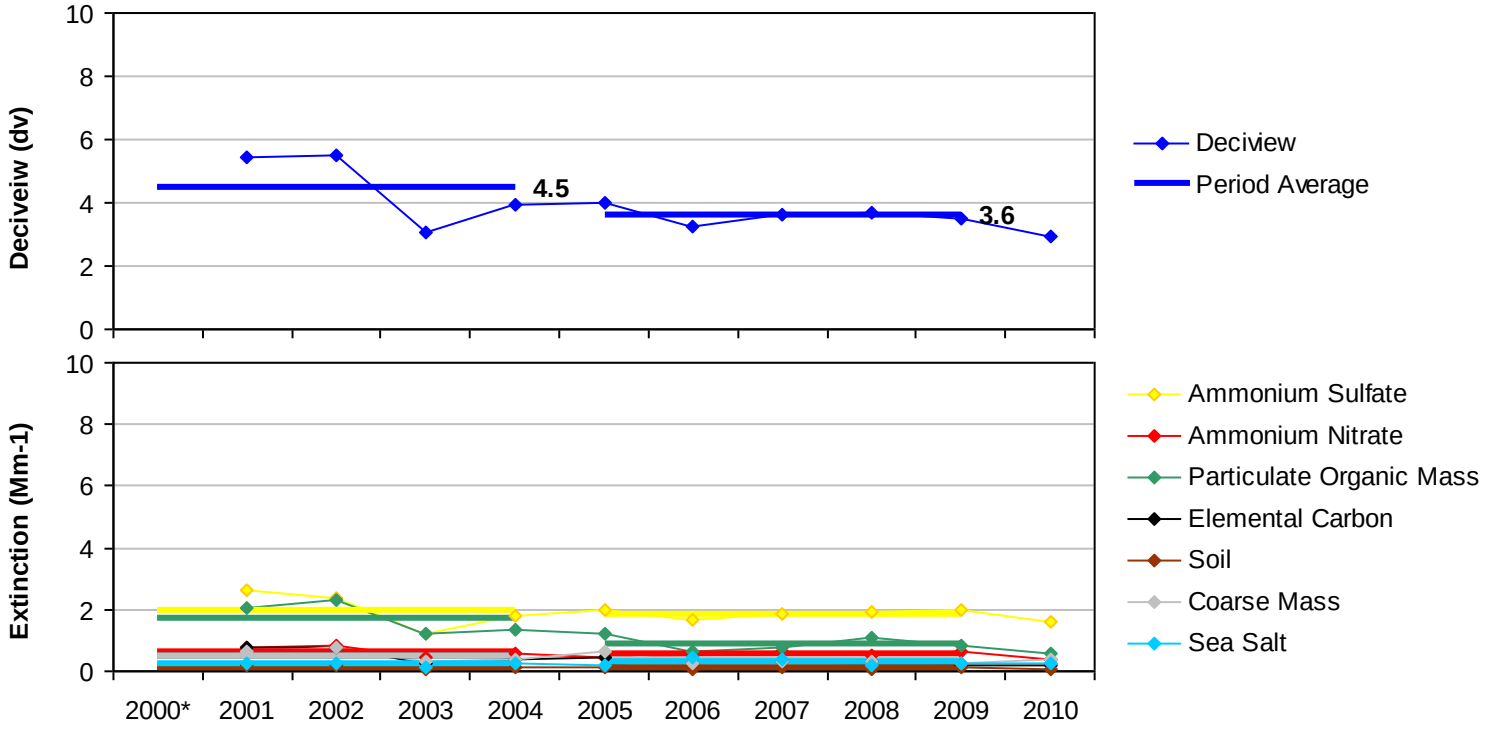
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure K.7-1
Eagle Cap and Strawberry Mountain Was, OR (STAR1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure K.7-2
Eagle Cap and Strawberry Mountain Was, OR (STAR1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

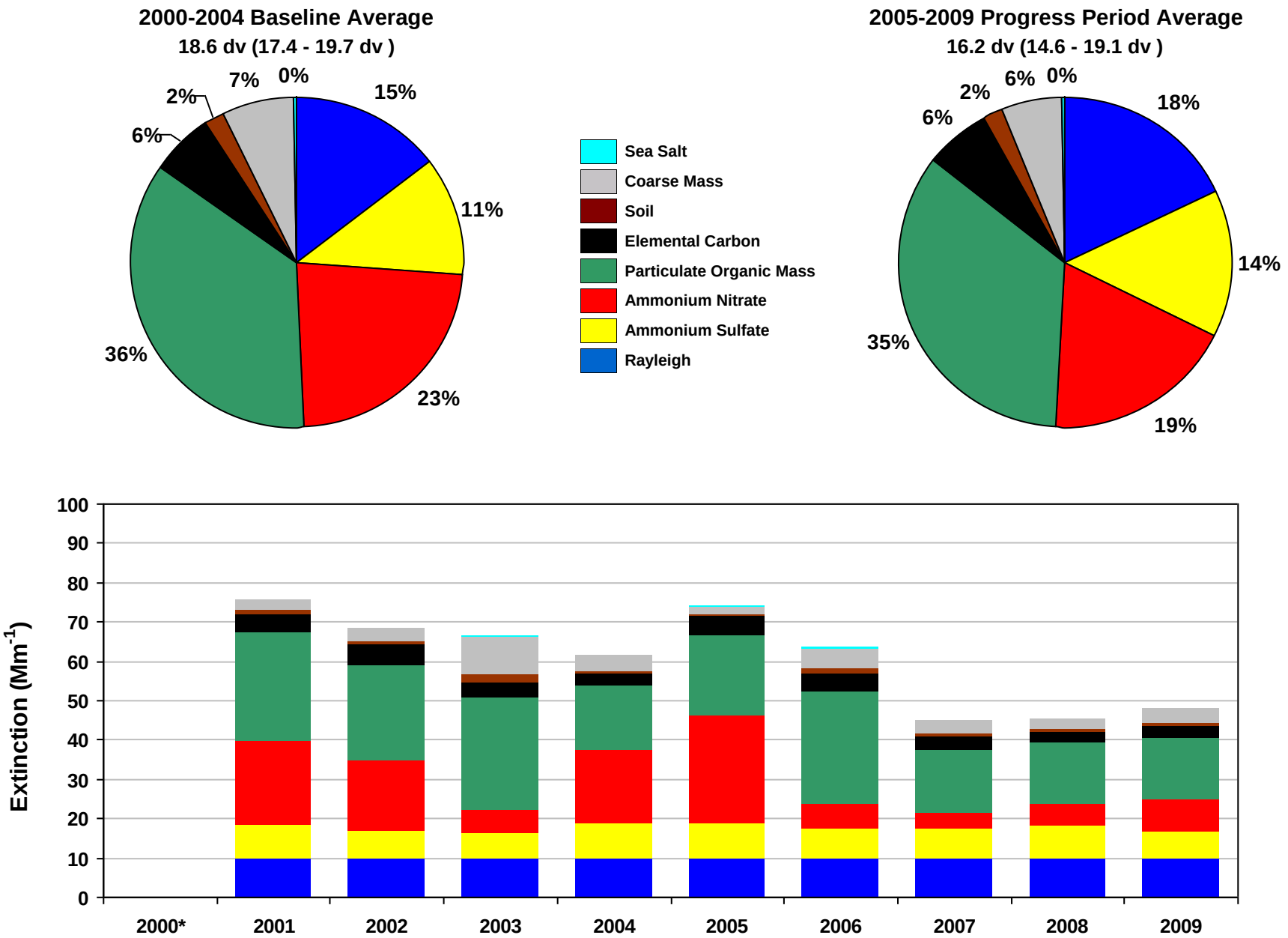


*Missing years did not meet RHR data completeness criteria.

Figure K.7-3

Eagle Cap and Strawberry Mountain Was, OR (STAR1 Site)

20% Most Impaired Visibility Days

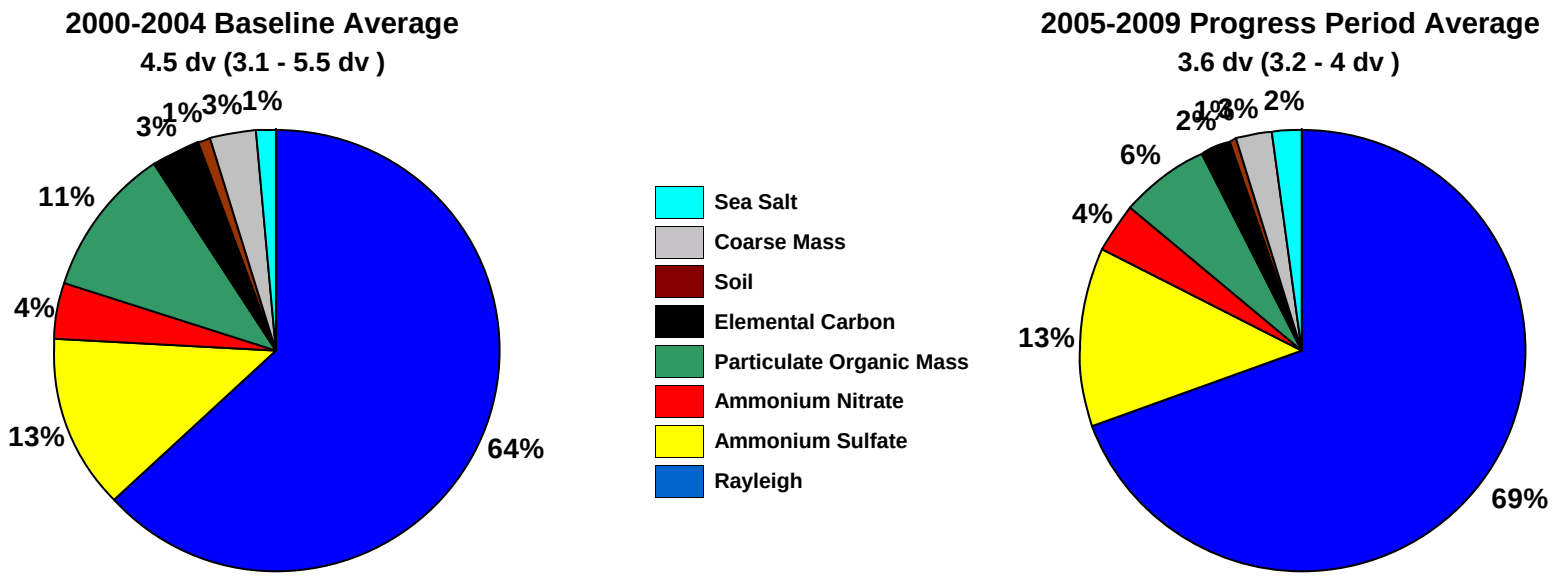


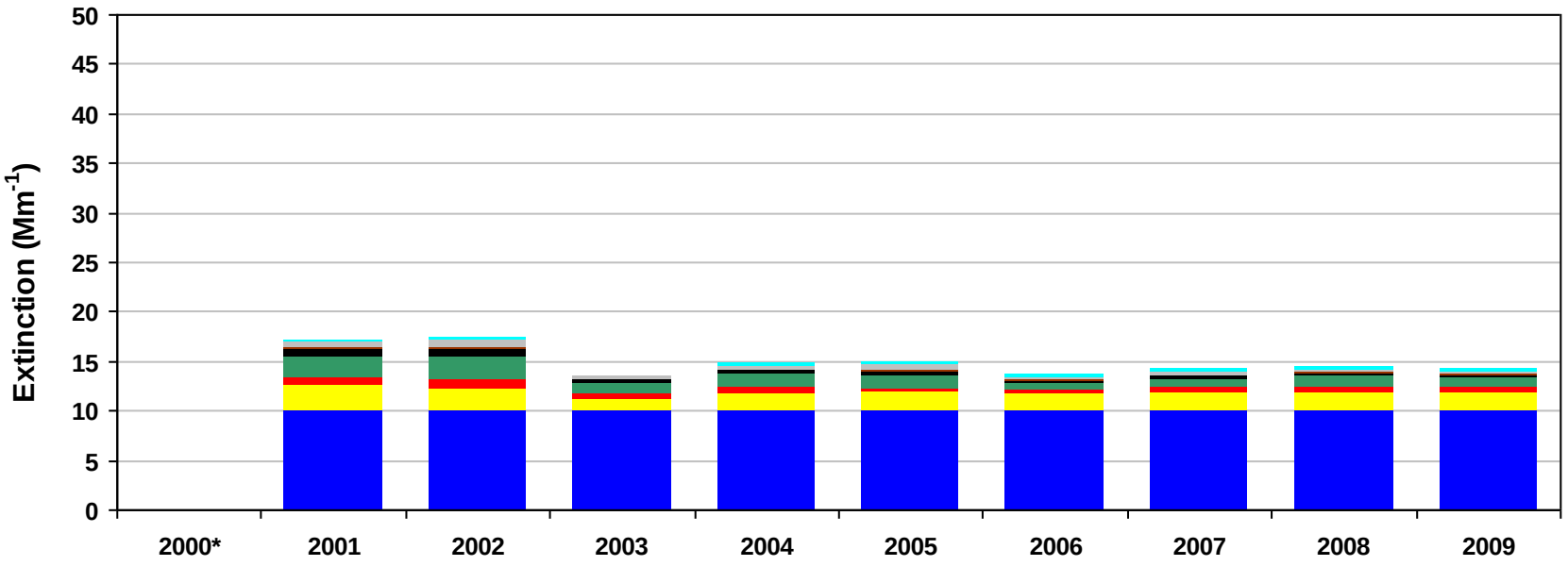
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure K.7-4

Eagle Cap and Strawberry Mountain Was, OR (STAR1 Site)

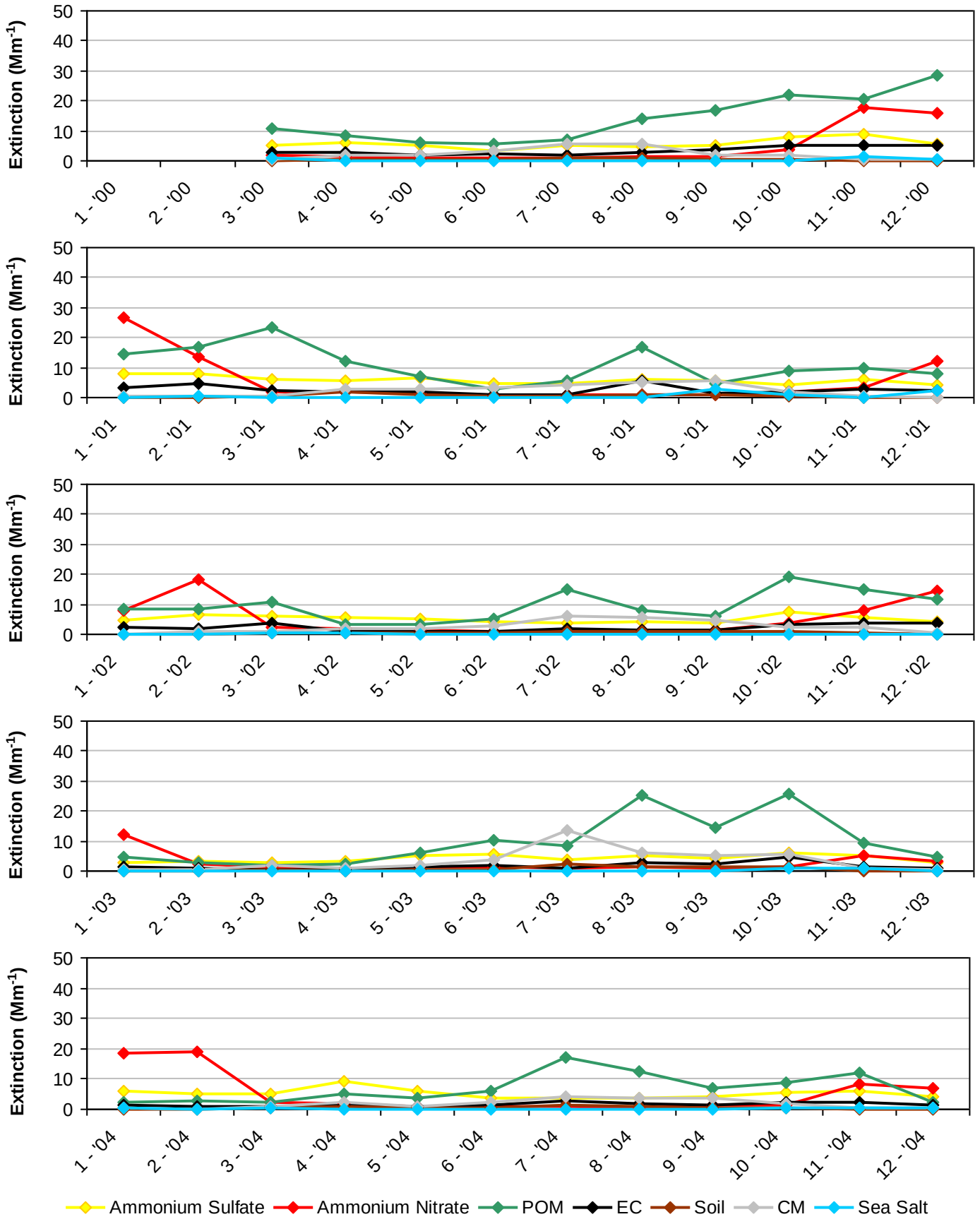
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure K.7-5
Eagle Cap and Strawberry Mountain Was, OR (STAR1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure K.7-6
Eagle Cap and Strawberry Mountain Was, OR (STAR1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

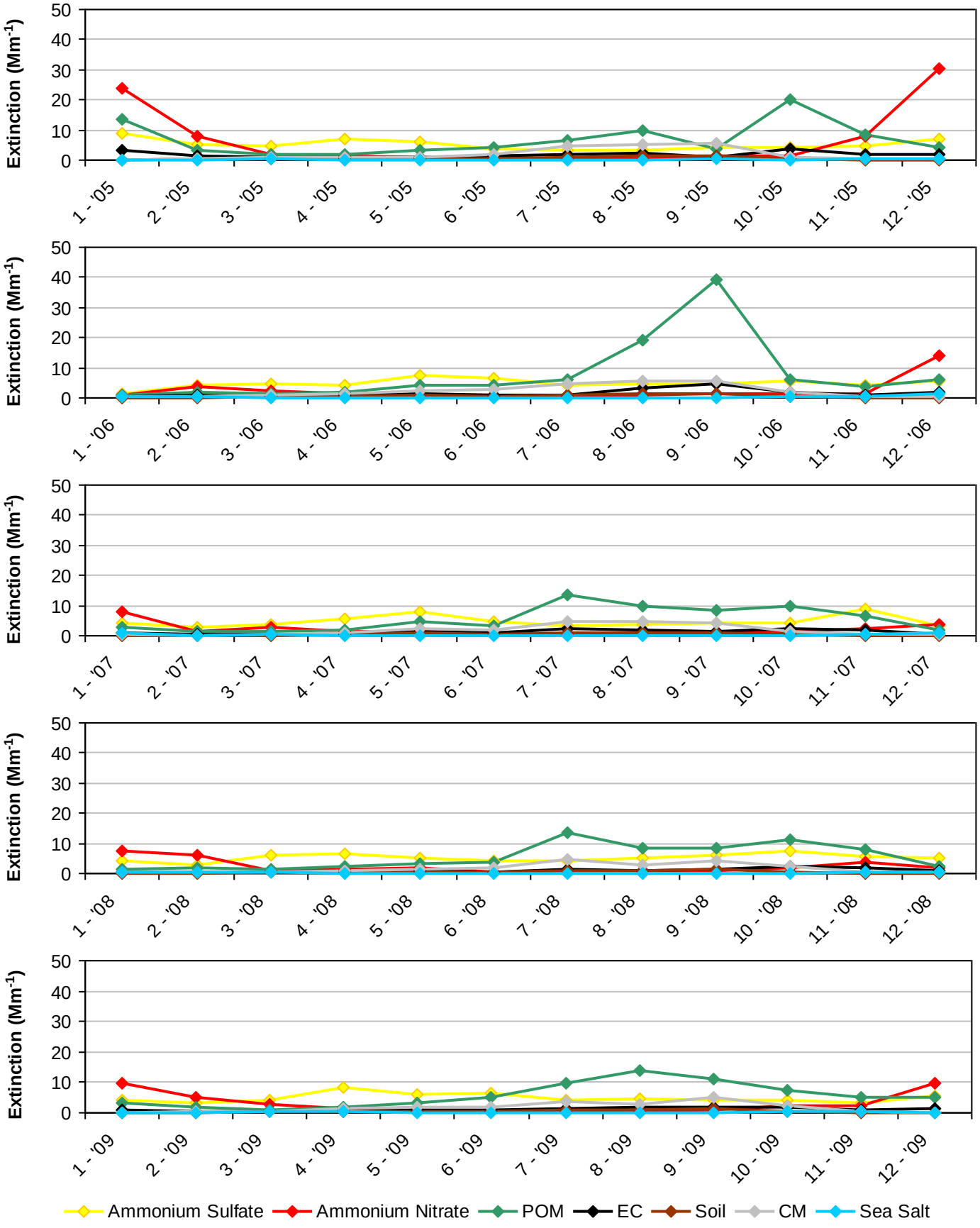
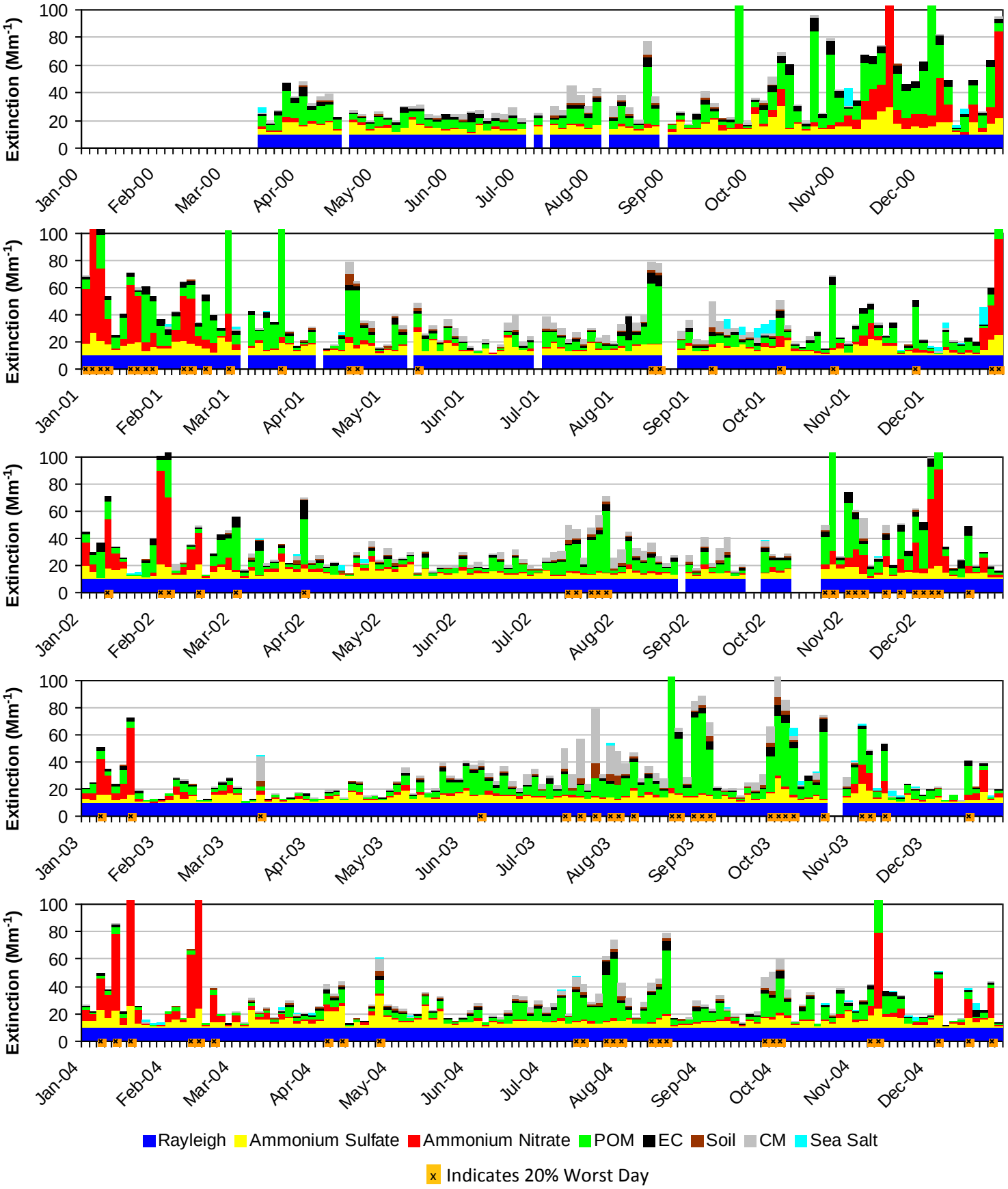
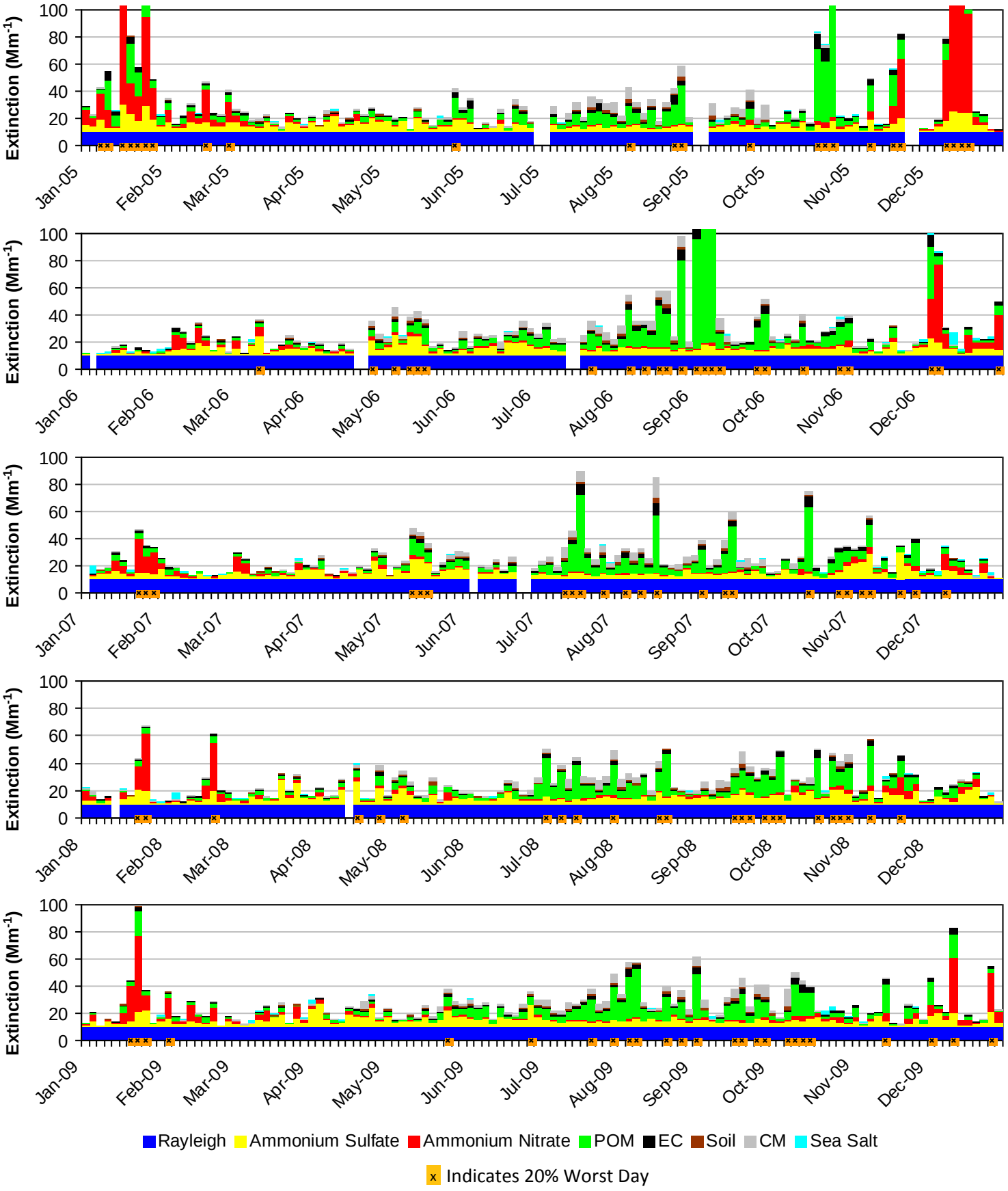


Figure K.7-7
Eagle Cap and Strawberry Mountain Was, OR (STAR1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure K.7-8
Eagle Cap and Strawberry Mountain Was, OR (STAR1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



K.8. THREE SISTERS WA, MOUNT JEFFERSON WA, AND MOUNT WASHINGTON WA (THSI1)

The following tables and figures are presented in this section for the Three Sisters WA, Mount Jefferson WA, and Mount Washington WA represented by the THSI1 IMPROVE Monitor:

- **Table K.8-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure K.8-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure K.8-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure K.8-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure K.8-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure K.8-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure K.8-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure K.8-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure K.8-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table K.8-1
Three Sisters, Mount Jefferson and Mount Washington Was, OR (THSI1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	3.7	3.8	2.8	2.3	2.6	2.9	2.8	2.9	3.3	3.2	2.5	0.0	0.5	3.0	3.0	0.0	0%
Worst 20% Days	14.9	14.1	15.7	16.5	15.5	14.5	17.5	15.1	15.8	18.1	13.6	0.3	0.1	15.3	16.2	0.9	6%
All Days	9.3	8.9	9.4	8.9	8.6	8.5	9.0	8.4	8.8	9.5	7.4	-0.1	0.2	9.0	8.9	-0.1	-1%
Total Extinction (Mm-1)																	
Best 20% Days	14.5	14.7	13.3	12.6	13.0	13.4	13.2	13.4	13.9	13.8	12.8	0.0	0.5	13.6	13.6	0.0	0%
Worst 20% Days	45.1	41.2	50.6	56.3	53.5	43.2	62.1	48.1	52.2	63.7	41.0	1.9	0.1	49.3	53.9	4.6	9%
All Days	27.6	26.2	28.6	28.3	27.5	25.7	29.3	26.0	27.4	30.7	23.1	0.2	0.4	27.6	27.8	0.2	1%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	1.3	1.7	1.1	0.6	0.9	1.2	1.0	1.0	1.4	1.4	0.9	0.0	0.4	1.1	1.2	0.1	9%
Worst 20% Days	13.4	12.8	11.4	10.7	10.6	10.0	11.5	10.9	12.4	9.3	10.2	-0.3	0.1	11.8	10.8	-1.0	-9%
All Days	6.7	6.8	6.3	5.2	5.5	5.9	5.9	5.5	6.3	5.8	4.7	-0.1	0.2	6.1	5.8	-0.3	-5%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.4	0.6	0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.0	0.1	0.3	0.2	-0.1	-33%
Worst 20% Days	3.2	2.1	2.2	3.6	2.4	2.6	2.7	1.9	1.6	2.0	1.7	-0.1	0.1	2.7	2.2	-0.5	-19%
All Days	1.5	1.4	1.4	1.6	1.2	1.2	1.3	1.0	0.9	1.0	0.8	-0.1	0.0	1.4	1.1	-0.3	-21%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	0.5	0.6	0.5	0.4	0.4	0.3	0.4	0.5	0.6	0.5	0.3	0.0	0.4	0.5	0.4	-0.1	-20%
Worst 20% Days	11.7	9.3	18.7	23.0	22.8	11.7	23.9	15.7	20.4	14.0	9.6	0.6	0.3	17.1	17.1	0.0	0%
All Days	5.0	3.9	6.4	7.0	6.8	4.3	6.8	5.0	6.1	5.0	3.3	0.0	0.5	5.8	5.4	-0.4	-7%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.4	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.0	0.1	0.2	0.2	0.0	0%
Worst 20% Days	3.2	2.4	3.7	3.6	3.1	3.5	4.5	2.9	3.2	2.6	1.9	-0.1	0.4	3.2	3.3	0.1	3%
All Days	1.6	1.2	1.5	1.4	1.3	1.5	1.5	1.1	1.2	1.1	0.8	0.0	0.0	1.4	1.3	-0.1	-7%
Soil Extinction (Mm-1)																	
Best 20% Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0%
Worst 20% Days	0.4	0.9	0.7	0.6	0.5	0.7	1.1	0.7	0.7	3.9	1.2	0.0	0.1	0.6	1.4	0.8	>100%
All Days	0.2	0.4	0.3	0.2	0.2	0.2	0.4	0.3	0.3	1.1	0.4	0.0	0.1	0.3	0.5	0.2	67%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	0.5	0.3	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.0	0.4	0.2	0.2	0.0	0%
Worst 20% Days	2.2	2.3	2.8	3.5	2.8	3.8	6.3	4.8	2.8	20.3	5.1	0.4	0.0	2.7	7.6	4.9	>100%
All Days	1.2	1.1	1.4	1.4	1.2	1.3	1.9	1.7	1.3	5.3	1.6	0.1	0.0	1.3	2.3	1.0	77%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.4	0.3	0.2	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0.0	0.5	0.2	0.3	0.1	50%
Worst 20% Days	0.0	0.5	0.0	0.3	0.2	0.1	0.9	0.2	0.2	0.5	0.4	0.0	0.2	0.2	0.4	0.2	100%
All Days	0.4	0.4	0.3	0.4	0.3	0.3	0.5	0.4	0.4	0.5	0.4	0.0	0.2	0.4	0.4	0.0	0%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure K.8-1
Three Sisters, Mount Jefferson and Mount Washington Was, OR (THSI1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

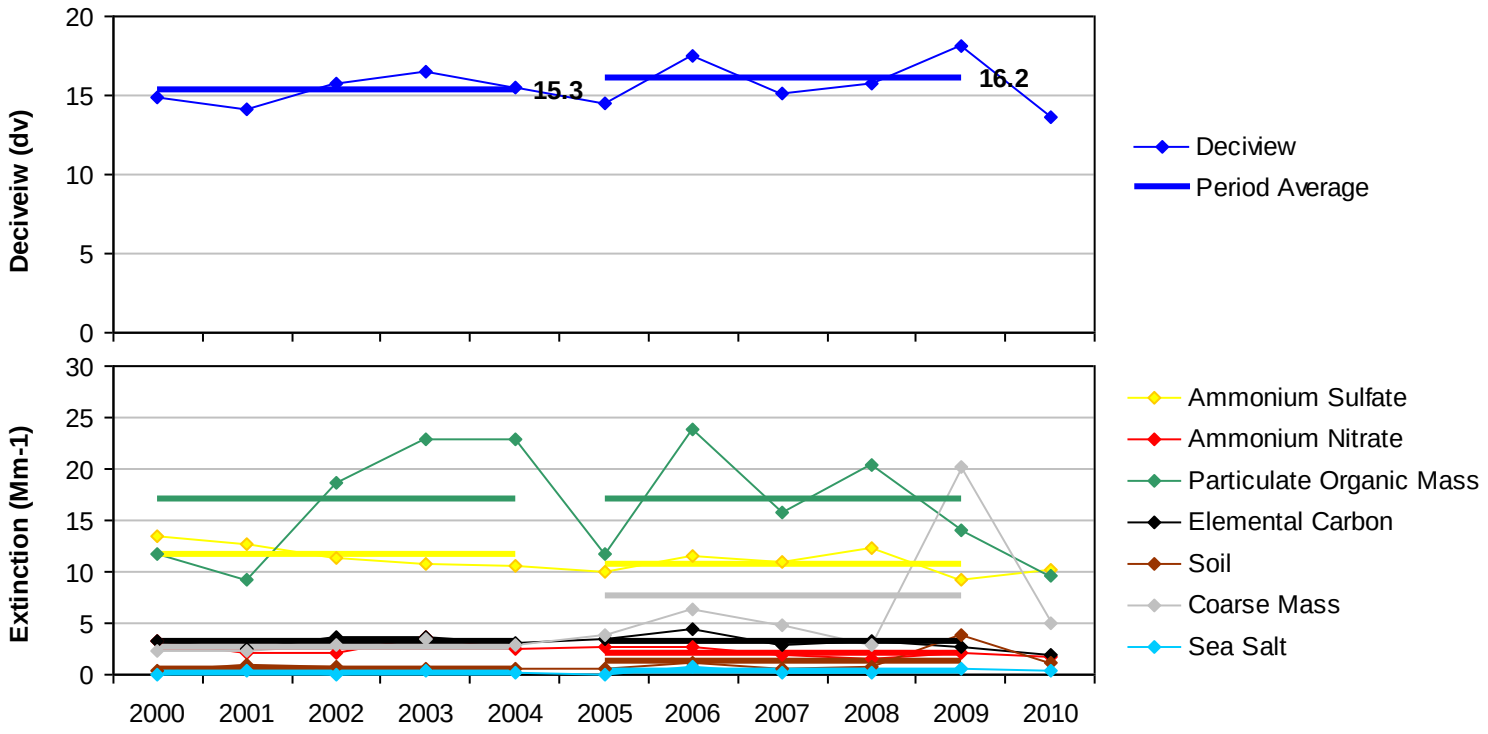


Figure K.8-2
Three Sisters, Mount Jefferson and Mount Washington Was, OR (THSI1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

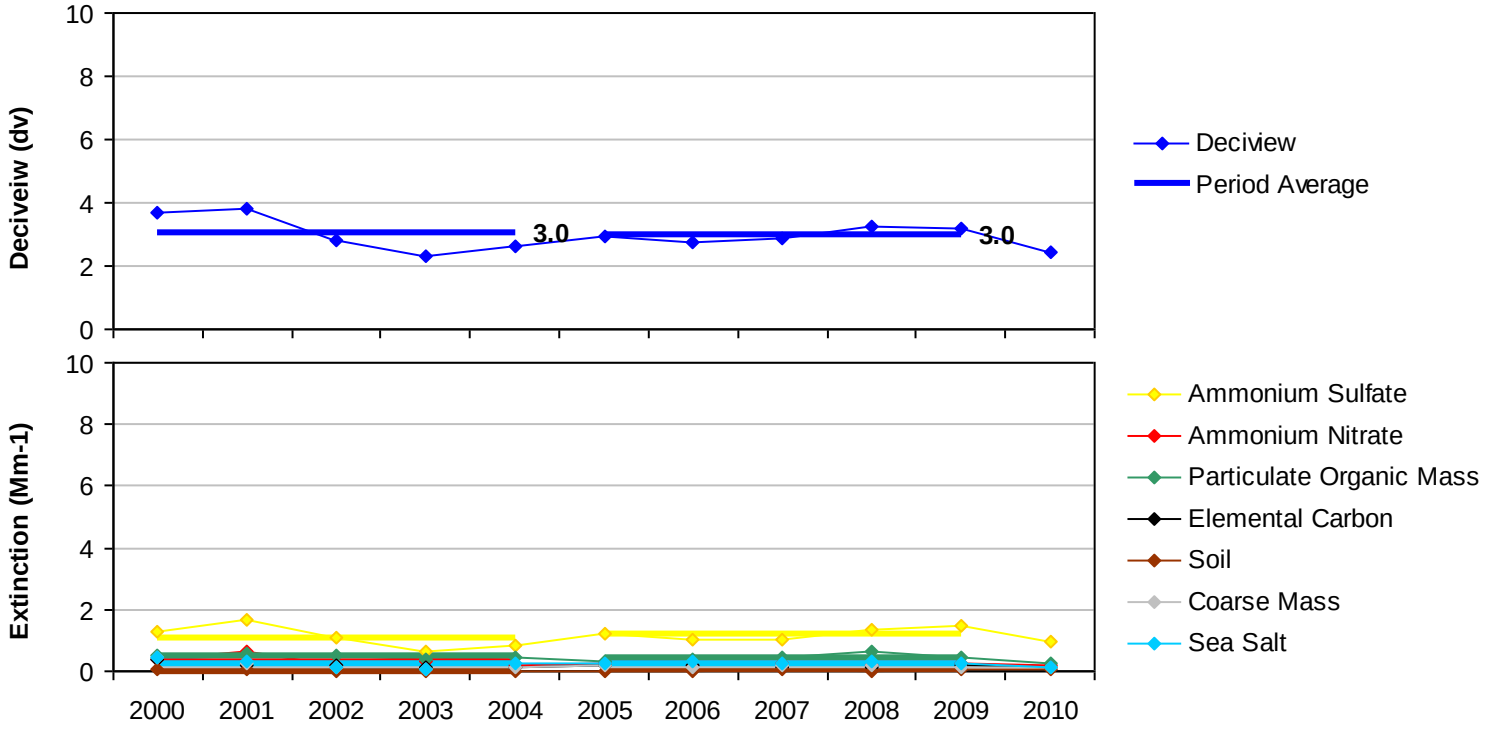


Figure K.8-3

Three Sisters, Mount Jefferson and Mount Washington Was, OR (THSI1 Site)

20% Most Impaired Visibility Days

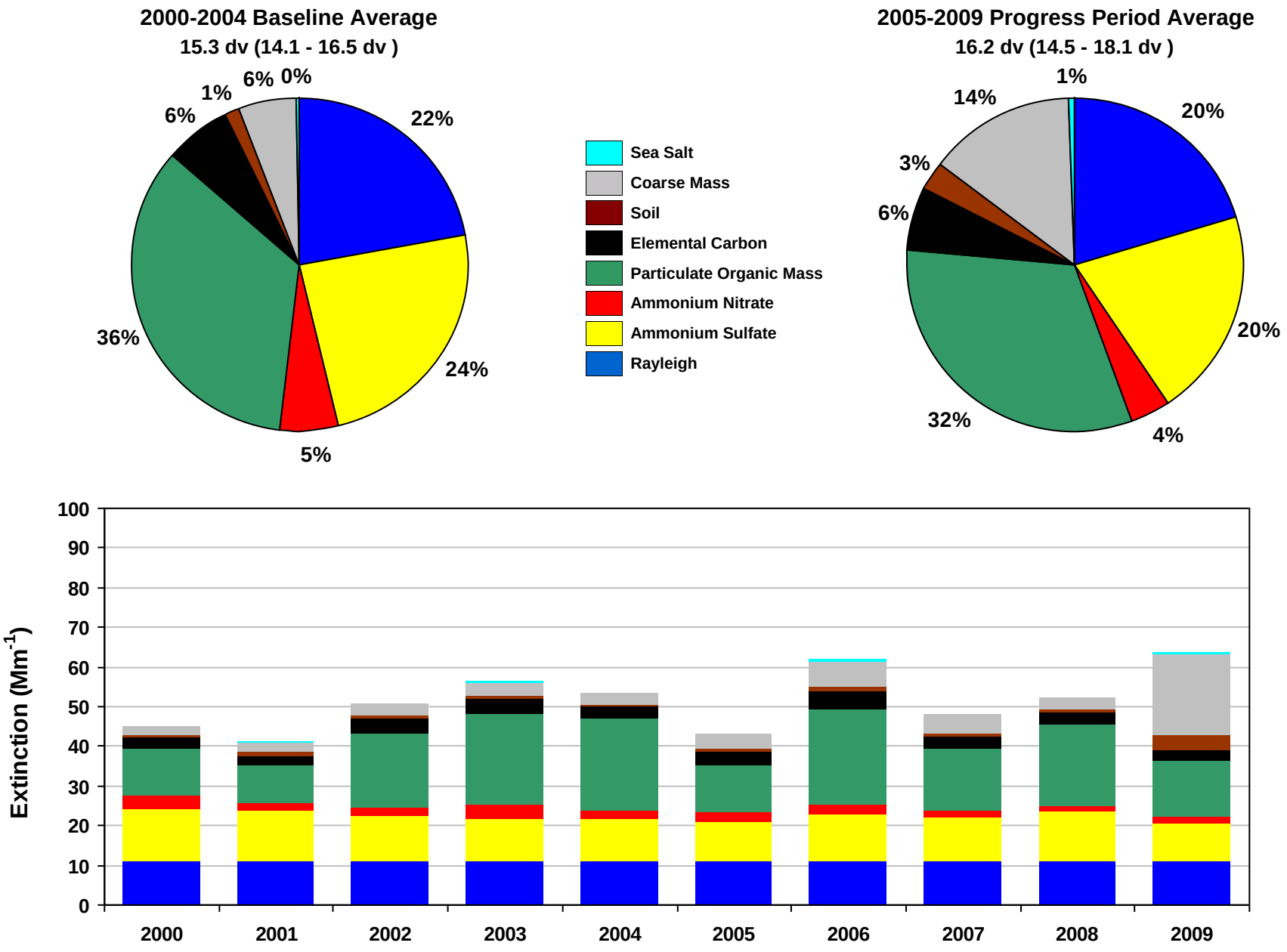


Figure K.8-4

Three Sisters, Mount Jefferson and Mount Washington Was, OR (THSI1 Site)

20% Least Impaired Visibility Days

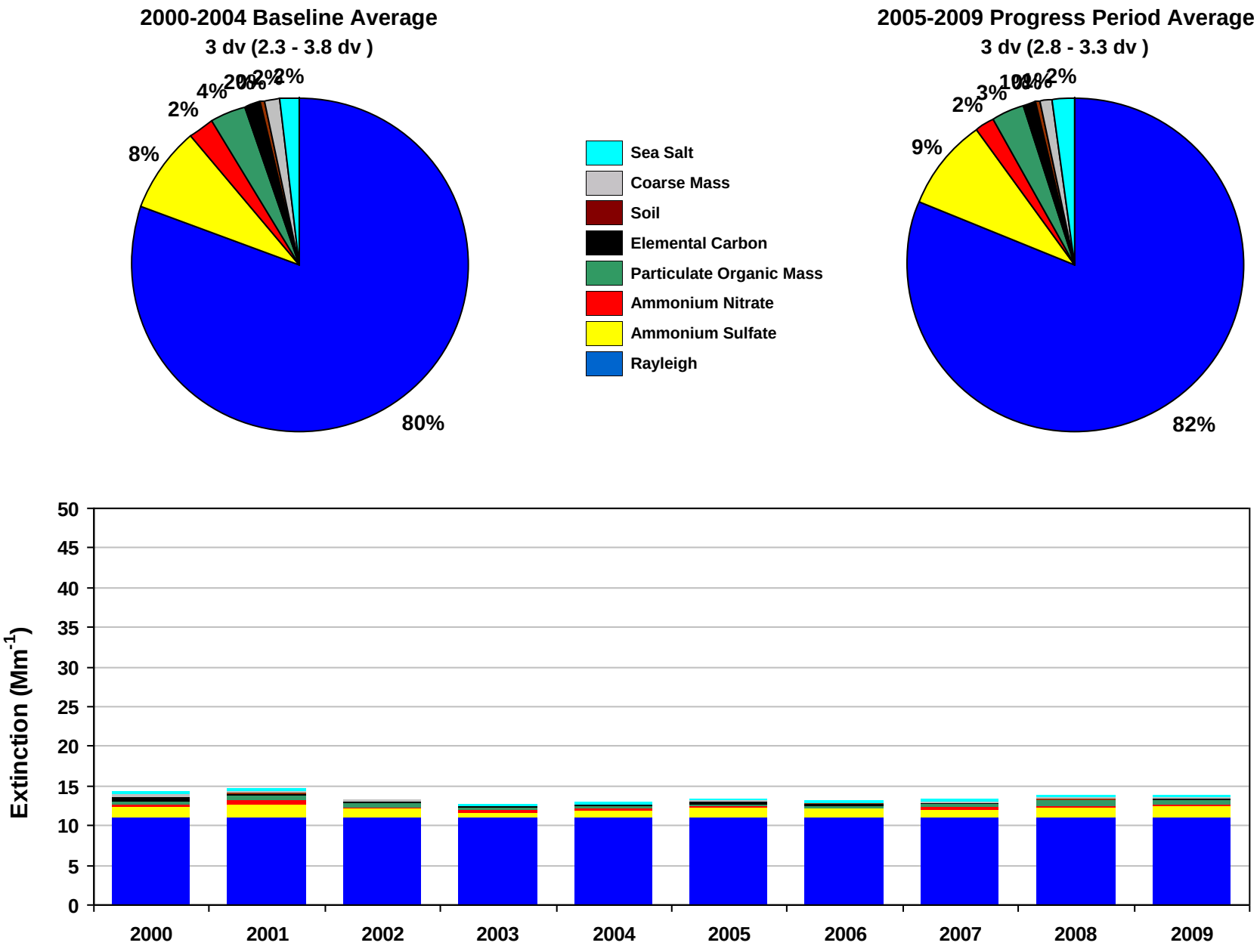


Figure K.8-5
Three Sisters, Mount Jefferson and Mount Washington Was, OR (THSI1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

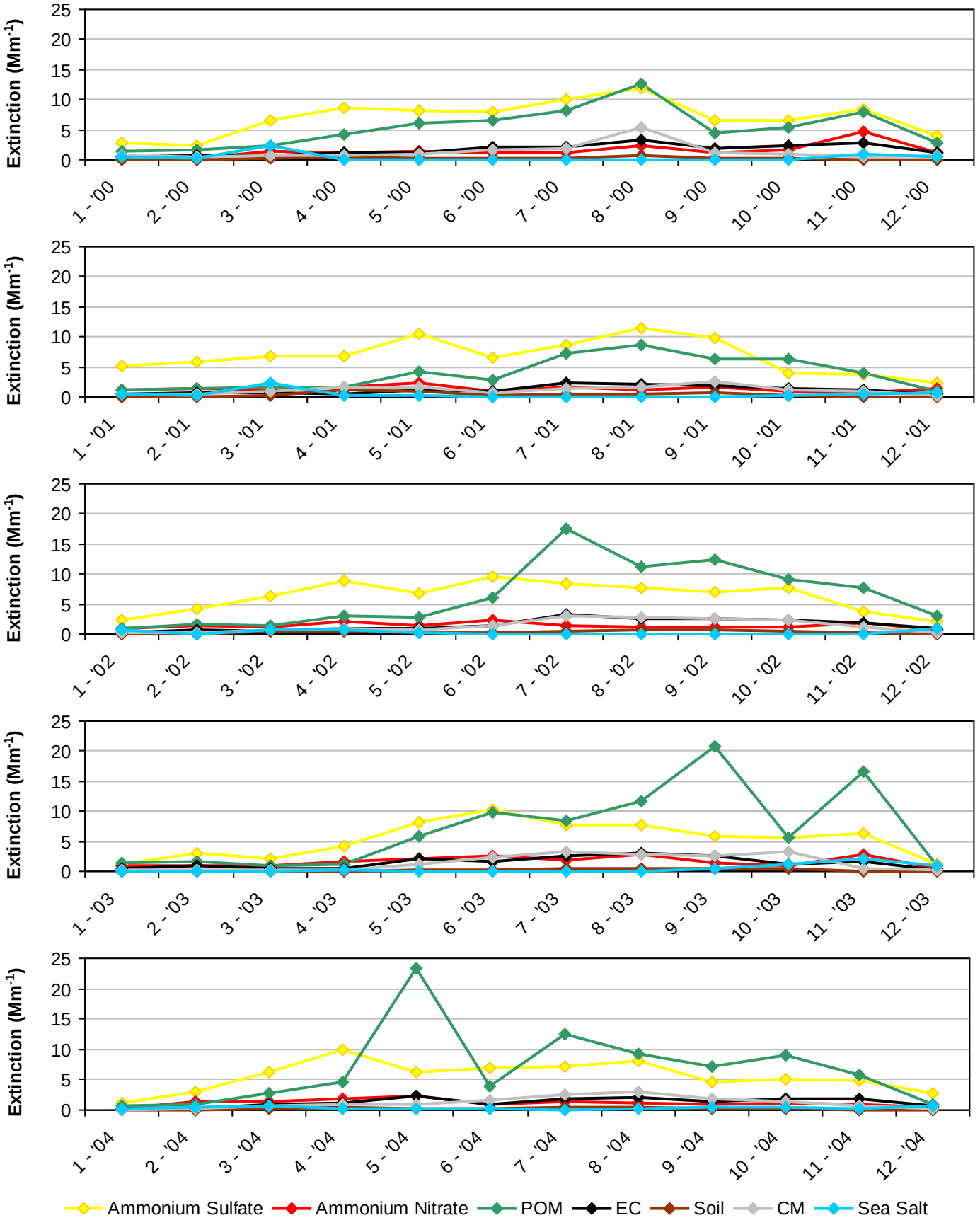


Figure K.8-6
Three Sisters, Mount Jefferson and Mount Washington Was, OR (THSI1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

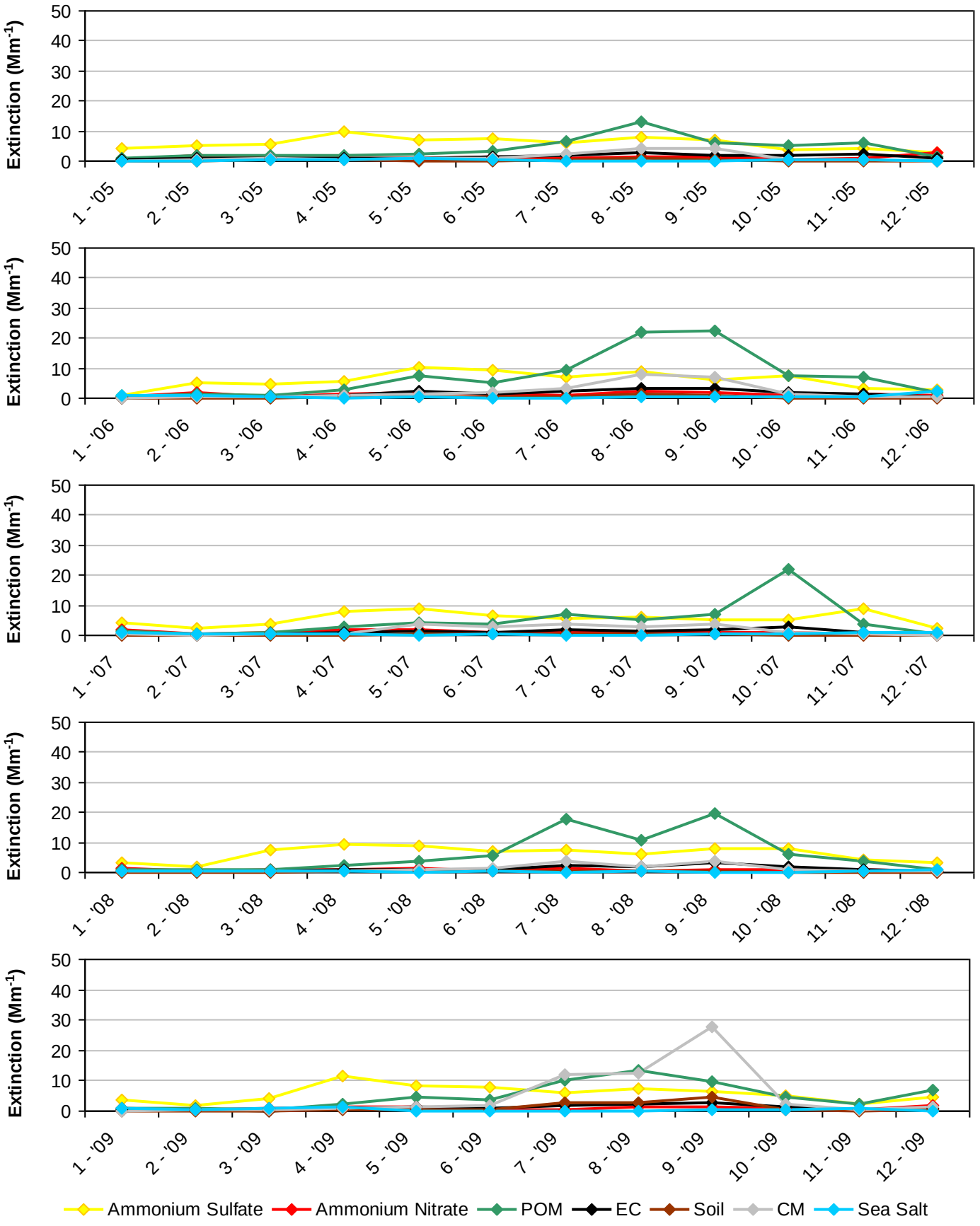


Figure K.8-7
Three Sisters, Mount Jefferson and Mount Washington Was, OR (THSI1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

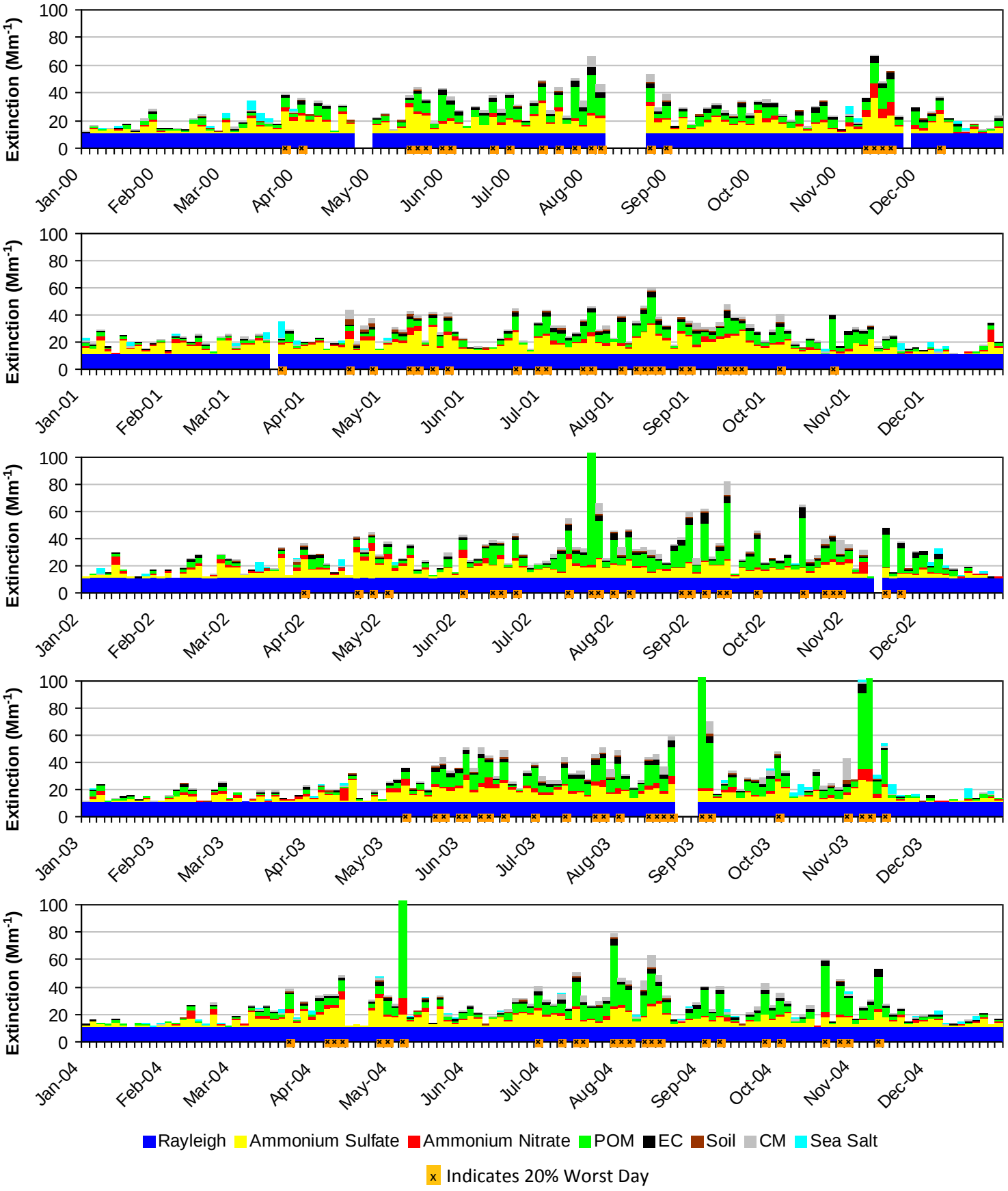
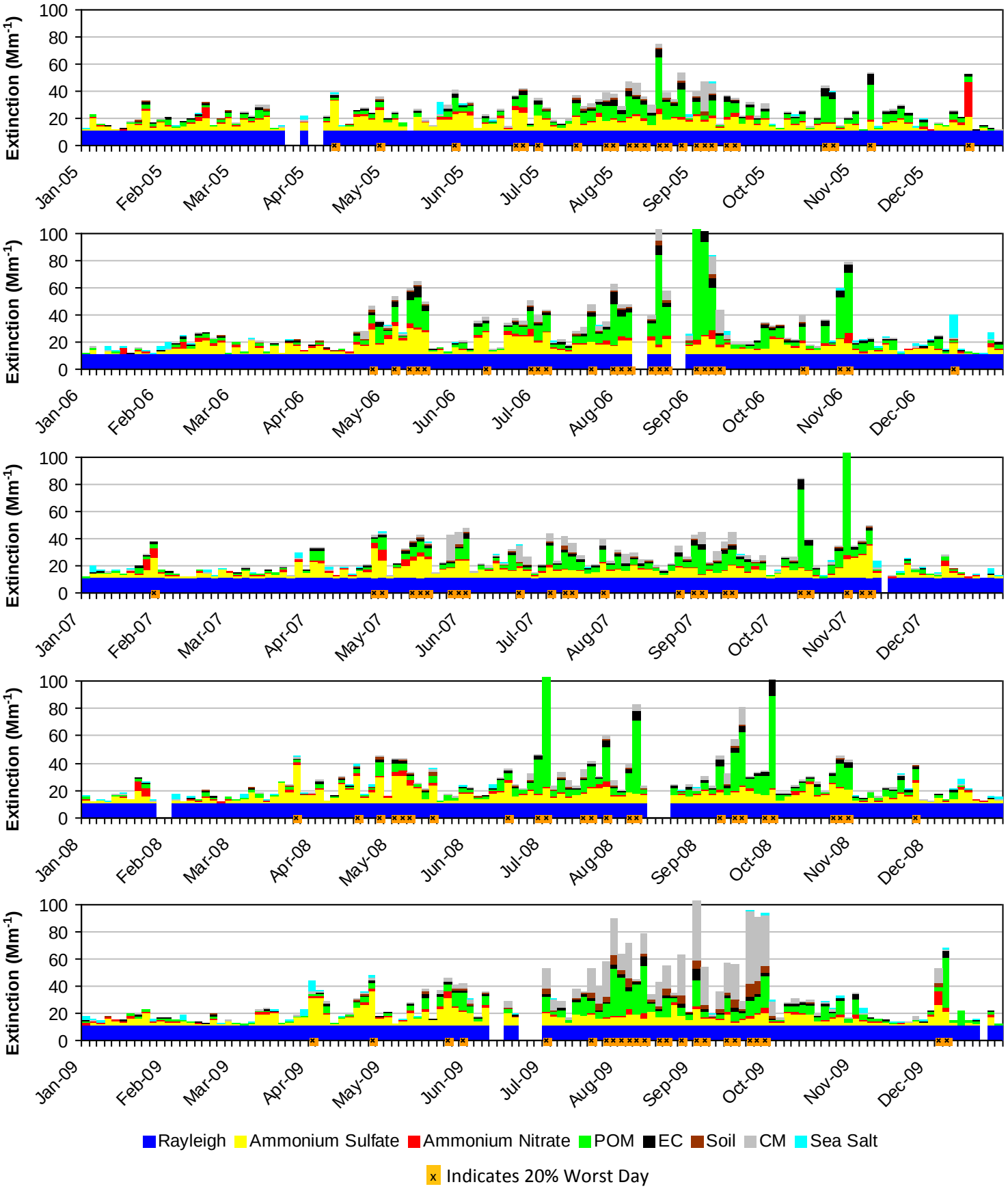


Figure K.8-8
Three Sisters, Mount Jefferson and Mount Washington Was, OR (THSI1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



APPENDIX L:

South Dakota Class I Area Monitoring Data Summary Tables and Charts

Includes the following subsections:

Subsection	IMPROVE Monitor	Class I Area(s) Represented
L.1	BADL1	Badlands NP and Mount Baldy WA
L.2	WICA1	Wind Cave NP

L.1. BADLANDS NP (BADL1)

The following tables and figures are presented in this section for Badlands NP represented by the BADL1 IMPROVE Monitor:

- **Table L.1-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure L.1-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure L.1-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure L.1-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure L.1-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure L.1-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure L.1-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure L.1-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure L.1-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table L.1-1
Badlands NP, SD (BADL1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period						2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	7.4	7.5	6.7	6.3	6.6	7.0	6.2	7.1	7.6	6.1	6.3	0.0	0.2	6.9	6.8	-0.1	-1%
Worst 20% Days	18.1	17.6	16.2	17.8	15.9	16.3	17.5	16.6	17.3	15.1	16.6	-0.1	0.1	17.1	16.6	-0.5	-3%
All Days	12.2	12.2	11.1	11.5	10.9	11.4	11.5	11.8	12.2	10.5	10.9	-0.1	0.3	11.6	11.5	-0.1	-1%
Total Extinction (Mm-1)																	
Best 20% Days	21.1	21.2	19.6	18.8	19.4	20.4	18.7	20.3	21.5	18.5	18.8	-0.1	0.2	20.0	19.9	-0.1	-1%
Worst 20% Days	63.5	59.3	51.3	61.5	50.3	51.5	58.4	53.3	61.9	45.9	53.7	-0.9	0.2	57.2	54.2	-3.0	-5%
All Days	36.8	36.2	32.1	34.7	31.7	33.1	34.3	34.4	36.9	30.1	31.9	-0.3	0.2	34.3	33.8	-0.5	-2%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	4.3	3.9	2.6	3.0	3.0	4.0	3.0	3.6	3.5	3.2	3.4	0.0	0.3	3.4	3.5	0.1	3%
Worst 20% Days	19.0	23.3	17.4	16.2	18.4	21.8	18.2	17.8	17.2	19.1	22.1	-0.1	0.3	18.9	18.8	-0.1	-1%
All Days	10.1	11.1	8.5	8.6	9.0	10.7	10.1	9.7	9.6	9.3	9.8	-0.1	0.4	9.4	9.9	0.5	5%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	1.4	1.6	0.9	0.8	1.3	1.2	0.8	1.5	1.1	1.0	1.1	0.0	0.2	1.2	1.1	-0.1	-8%
Worst 20% Days	3.6	7.4	4.7	7.2	6.3	6.1	5.3	6.2	5.3	4.0	10.9	-0.2	0.2	5.8	5.4	-0.4	-7%
All Days	2.8	3.9	2.8	3.6	2.7	2.6	2.7	3.4	2.8	2.5	3.9	0.0	0.0	3.1	2.8	-0.3	-10%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.9	1.9	1.8	1.8	1.6	2.0	1.4	1.8	4.1	1.5	1.3	0.0	0.2	1.8	2.2	0.4	22%
Worst 20% Days	18.7	7.9	7.4	16.2	8.6	5.8	13.2	10.6	17.2	5.7	4.7	-0.3	0.3	11.8	10.5	-1.3	-11%
All Days	7.2	4.4	4.0	6.1	4.4	4.1	5.2	5.3	8.6	3.4	3.2	-0.1	0.5	5.2	5.3	0.1	2%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.8	0.9	0.9	0.6	0.7	0.8	0.6	0.6	0.3	0.5	0.5	0.0	0.0	0.8	0.6	-0.2	-25%
Worst 20% Days	4.0	2.6	1.9	2.9	1.6	2.1	2.7	2.0	1.6	1.2	1.4	-0.2	0.0	2.6	1.9	-0.7	-27%
All Days	2.0	1.6	1.2	1.5	1.1	1.3	1.4	1.2	0.8	0.8	0.9	-0.1	0.0	1.5	1.1	-0.4	-27%
Soil Extinction (Mm-1)																	
Best 20% Days	0.3	0.4	0.4	0.2	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.0	0.5	0.3	0.3	0.0	0%
Worst 20% Days	1.0	1.3	1.1	0.7	0.7	0.8	1.2	0.9	1.2	0.7	0.7	0.0	0.4	1.0	1.0	0.0	0%
All Days	0.6	0.8	0.7	0.5	0.5	0.6	0.6	0.6	0.7	0.5	0.6	0.0	0.5	0.6	0.6	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	1.3	1.6	1.9	1.3	1.4	1.1	1.4	1.5	1.1	1.0	1.2	0.0	0.2	1.5	1.2	-0.3	-20%
Worst 20% Days	6.1	5.9	7.3	7.0	3.5	3.9	6.8	4.7	6.3	4.0	2.8	-0.2	0.2	5.9	5.1	-0.8	-14%
All Days	3.1	3.5	3.8	3.5	2.9	2.7	3.2	3.2	3.0	2.4	2.4	-0.1	0.0	3.4	2.9	-0.5	-15%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0%
Worst 20% Days	0.0	0.0	0.5	0.3	0.1	0.1	0.1	0.2	2.2	0.2	0.1	0.0	0.2	0.2	0.5	0.3	>100%
All Days	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.5	0.1	0.0	0.0	0.2	0.1	0.1	0.0	0%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure L.1-1
Badlands NP, SD (BADL1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

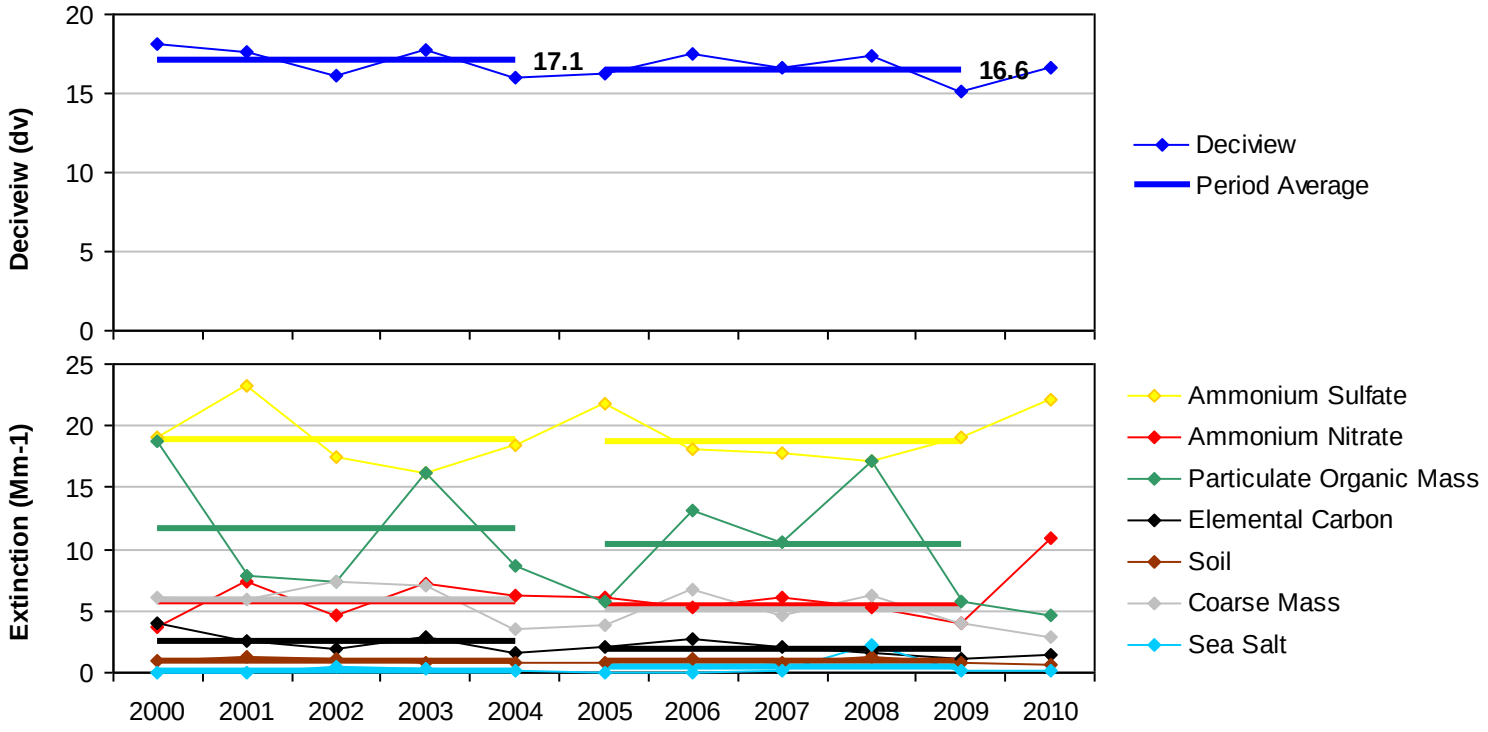


Figure L.1-2
Badlands NP, SD (BADL1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

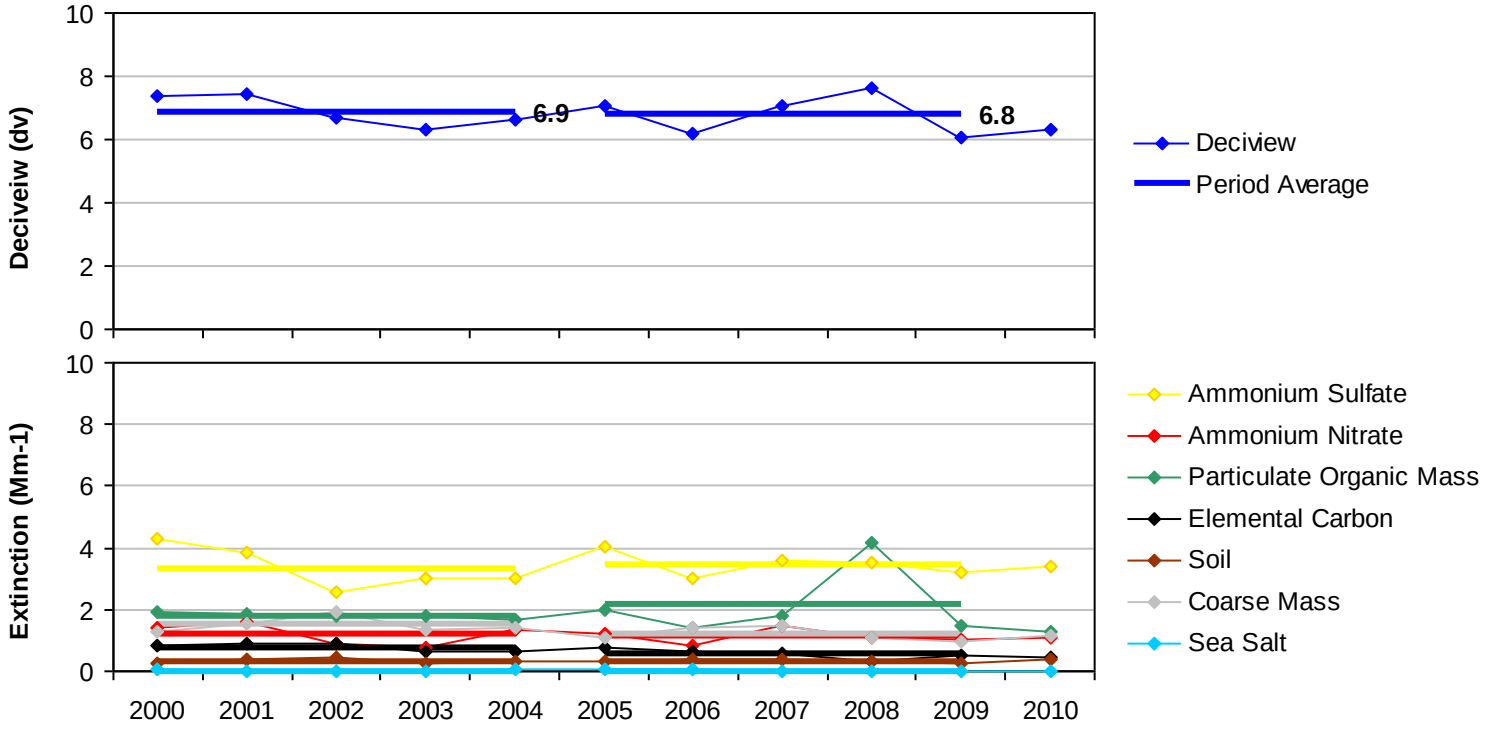
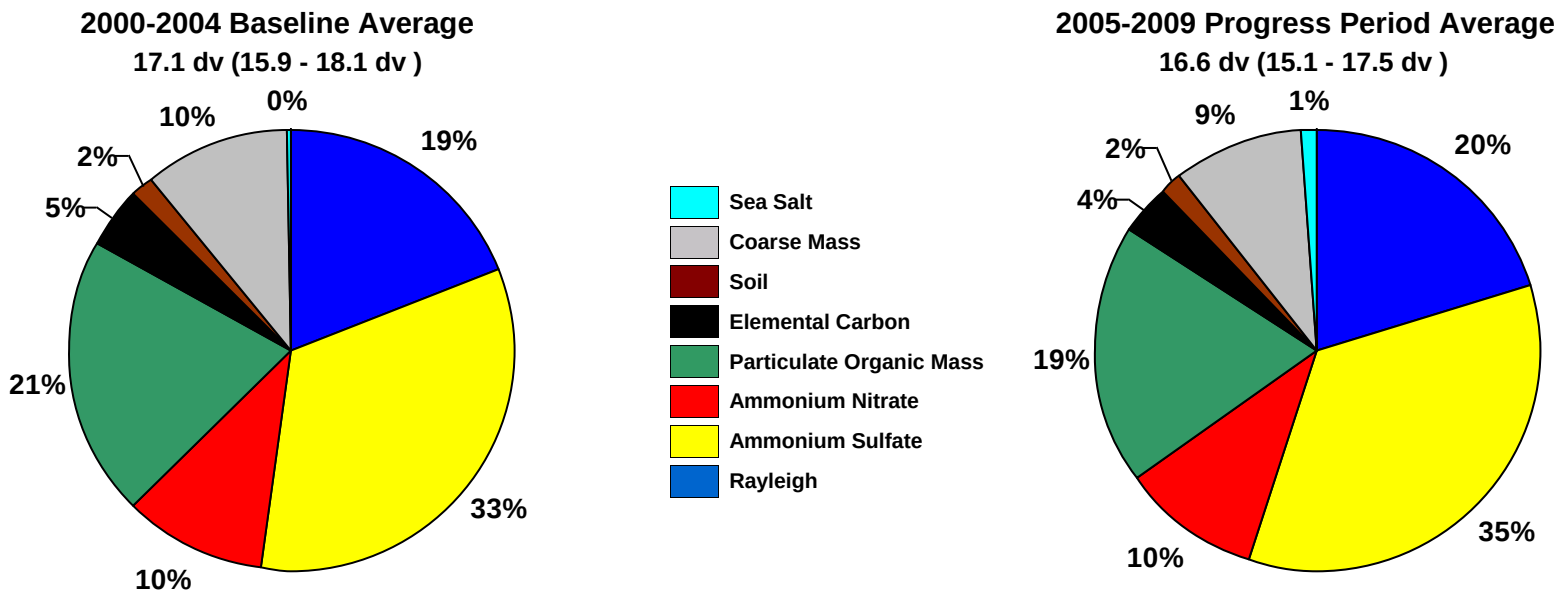


Figure L.1-3
Badlands NP, SD (BADL1 Site)
20% Most Impaired Visibility Days



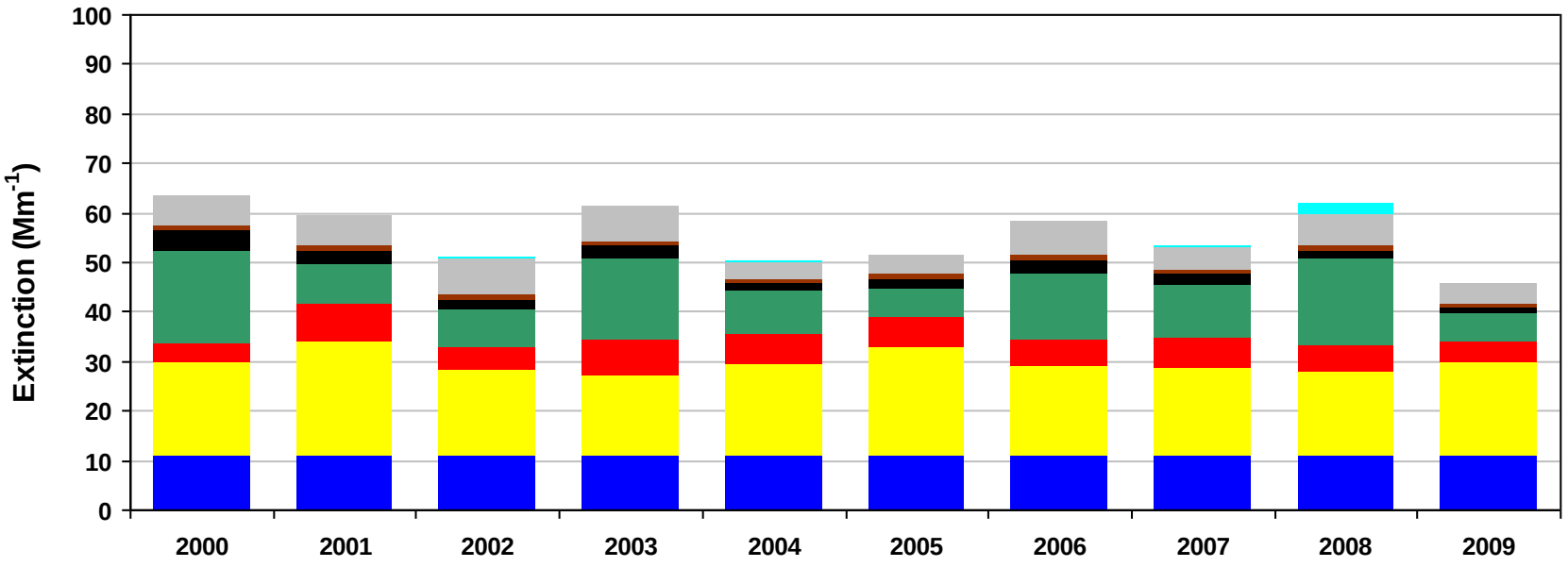


Figure L.1-4
Badlands NP, SD (BADL1 Site)
20% Least Impaired Visibility Days

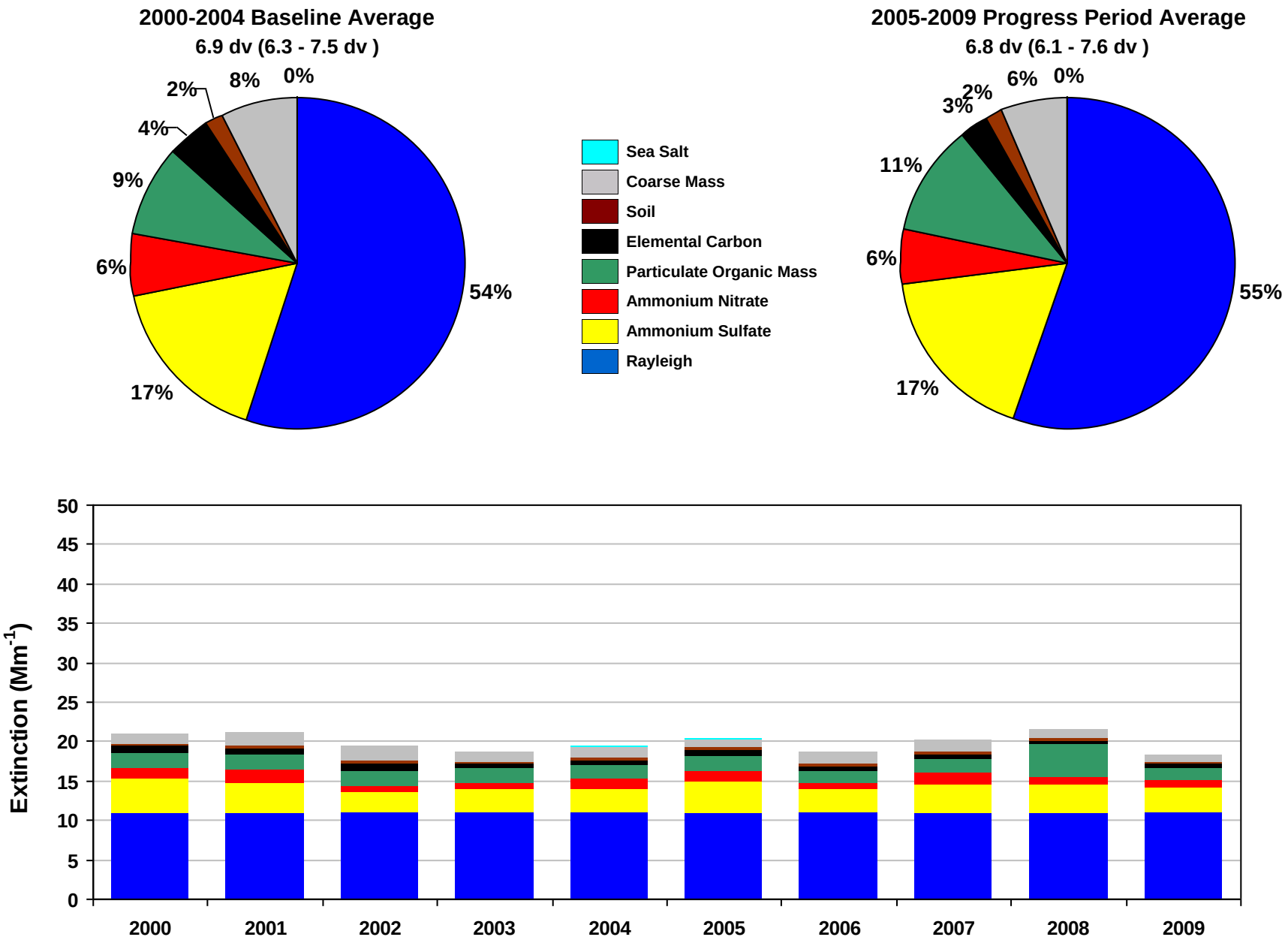


Figure L.1-5
Badlands NP, SD (BADL1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

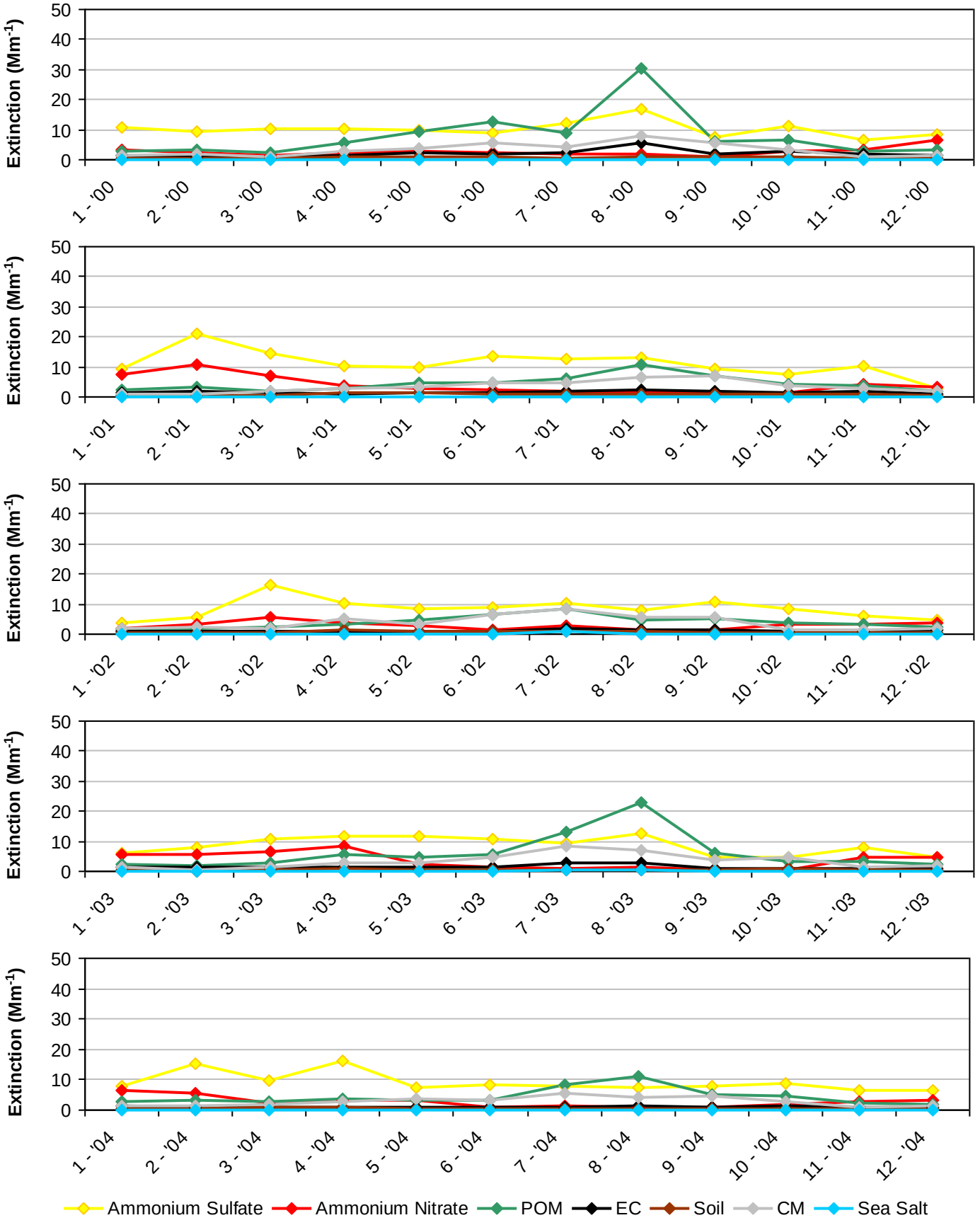


Figure L.1-6
Badlands NP, SD (BADL1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

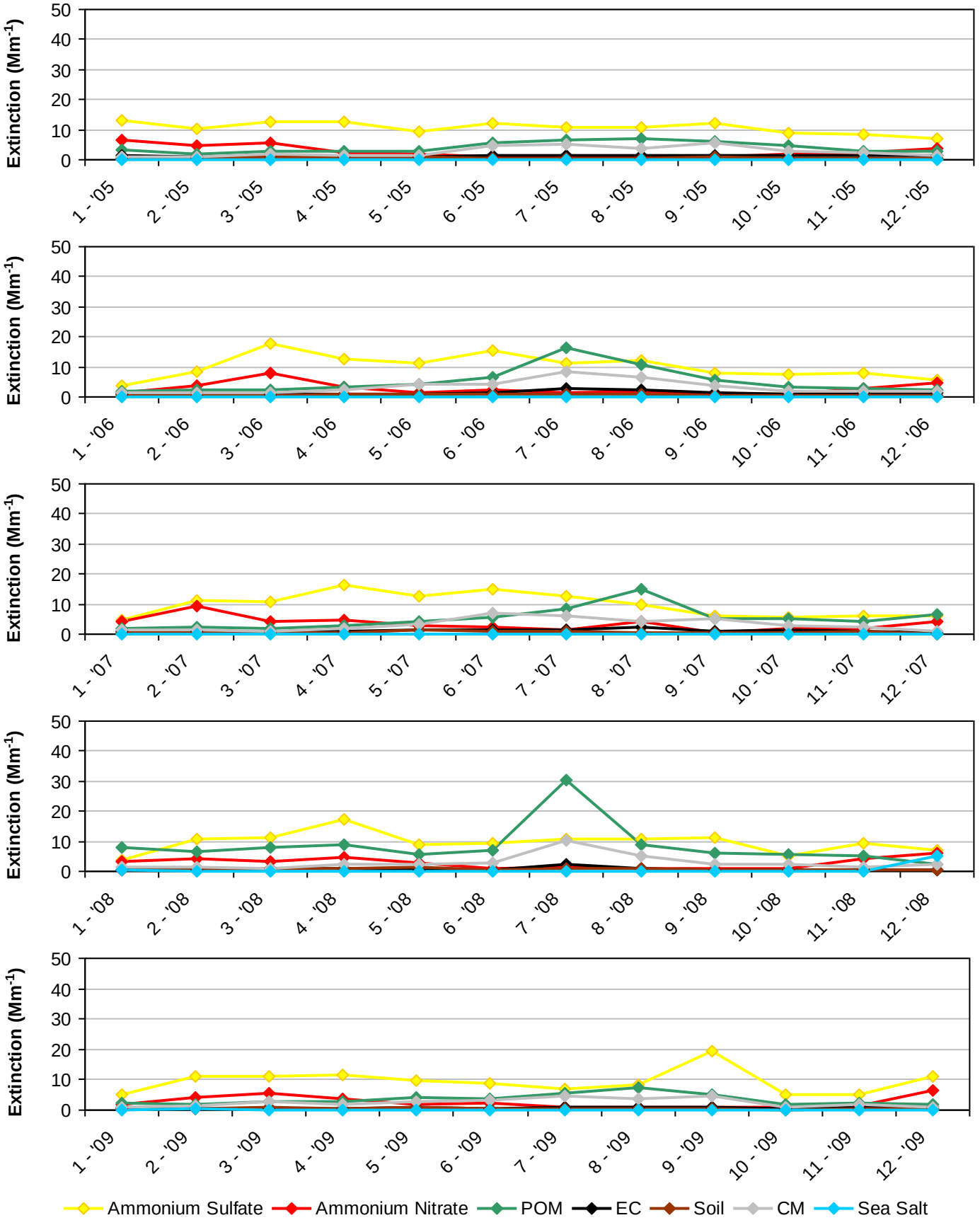


Figure L.1-7
Badlands NP, SD (BADL1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

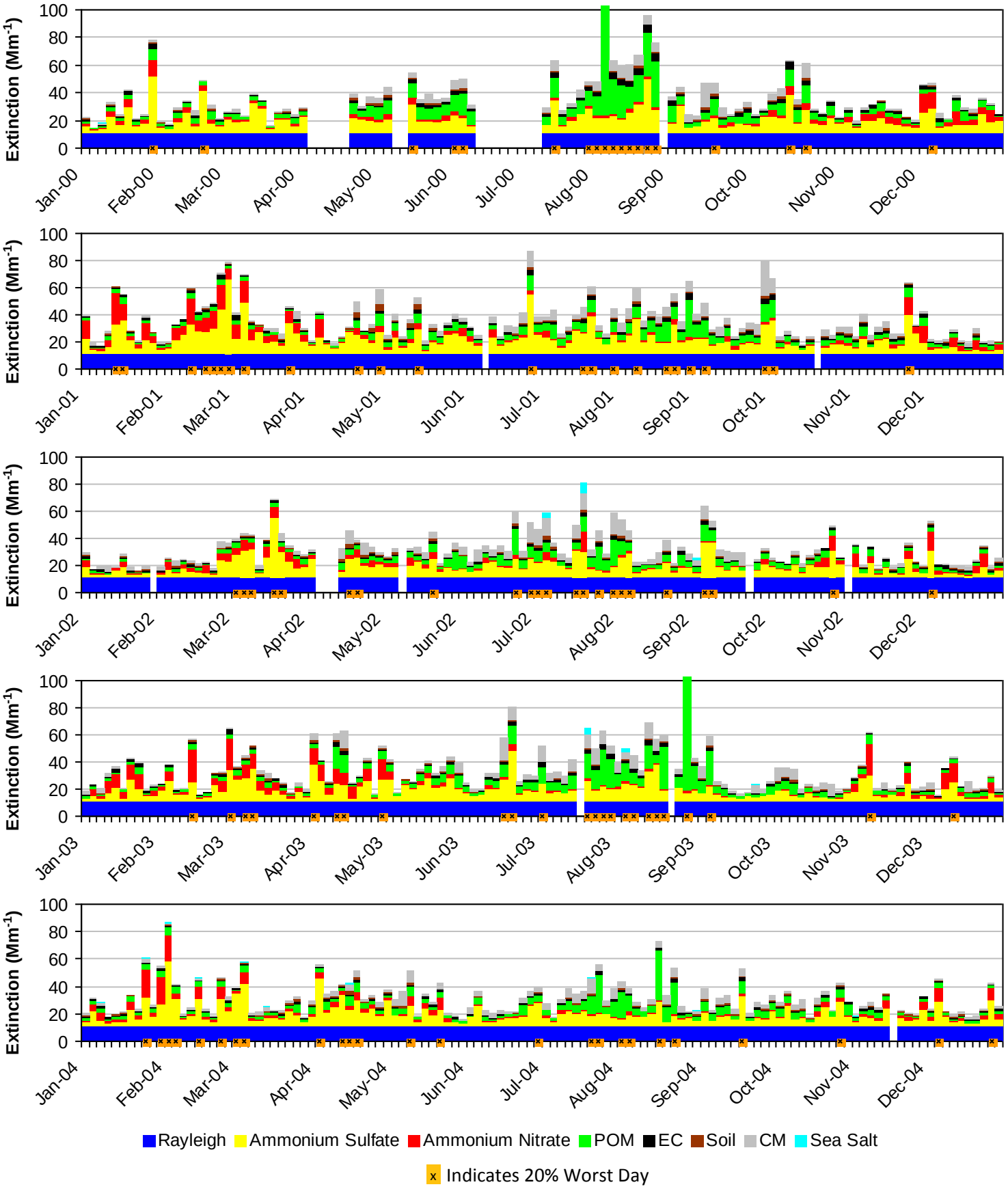
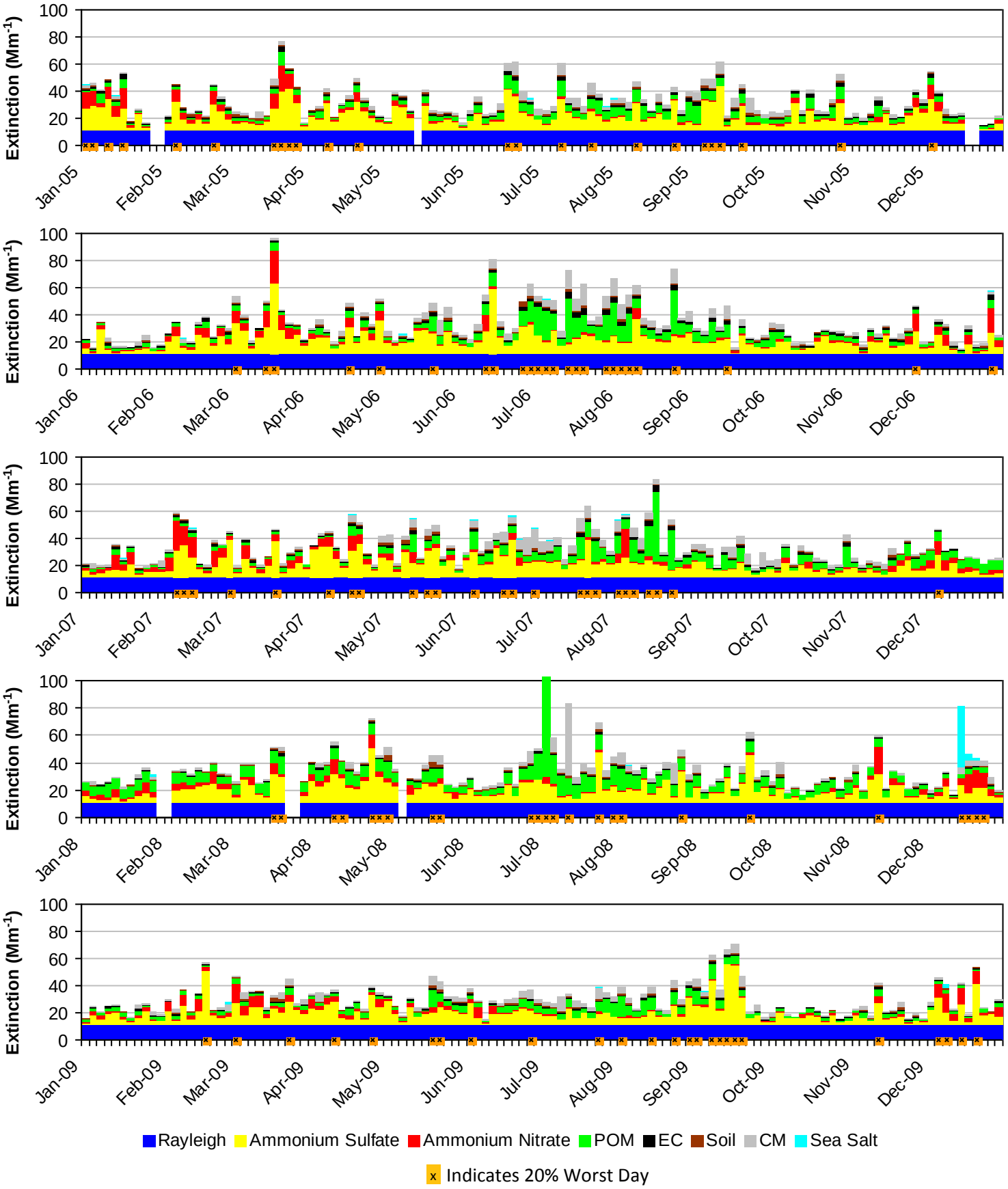


Figure L.1-8
Badlands NP, SD (BADL1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



L.2. WIND CAVE NP (WICA1)

The following tables and figures are presented in this section for the Wind Cave NP represented by the WICA1 IMPROVE Monitor:

- **Table L.2-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure L.2-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure L.2-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure L.2-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure L.2-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure L.2-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure L.2-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure L.2-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure L.2-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table L.2-1
Wind Cave NP, SD (WICA1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	5.6	5.1	5.2	5.0	4.8	4.7	4.5	5.5	4.3	3.8	4.5	-0.2	0.0	5.1	4.6	-0.5	-10%
Worst 20% Days	16.1	15.3	16.6	16.1	15.1	15.7	16.3	16.5	15.1	13.9	15.3	-0.1	0.2	15.8	15.5	-0.3	-2%
All Days	10.0	9.7	10.0	9.9	9.3	9.6	9.9	10.5	9.5	8.5	9.1	-0.1	0.1	9.8	9.6	-0.2	-2%
Total Extinction (Mm-1)																	
Best 20% Days	17.6	16.7	16.9	16.5	16.3	16.1	15.8	17.4	15.5	14.7	15.7	-0.2	0.0	16.8	15.9	-0.9	-5%
Worst 20% Days	51.9	48.1	55.3	51.1	47.3	51.3	54.5	54.6	50.5	41.9	68.8	-0.2	0.3	50.7	50.6	-0.1	0%
All Days	29.6	28.4	30.1	29.5	27.6	28.7	29.9	31.4	28.8	25.4	31.2	-0.1	0.4	29.1	28.8	-0.3	-1%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	3.1	2.6	2.3	2.5	2.4	2.7	2.3	3.2	2.1	2.1	2.5	-0.1	0.1	2.6	2.5	-0.1	-4%
Worst 20% Days	11.6	14.3	14.7	12.7	12.8	14.6	16.2	14.2	10.1	13.4	10.6	0.1	0.5	13.2	13.7	0.5	4%
All Days	6.8	7.3	7.1	6.8	6.5	7.6	7.7	7.8	6.6	6.6	5.9	0.0	0.4	6.9	7.3	0.4	6%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	1.1	0.9	0.7	0.5	0.8	0.7	0.5	0.8	0.7	0.6	0.6	0.0	0.1	0.8	0.6	-0.2	-25%
Worst 20% Days	4.7	9.3	5.9	6.2	8.9	8.7	5.6	6.9	4.5	3.7	11.2	-0.2	0.1	7.0	5.9	-1.1	-16%
All Days	2.5	3.3	2.3	2.7	2.9	2.7	2.2	3.0	2.1	1.6	3.3	-0.1	0.1	2.7	2.3	-0.4	-15%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.7	1.3	1.4	1.5	1.3	1.1	1.1	1.6	1.3	0.9	1.1	0.0	0.1	1.4	1.2	-0.2	-14%
Worst 20% Days	17.0	7.9	16.6	15.1	9.5	11.2	14.0	16.1	17.1	8.4	29.8	-0.1	0.5	13.2	13.4	0.2	2%
All Days	6.0	4.0	5.9	6.0	4.4	4.4	5.4	6.2	5.9	3.7	8.1	0.0	0.4	5.2	5.1	-0.1	-2%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.9	0.6	0.7	0.6	0.7	0.7	0.6	0.6	0.4	0.4	0.4	0.0	0.0	0.7	0.5	-0.2	-29%
Worst 20% Days	3.7	2.2	3.1	2.4	3.2	2.8	3.3	2.8	2.5	1.6	3.6	-0.1	0.2	2.9	2.6	-0.3	-10%
All Days	1.8	1.3	1.4	1.4	1.4	1.4	1.6	1.4	1.2	0.9	1.4	0.0	0.2	1.5	1.3	-0.2	-13%
Soil Extinction (Mm-1)																	
Best 20% Days	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.3	0.2	0.2	0.0	0%
Worst 20% Days	1.0	0.8	1.0	0.7	0.8	0.8	1.0	1.0	1.0	1.2	0.7	0.0	0.1	0.9	1.0	0.1	11%
All Days	0.5	0.5	0.6	0.4	0.5	0.6	0.6	0.6	0.6	0.7	0.6	0.0	0.0	0.5	0.6	0.1	20%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	0.7	1.0	1.5	1.1	0.9	0.8	1.1	0.9	0.8	0.6	0.8	0.0	0.2	1.1	0.8	-0.3	-27%
Worst 20% Days	3.9	3.5	4.1	4.0	2.1	3.1	4.3	3.6	4.4	3.4	2.9	0.0	0.4	3.5	3.8	0.3	9%
All Days	2.1	2.1	2.7	2.2	1.7	1.8	2.4	2.2	2.3	1.8	2.0	0.0	0.5	2.2	2.1	-0.1	-5%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0%
Worst 20% Days	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	1.0	0.2	0.1	0.0	0.0	0.0	0.3	0.3	0%
All Days	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure L.2-1
Wind Cave NP, SD (WICA1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

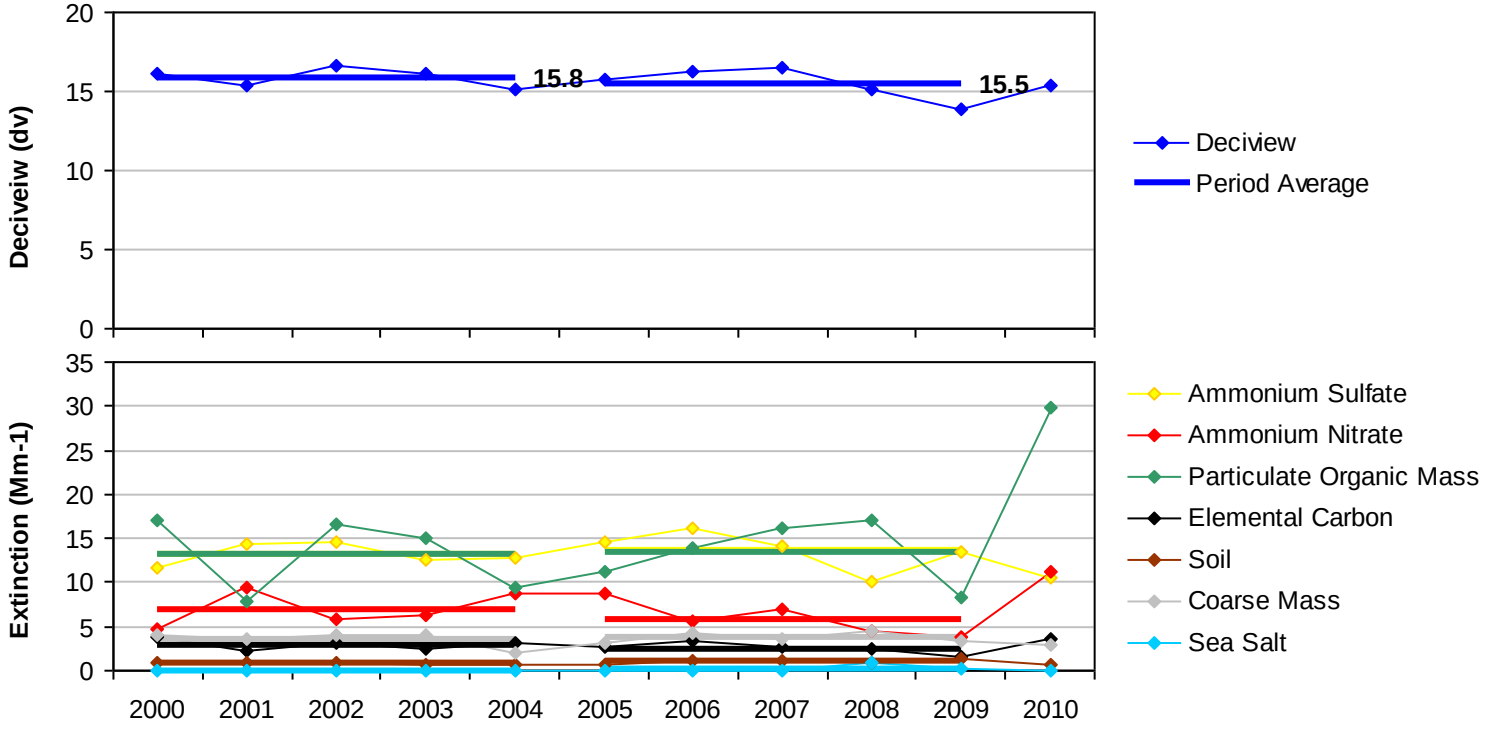


Figure L.2-2
Wind Cave NP, SD (WICA1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

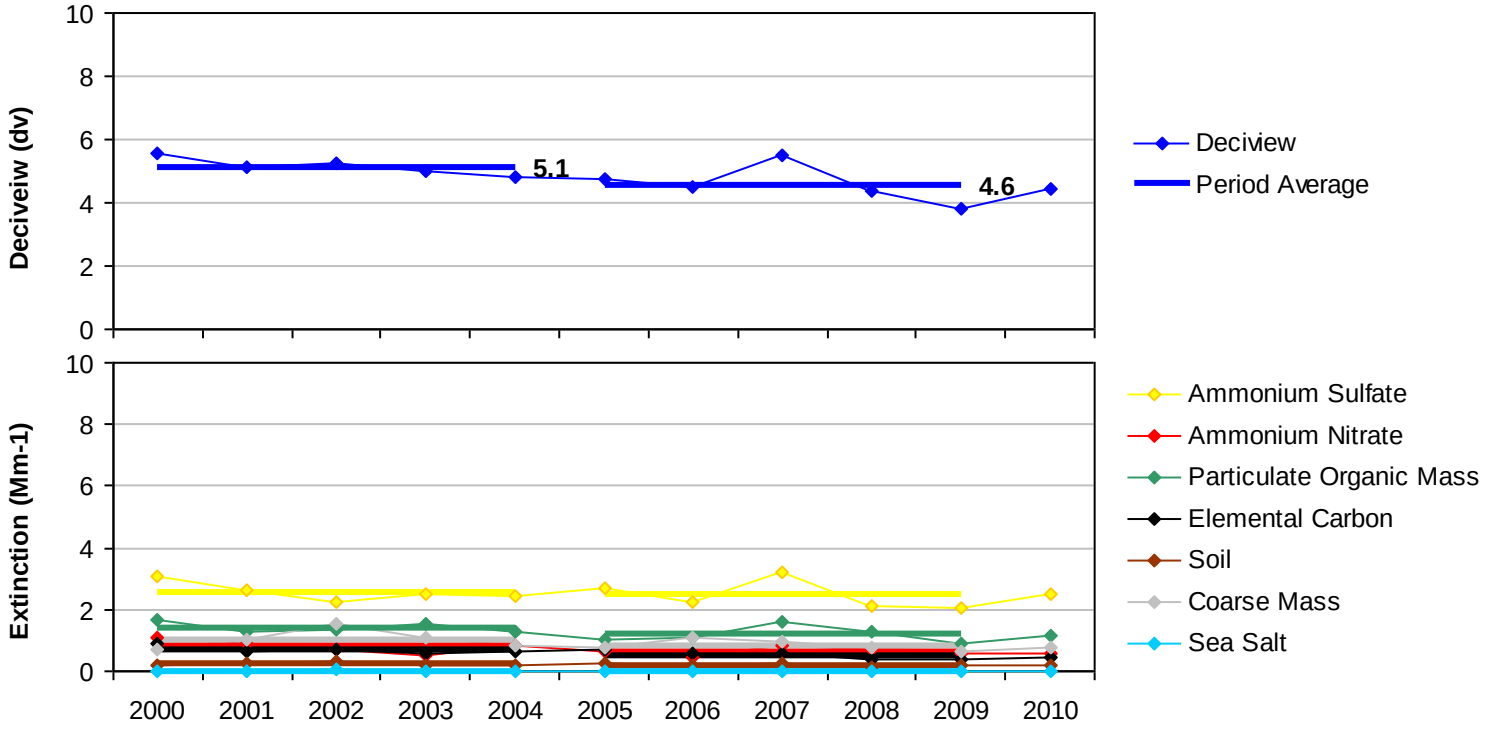
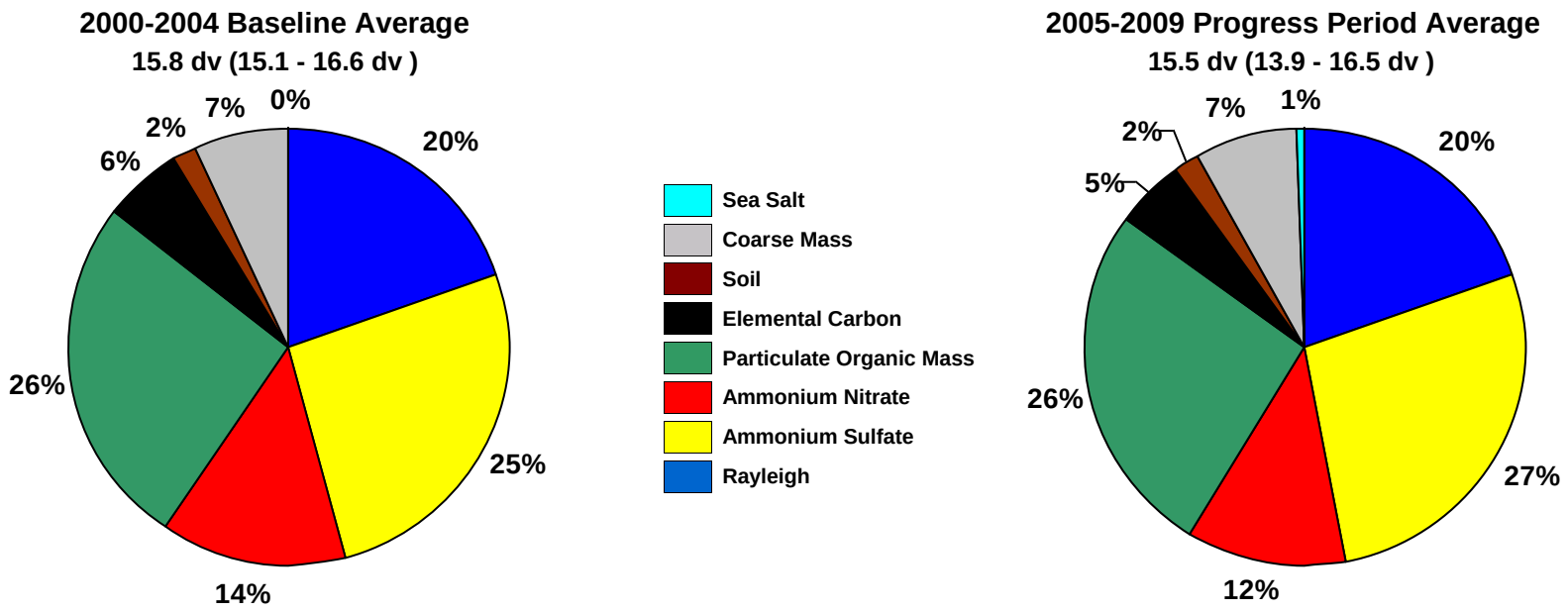


Figure L.2-3
Wind Cave NP, SD (WICA1 Site)
20% Most Impaired Visibility Days



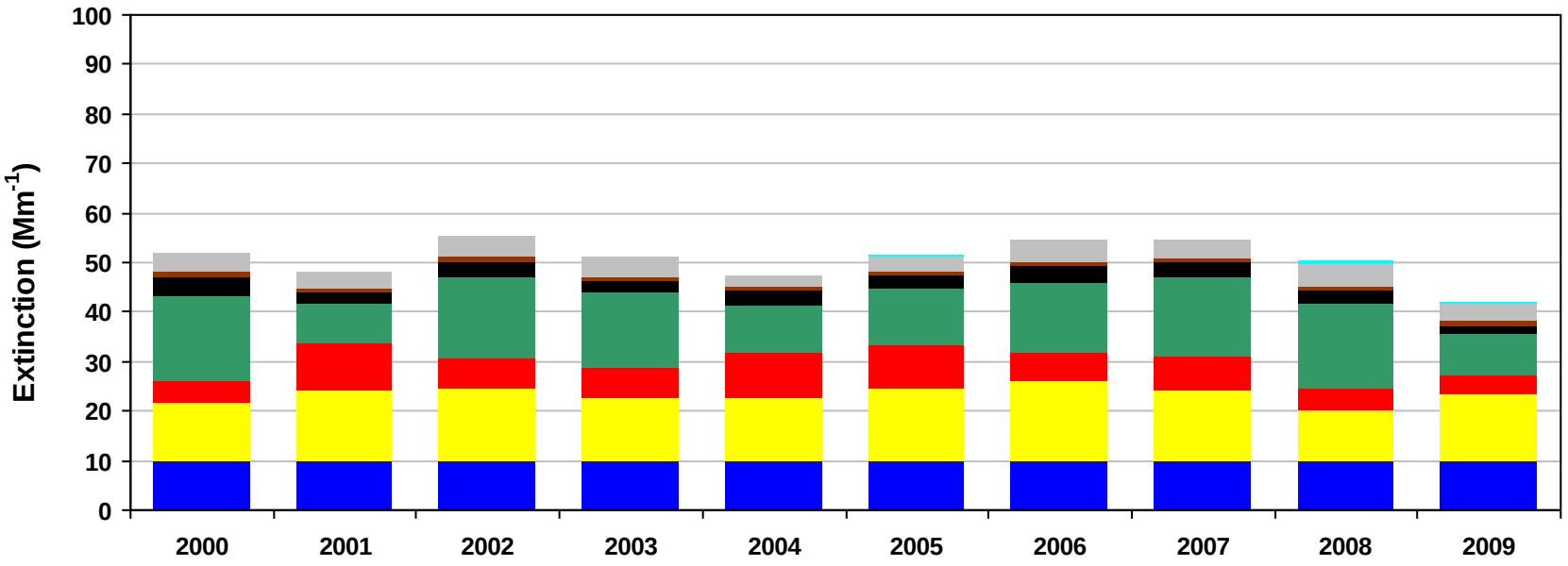
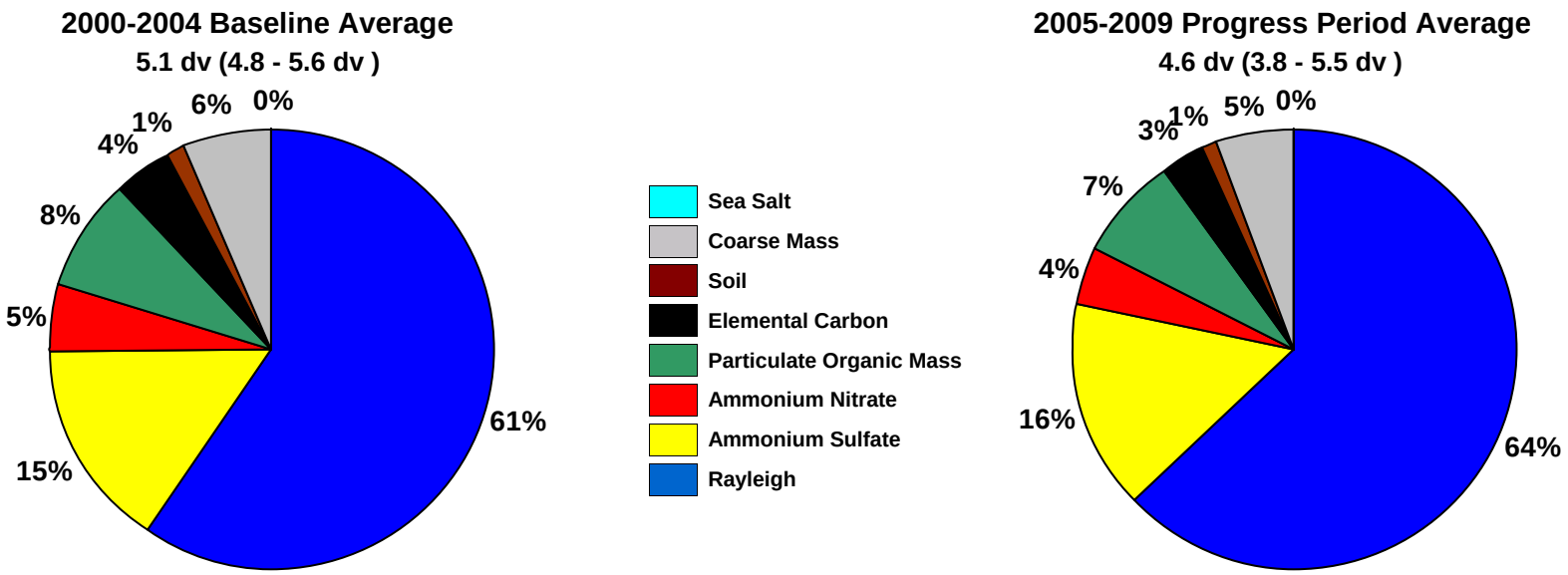


Figure L.2-4
Wind Cave NP, SD (WICA1 Site)
20% Least Impaired Visibility Days



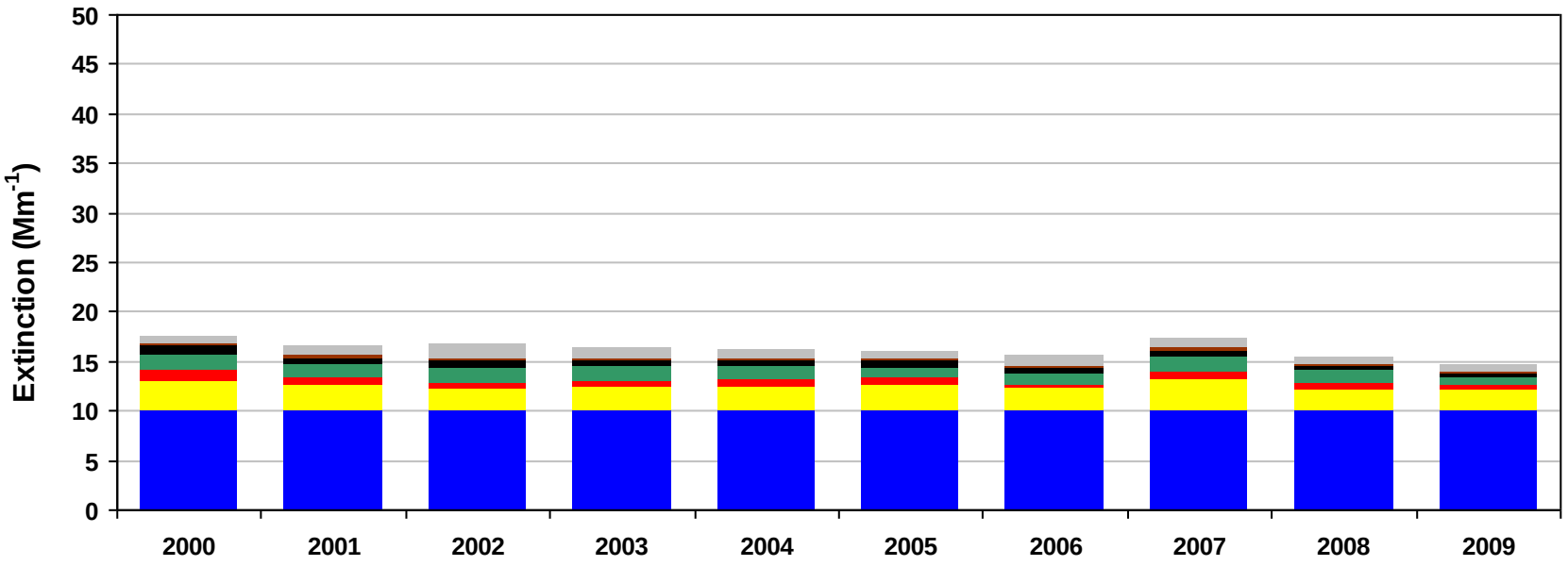


Figure L.2-5
Wind Cave NP, SD (WICA1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

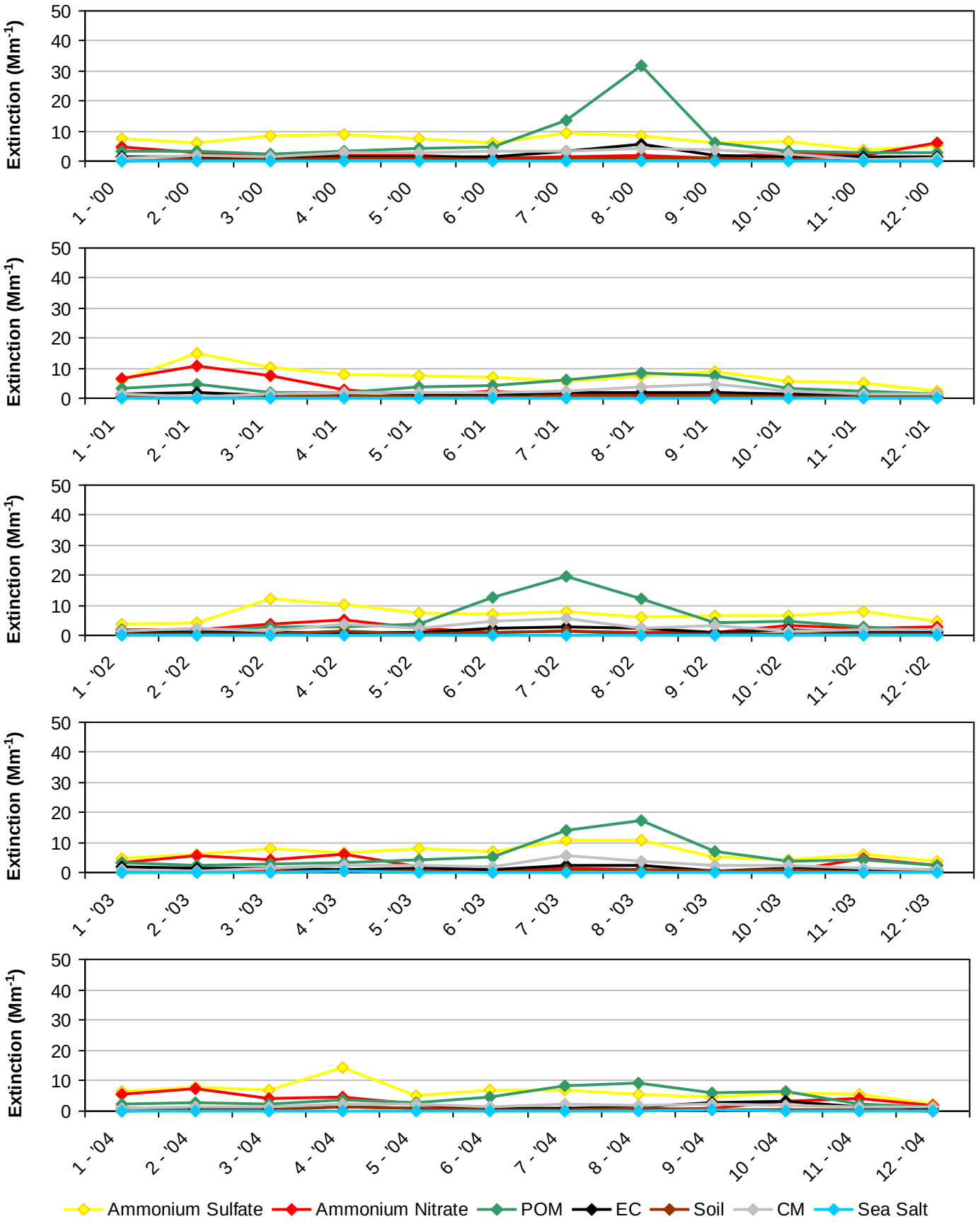


Figure L.2-6
Wind Cave NP, SD (WICA1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

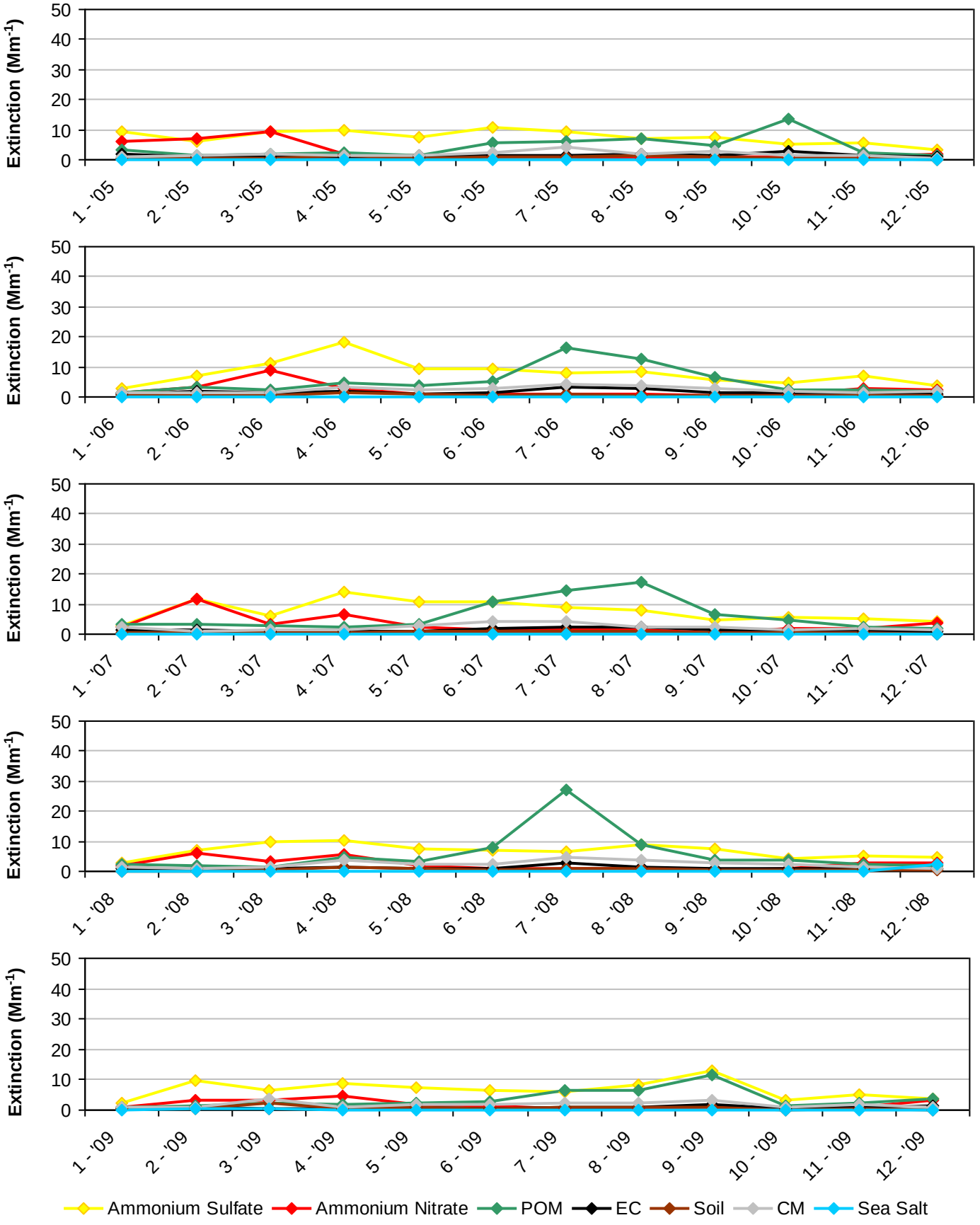


Figure L.2-7
Wind Cave NP, SD (WICA1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

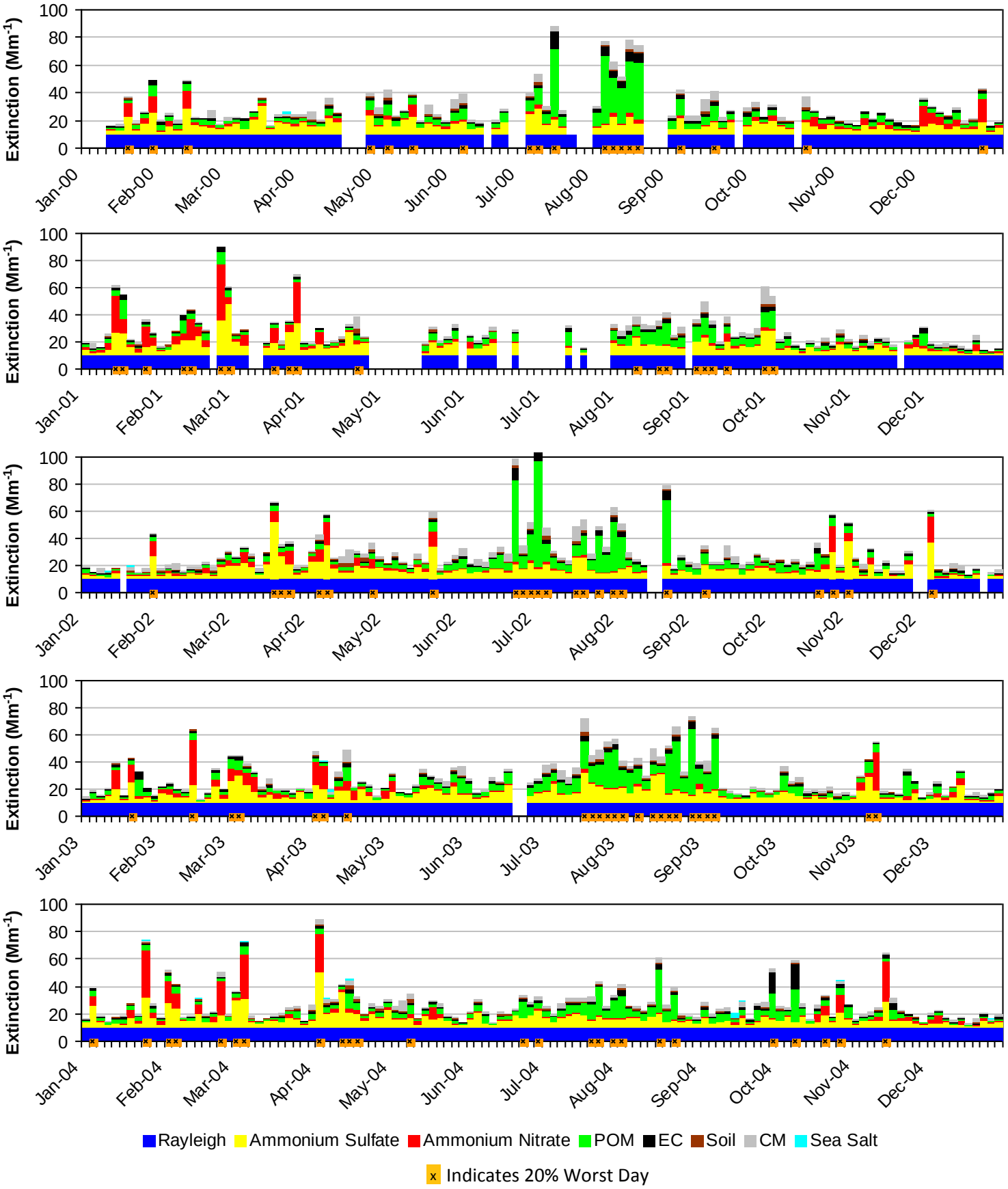
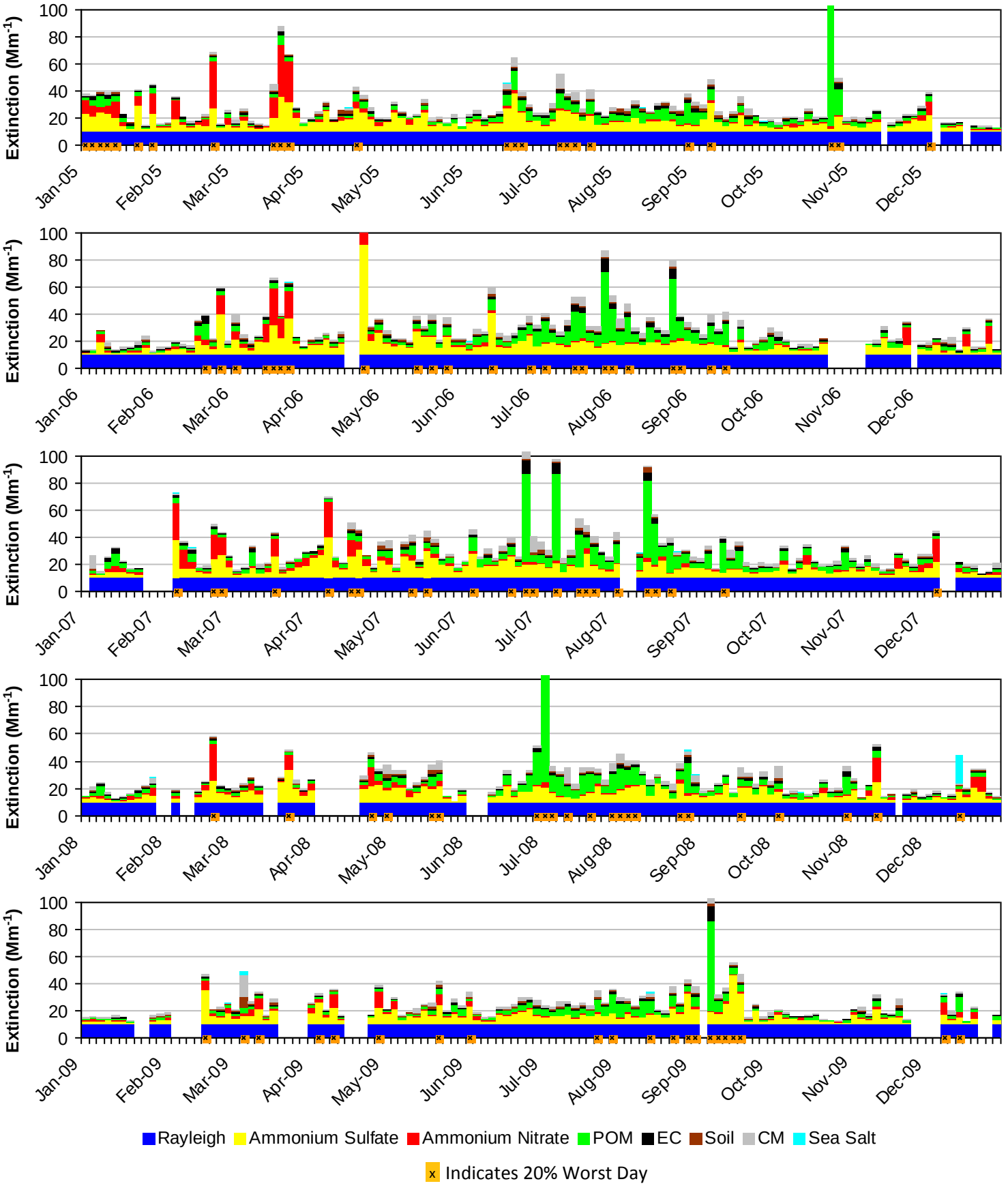


Figure L.2-8
Wind Cave NP, SD (WICA1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



APPENDIX M:

Utah Class I Area Monitoring Data Summary Tables and Charts

Includes the following subsections:

Subsection	IMPROVE Monitor	Class I Area(s) Represented
M.1	BRCA1	Bryce Canyon NP
M.2	CANY1	Canyonlands NP and Arches NP
M.3	CAPI1	Capitol Reef NP
M.4	ZICA1	Zion NP

M.1. BRYCE CANYON NP (BRCA1)

The following tables and figures are presented in this section for the Bryce Canyon NP represented by the BRCA1 IMPROVE Monitor:

- **Table M.1-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure M.1-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure M.1-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure M.1-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure M.1-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure M.1-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure M.1-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure M.1-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure M.1-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table M.1-1
Bryce Canyon NP, UT (BRCA1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	3.0	3.1	2.6	2.4	2.8	1.9	2.4	2.4	1.7	2.1	1.5	-0.1	0.0	2.8	2.1	-0.7	-25%
Worst 20% Days	10.8	11.3	13.2	11.1	11.8	11.8	10.7	12.7	11.0	13.3	9.2	0.1	0.2	11.6	11.9	0.3	3%
All Days	6.8	7.0	7.3	6.3	7.0	6.5	6.3	7.1	6.1	6.6	5.4	-0.1	0.2	6.9	6.5	-0.4	-6%
Total Extinction (Mm-1)																	
Best 20% Days	13.5	13.6	13.0	12.7	13.3	12.1	12.7	12.8	11.8	12.4	11.6	-0.1	0.0	13.2	12.4	-0.8	-6%
Worst 20% Days	30.0	33.0	38.8	33.8	33.4	33.8	29.4	37.9	30.9	43.7	25.9	0.4	0.2	33.8	35.1	1.3	4%
All Days	20.5	21.5	22.5	20.4	21.4	20.5	19.7	22.3	19.6	22.3	17.9	0.0	0.3	21.2	20.9	-0.3	-1%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	1.6	1.8	1.4	1.1	1.5	1.2	1.7	1.3	1.1	1.4	1.0	0.0	0.2	1.5	1.4	-0.1	-7%
Worst 20% Days	6.5	6.3	4.2	4.4	4.8	6.2	5.1	4.9	5.0	4.0	4.3	-0.2	0.2	5.2	5.0	-0.2	-4%
All Days	3.8	4.1	3.0	2.7	3.3	3.8	3.6	3.4	3.1	2.8	2.7	-0.1	0.2	3.4	3.3	-0.1	-3%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.7	0.8	0.8	0.5	0.7	0.4	0.4	0.7	0.4	0.6	0.4	0.0	0.0	0.7	0.5	-0.2	-29%
Worst 20% Days	2.6	3.8	1.4	1.4	3.4	2.3	2.3	3.8	1.5	1.4	3.1	-0.1	0.4	2.5	2.2	-0.3	-12%
All Days	1.4	1.6	1.5	1.2	1.7	1.1	1.3	1.8	1.0	1.0	1.2	0.0	0.2	1.5	1.2	-0.3	-20%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.2	0.8	1.0	1.1	1.1	0.8	0.7	0.9	0.6	0.6	0.7	-0.1	0.0	1.0	0.7	-0.3	-30%
Worst 20% Days	6.1	7.5	14.1	11.1	8.0	10.5	7.5	13.0	7.5	20.7	4.8	0.5	0.2	9.4	11.8	2.4	26%
All Days	3.1	3.2	4.6	4.0	3.6	3.8	2.9	4.4	3.0	5.7	2.3	0.1	0.3	3.7	4.0	0.3	8%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.4	0.4	0.4	0.3	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.0	0.0	0.4	0.2	-0.2	-50%
Worst 20% Days	2.1	1.9	2.3	2.4	3.2	2.6	2.1	3.0	1.5	3.5	1.3	0.1	0.2	2.4	2.5	0.1	4%
All Days	1.2	1.1	1.0	1.1	1.4	1.1	1.0	1.2	0.7	1.2	0.7	0.0	0.4	1.2	1.0	-0.2	-17%
Soil Extinction (Mm-1)																	
Best 20% Days	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.0	0.4	0.1	0.1	0.0	0%
Worst 20% Days	1.0	1.4	1.5	1.1	1.2	0.8	0.8	1.2	2.4	1.3	0.8	0.0	0.3	1.2	1.3	0.1	8%
All Days	0.5	0.7	0.7	0.5	0.6	0.4	0.5	0.7	0.9	0.7	0.5	0.0	0.2	0.6	0.6	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	0.5	0.7	0.4	0.5	0.3	0.3	0.4	0.4	0.4	0.4	0.2	0.0	0.1	0.5	0.4	-0.1	-20%
Worst 20% Days	2.6	3.1	6.1	4.3	3.9	2.5	2.6	2.9	3.7	3.7	2.5	0.0	0.4	4.0	3.1	-0.9	-23%
All Days	1.5	1.7	2.5	1.8	1.7	1.2	1.4	1.7	1.7	1.8	1.4	0.0	0.4	1.9	1.6	-0.3	-16%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
Worst 20% Days	0.0	0.0	0.3	0.0	0.1	0.0	0.0	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0%
All Days	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure M.1-1
Bryce Canyon NP, UT (BRCA1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

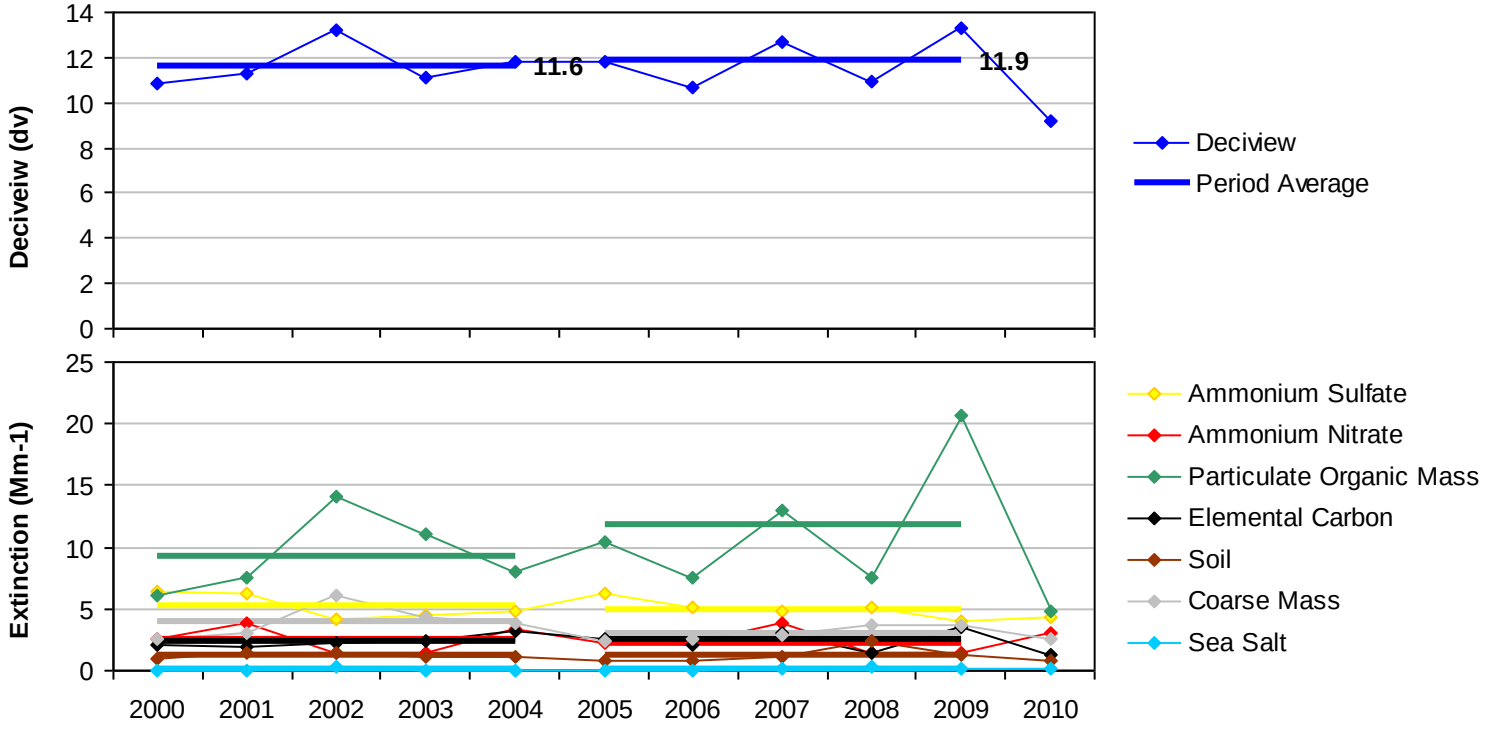


Figure M.1-2
Bryce Canyon NP, UT (BRCA1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

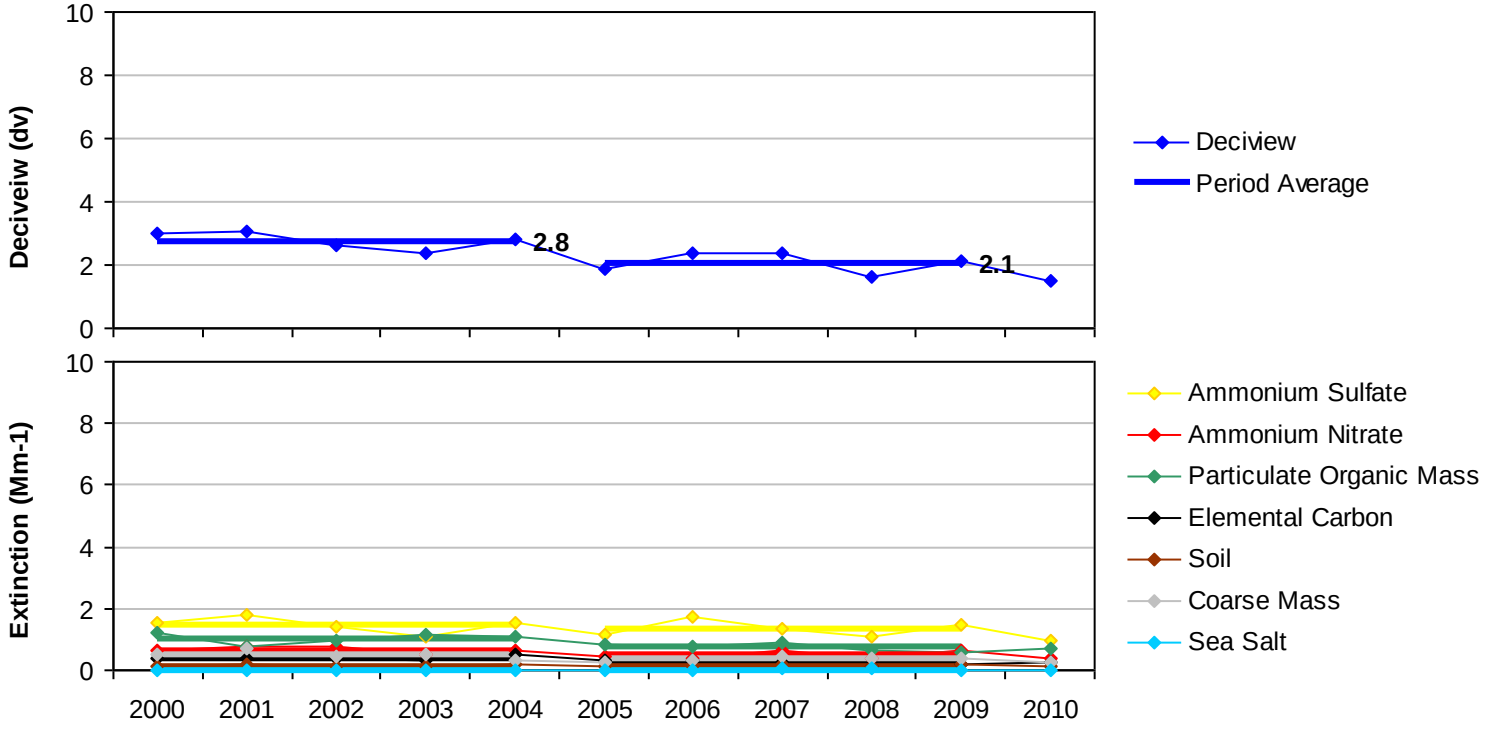


Figure M.1-3
Bryce Canyon NP, UT (BRCA1 Site)
20% Most Impaired Visibility Days

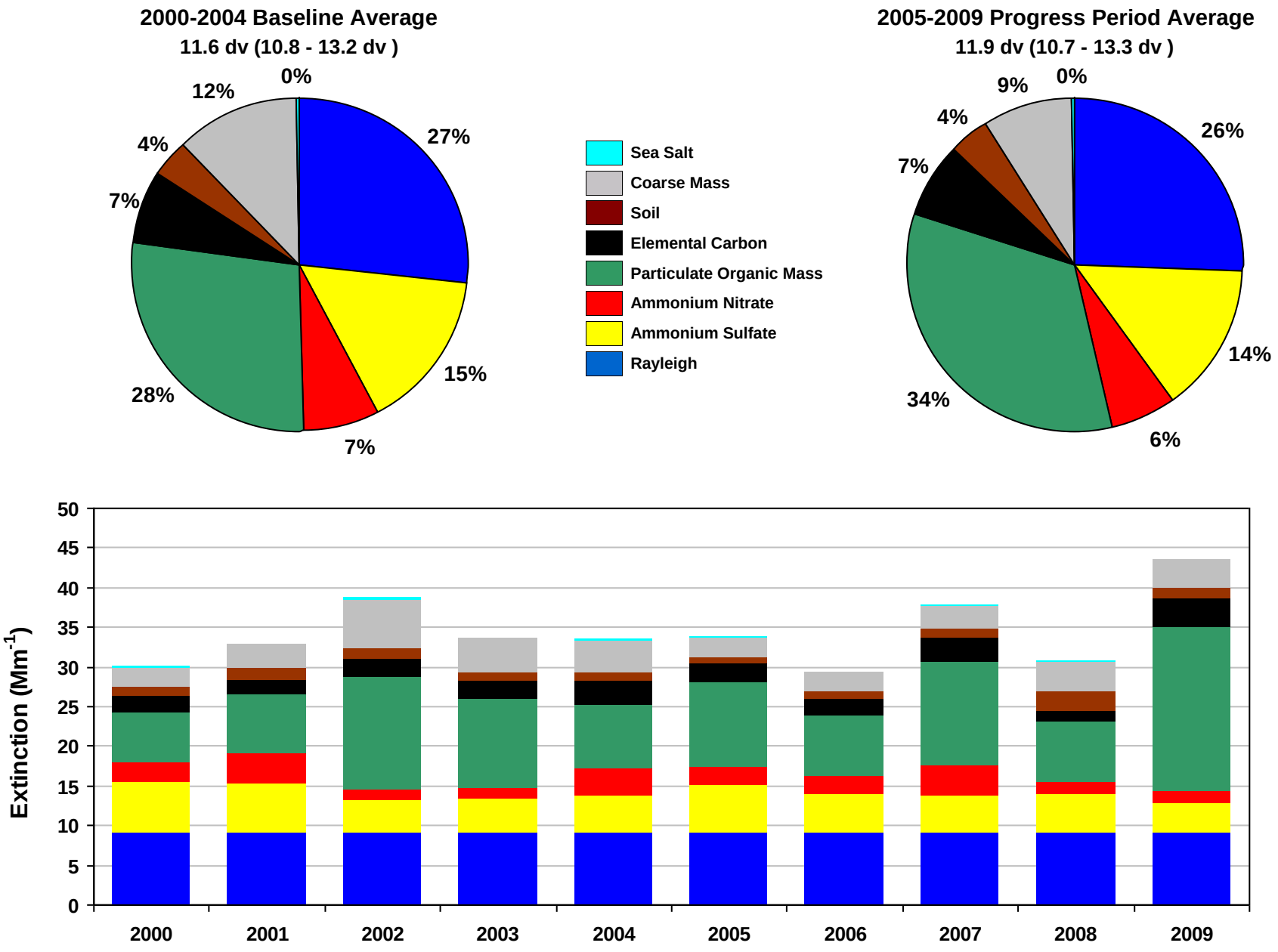
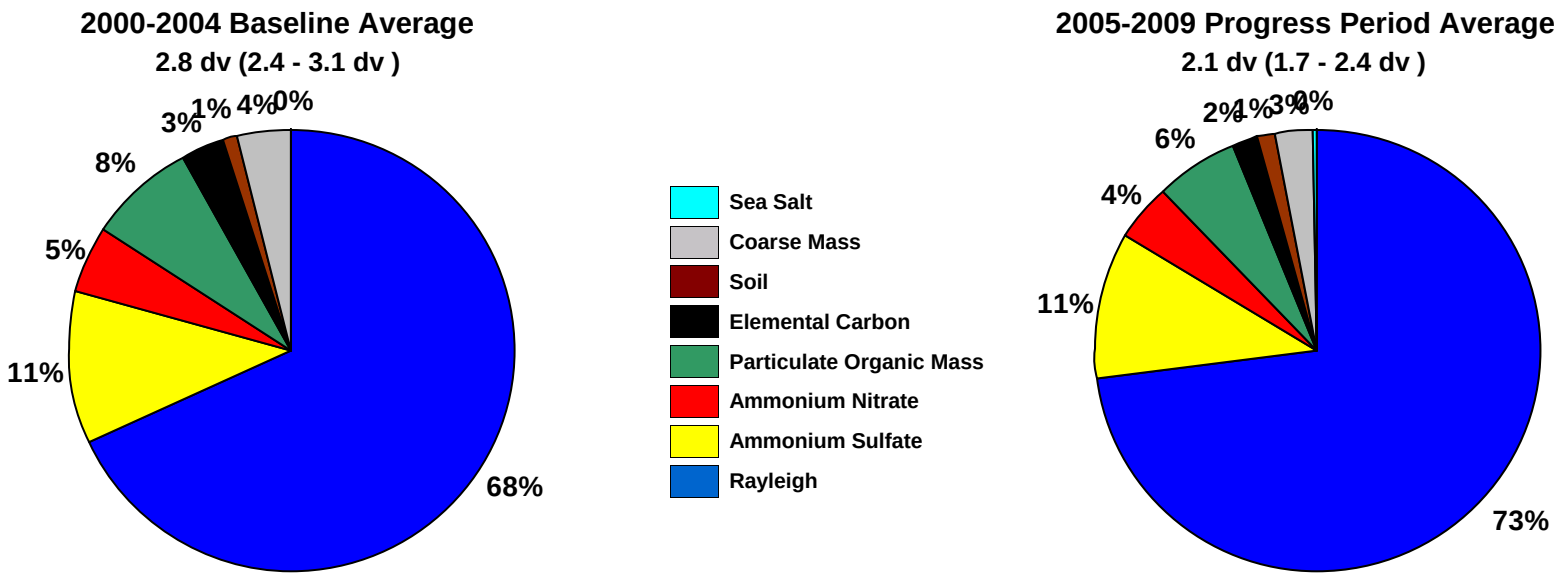


Figure M.1-4
Bryce Canyon NP, UT (BRCA1 Site)
20% Least Impaired Visibility Days



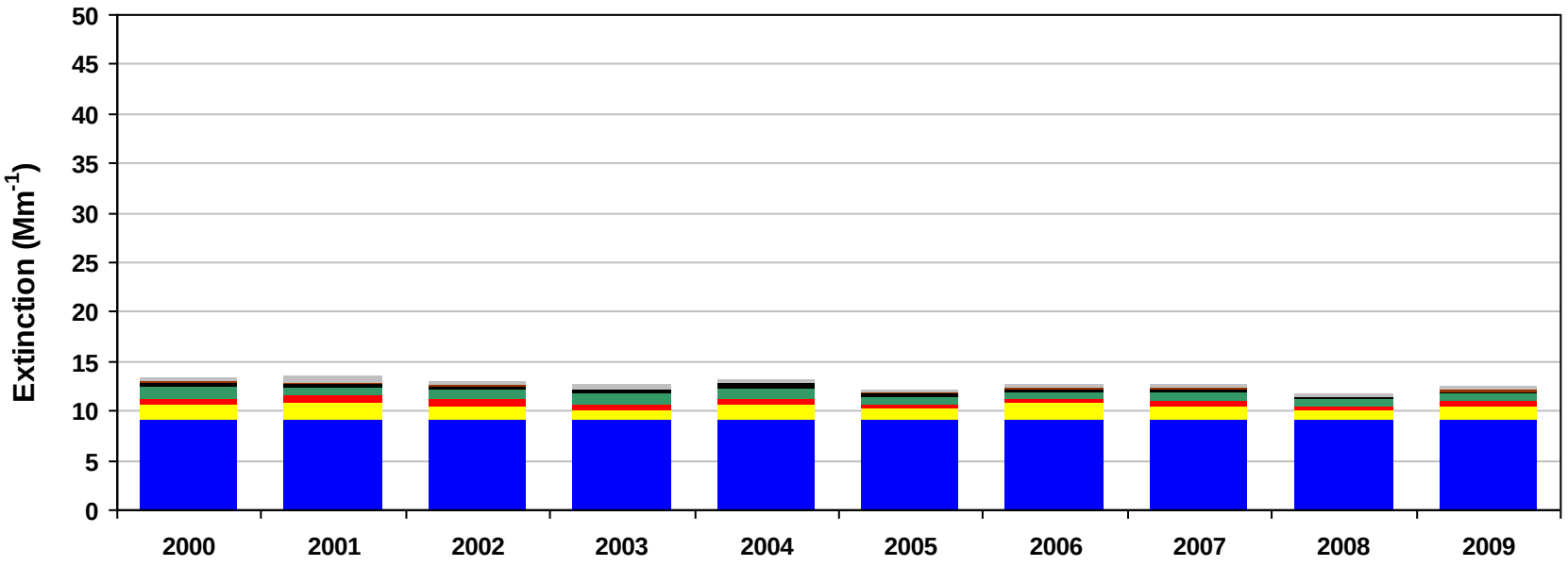


Figure M.1-5
Bryce Canyon NP, UT (BRCA1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

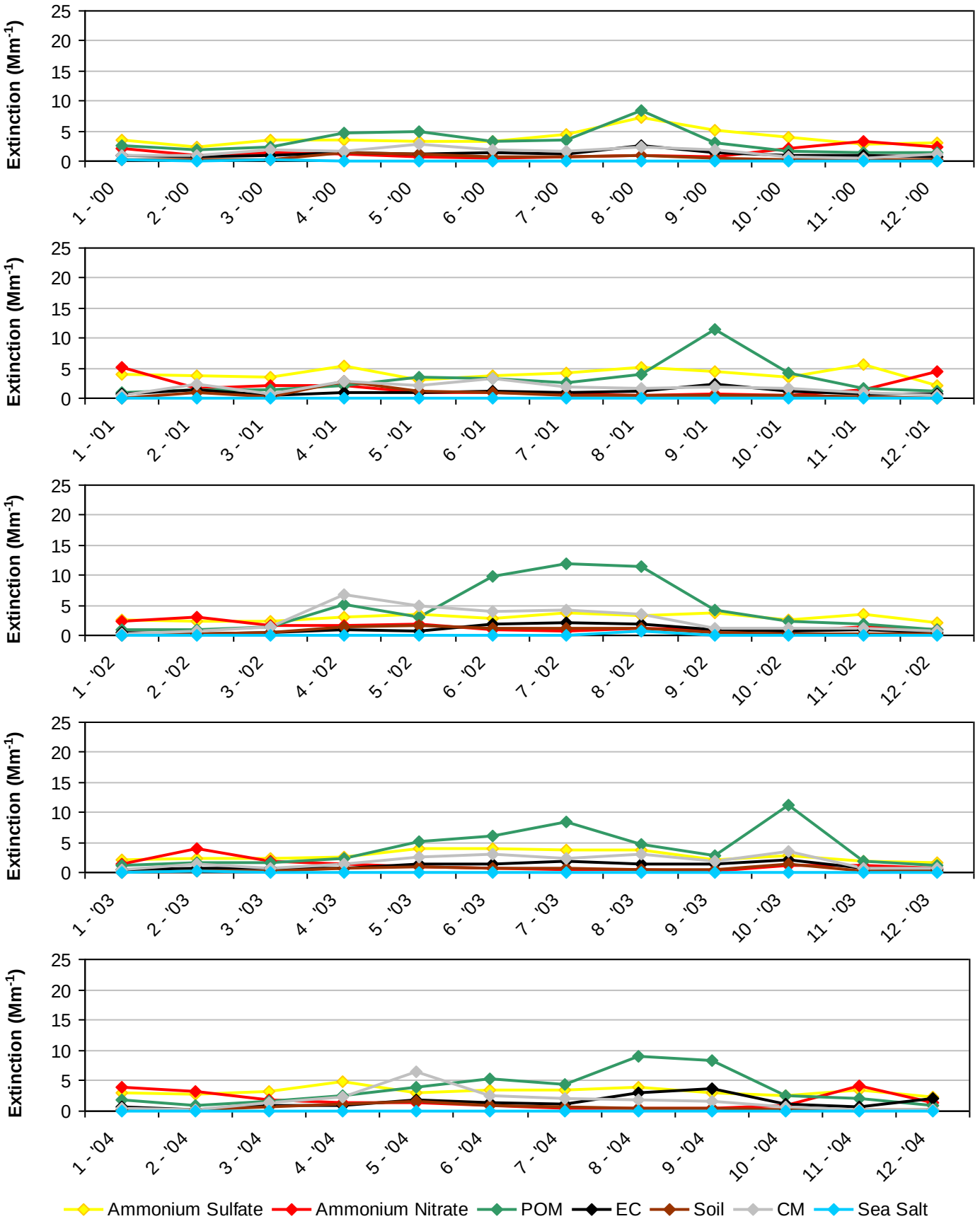


Figure M.1-6
Bryce Canyon NP, UT (BRCA1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

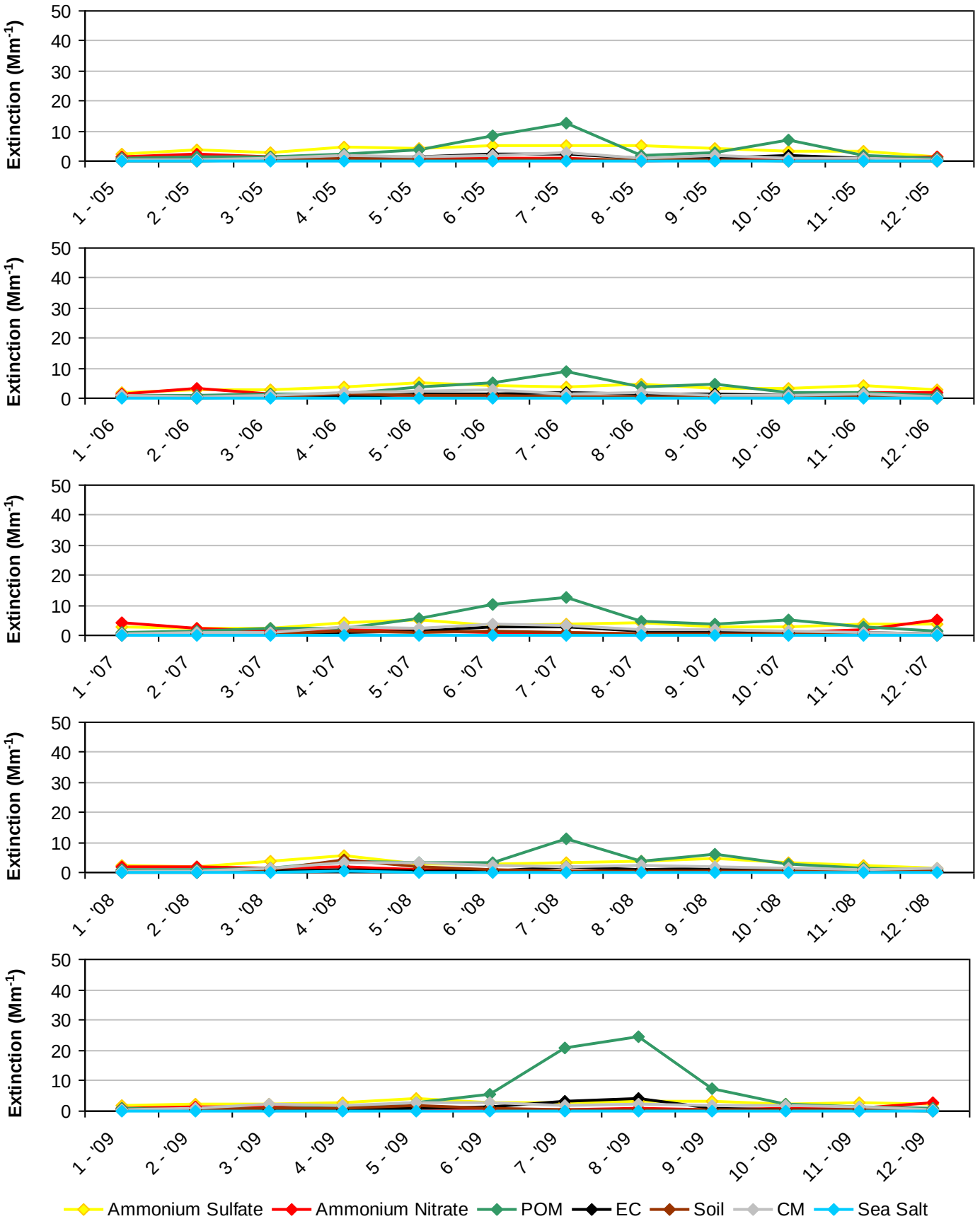


Figure M.1-7
Bryce Canyon NP, UT (BRCA1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

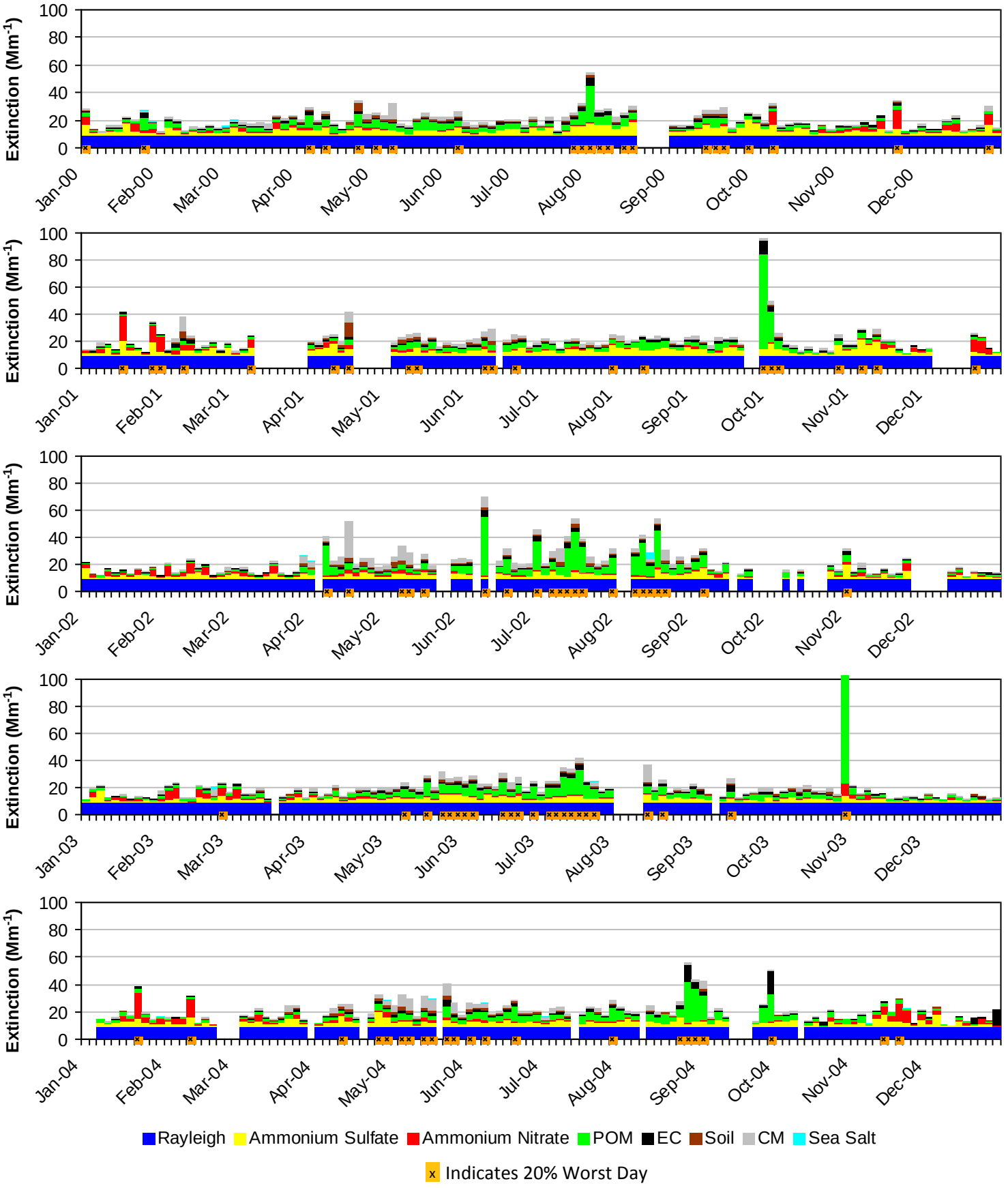
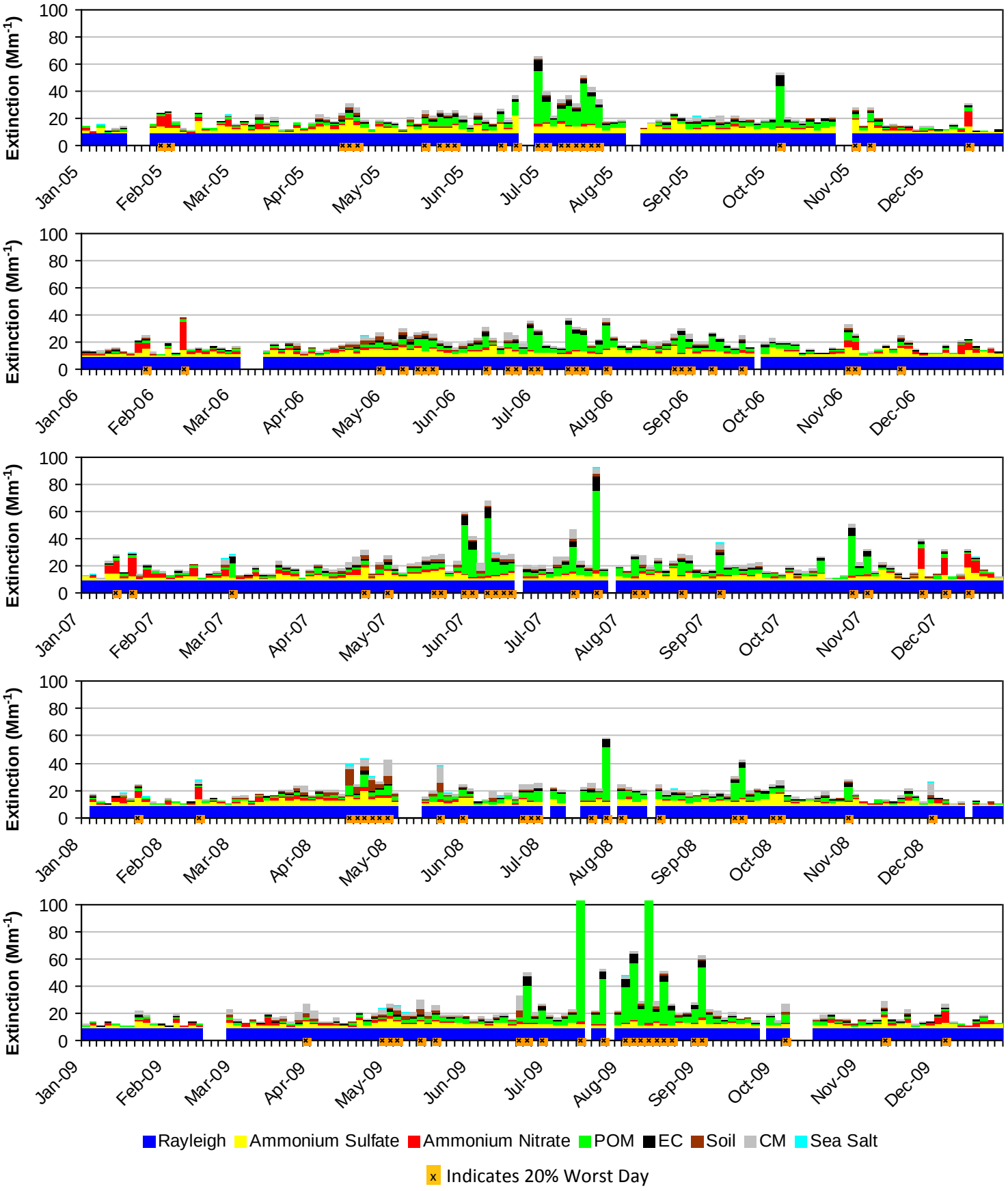


Figure M.1-8
Bryce Canyon NP, UT (BRCA1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



M.2. CANYONLANDS NP AND ARCHES NP (CANY1)

The following tables and figures are presented in this section for the Canyonlands NP and Arches NP represented by the CANY1 IMPROVE Monitor:

- **Table M.2-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure M.2-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure M.2-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure M.2-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure M.2-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure M.2-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure M.2-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure M.2-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure M.2-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table M.2-1
Canyonlands NP and Arches NP, UT (CANY1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period						2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	3.6	4.1	4.2	3.3	3.5	2.3	2.7	3.0	2.7	3.3	2.6	-0.1	0.1	3.7	2.8	-0.9	-24%
Worst 20% Days	11.2	10.9	12.7	11.8	9.6	10.6	10.5	11.4	11.1	11.5	10.6	0.0	0.5	11.2	11.0	-0.2	-2%
All Days	7.2	7.4	7.9	6.9	6.4	6.4	6.6	7.1	6.7	6.4	6.1	-0.1	0.0	7.2	6.6	-0.6	-8%
Total Extinction (Mm-1)																	
Best 20% Days	14.4	15.1	15.3	14.0	14.3	12.7	13.1	13.6	13.2	13.9	13.0	-0.2	0.1	14.6	13.3	-1.3	-9%
Worst 20% Days	31.6	30.3	36.9	33.2	26.5	29.2	28.9	32.8	31.7	35.2	30.4	0.2	0.4	31.7	31.6	-0.1	0%
All Days	21.4	21.6	23.3	21.1	19.5	19.8	20.1	21.4	20.6	20.5	19.4	-0.1	0.2	21.4	20.5	-0.9	-4%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	2.1	2.3	2.4	1.9	2.1	1.8	1.9	1.7	1.7	2.0	1.7	-0.1	0.0	2.2	1.8	-0.4	-18%
Worst 20% Days	6.3	6.8	4.0	5.5	5.3	5.8	5.6	5.0	5.2	4.8	5.6	-0.1	0.1	5.6	5.3	-0.3	-5%
All Days	4.1	4.5	3.6	3.4	3.6	4.1	3.8	3.6	3.4	3.0	3.2	-0.1	0.0	3.8	3.6	-0.2	-5%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.4	0.6	0.8	0.6	0.5	0.4	0.5	0.6	0.6	0.6	0.5	0.0	0.3	0.6	0.5	-0.1	-17%
Worst 20% Days	3.4	3.9	2.1	2.1	3.2	3.9	3.4	3.7	1.6	3.7	5.1	0.0	0.5	3.0	3.3	0.3	10%
All Days	1.4	1.8	1.6	1.2	1.5	1.3	1.4	1.5	1.1	1.3	1.6	0.0	0.1	1.5	1.3	-0.2	-13%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.2	1.2	1.2	1.0	1.1	0.5	0.5	0.7	0.8	0.7	0.8	-0.1	0.0	1.1	0.7	-0.4	-36%
Worst 20% Days	6.4	4.2	11.0	9.5	4.2	4.7	4.3	8.7	4.4	8.6	3.5	0.0	0.5	7.1	6.2	-0.9	-13%
All Days	3.2	2.5	3.9	3.6	2.5	2.3	2.3	3.4	2.4	3.1	2.0	0.0	0.2	3.1	2.7	-0.4	-13%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.4	0.5	0.5	0.4	0.4	0.2	0.4	0.3	0.3	0.3	0.2	0.0	0.0	0.4	0.3	-0.1	-25%
Worst 20% Days	2.1	1.4	2.0	1.9	1.3	1.8	1.7	2.1	0.9	1.7	1.2	0.0	0.2	1.7	1.6	-0.1	-6%
All Days	1.2	0.9	1.1	1.0	0.8	0.9	1.0	1.0	0.6	0.7	0.6	0.0	0.1	1.0	0.8	-0.2	-20%
Soil Extinction (Mm-1)																	
Best 20% Days	0.2	0.4	0.4	0.2	0.3	0.1	0.2	0.3	0.2	0.3	0.2	0.0	0.2	0.3	0.2	-0.1	-33%
Worst 20% Days	0.8	1.8	2.8	1.0	0.9	0.9	1.4	0.9	2.6	1.8	1.4	0.0	0.3	1.5	1.5	0.0	0%
All Days	0.5	0.8	1.3	0.6	0.6	0.5	0.6	0.7	1.0	0.8	0.7	0.0	0.2	0.8	0.7	-0.1	-13%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	1.0	1.1	1.1	0.9	0.7	0.6	0.6	0.9	0.6	0.9	0.6	-0.1	0.1	1.0	0.7	-0.3	-30%
Worst 20% Days	3.4	3.1	6.0	4.1	2.4	3.0	3.5	3.3	7.8	5.4	4.5	0.2	0.2	3.8	4.6	0.8	21%
All Days	2.0	2.0	2.7	2.3	1.6	1.7	2.0	2.2	3.0	2.5	2.3	0.1	0.2	2.1	2.3	0.2	10%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0%
Worst 20% Days	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0%
All Days	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.2	0.0	0.1	0.1	0%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure M.2-1
Canyonlands NP and Arches NP, UT (CANY1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

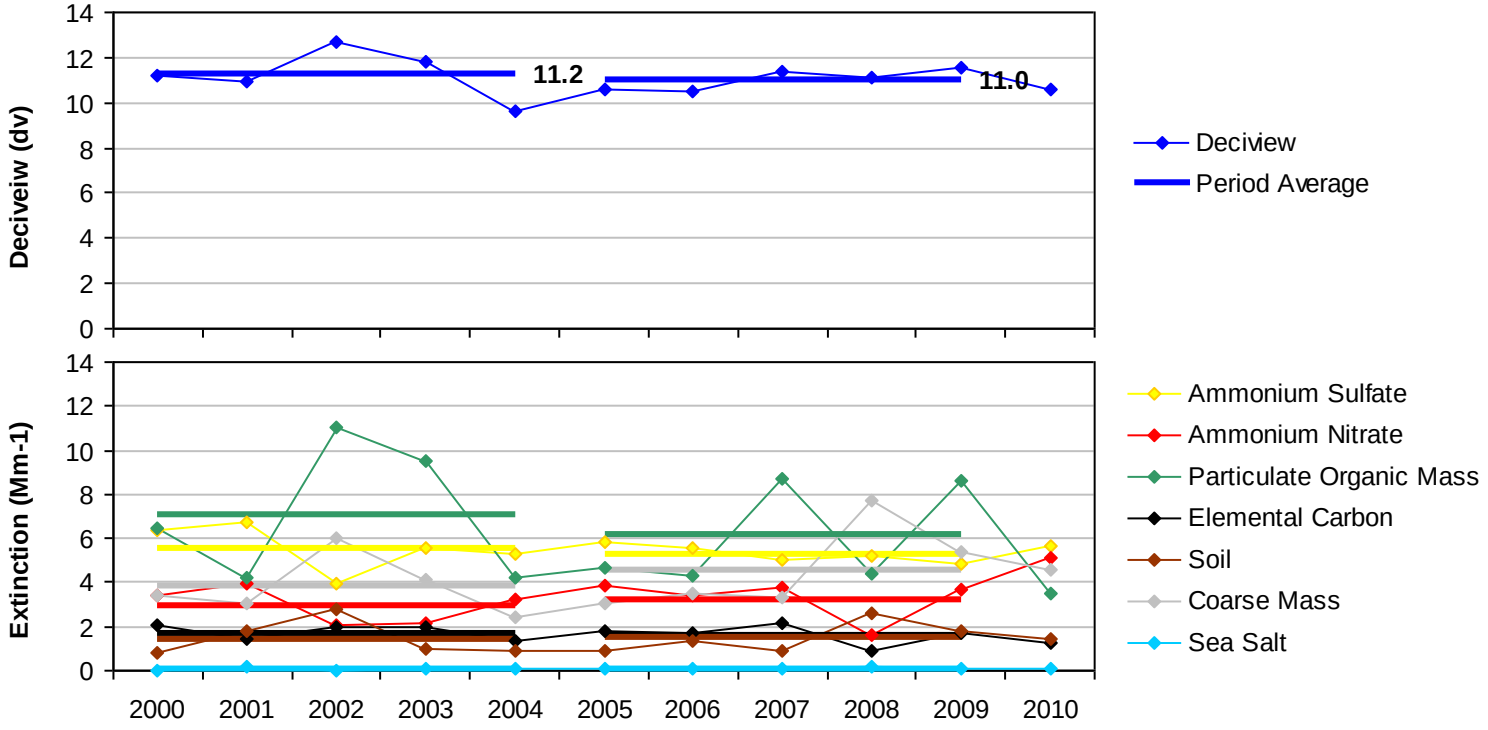


Figure M.2-2
Canyonlands NP and Arches NP, UT (CANY1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

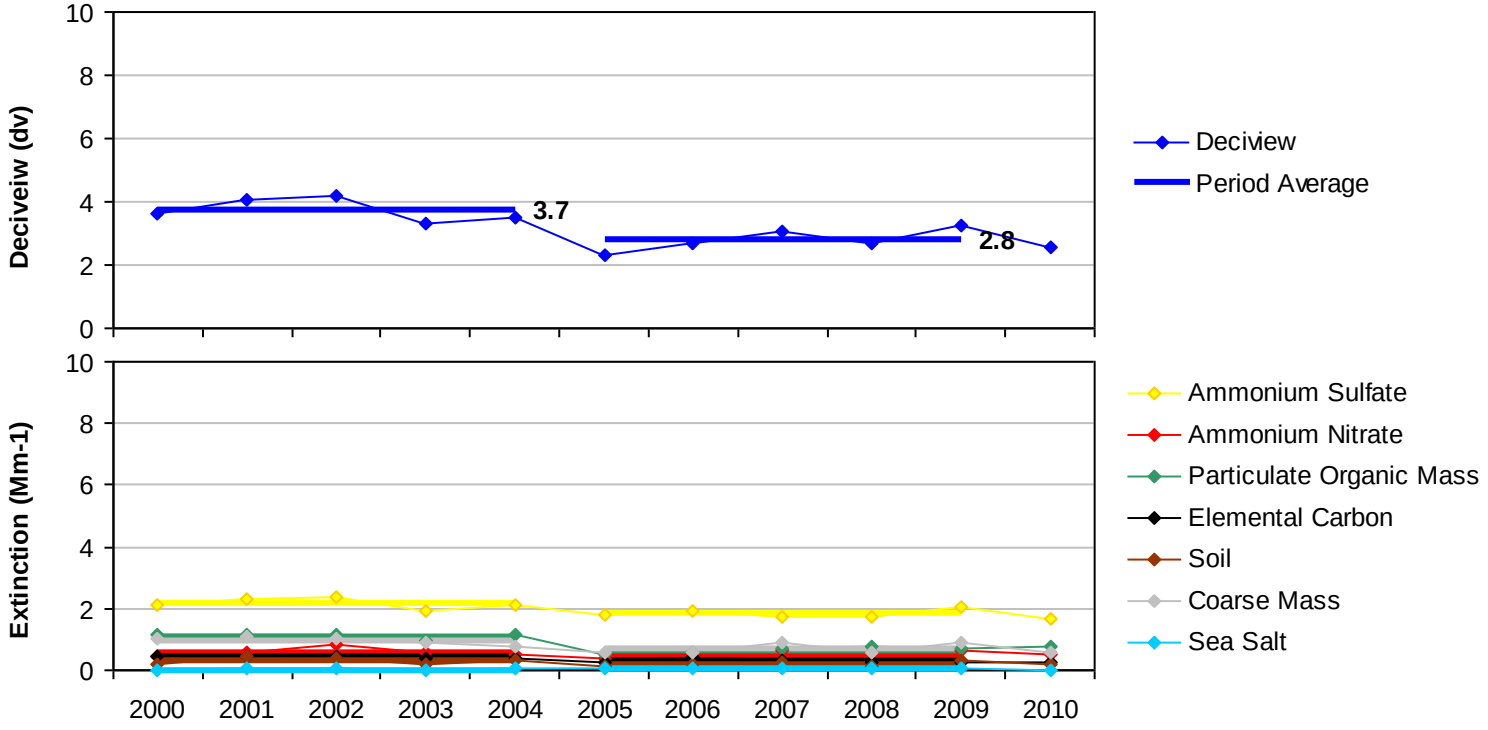


Figure M.2-3
Canyonlands NP and Arches NP, UT (CANY1 Site)
20% Most Impaired Visibility Days

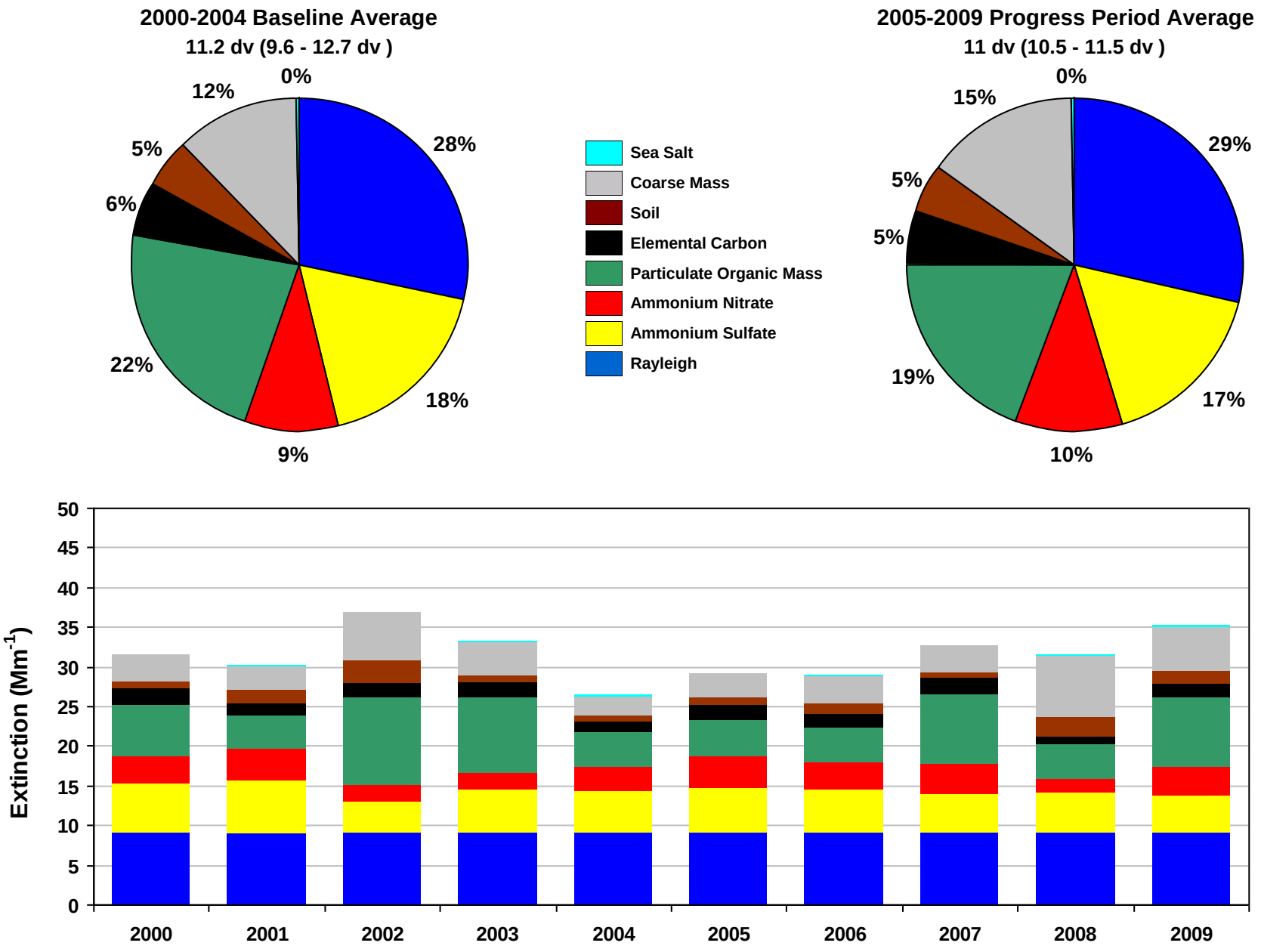


Figure M.2-4
Canyonlands NP and Arches NP, UT (CANY1 Site)
20% Least Impaired Visibility Days

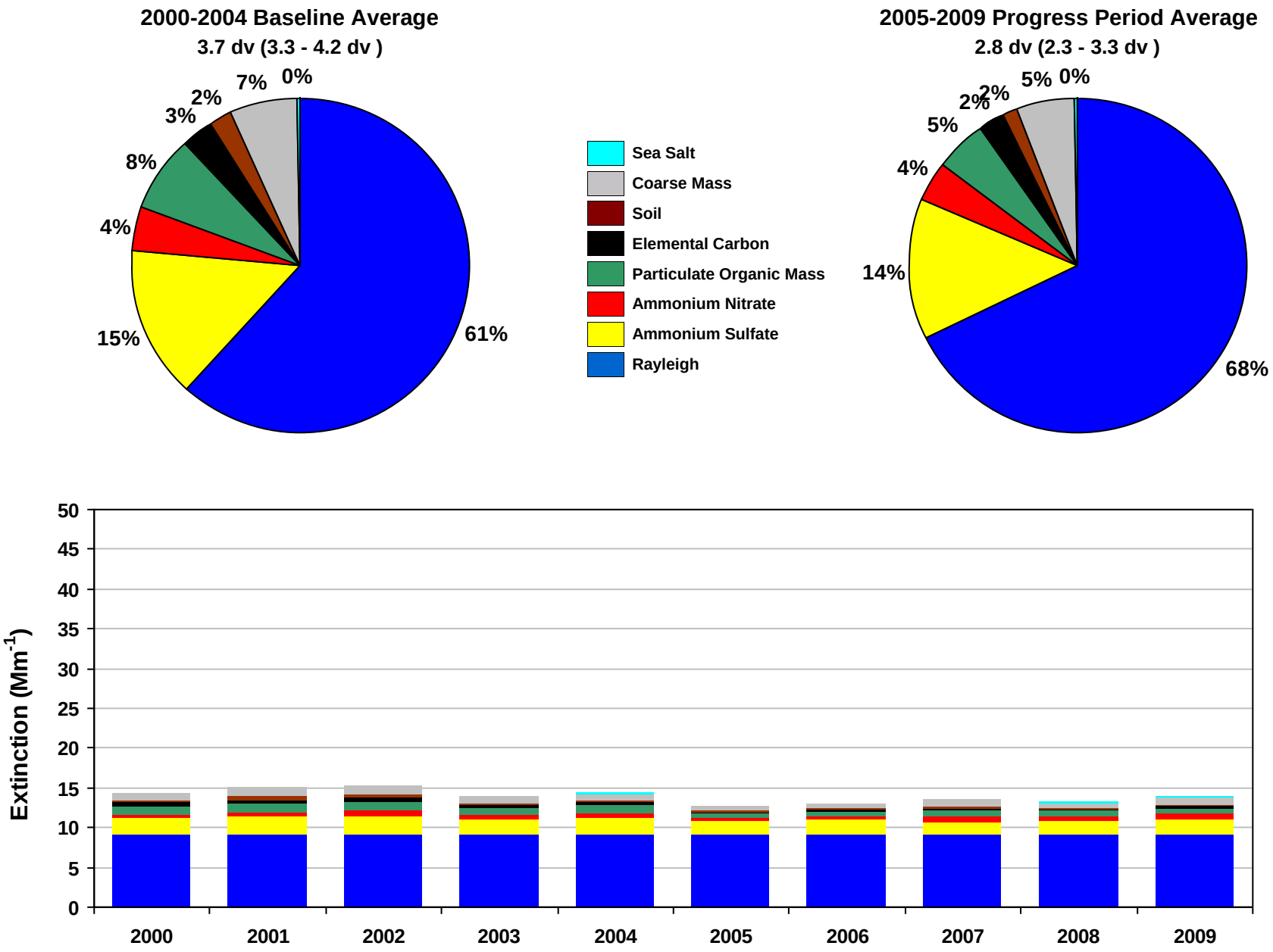


Figure M.2-5
Canyonlands NP and Arches NP, UT (CANY1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

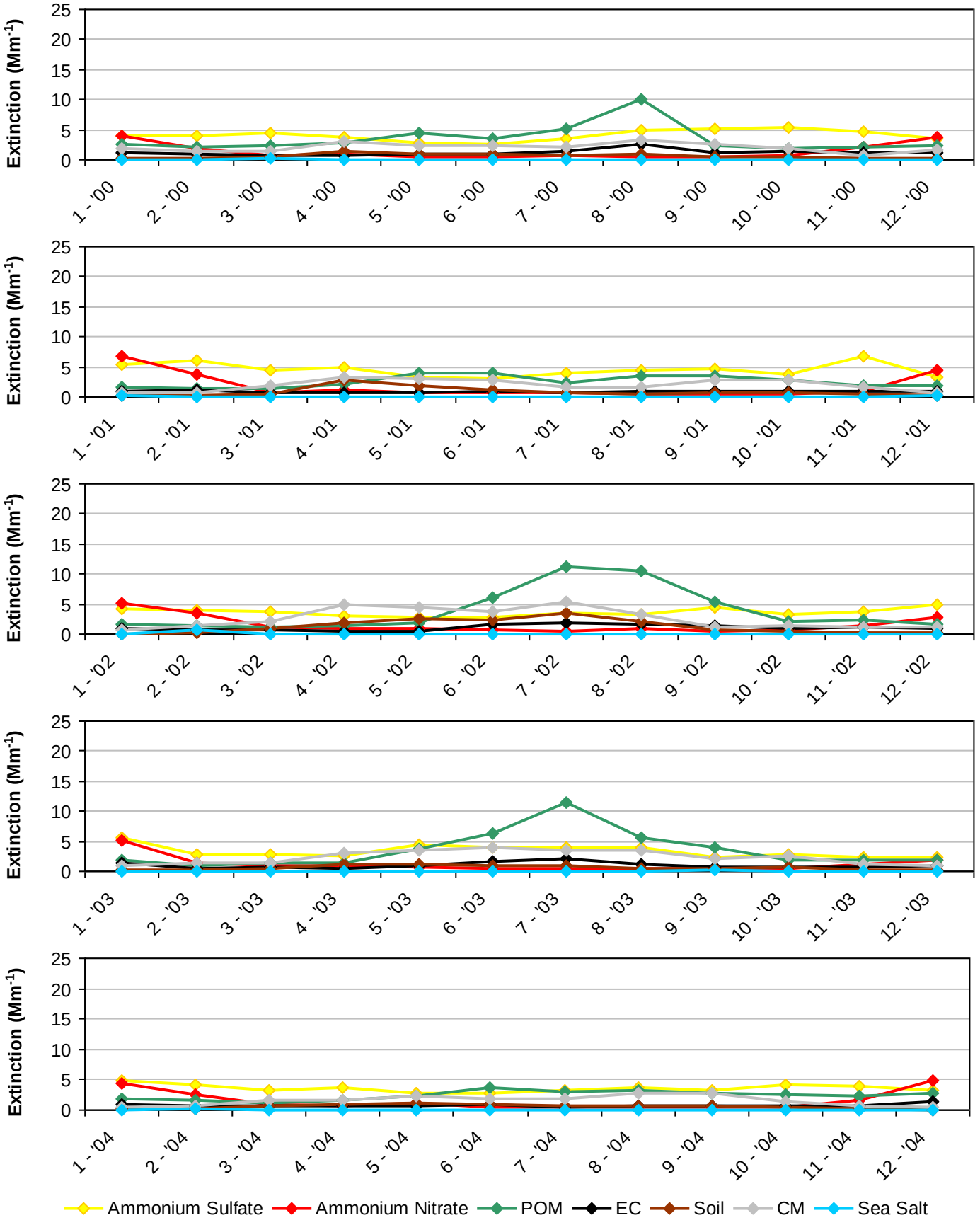


Figure M.2-6
Canyonlands NP and Arches NP, UT (CANY1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

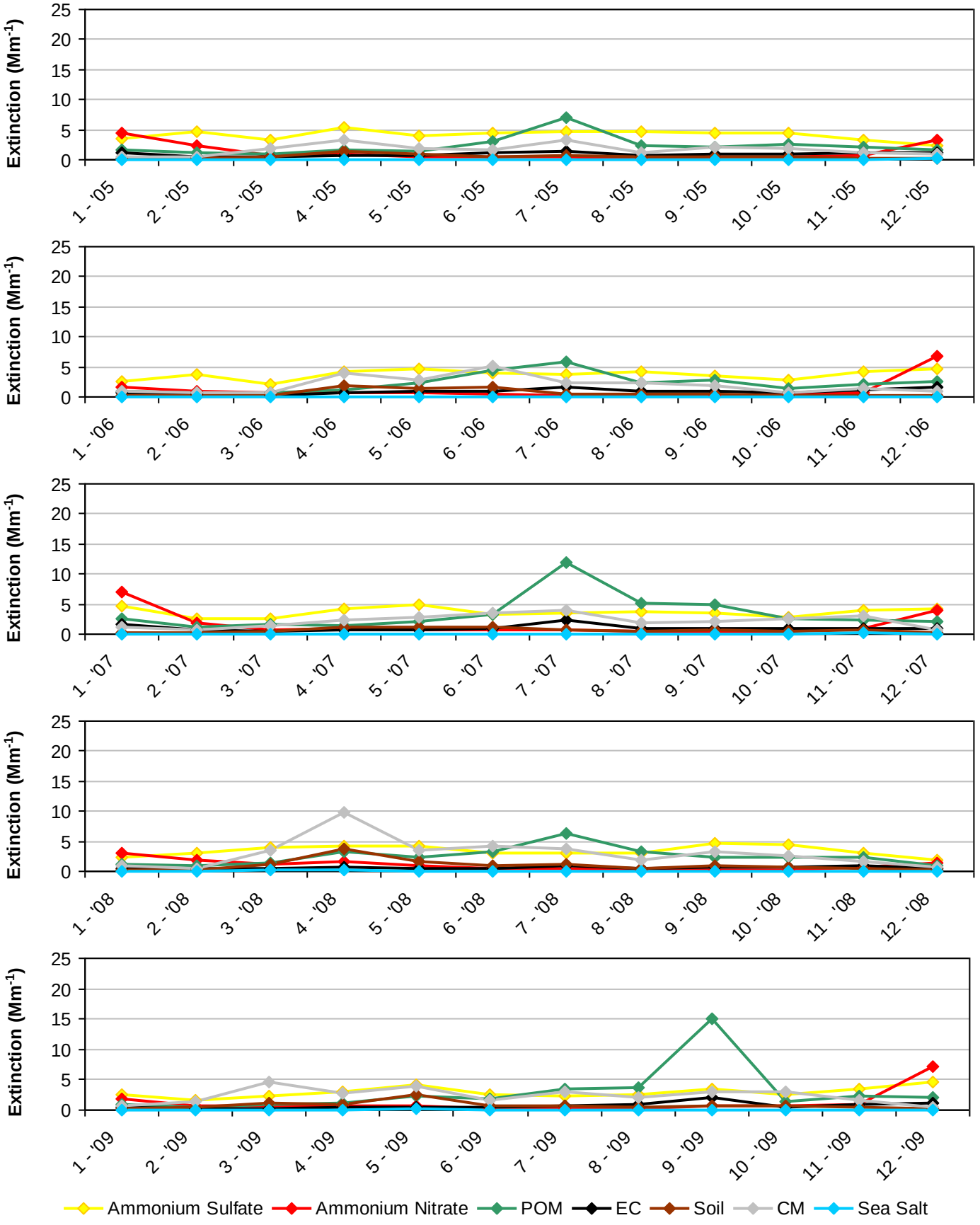


Figure M.2-7
Canyonlands NP and Arches NP, UT (CANY1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

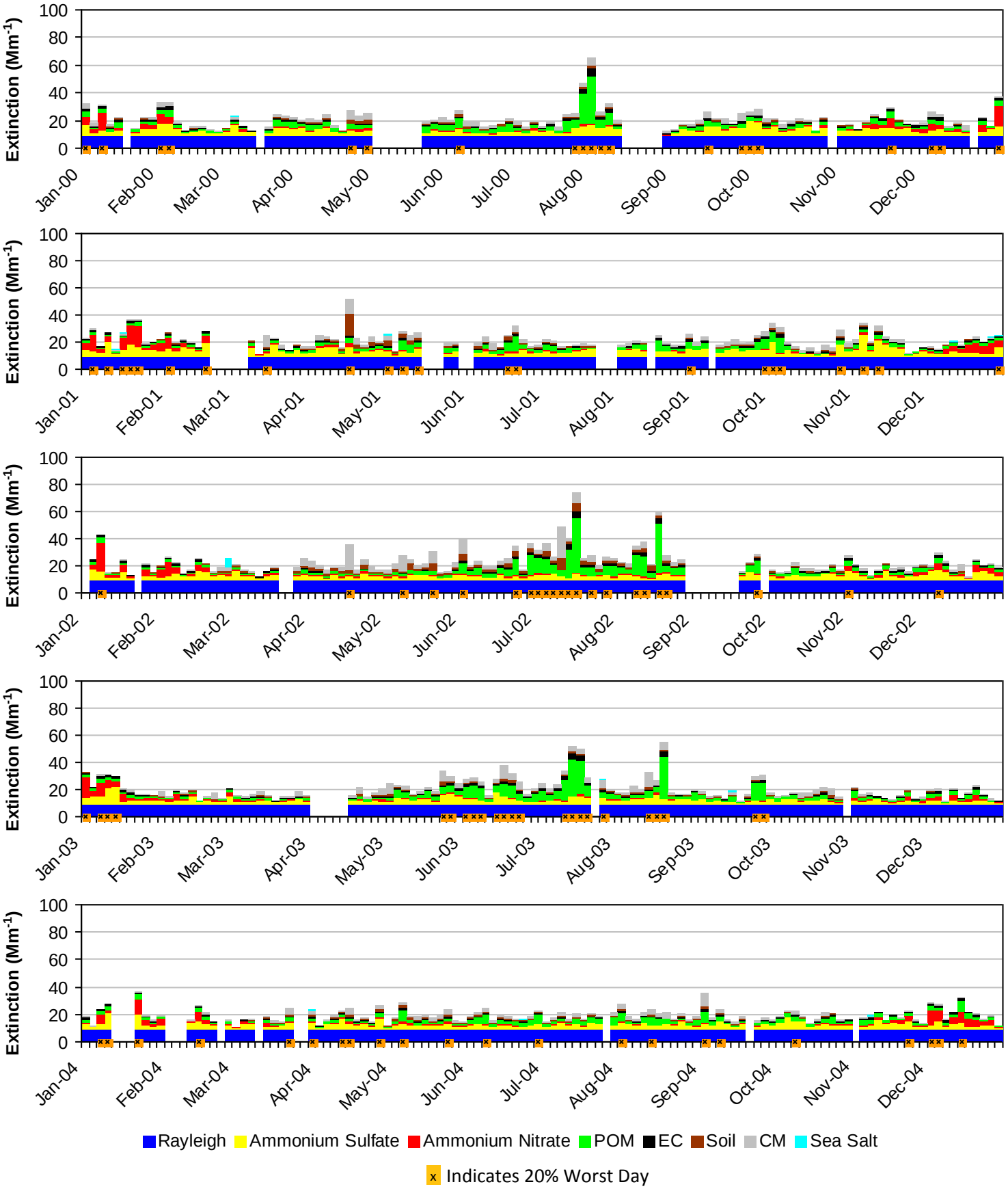
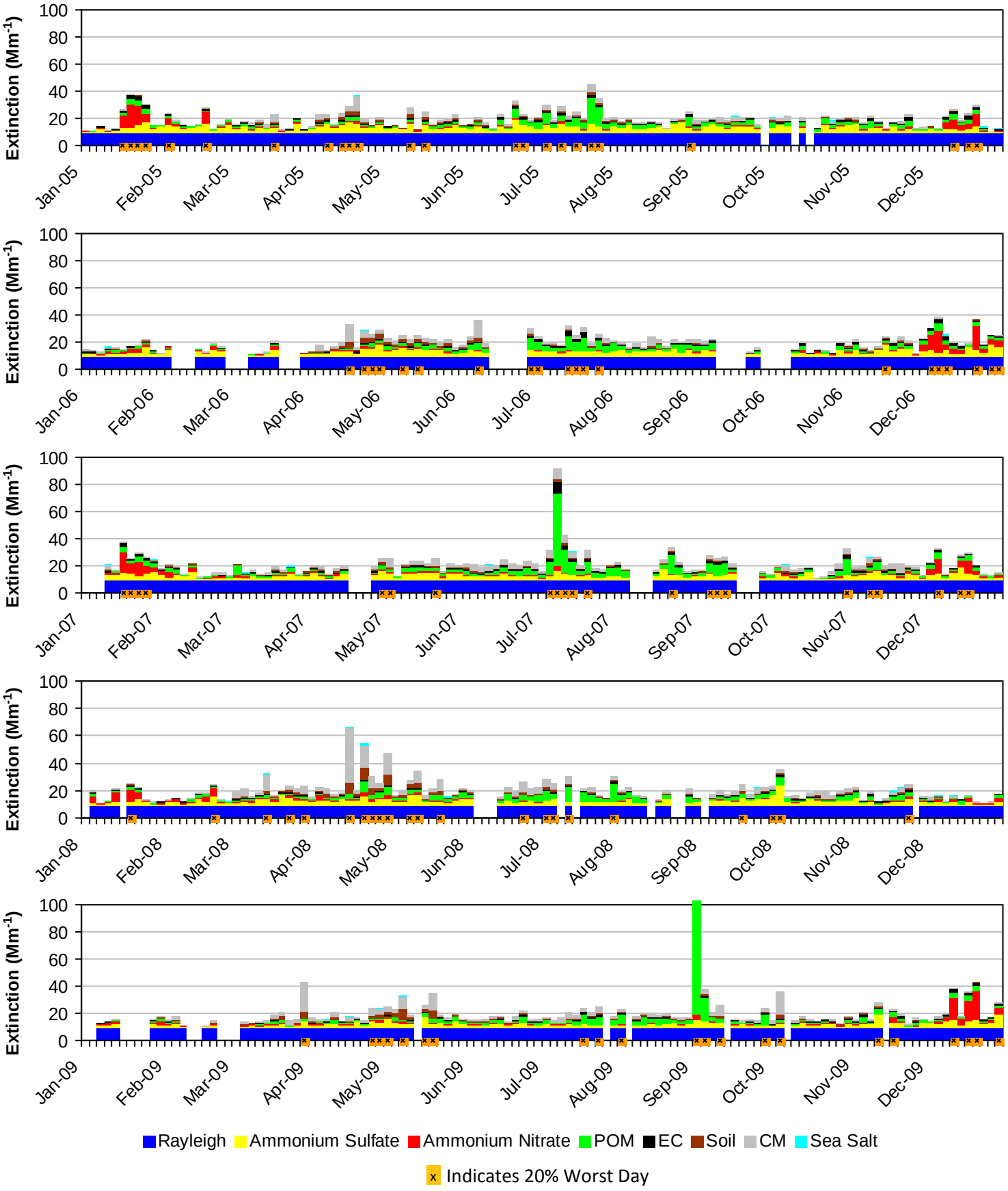


Figure M.2-8
Canyonlands NP and Arches NP, UT (CANY1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



M.3. CAPITOL REEF NP (CAPI1)

The following tables and figures are presented in this section for the Capitol Reef NP represented by the CAPI1 IMPROVE Monitor:

- **Table M.3-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure M.3-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure M.3-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure M.3-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure M.3-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure M.3-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure M.3-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure M.3-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

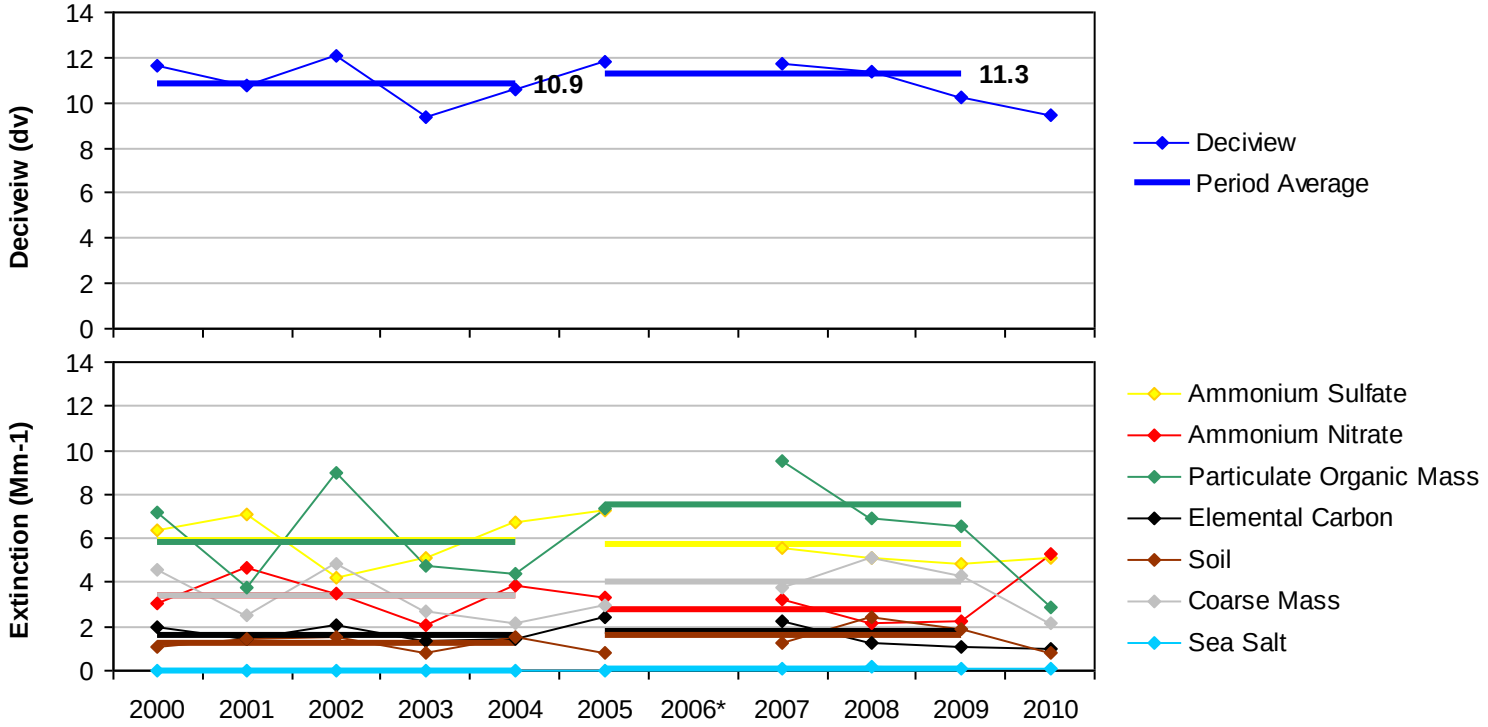
- **Figure M.3-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table M.3-1
Capitol Reef NP, UT (CAPI1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	4.5	4.6	4.3	3.1	4.1	2.6	---	3.1	2.5	2.7	2.0	-0.2	0.0	4.1	2.7	-1.4	-34%
Worst 20% Days	11.6	10.8	12.1	9.4	10.6	11.8	---	11.7	11.4	10.3	9.5	-0.1	0.3	10.9	11.3	0.4	4%
All Days	7.6	7.6	7.7	6.1	7.2	7.0	---	7.0	6.6	6.3	5.7	-0.1	0.0	7.2	6.7	-0.5	-7%
Total Extinction (Mm-1)																	
Best 20% Days	15.7	15.8	15.4	13.7	15.2	13.0	---	13.7	12.9	13.2	12.2	-0.3	0.0	15.2	13.2	-2.0	-13%
Worst 20% Days	33.2	29.8	34.1	25.7	29.1	33.4	---	34.7	32.2	30.1	26.2	0.0	0.5	30.4	32.6	2.2	7%
All Days	22.2	22.0	22.5	19.0	21.1	21.4	---	21.6	20.5	19.8	18.4	-0.2	0.1	21.4	20.8	-0.6	-3%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	1.9	2.2	1.9	1.4	2.2	1.6	---	1.6	1.4	1.9	1.3	-0.1	0.1	1.9	1.6	-0.3	-16%
Worst 20% Days	6.3	7.1	4.2	5.1	6.7	7.3	---	5.6	5.1	4.8	5.1	-0.1	0.3	5.9	5.7	-0.2	-3%
All Days	4.1	4.5	3.2	3.1	4.0	4.4	---	3.6	3.4	3.1	3.0	-0.1	0.1	3.8	3.6	-0.2	-5%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	1.1	1.2	1.1	0.7	0.9	0.4	---	0.6	0.6	0.6	0.3	-0.1	0.0	1.0	0.6	-0.4	-40%
Worst 20% Days	3.1	4.7	3.5	2.0	3.8	3.3	---	3.2	2.2	2.2	5.3	-0.2	0.1	3.4	2.7	-0.7	-21%
All Days	1.8	2.1	2.1	1.3	2.0	1.4	---	1.6	1.2	1.2	1.8	-0.1	0.0	1.9	1.3	-0.6	-32%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.7	1.1	1.6	1.0	1.4	1.0	---	1.1	0.9	0.5	0.8	-0.1	0.0	1.3	0.9	-0.4	-31%
Worst 20% Days	7.2	3.8	9.0	4.8	4.4	7.4	---	9.5	6.9	6.6	2.9	0.2	0.4	5.8	7.6	1.8	31%
All Days	3.4	2.6	3.7	2.5	2.8	3.2	---	3.6	2.9	2.7	1.8	0.0	0.5	3.0	3.1	0.1	3%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.6	0.6	0.8	0.5	0.5	0.4	---	0.4	0.3	0.2	0.3	0.0	0.0	0.6	0.3	-0.3	-50%
Worst 20% Days	2.0	1.4	2.0	1.3	1.4	2.5	---	2.2	1.3	1.1	1.0	0.0	0.2	1.6	1.8	0.2	13%
All Days	1.2	1.0	1.2	0.9	0.9	1.2	---	1.0	0.7	0.7	0.6	0.0	0.1	1.0	0.9	-0.1	-10%
Soil Extinction (Mm-1)																	
Best 20% Days	0.2	0.3	0.2	0.4	0.4	0.1	---	0.3	0.1	0.3	0.2	0.0	0.5	0.3	0.2	-0.1	-33%
Worst 20% Days	1.0	1.4	1.5	0.8	1.5	0.8	---	1.3	2.4	1.9	0.8	0.1	0.1	1.3	1.6	0.3	23%
All Days	0.5	0.8	0.8	0.6	1.0	0.5	---	0.7	0.9	0.9	0.6	0.0	0.2	0.7	0.8	0.1	14%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	1.2	1.4	0.8	0.7	0.7	0.4	---	0.7	0.6	0.7	0.4	-0.1	0.0	1.0	0.6	-0.4	-40%
Worst 20% Days	4.6	2.5	4.9	2.7	2.1	3.0	---	3.8	5.1	4.3	2.2	0.1	0.2	3.4	4.1	0.7	21%
All Days	2.2	2.1	2.5	1.5	1.4	1.6	---	2.0	2.2	2.1	1.5	0.0	0.5	2.0	2.0	0.0	0%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.0	0.1	0.0	0.1	0.1	0.0	---	0.1	0.1	0.0	0.0	0.0	0.4	0.1	0.0	-0.1	-100%
Worst 20% Days	0.0	0.0	0.0	0.0	0.0	0.0	---	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0%
All Days	0.0	0.0	0.0	0.0	0.1	0.0	---	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0%

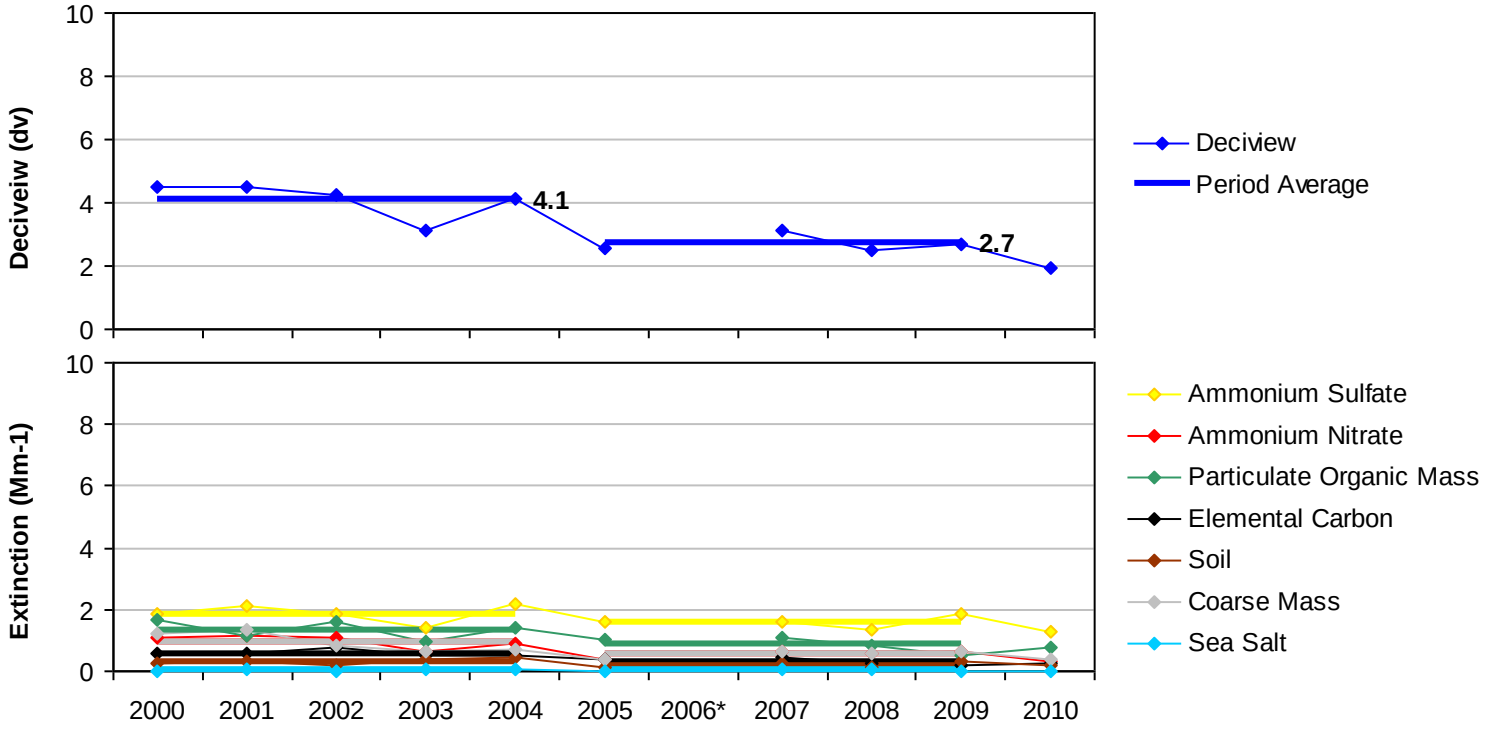
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure M.3-1
Capitol Reef NP, UT (CAPI1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



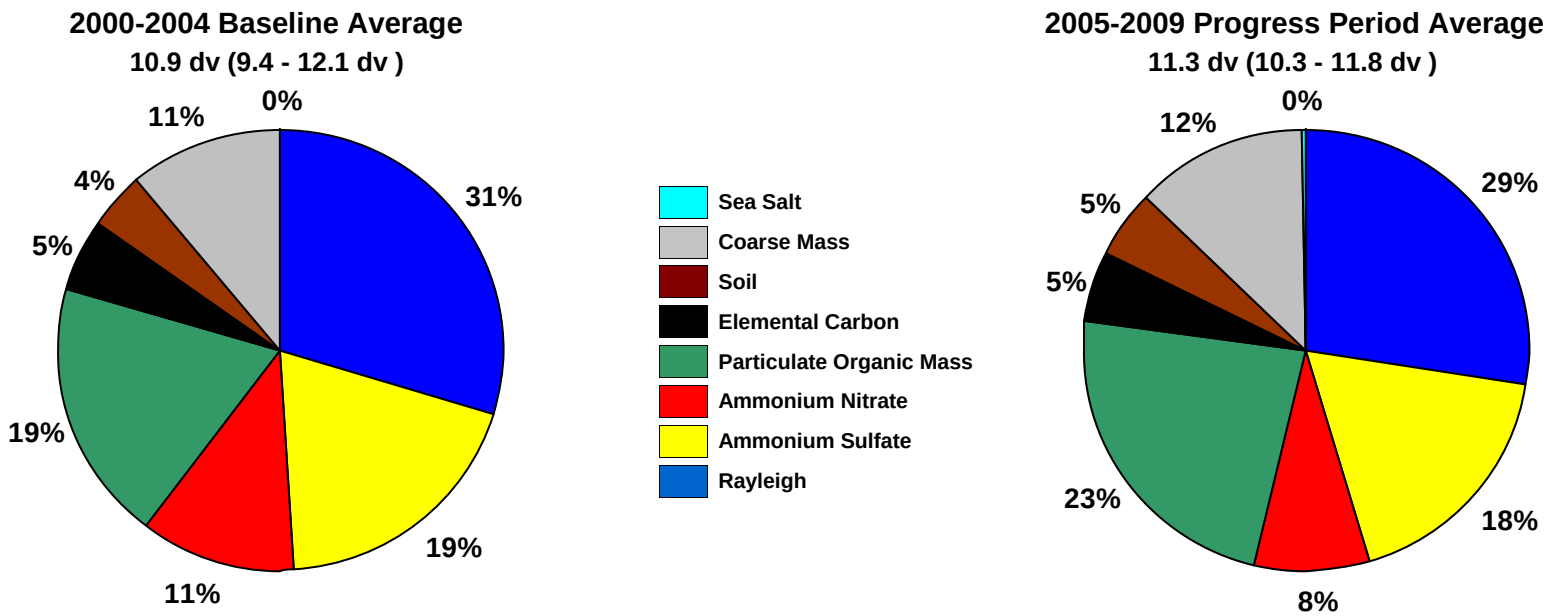
*Missing years did not meet RHR data completeness criteria.

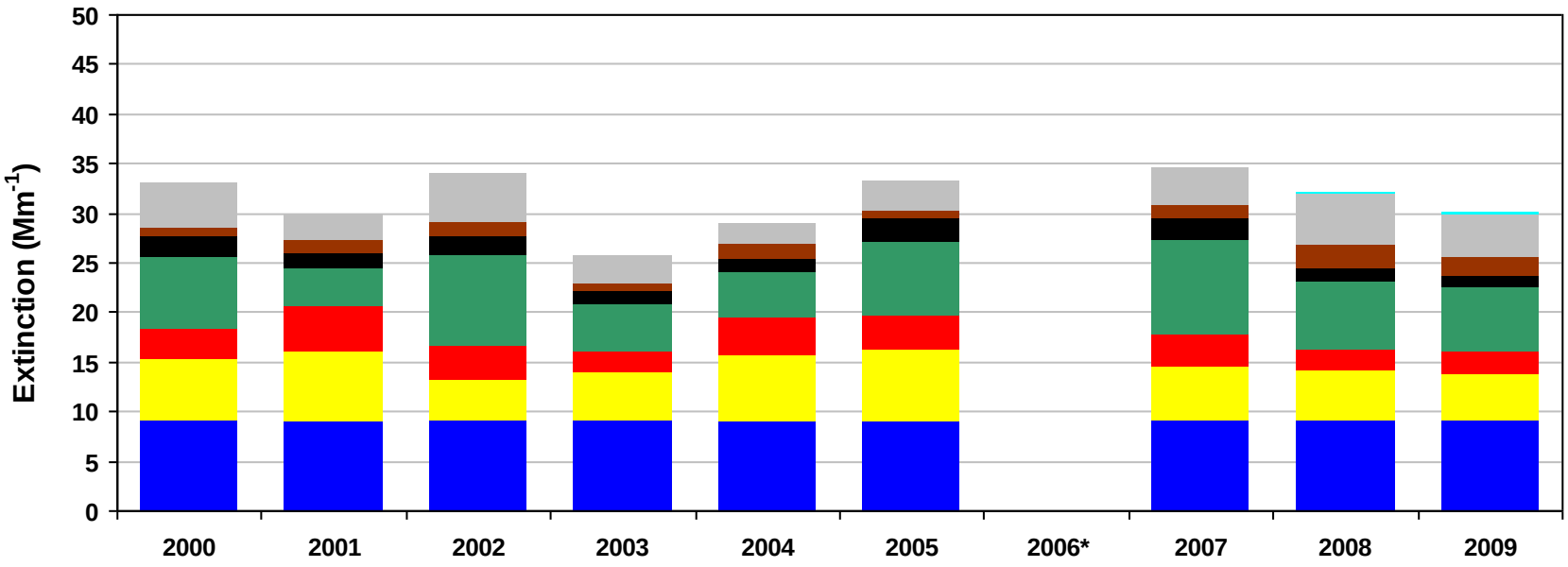
Figure M.3-2
Capitol Reef NP, UT (CAPI1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

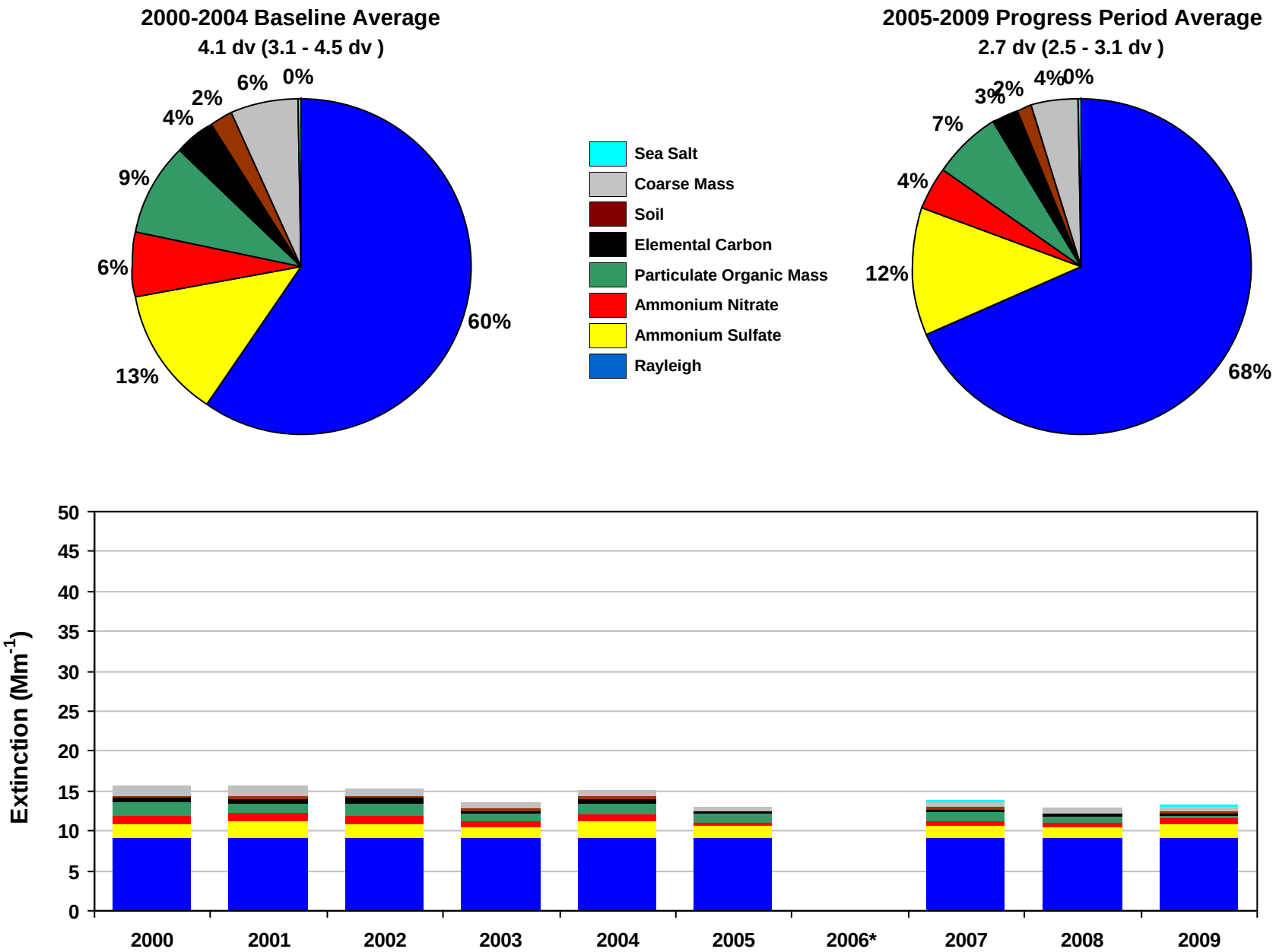
Figure M.3-3
Capitol Reef NP, UT (CAPI1 Site)
20% Most Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure M.3-4
Capitol Reef NP, UT (CAPI1 Site)
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure M.3-5
Capitol Reef NP, UT (CAPI1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

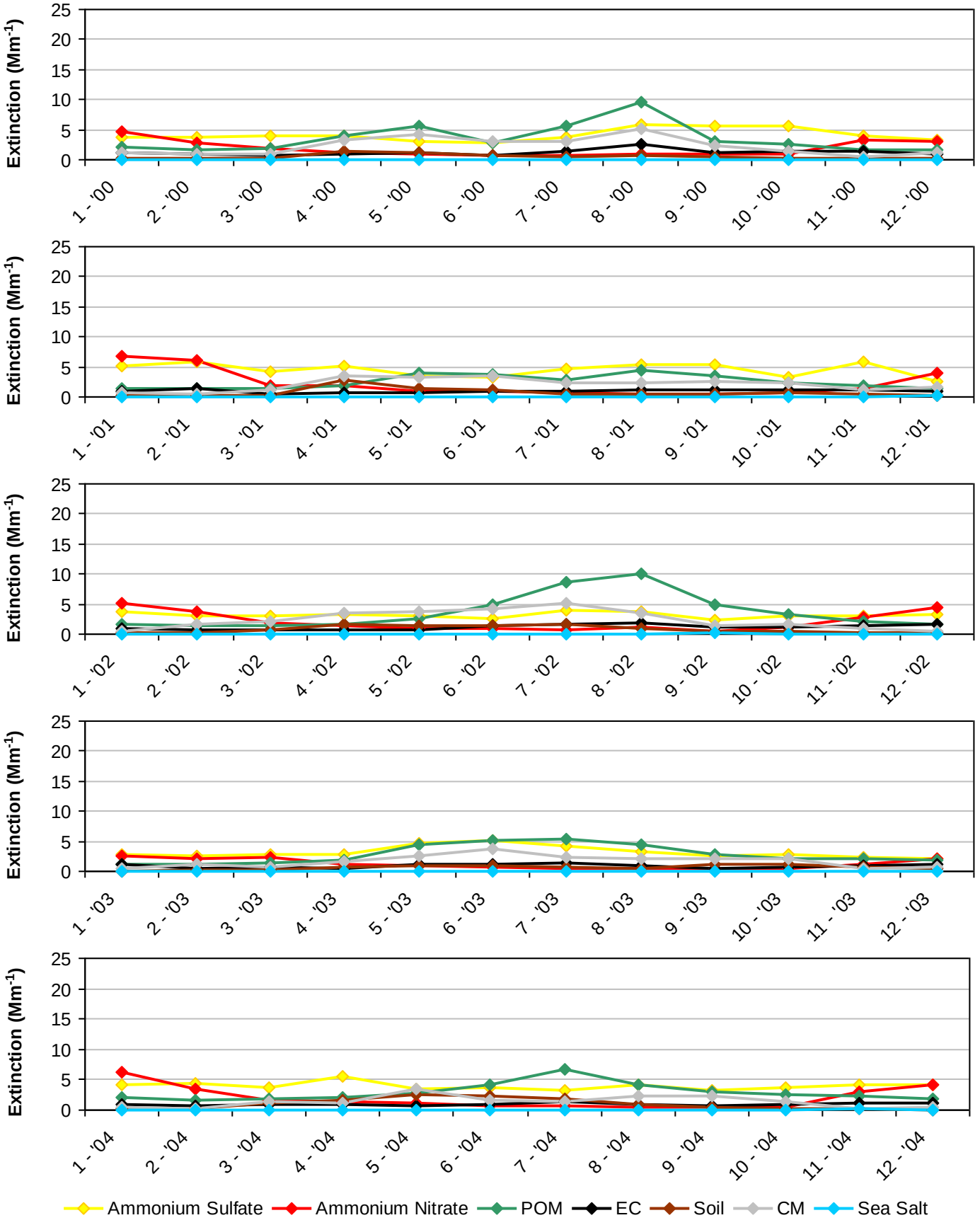
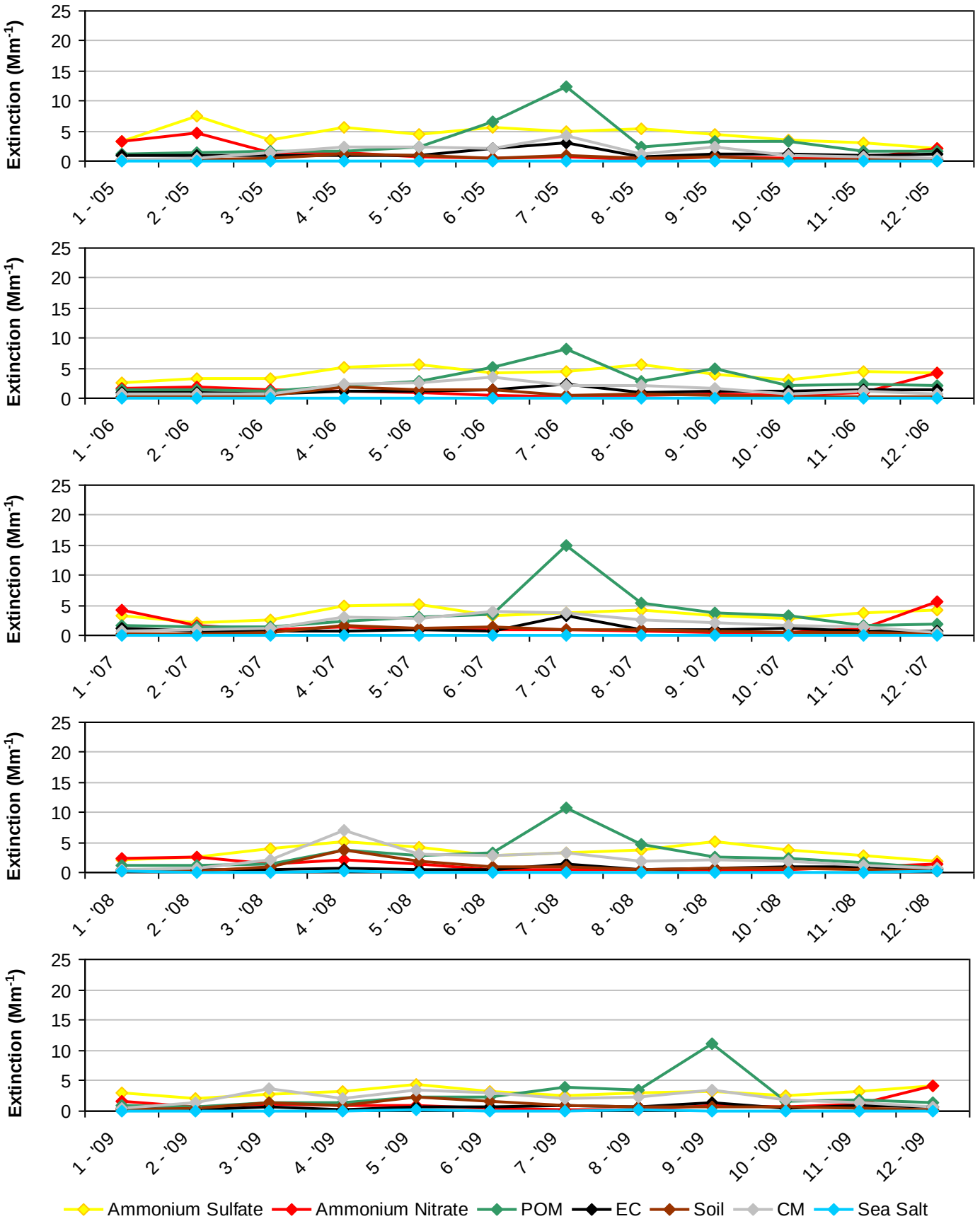


Figure M.3-6
Capitol Reef NP, UT (CAPI1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2006 are shown here, but this year did not meet RHR data completeness criteria.

Figure M.3-7
Capitol Reef NP, UT (CAPI1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

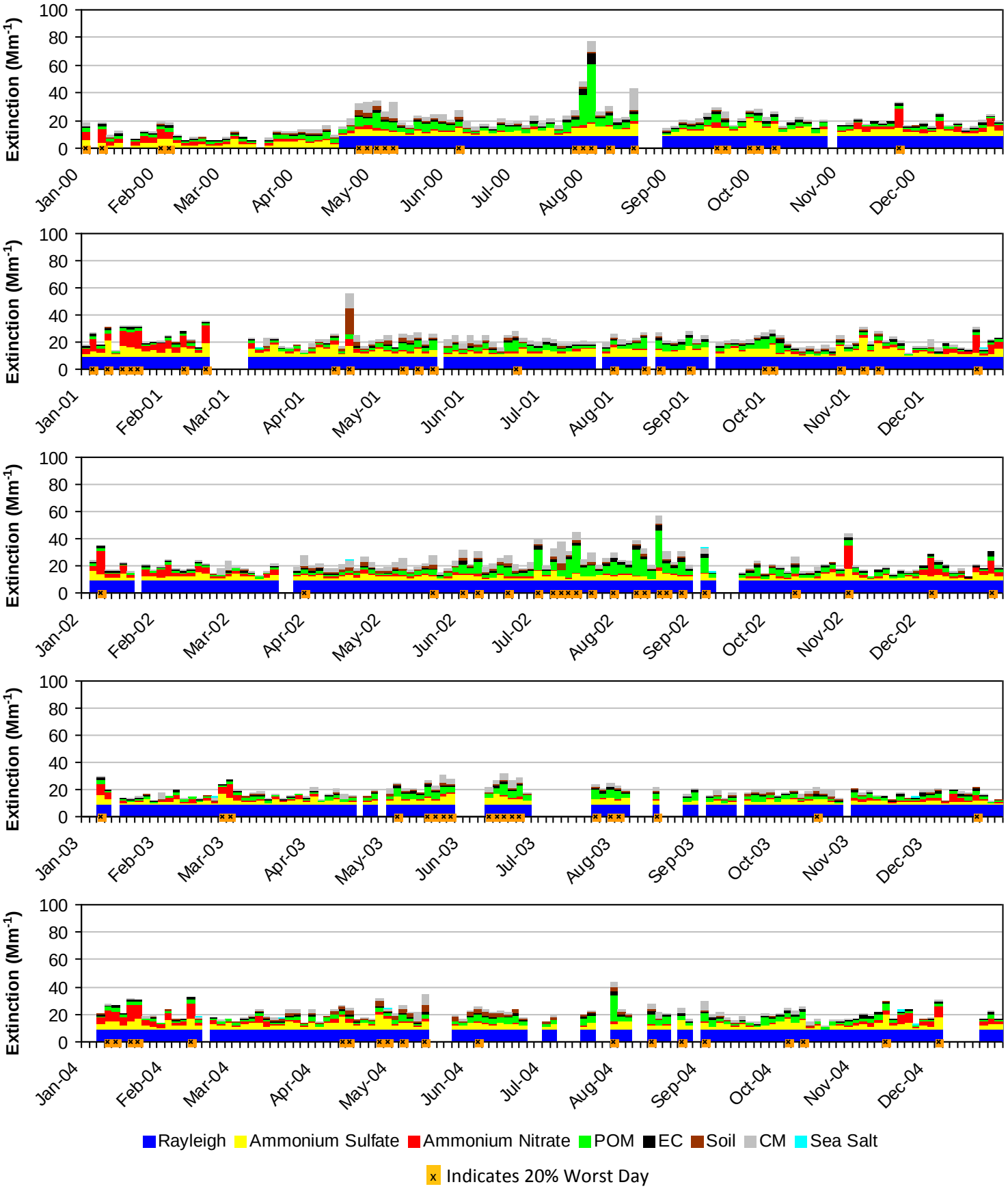
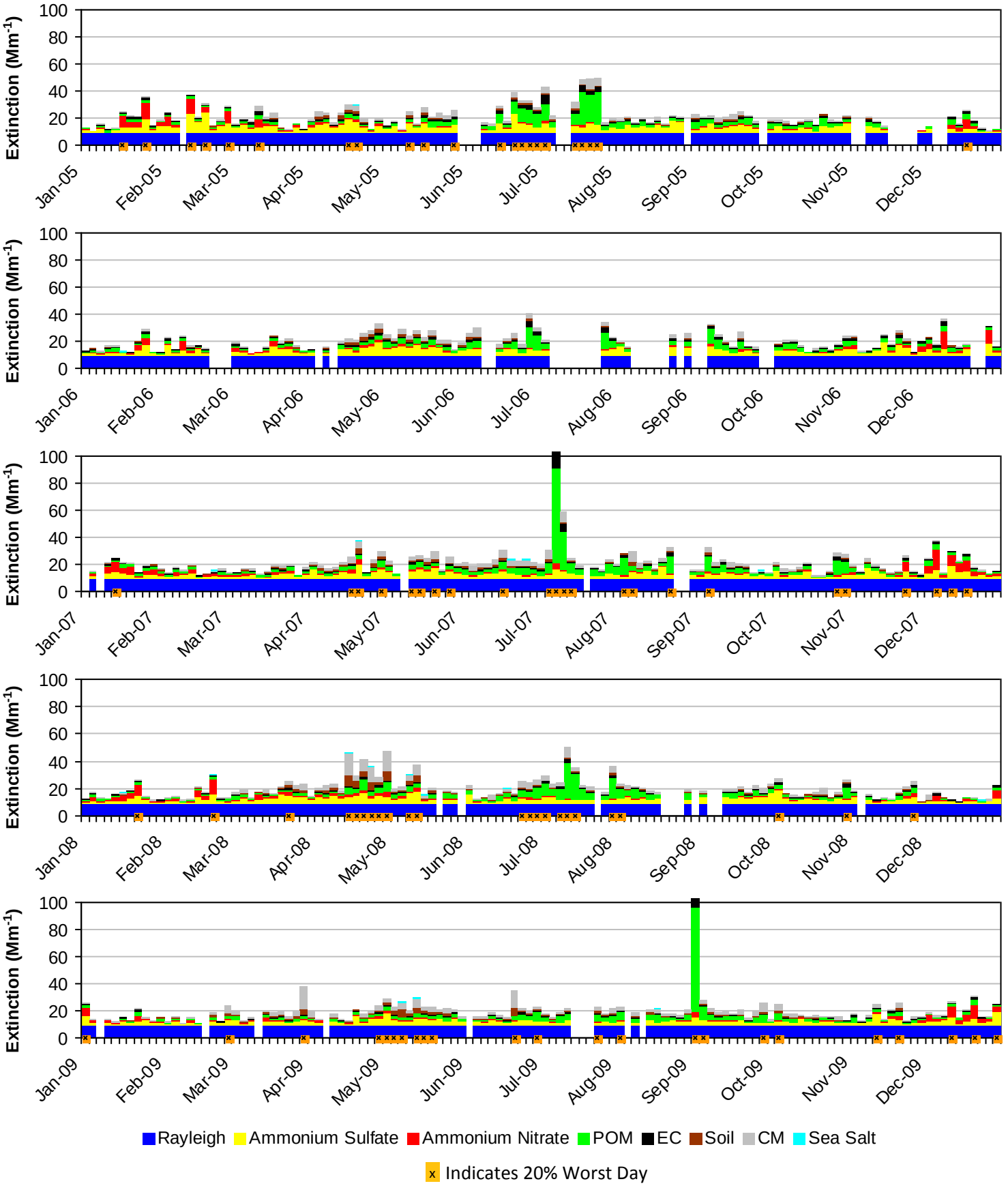


Figure M.3-8
Capitol Reef NP, UT (CAPI1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2006 are shown here, but this year did not meet RHR data completeness criteria.

M.4. ZION NP (ZICA1)

The following tables and figures are presented in this section for the Zion NP represented by the ZICA1 IMPROVE Monitor:

- **Table M.4-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure M.4-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure M.4-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure M.4-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure M.4-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure M.4-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure M.4-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure M.4-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

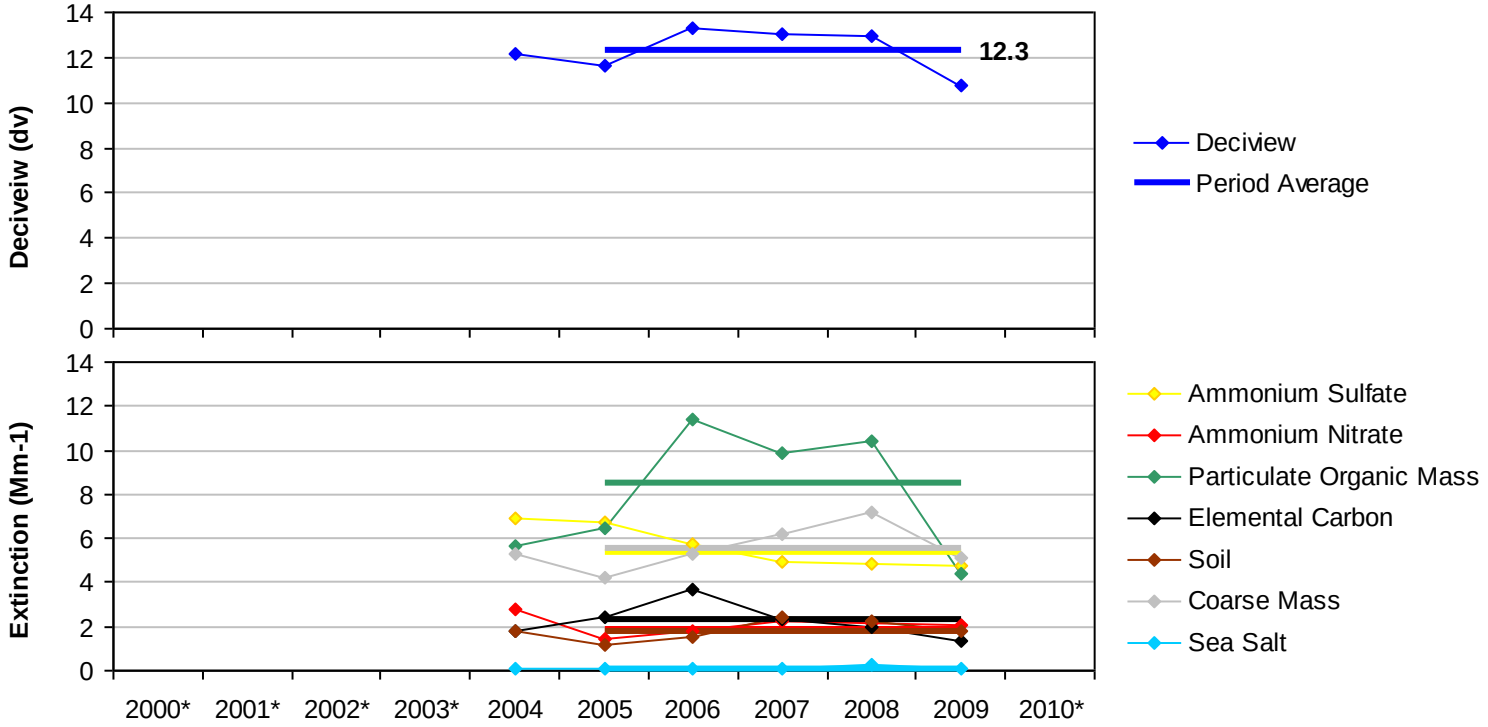
- **Figure M.4-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table M.4-1
Zion NP, UT (ZICA1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	---	---	---	4.5	3.9	4.7	4.9	4.0	4.2	---	0.0	0.5	5.0	4.3	-0.7	-14%
Worst 20% Days	---	---	---	---	12.2	11.6	13.3	13.0	12.9	10.8	---	-0.2	0.4	12.5	12.3	-0.2	-2%
All Days	---	---	---	---	8.2	7.7	8.3	8.7	8.1	7.3	---	-0.1	0.4	8.3	8.0	-0.3	-4%
Total Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	15.7	14.8	16.0	16.4	15.0	15.3	---	0.1	0.5	16.5	15.5	-1.0	-6%
Worst 20% Days	---	---	---	---	34.3	32.6	39.4	38.0	39.1	29.6	---	-0.2	0.5	36.9	35.7	-1.2	-3%
All Days	---	---	---	---	23.7	22.4	24.4	25.0	24.2	21.3	---	-0.1	0.5	24.4	23.5	-0.9	-4%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	1.8	1.7	1.9	1.6	1.4	1.7	---	0.0	0.1	1.8	1.7	-0.1	-6%
Worst 20% Days	---	---	---	---	6.9	6.8	5.7	4.9	4.9	4.8	---	-0.5	0.0	5.2	5.4	0.2	4%
All Days	---	---	---	---	4.1	4.2	3.9	3.5	3.5	3.2	---	-0.2	0.0	3.6	3.6	0.0	0%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	0.7	0.5	0.4	0.8	0.5	0.8	---	0.0	0.2	0.8	0.6	-0.2	-25%
Worst 20% Days	---	---	---	---	2.8	1.5	1.8	2.2	2.1	2.1	---	-0.1	0.5	2.2	1.9	-0.3	-14%
All Days	---	---	---	---	1.3	0.8	1.0	1.5	1.1	1.0	---	0.0	0.5	1.3	1.1	-0.2	-15%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	1.6	1.1	1.4	1.3	1.4	1.1	---	-0.1	0.4	1.8	1.3	-0.5	-28%
Worst 20% Days	---	---	---	---	5.6	6.5	11.4	9.9	10.4	4.4	---	0.6	0.5	9.3	8.5	-0.8	-9%
All Days	---	---	---	---	3.2	3.0	4.1	4.0	4.1	2.5	---	0.0	0.5	4.0	3.5	-0.5	-13%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	0.7	0.5	0.8	0.6	0.5	0.4	---	0.0	0.1	0.8	0.6	-0.2	-25%
Worst 20% Days	---	---	---	---	1.8	2.5	3.7	2.3	2.0	1.4	---	-0.2	0.2	2.4	2.4	0.0	0%
All Days	---	---	---	---	1.2	1.4	1.7	1.3	1.0	0.9	---	-0.1	0.1	1.4	1.3	-0.1	-7%
Soil Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	0.2	0.2	0.3	0.4	0.2	0.3	---	0.0	0.1	0.3	0.3	0.0	0%
Worst 20% Days	---	---	---	---	1.8	1.2	1.5	2.4	2.3	1.8	---	0.1	0.2	1.7	1.8	0.1	6%
All Days	---	---	---	---	0.9	0.6	0.8	1.2	1.0	1.0	---	0.1	0.1	0.9	0.9	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	0.7	0.8	1.1	1.5	0.9	0.9	---	0.0	0.2	1.1	1.0	-0.1	-9%
Worst 20% Days	---	---	---	---	5.3	4.2	5.3	6.2	7.2	5.1	---	0.3	0.4	5.6	5.6	0.0	0%
All Days	---	---	---	---	3.0	2.5	2.8	3.5	3.3	2.7	---	0.1	0.5	3.1	3.0	-0.1	-3%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	---	---	---	0.0	0.0	0.0	0.0	0.1	0.0	---	0.0	0.1	0.0	0.0	0.0	0%
Worst 20% Days	---	---	---	---	0.1	0.1	0.1	0.1	0.3	0.1	---	0.0	0.4	0.1	0.1	0.0	0%
All Days	---	---	---	---	0.0	0.0	0.0	0.1	0.1	0.0	---	0.0	0.2	0.0	0.1	0.1	0%

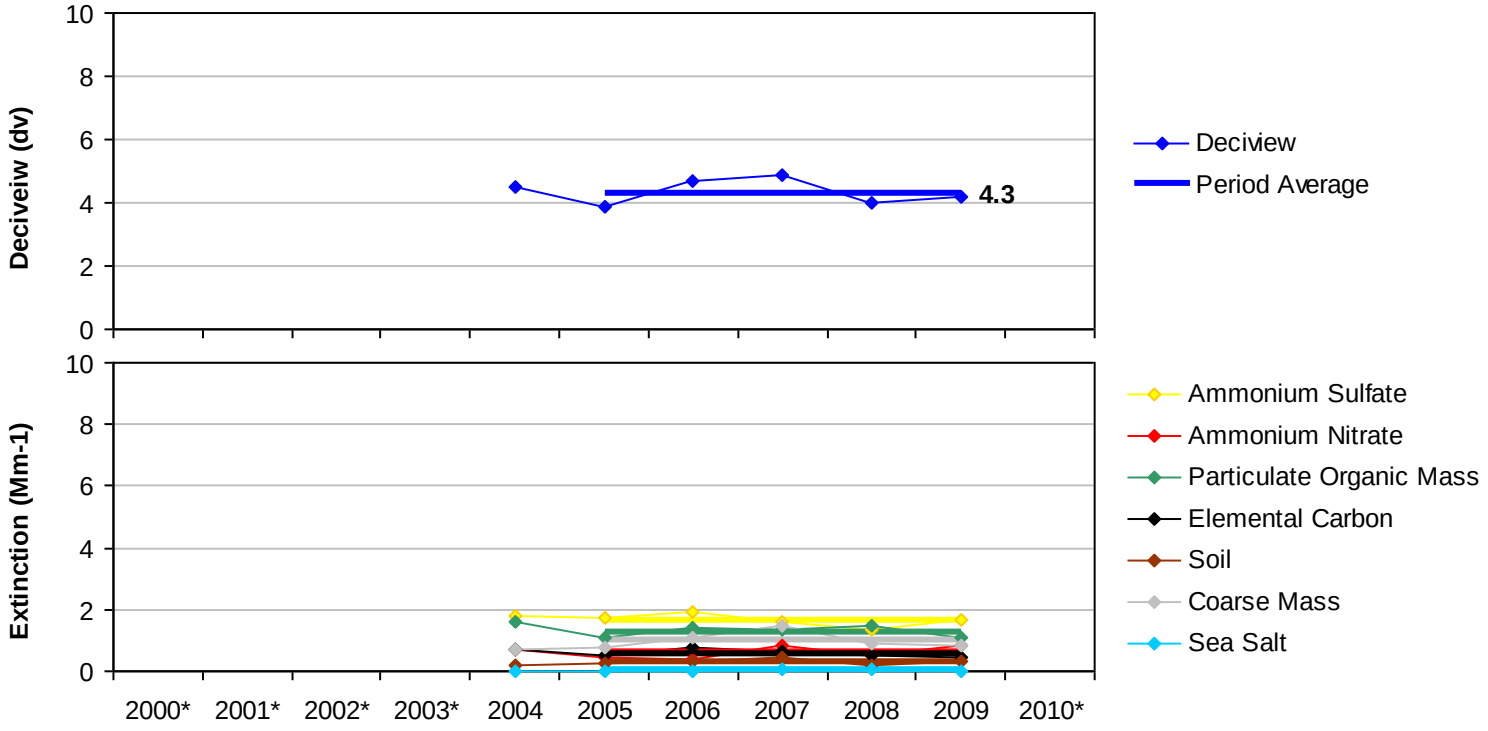
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure M.4-1
Zion NP, UT (ZICA1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



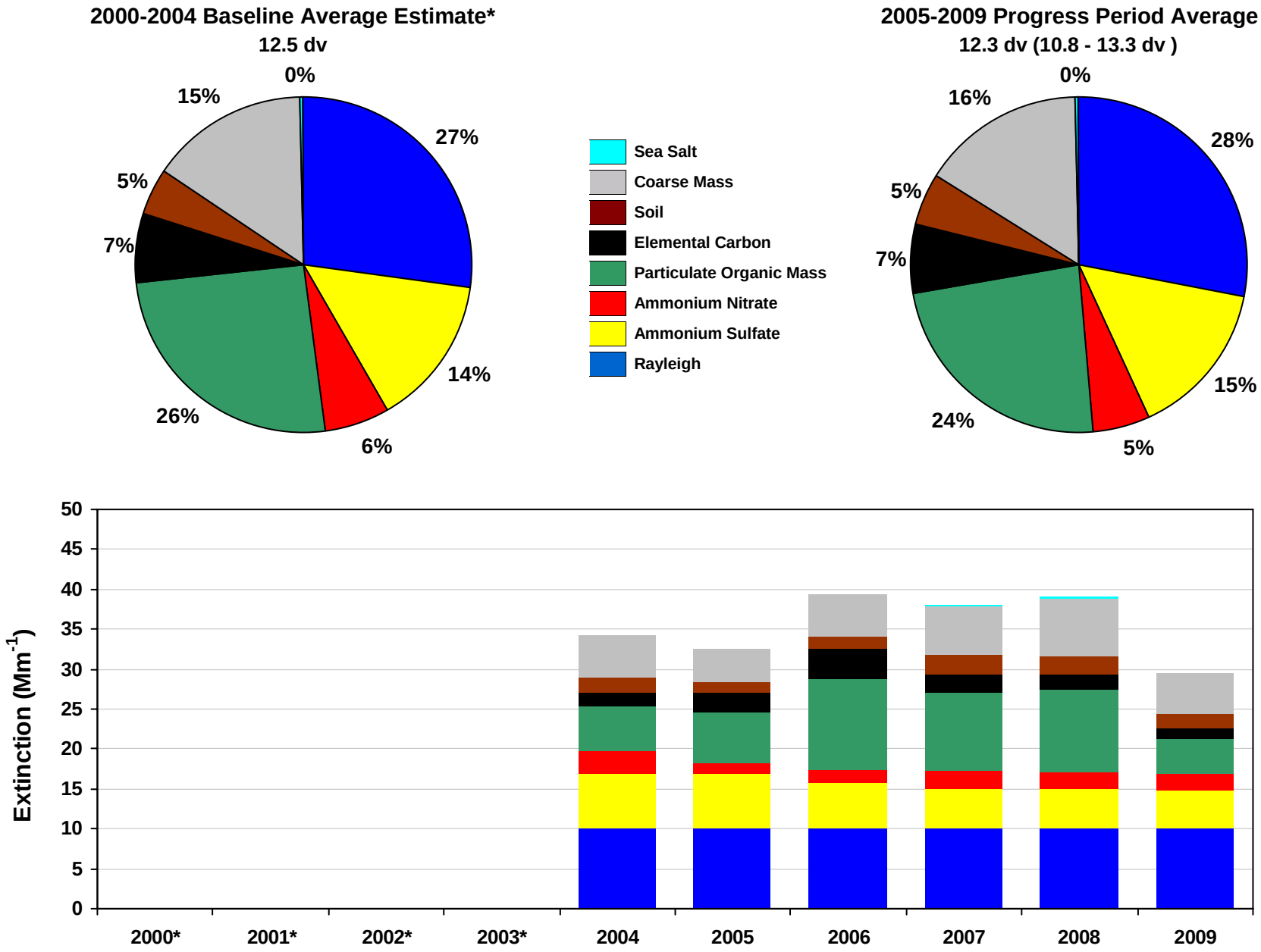
*Missing years did not meet RHR data completeness criteria.

Figure M.4-2
Zion NP, UT (ZICA1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



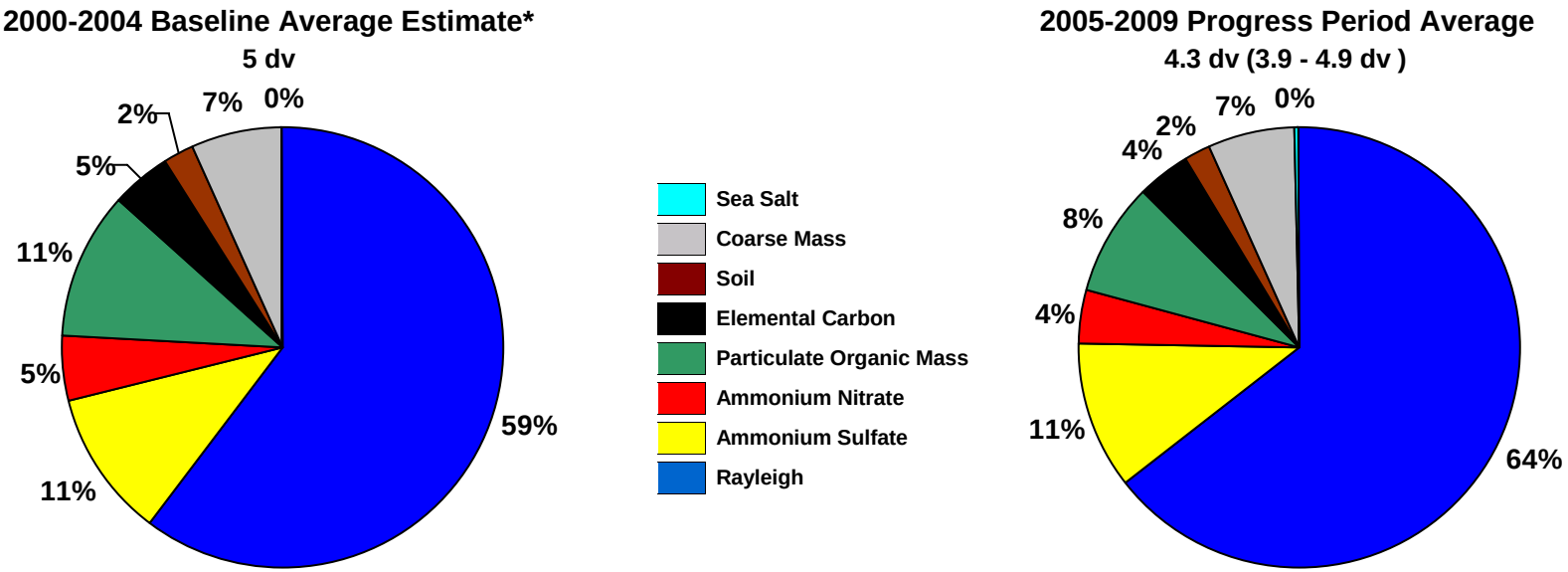
*Missing years did not meet RHR data completeness criteria.

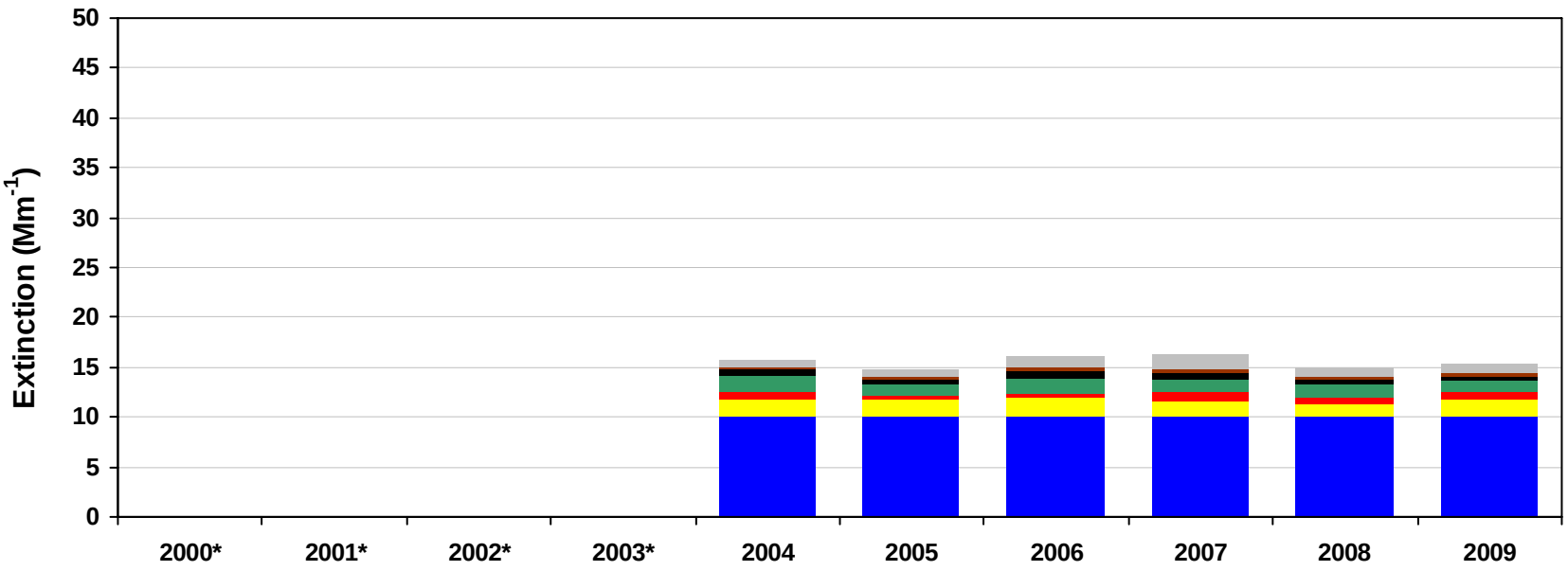
Figure M.4-3
Zion NP, UT (ZICA1 Site)
20% Most Impaired Visibility Days



*Baseline years did not meet RHR data completeness criteria. The 5-year baseline average represents an approximation based on methods described in text.

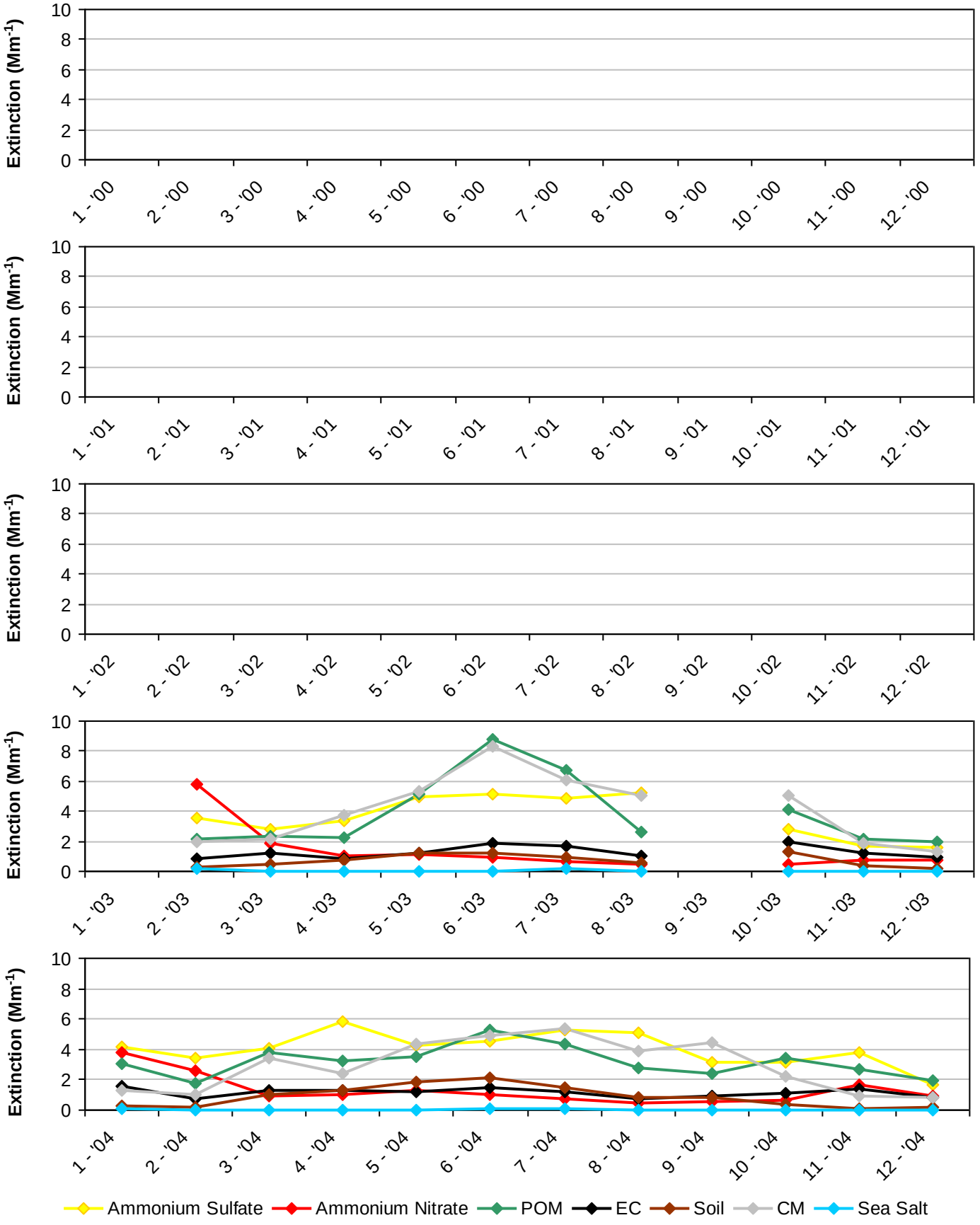
Figure M.4-4
Zion NP, UT (ZICA1 Site)
20% Least Impaired Visibility Days





*Baseline years did not meet RHR data completeness criteria. The 5-year baseline average represents an approximation based on methods described in text.

Figure M.4-5
Zion NP, UT (ZICA1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the years 2000, 2001, 2002 and 2003 are shown here, but these years did not meet RHR data completeness criteria.

Figure M.4-6
Zion NP, UT (ZICA1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

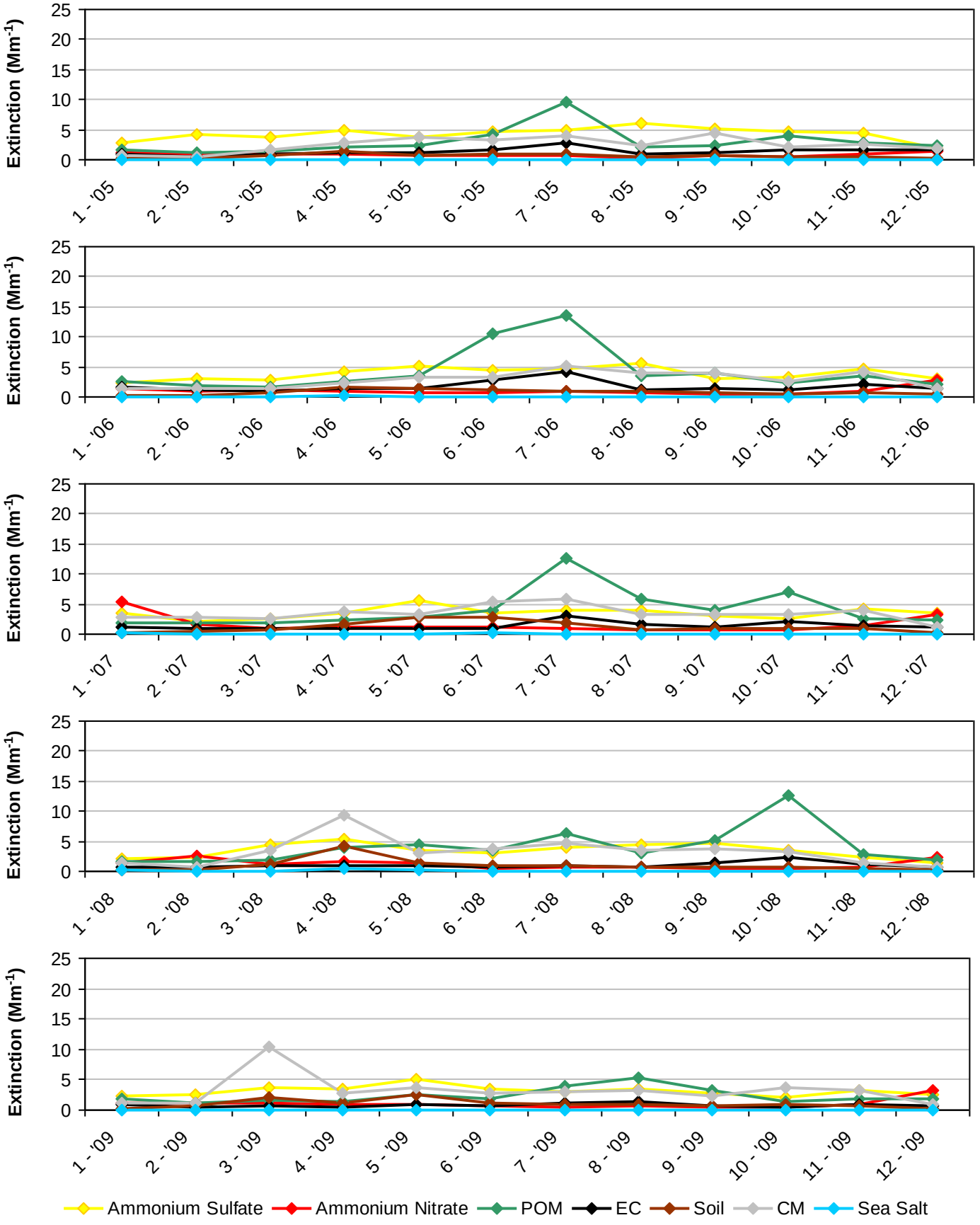
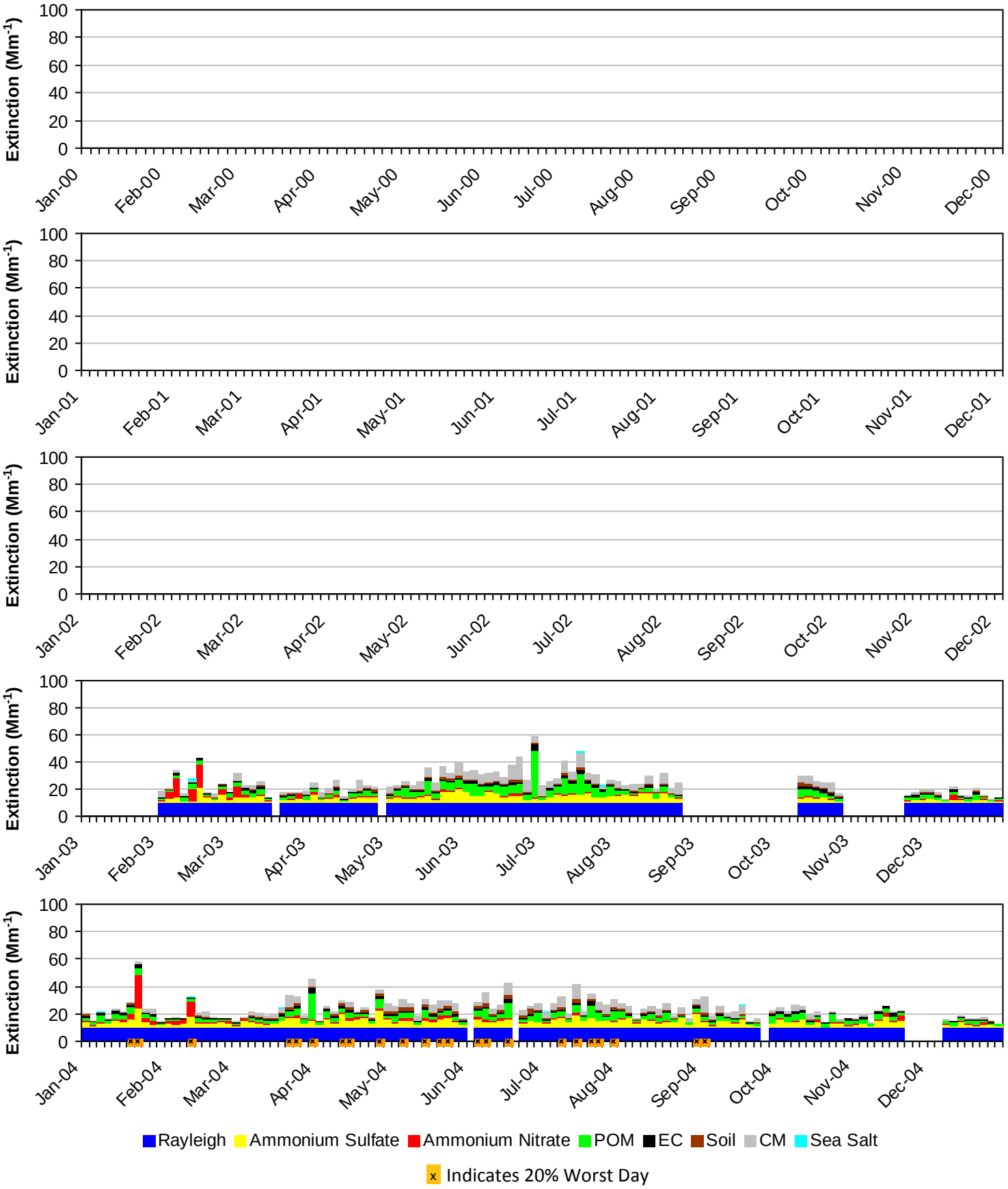
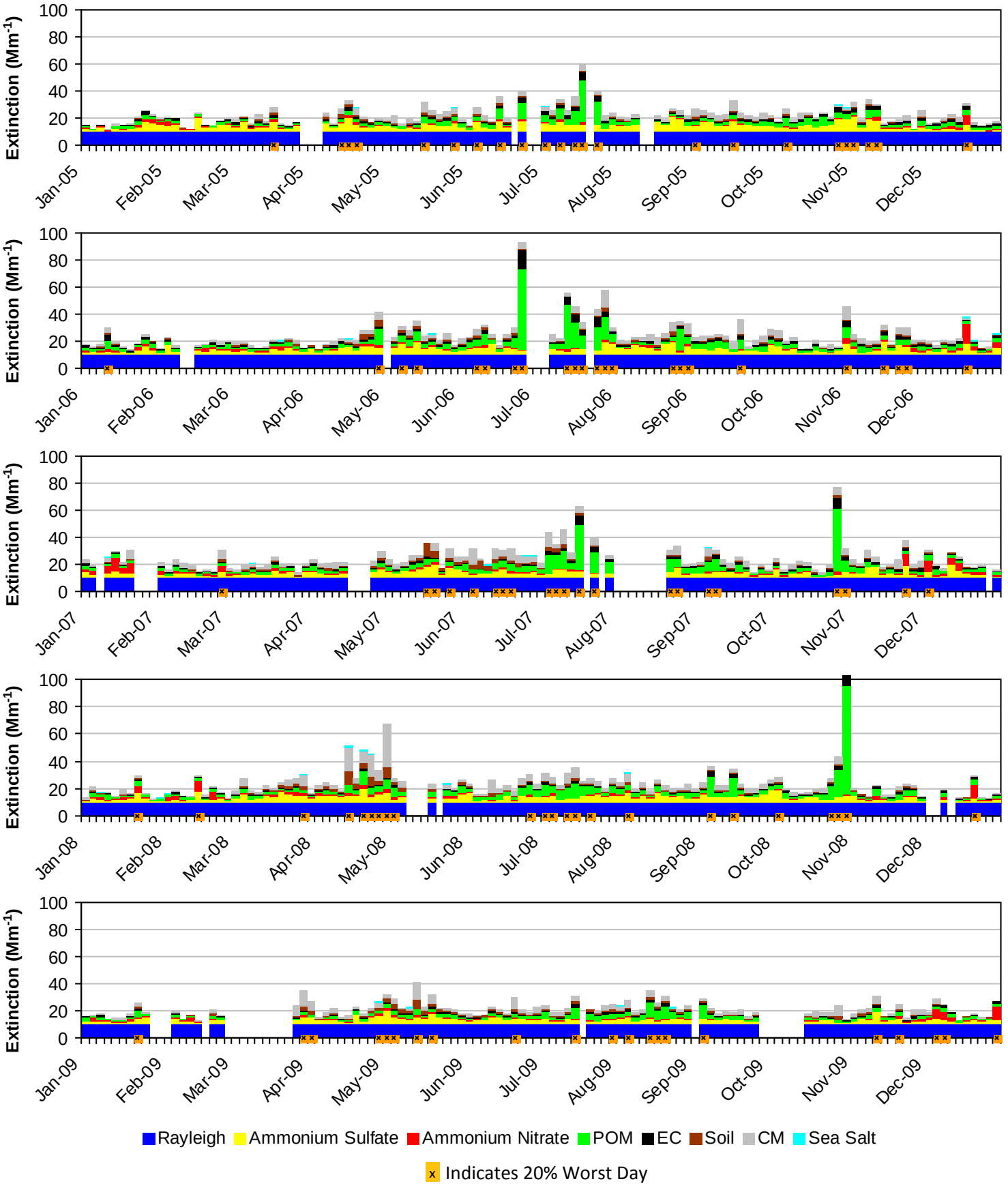


Figure M.4-7
Zion NP, UT (ZICA1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2000, 2001, 2002 and 2003 are shown here, but these years did not meet RHR data completeness criteria.

Figure M.4-8
Zion NP, UT (ZICA1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



APPENDIX N:

Washington Class I Area Monitoring Data Summary Tables and Charts

Includes the following subsections:

Subsection	IMPROVE Monitor	Class I Area(s) Represented
N.1	MORA1	Mount Rainer NP
N.2	NOCA1	North Cascades NP and Glacier Peak WA
N.3	OLYM1	Olympic NP
N.4	PASA1	Pasayten WA
N.5	SNPA1	Alpine Lakes WA
N.6	WHPA1	Goat Rocks WA and Mount Adams WA

N.1. MOUNT RAINER NP (MORA1)

The following tables and figures are presented in this section for the Mount Rainer NP represented by the MORA1 IMPROVE Monitor:

- **Table N.1-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure N.1-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure N.1-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure N.1-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure N.1-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure N.1-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure N.1-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure N.1-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

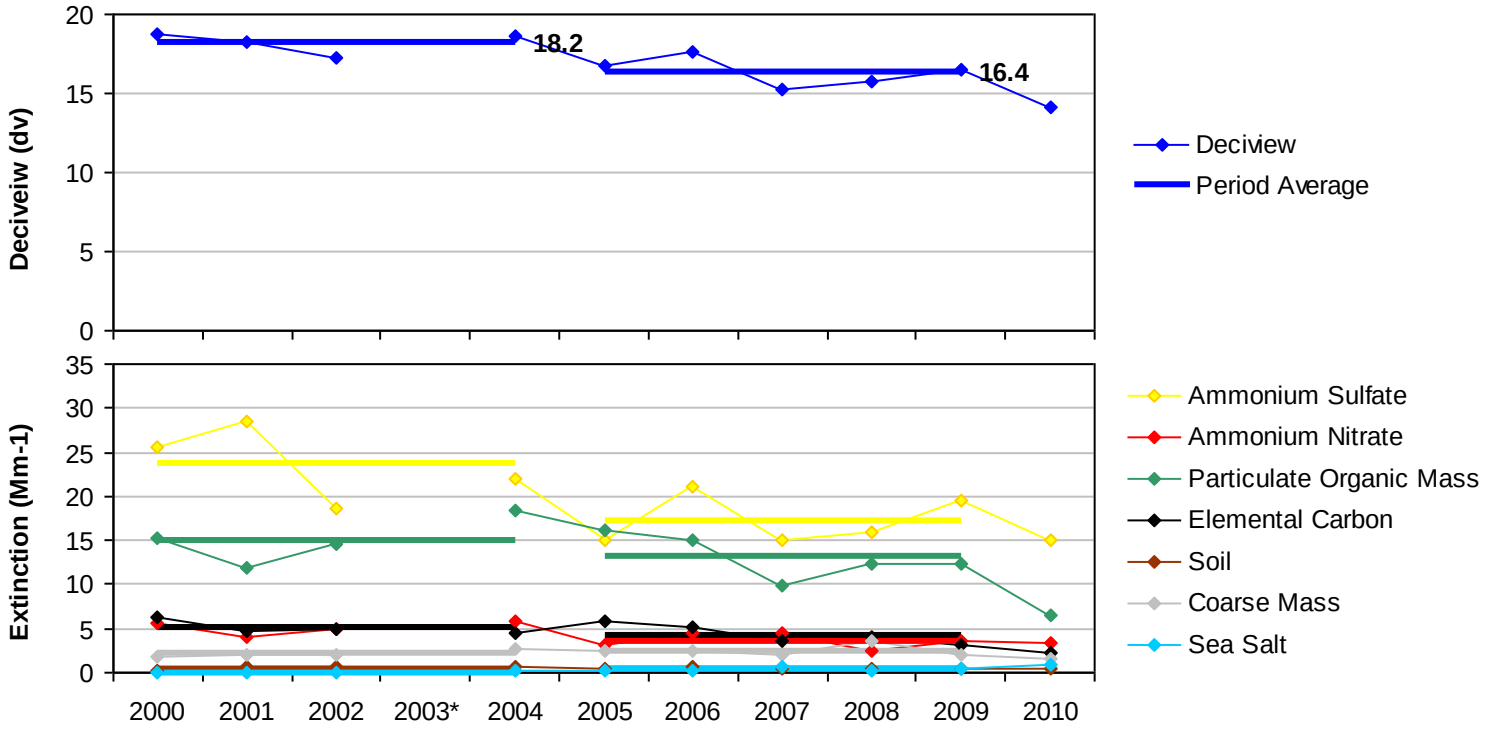
- **Figure N.1-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table N.1-1
Mount Rainer NP, WA (MORA1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	6.1	6.1	4.8	---	4.9	5.7	4.8	5.1	4.7	4.3	3.5	-0.2	0.0	5.5	4.9	-0.6	-11%
Worst 20% Days	18.8	18.3	17.3	---	18.6	16.8	17.6	15.3	15.8	16.5	14.1	-0.4	0.0	18.2	16.4	-1.8	-10%
All Days	12.6	12.0	11.4	---	11.9	11.5	11.1	9.9	10.3	10.2	8.5	-0.3	0.0	12.0	10.6	-1.4	-12%
Total Extinction (Mm-1)																	
Best 20% Days	18.5	18.4	16.3	---	16.5	17.9	16.3	16.6	16.2	15.5	14.2	-0.3	0.0	17.4	16.5	-0.9	-5%
Worst 20% Days	66.0	62.9	56.7	---	65.6	54.4	59.9	47.0	49.8	52.5	41.3	-1.9	0.0	62.8	52.7	-10.1	-16%
All Days	39.2	36.7	34.4	---	37.1	34.3	33.9	28.9	30.5	30.5	25.4	-1.0	0.0	36.8	31.6	-5.2	-14%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	3.1	3.0	2.1	---	2.1	3.2	2.0	2.3	2.5	2.2	1.5	-0.1	0.3	2.6	2.5	-0.1	-4%
Worst 20% Days	25.6	28.6	18.6	---	22.1	14.9	21.0	15.0	15.8	19.6	15.1	-0.8	0.1	23.7	17.3	-6.4	-27%
All Days	12.8	13.1	9.7	---	10.3	9.4	10.1	7.6	8.8	9.1	7.1	-0.4	0.0	11.5	9.0	-2.5	-22%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.7	0.8	0.6	---	0.5	0.4	0.4	0.4	0.5	0.4	0.3	0.0	0.0	0.6	0.4	-0.2	-33%
Worst 20% Days	5.7	4.1	4.9	---	5.9	3.2	4.5	4.5	2.4	3.5	3.3	-0.2	0.1	5.1	3.6	-1.5	-29%
All Days	2.8	2.4	2.6	---	2.5	1.7	2.1	1.8	1.8	1.7	1.4	-0.1	0.0	2.6	1.8	-0.8	-31%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.9	1.7	1.2	---	1.2	1.4	1.0	1.2	0.9	0.7	0.4	-0.1	0.0	1.5	1.0	-0.5	-33%
Worst 20% Days	15.3	11.8	14.7	---	18.5	16.2	15.0	9.8	12.3	12.4	6.5	-0.3	0.2	15.1	13.1	-2.0	-13%
All Days	7.3	5.6	6.6	---	8.0	7.0	5.7	4.4	4.8	5.1	2.8	-0.3	0.1	6.9	5.4	-1.5	-22%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.7	0.9	0.5	---	0.5	0.7	0.7	0.5	0.3	0.4	0.3	0.0	0.0	0.7	0.5	-0.2	-29%
Worst 20% Days	6.3	4.8	4.9	---	4.6	5.9	5.2	3.6	3.9	3.2	2.2	-0.2	0.0	5.1	4.4	-0.7	-14%
All Days	3.1	2.5	2.6	---	2.6	3.0	2.4	1.7	1.8	1.7	1.2	-0.1	0.0	2.7	2.1	-0.6	-22%
Soil Extinction (Mm-1)																	
Best 20% Days	0.1	0.1	0.0	---	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0%
Worst 20% Days	0.3	0.6	0.6	---	0.6	0.4	0.6	0.4	0.6	0.4	0.5	0.0	0.5	0.5	0.5	0.0	0%
All Days	0.2	0.3	0.2	---	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.0	0.3	0.2	0.2	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	0.5	0.6	0.6	---	0.5	0.6	0.3	0.5	0.4	0.4	0.3	0.0	0.1	0.5	0.4	-0.1	-20%
Worst 20% Days	1.9	2.1	2.1	---	2.7	2.4	2.5	2.0	3.5	2.0	1.6	0.1	0.2	2.2	2.5	0.3	14%
All Days	1.3	1.3	1.2	---	1.7	1.4	1.3	1.2	1.4	1.1	1.0	0.0	0.4	1.4	1.3	-0.1	-7%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.5	0.5	0.4	---	0.6	0.6	0.8	0.6	0.5	0.4	0.3	0.0	0.3	0.5	0.6	0.1	20%
Worst 20% Days	0.0	0.0	0.0	---	0.2	0.3	0.2	0.7	0.3	0.4	1.0	0.0	0.0	0.1	0.4	0.3	>100%
All Days	0.8	0.5	0.4	---	0.8	0.6	1.1	0.9	0.6	0.7	0.7	0.0	0.4	0.6	0.8	0.2	33%

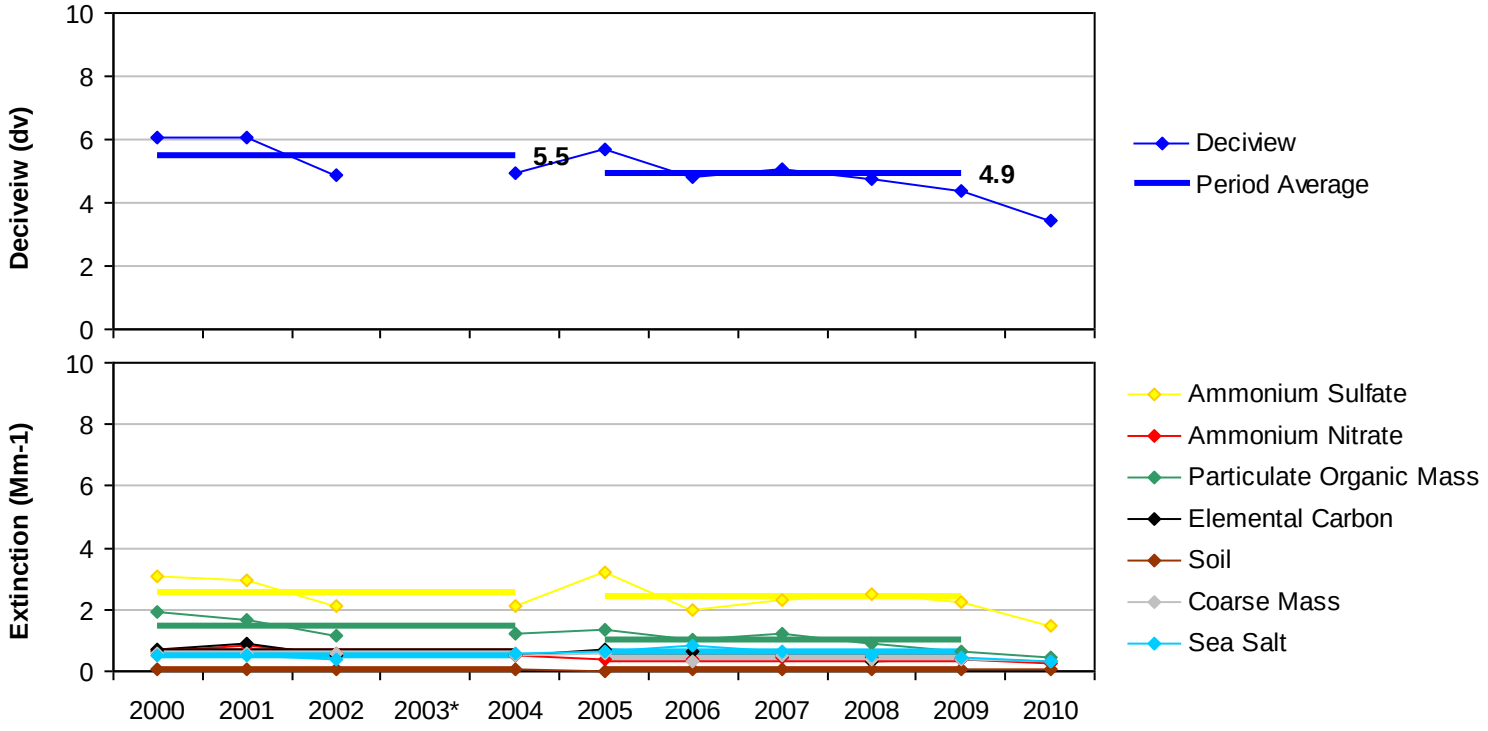
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure N.1-1
Mount Rainer NP, WA (MORA1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



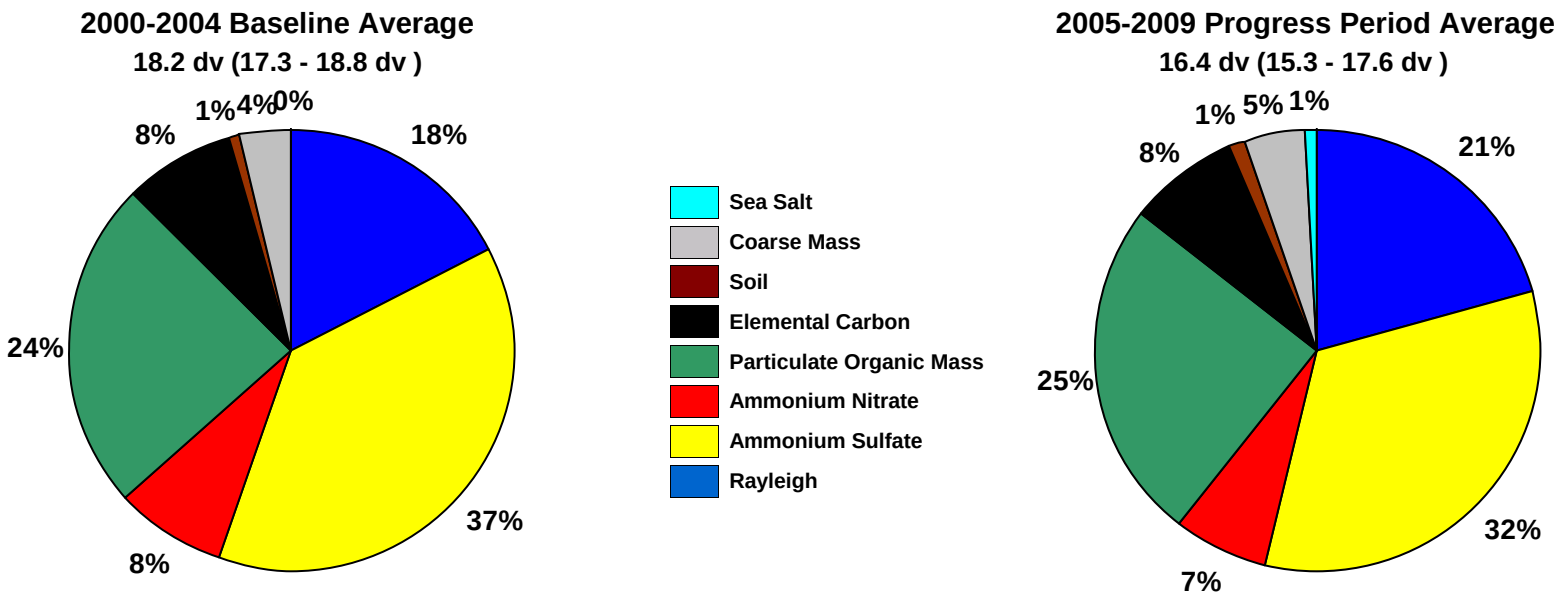
*Missing years did not meet RHR data completeness criteria.

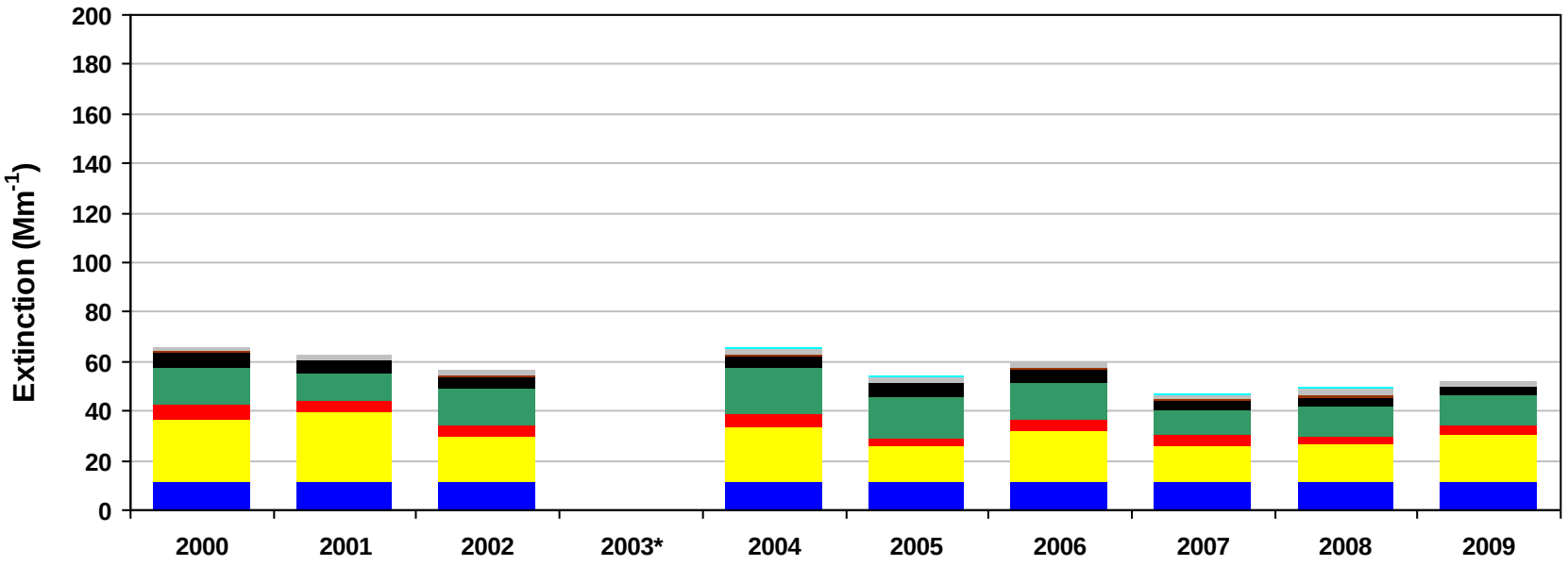
Figure N.1-2
Mount Rainer NP, WA (MORA1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

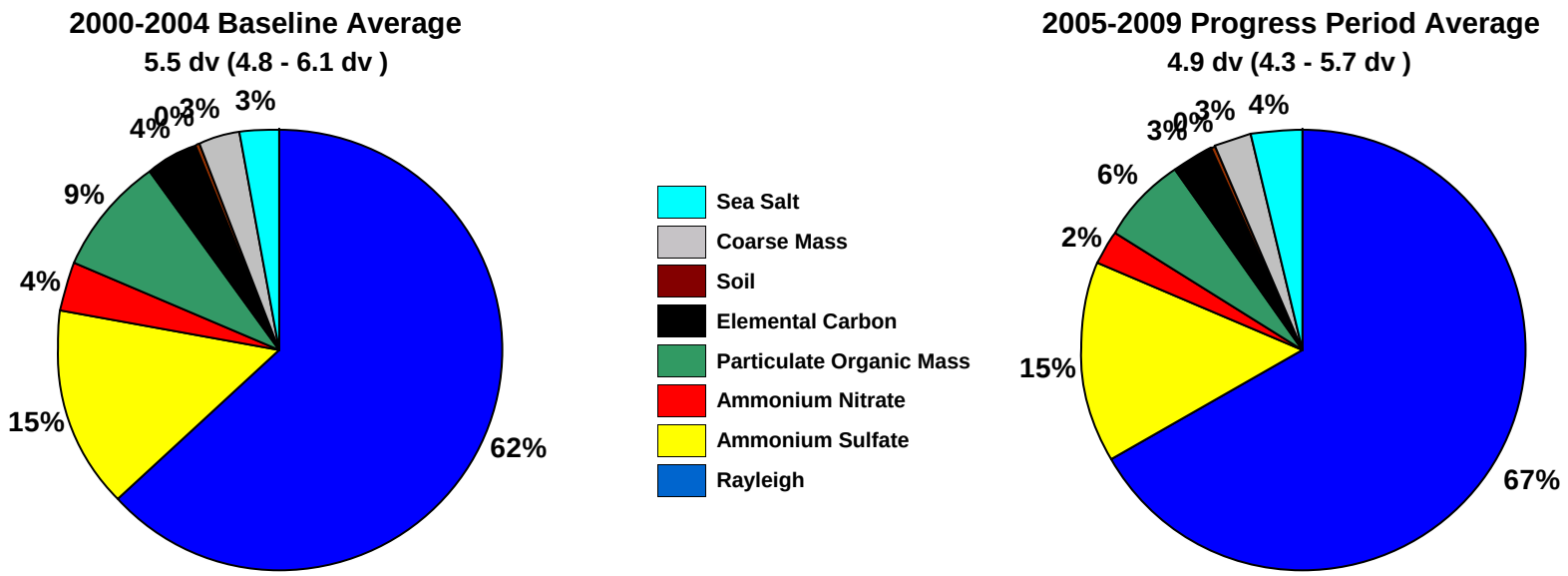
Figure N.1-3
Mount Rainer NP, WA (MORA1 Site)
20% Most Impaired Visibility Days

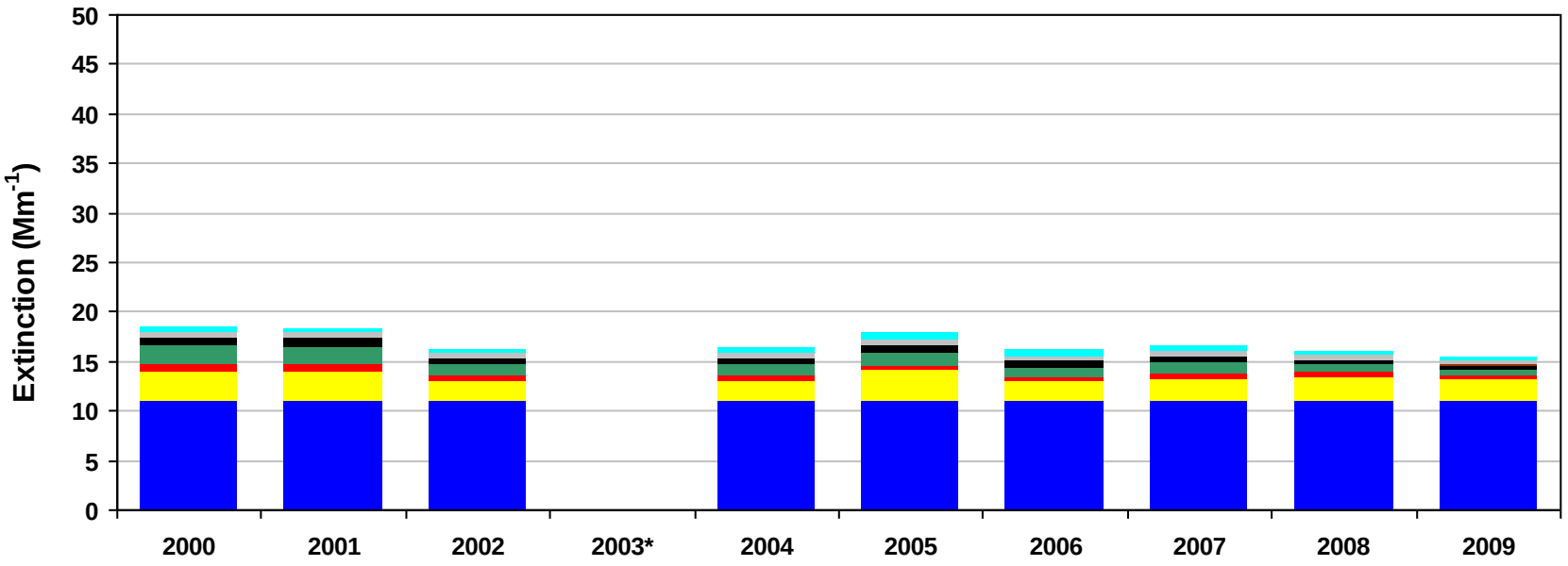




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

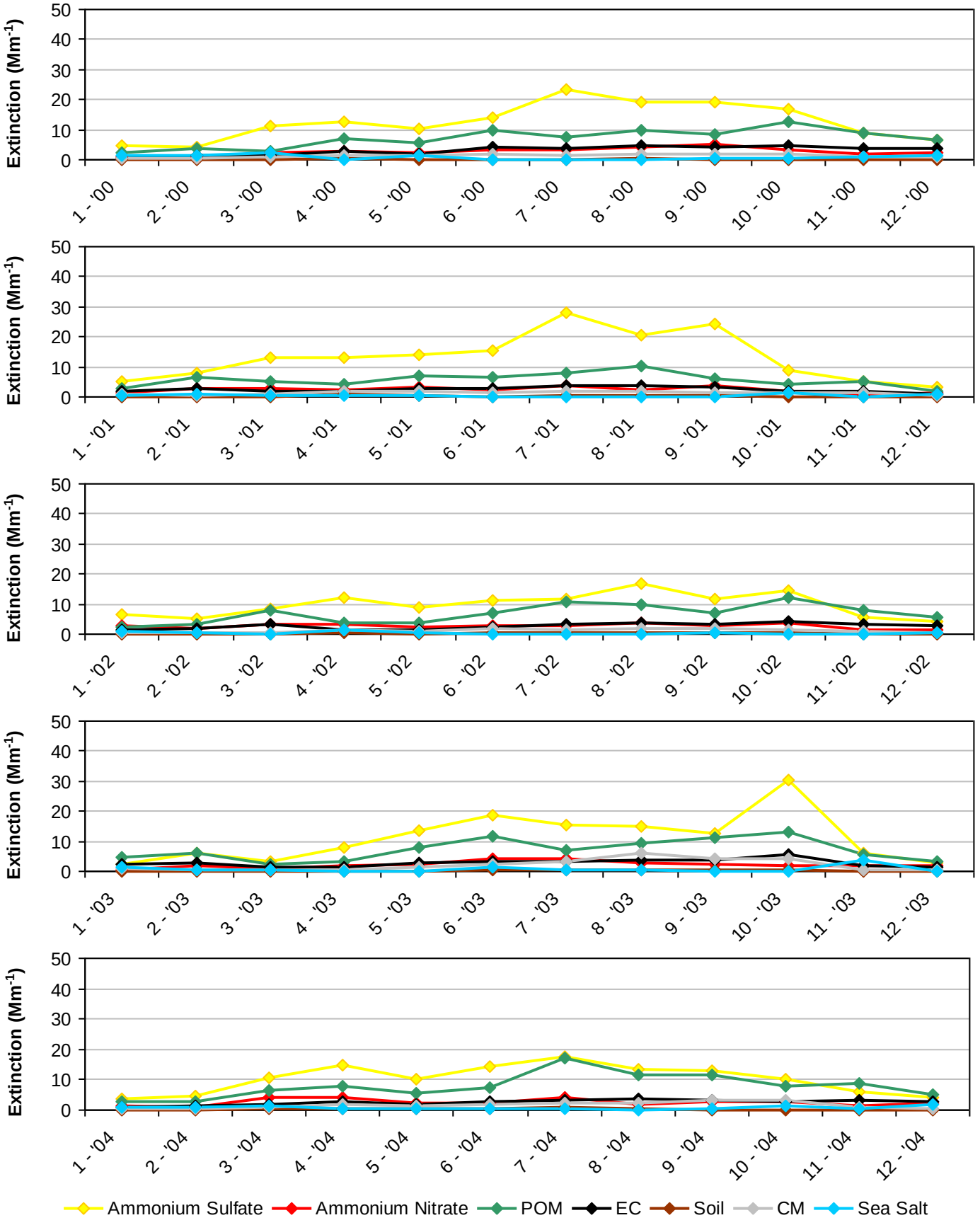
Figure N.1-4
Mount Rainer NP, WA (MORA1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure N.1-5
Mount Rainer NP, WA (MORA1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2003 are shown here, but this year did not meet RHR data completeness criteria.

Figure N.1-6
Mount Rainer NP, WA (MORA1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

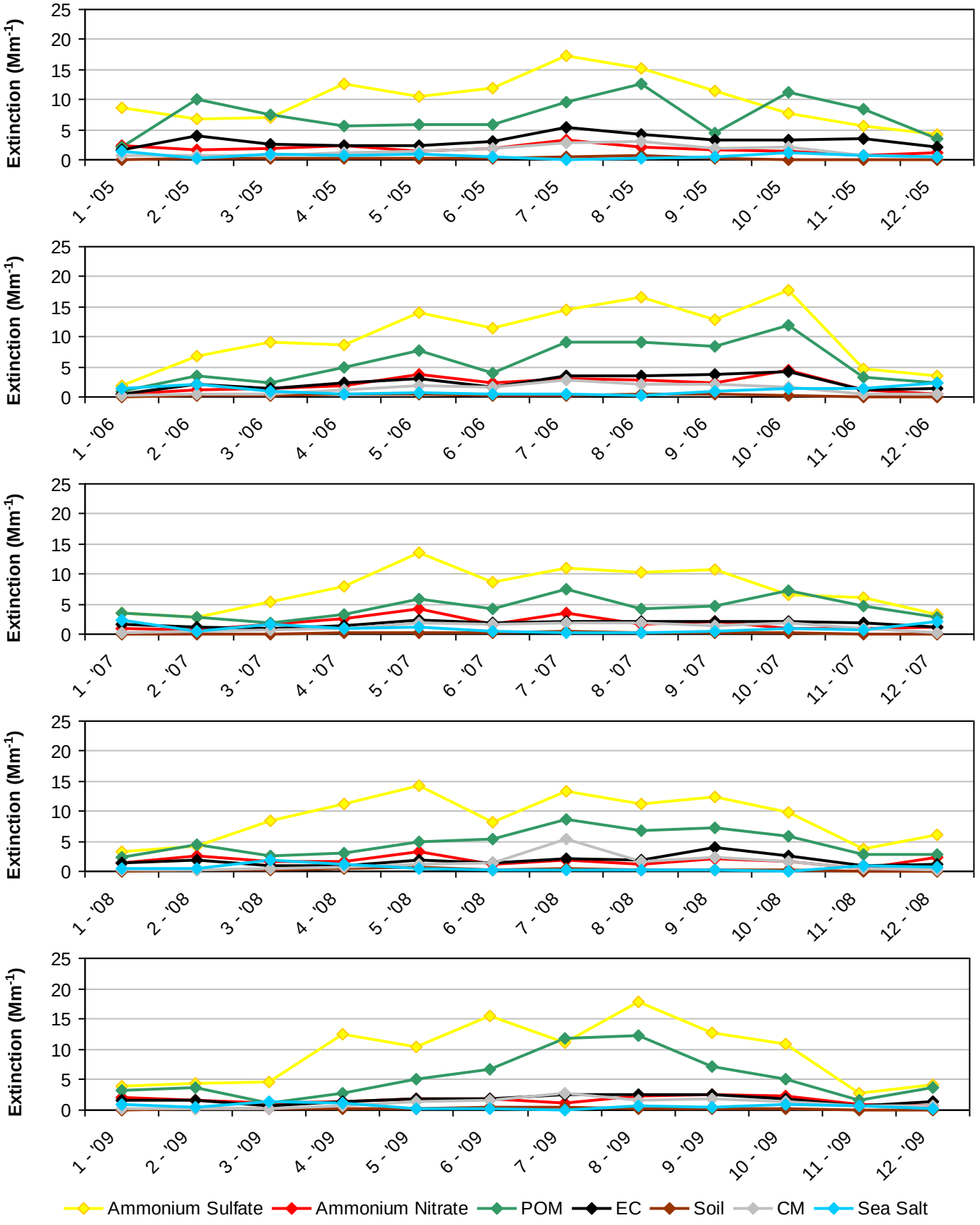
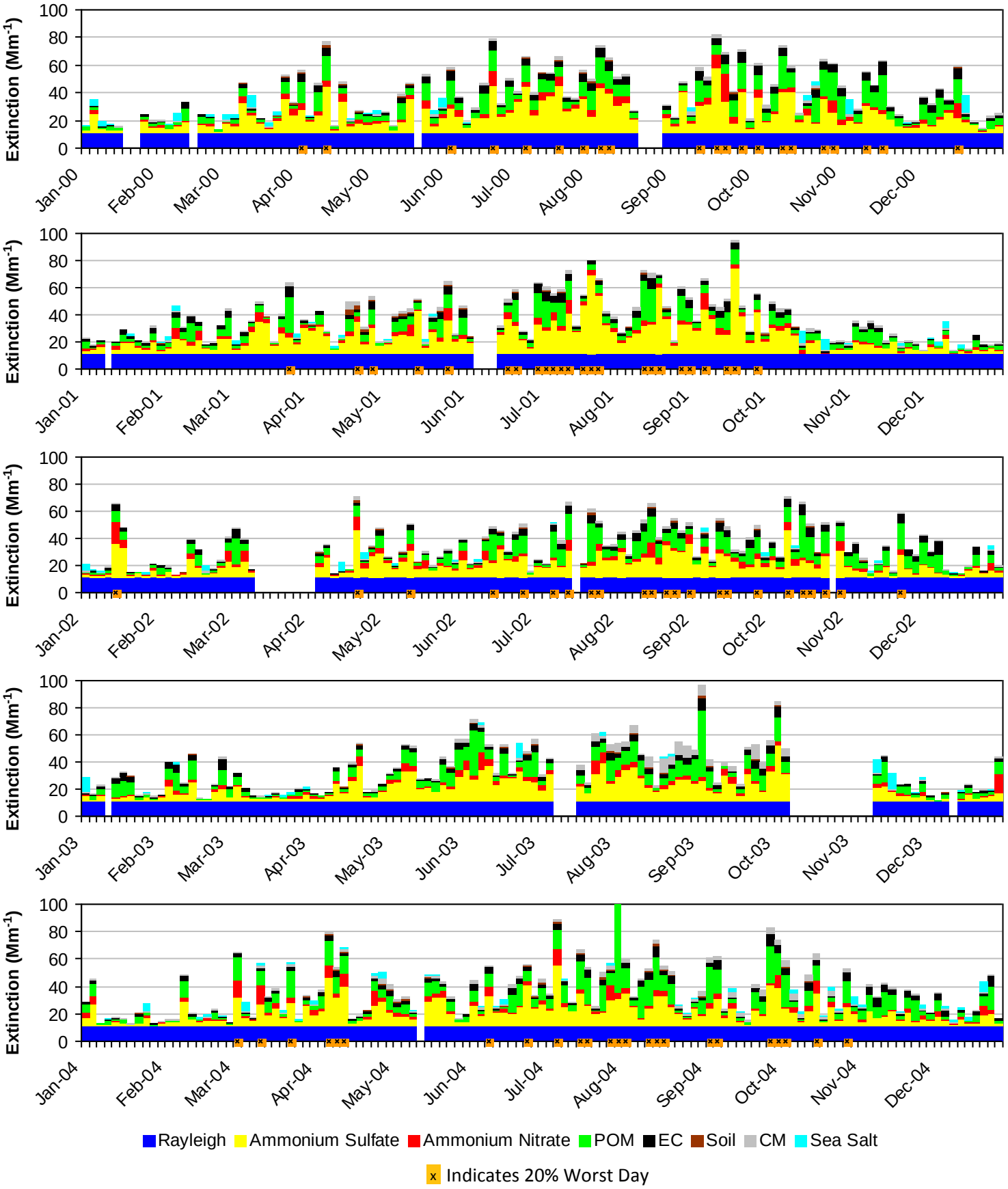
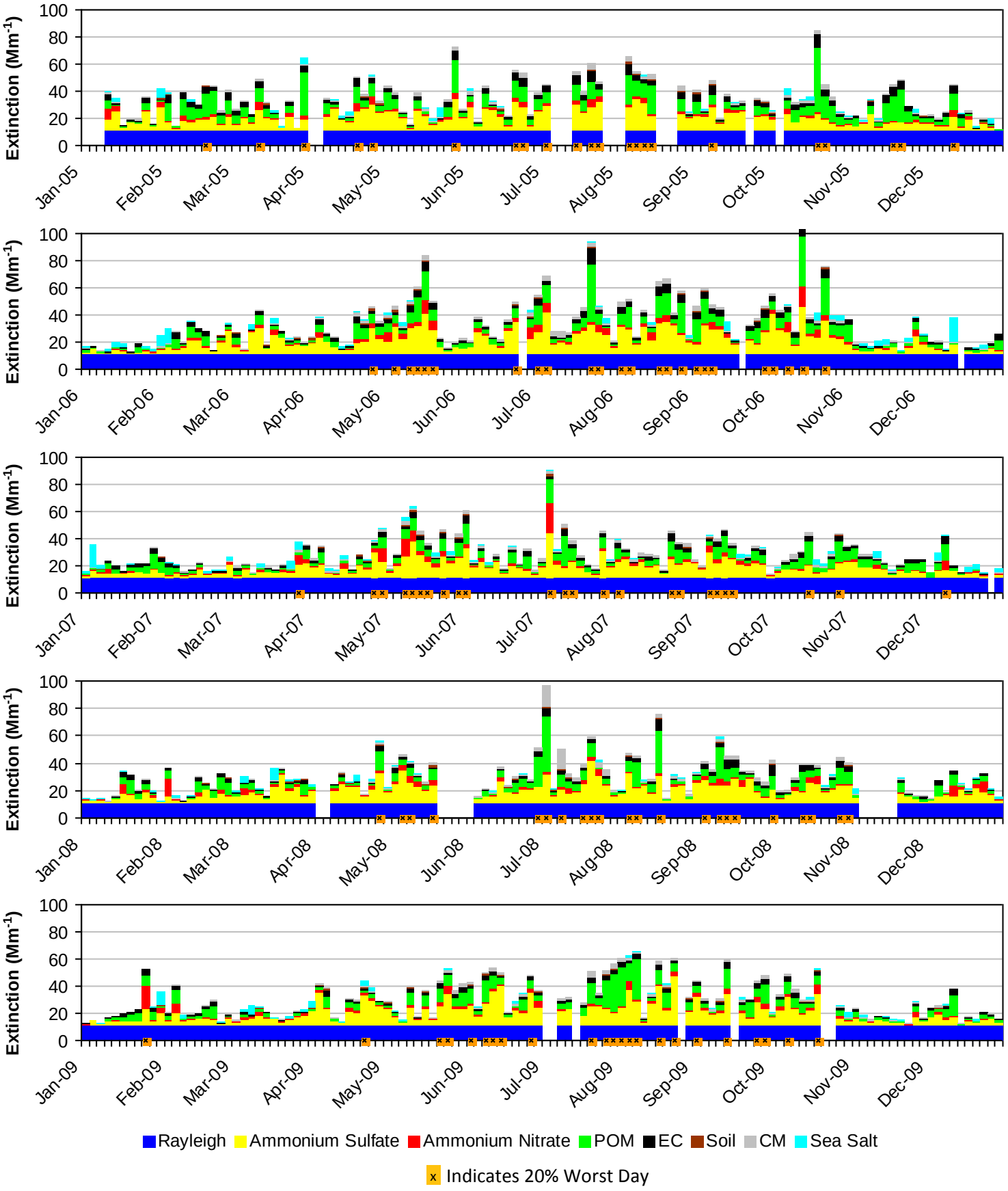


Figure N.1-7
Mount Rainer NP, WA (MORA1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2003 are shown here, but this year did not meet RHR data completeness criteria.

Figure N.1-8
Mount Rainer NP, WA (MORA1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



N.2. NORTH CASCADES NP AND GLACIER PEAK WA (NOCA1)

The following tables and figures are presented in this section for the North Cascades NP and Glacier Peak WA represented by the NOCA1 IMPROVE Monitor:

- **Table N.2-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure N.2-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure N.2-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure N.2-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure N.2-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure N.2-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure N.2-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure N.2-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

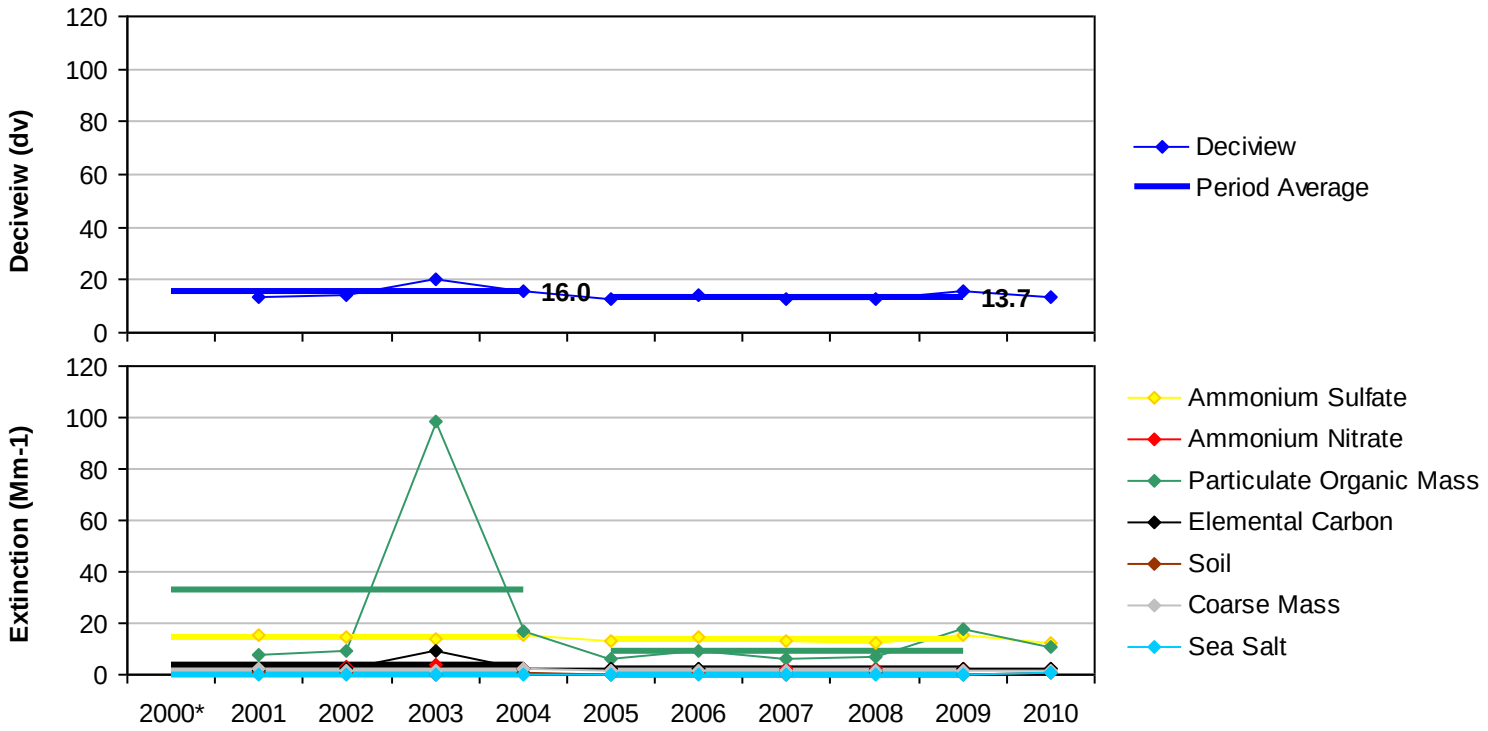
- **Figure N.2-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table N.2-1
North Cascades NP and Glacier Peak WA, WA (NOCA1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	3.8	3.1	3.2	3.4	3.3	2.8	3.0	3.7	3.2	2.6	0.0	0.3	3.4	3.2	-0.2	-6%
Worst 20% Days	---	13.8	14.1	20.5	15.7	12.9	14.4	12.6	12.9	15.8	13.5	-0.1	0.5	16.0	13.7	-2.3	-14%
All Days	---	8.3	8.3	9.7	8.4	7.8	8.3	7.4	8.0	8.8	7.1	0.0	0.3	8.7	8.1	-0.6	-7%
Total Extinction (Mm-1)																	
Best 20% Days	---	14.7	13.7	13.8	14.1	13.9	13.3	13.6	14.5	13.8	13.0	0.0	0.3	14.1	13.8	-0.3	-2%
Worst 20% Days	---	40.8	41.9	137.7	50.2	36.6	42.5	36.2	37.0	50.7	40.9	-0.4	0.5	67.6	40.6	-27.0	-40%
All Days	---	24.6	24.9	44.6	26.1	23.3	25.0	22.5	23.5	27.0	22.6	-0.2	0.5	30.1	24.3	-5.8	-19%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	1.8	1.3	1.2	1.2	1.6	1.2	1.4	2.2	1.6	1.1	0.0	0.4	1.4	1.6	0.2	14%
Worst 20% Days	---	15.6	14.9	13.6	15.4	12.9	14.7	13.5	12.4	15.2	12.2	-0.2	0.1	14.9	13.7	-1.2	-8%
All Days	---	7.5	6.9	6.7	6.3	6.5	7.2	5.9	6.8	7.5	5.4	0.0	0.5	6.8	6.8	0.0	0%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.5	0.4	0.4	0.5	0.2	0.2	0.2	0.3	0.2	0.2	0.0	0.0	0.4	0.2	-0.2	-50%
Worst 20% Days	---	2.1	2.8	3.7	2.2	2.2	2.5	2.2	2.4	2.1	2.5	0.0	0.3	2.7	2.3	-0.4	-15%
All Days	---	1.2	1.3	1.4	1.2	1.0	1.1	1.1	1.1	1.1	1.0	0.0	0.1	1.3	1.1	-0.2	-15%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	0.7	0.5	0.7	0.7	0.5	0.3	0.5	0.5	0.5	0.2	0.0	0.0	0.6	0.5	-0.1	-17%
Worst 20% Days	---	7.6	9.0	98.7	16.8	6.4	9.4	5.9	7.3	18.1	11.1	-0.1	0.5	33.0	9.4	-23.6	-72%
All Days	---	2.9	3.7	22.0	5.2	2.7	3.4	2.7	2.8	5.4	3.3	0.0	0.4	8.5	3.4	-5.1	-60%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.3	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.2	0.1	0.0	0.0	0.2	0.2	0.0	0%
Worst 20% Days	---	1.8	2.2	8.9	2.3	2.1	2.5	1.7	1.5	2.6	2.0	0.0	0.5	3.8	2.1	-1.7	-45%
All Days	---	0.8	1.1	2.5	1.0	1.0	1.1	0.8	0.7	1.0	0.7	0.0	0.2	1.3	0.9	-0.4	-31%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0%
Worst 20% Days	---	0.7	0.4	0.3	0.5	0.3	0.5	0.3	0.5	0.3	0.5	0.0	0.3	0.5	0.4	-0.1	-20%
All Days	---	0.3	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.0	0.4	0.2	0.2	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.0	0.3	0.2	0.2	0.0	0%
Worst 20% Days	---	1.9	1.6	1.5	2.0	1.5	1.8	1.3	1.6	1.3	1.2	0.0	0.1	1.8	1.5	-0.3	-17%
All Days	---	0.8	0.7	0.8	0.9	0.7	0.7	0.6	0.7	0.7	0.6	0.0	0.1	0.8	0.7	-0.1	-13%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.0	0%
Worst 20% Days	---	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.3	0.1	0.4	0.0	0.0	0.0	0.2	0.2	0%
All Days	---	0.1	0.1	0.2	0.3	0.2	0.4	0.3	0.2	0.2	0.3	0.0	0.1	0.2	0.3	0.1	50%

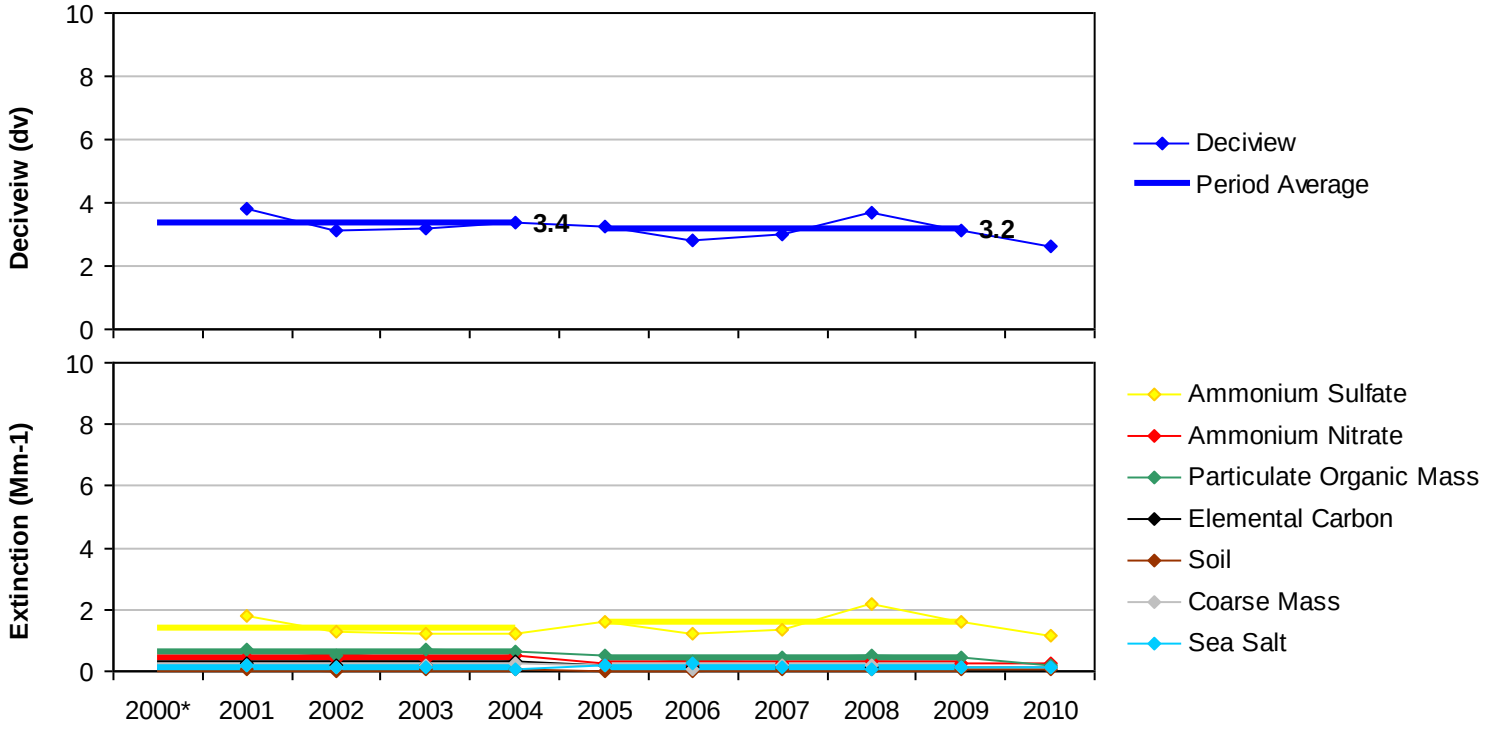
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure N.2-1
North Cascades NP and Glacier Peak WA, WA (NOCA1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure N.2-2
North Cascades NP and Glacier Peak WA, WA (NOCA1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

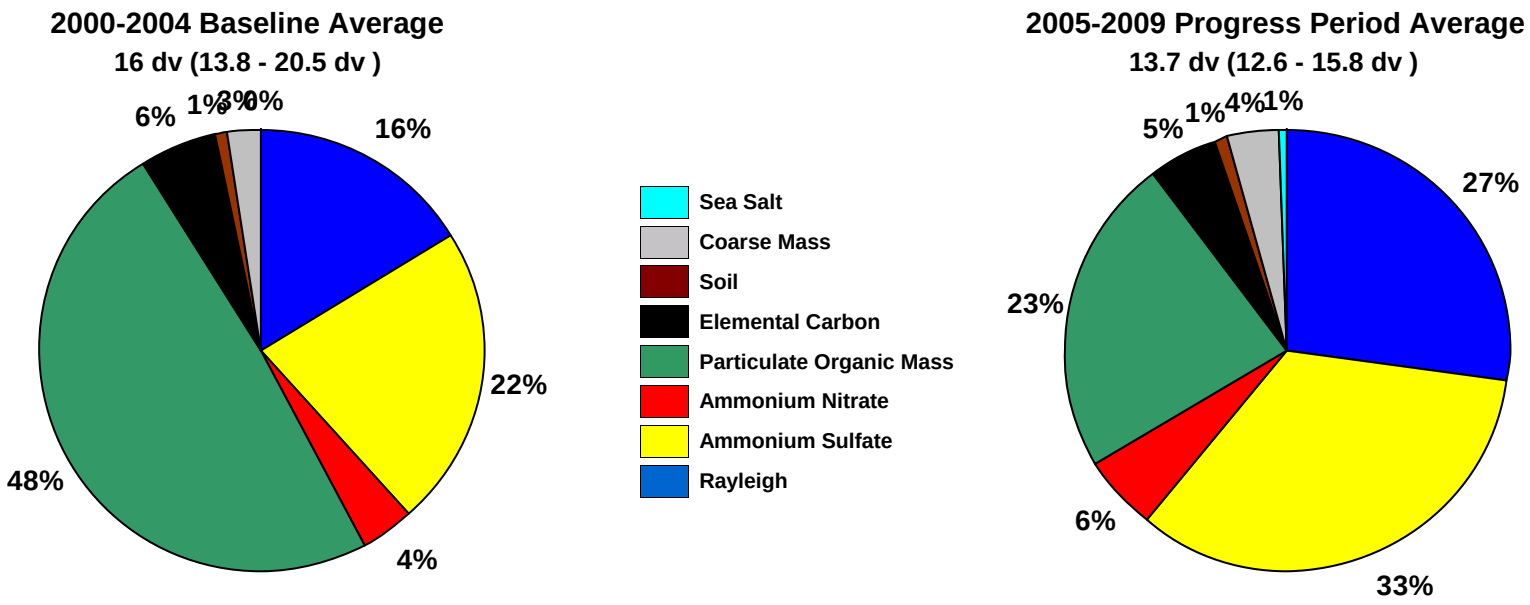


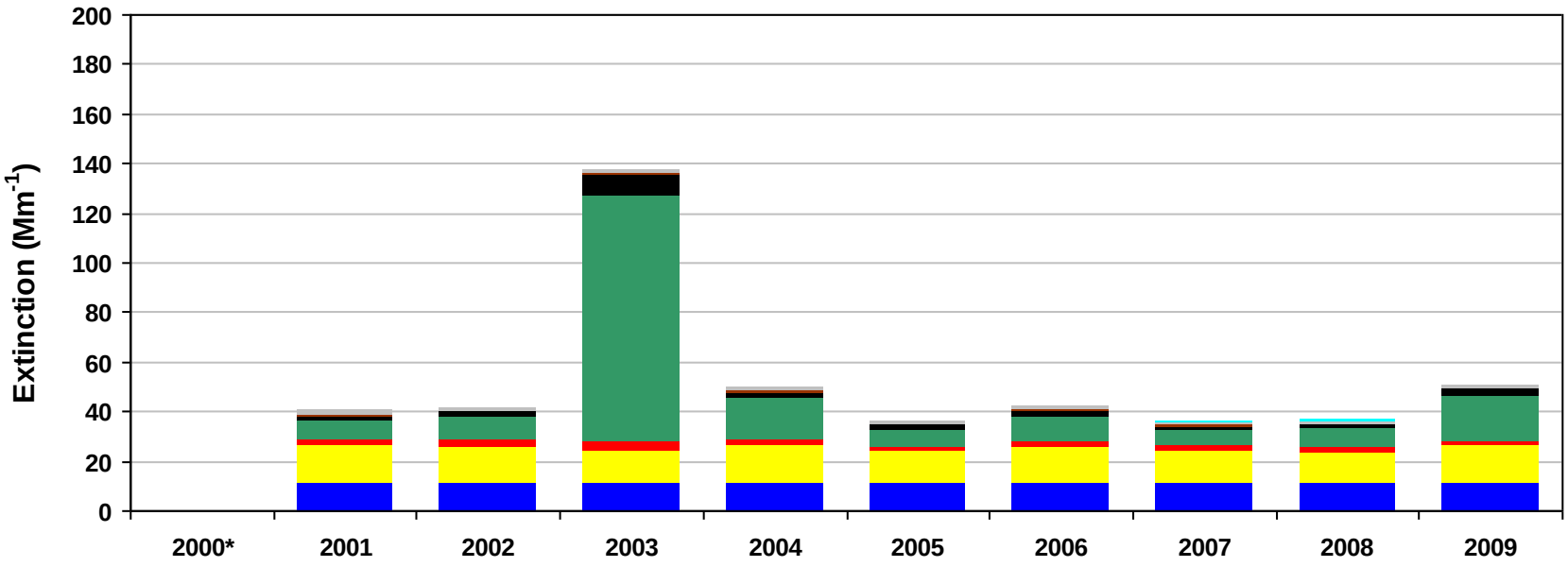
*Missing years did not meet RHR data completeness criteria.

Figure N.2-3

North Cascades NP and Glacier Peak WA, WA (NOCA1 Site)

20% Most Impaired Visibility Days



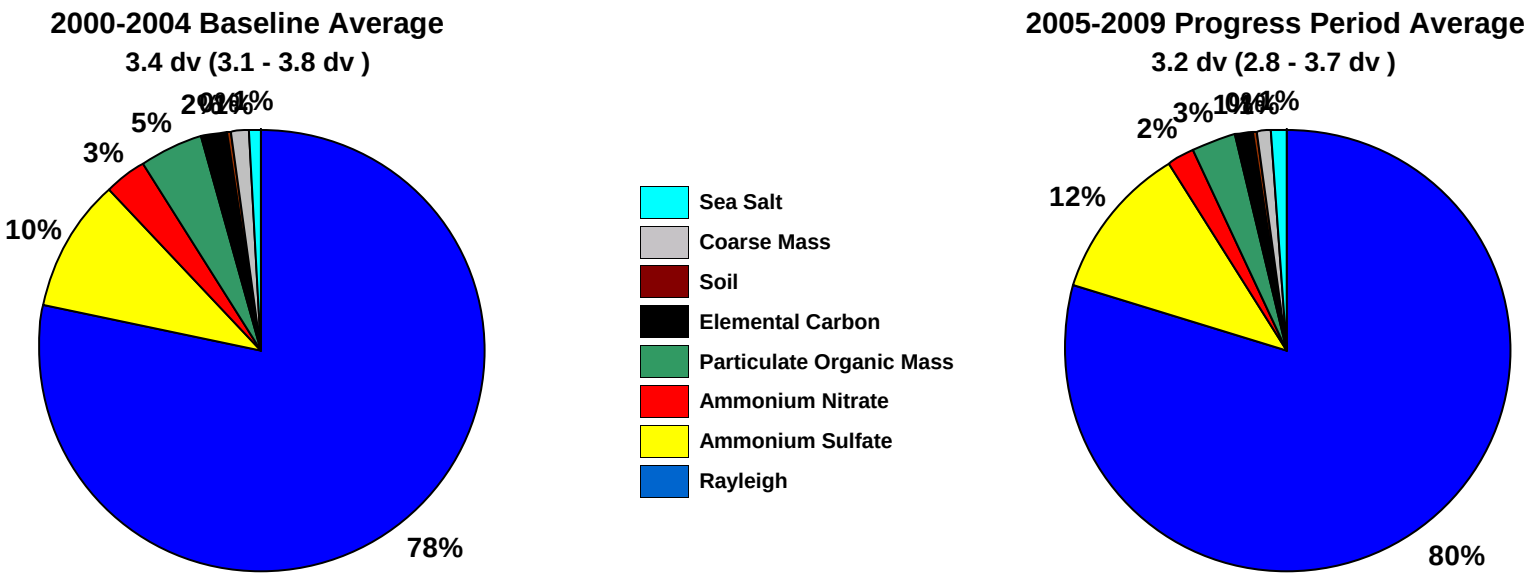


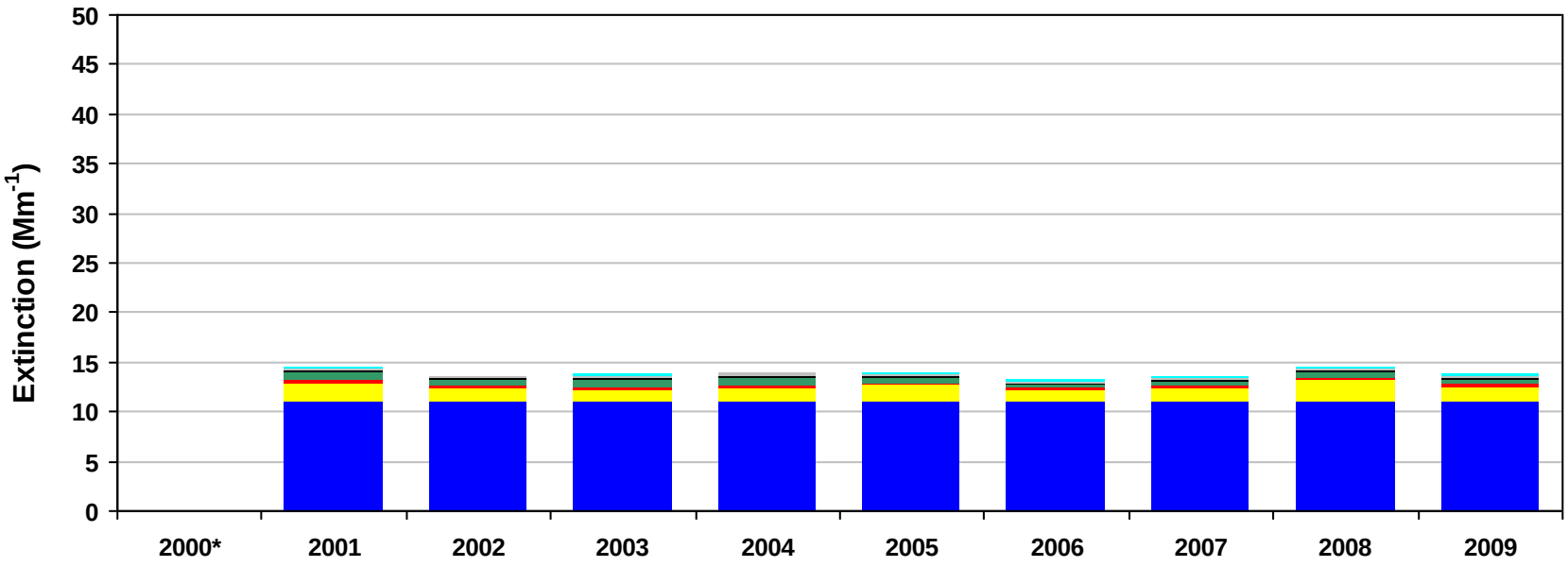
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure N.2-4

North Cascades NP and Glacier Peak WA, WA (NOCA1 Site)

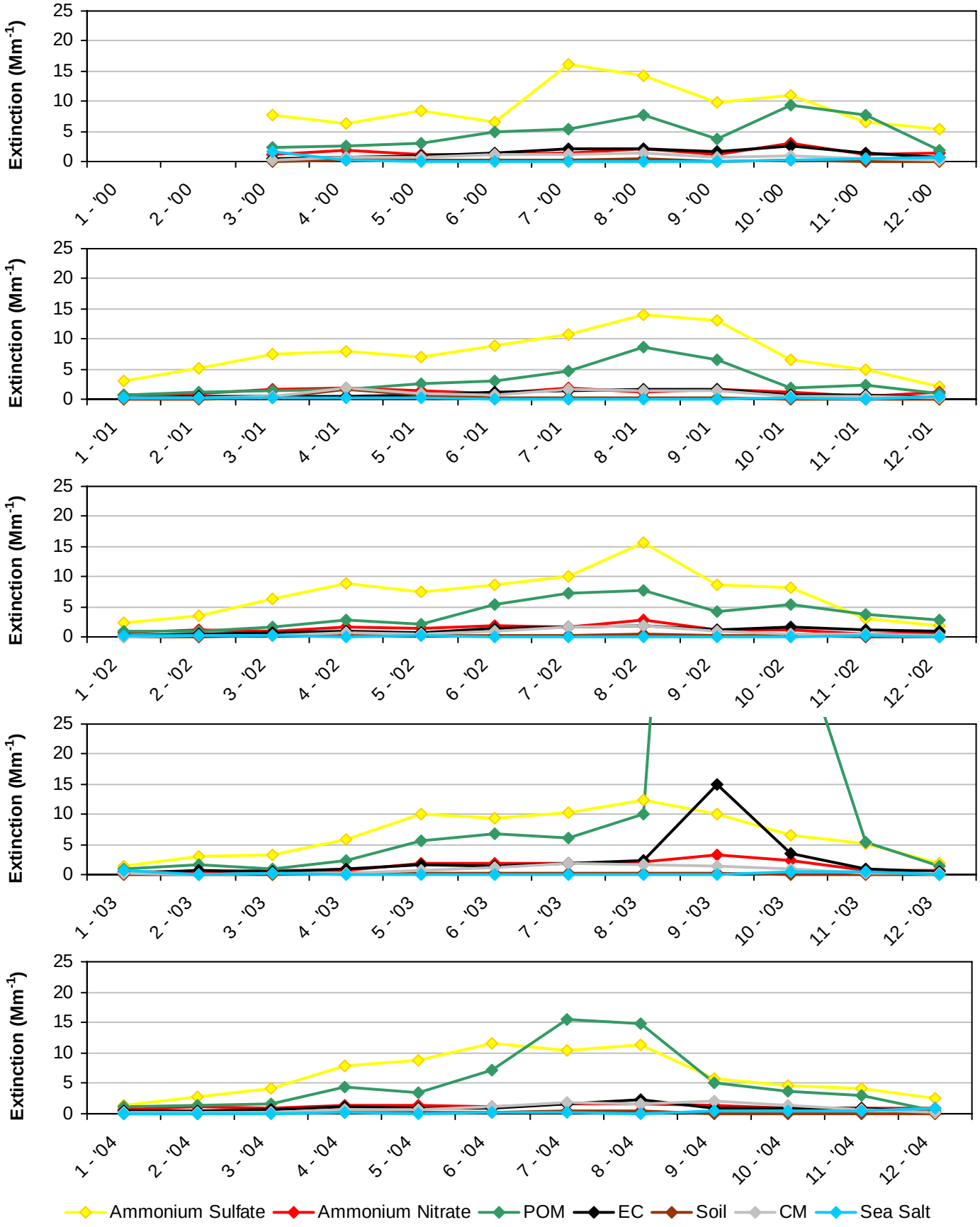
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure N.2-5
North Cascades NP and Glacier Peak WA, WA (NOCA1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure N.2-6
North Cascades NP and Glacier Peak WA, WA (NOCA1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

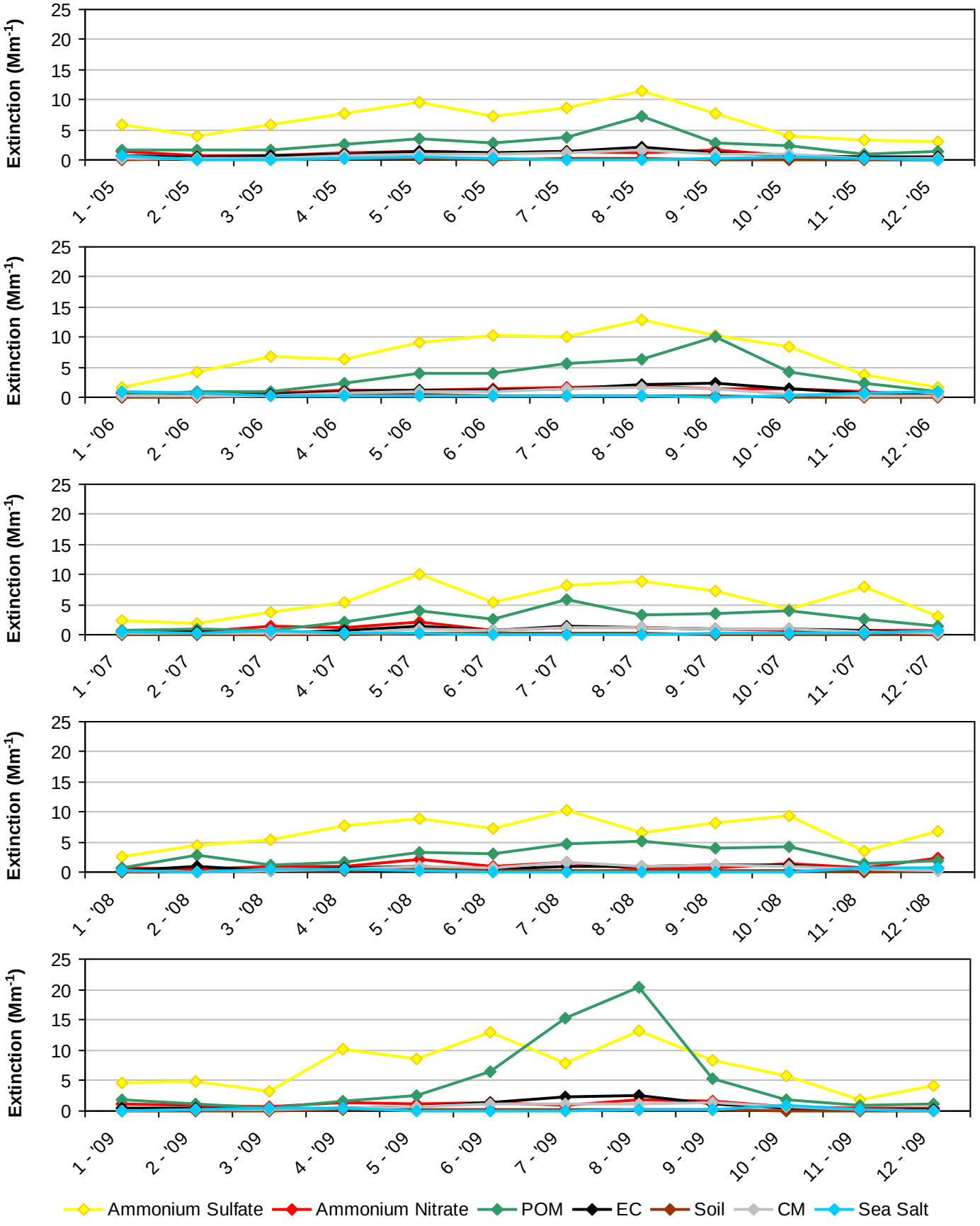
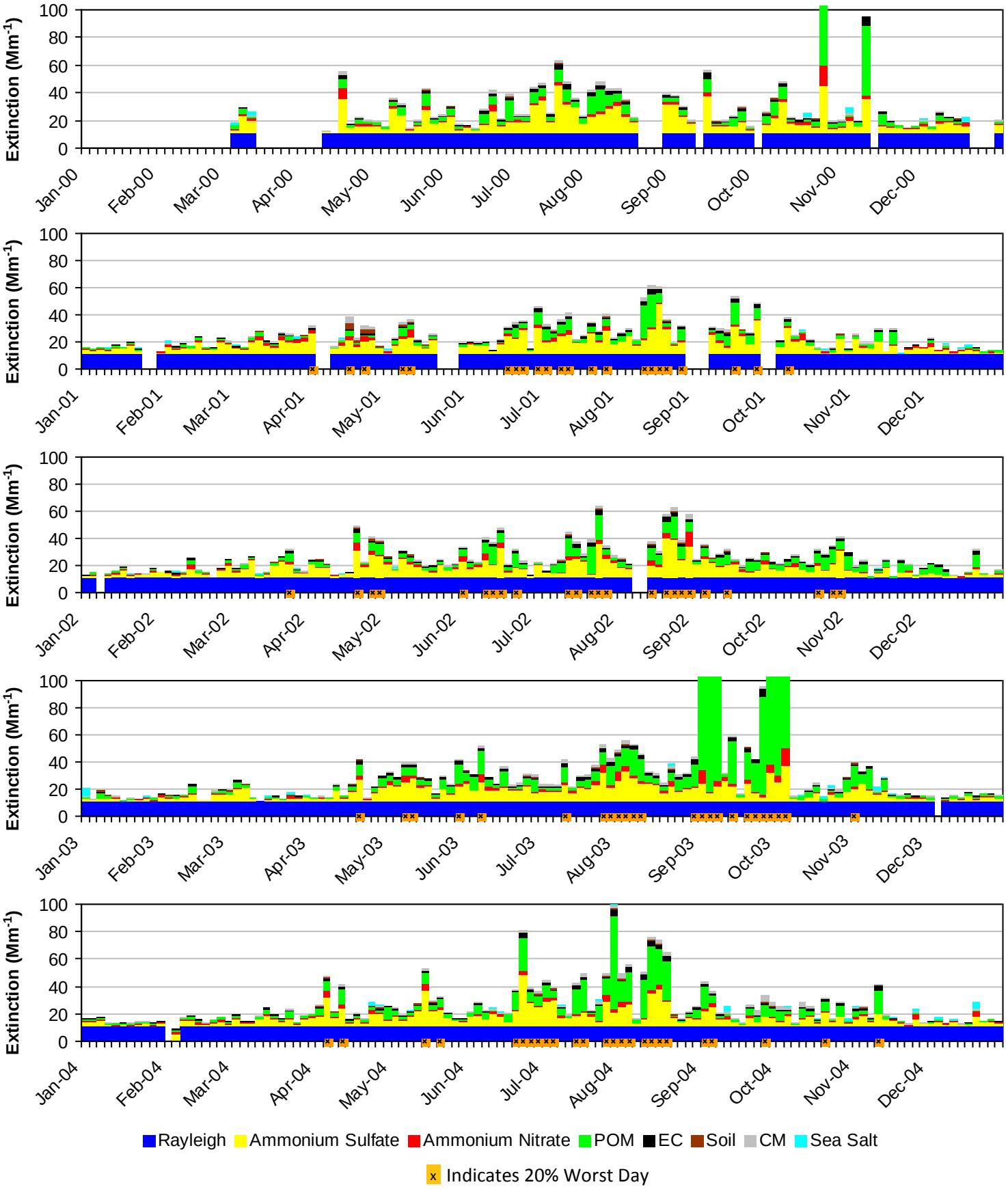
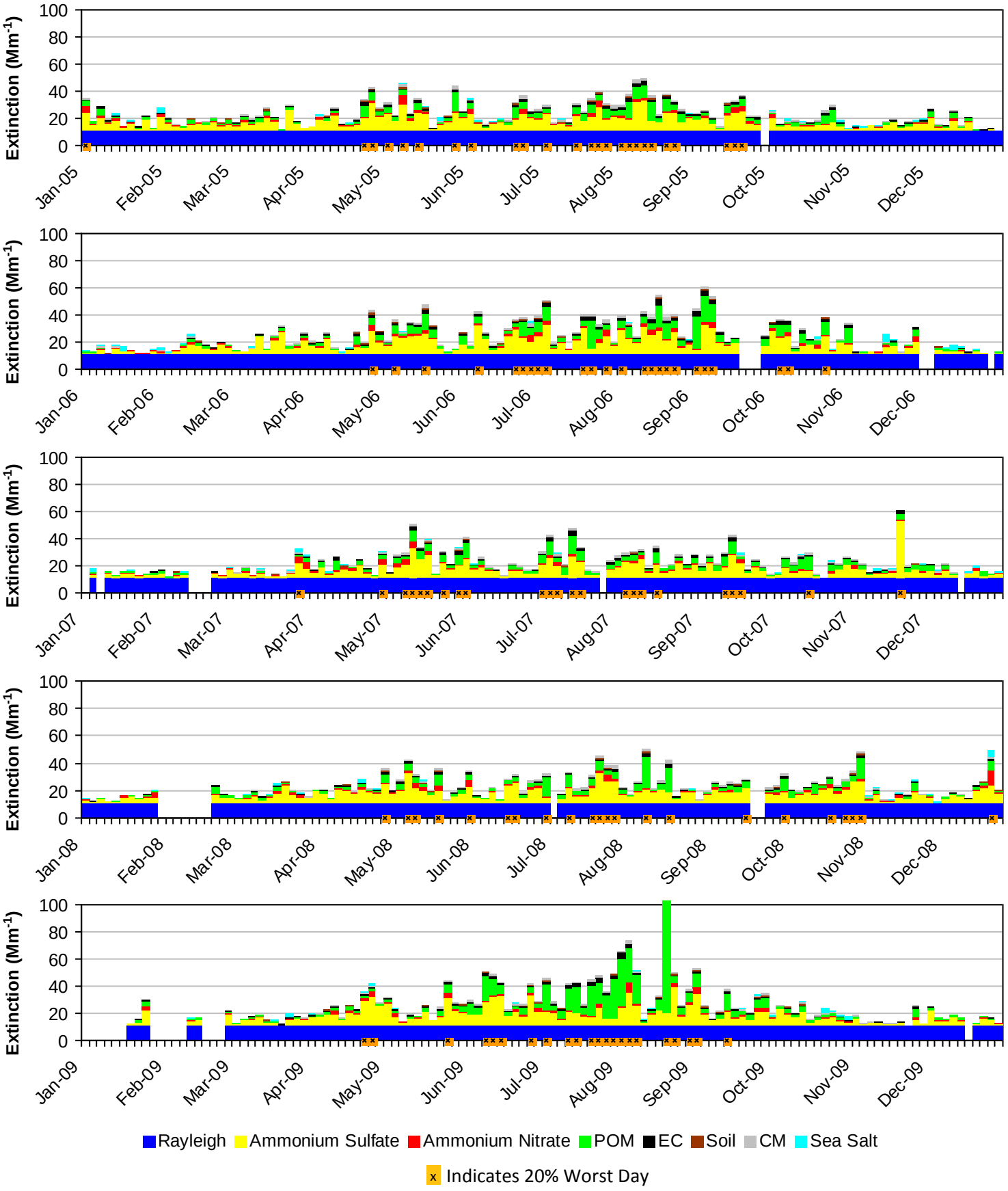


Figure N.2-7
North Cascades NP and Glacier Peak WA, WA (NOCA1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure N.2-8
North Cascades NP and Glacier Peak WA, WA (NOCA1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



N.3. OLYMPIC NP (OLYM1)

The following tables and figures are presented in this section for the Olympic NP represented by the OLYM1 IMPROVE Monitor:

- **Table N.3-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure N.3-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure N.3-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure N.3-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure N.3-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure N.3-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure N.3-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure N.3-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

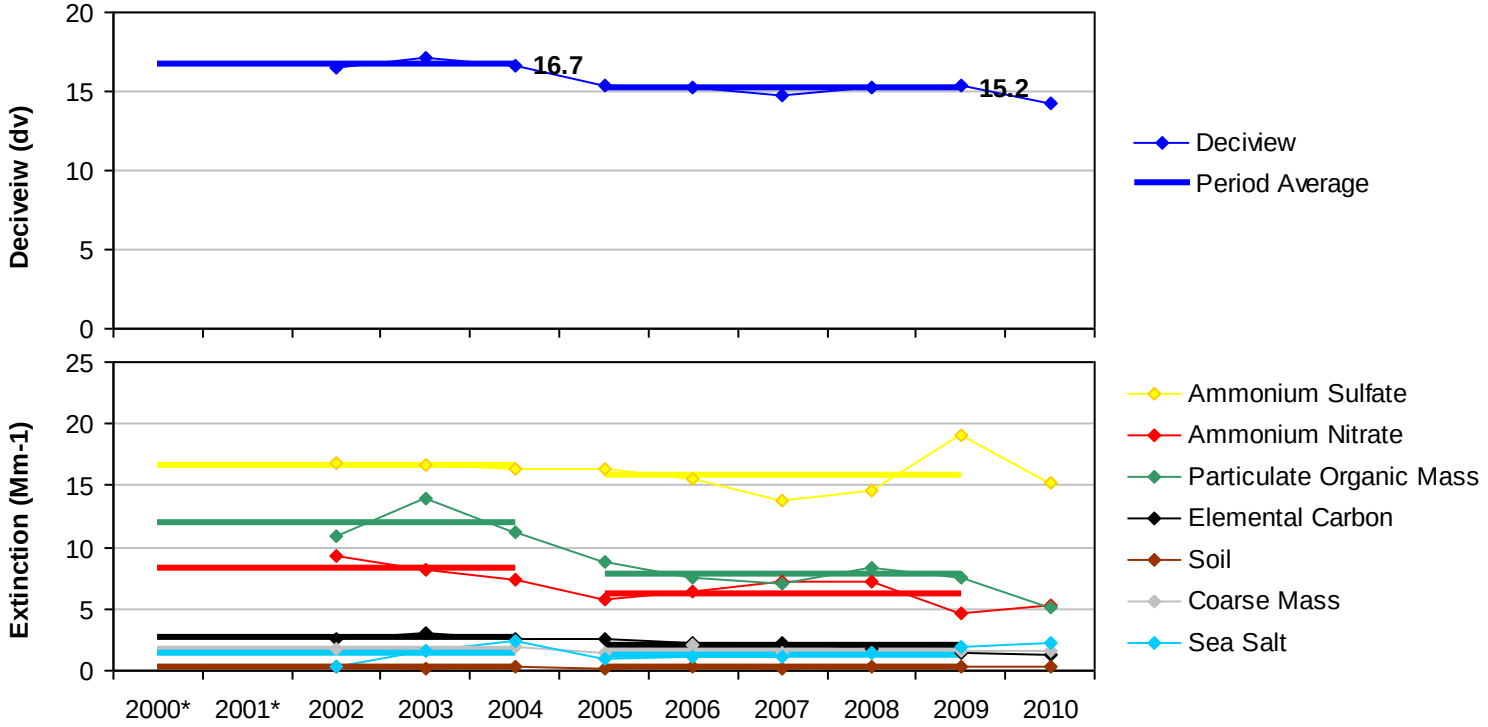
- **Figure N.3-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table N.3-1
Olympic NP, WA (OLYM1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	---	5.5	6.0	6.5	5.9	5.2	5.1	5.0	4.1	3.5	-0.3	0.0	6.0	5.0	-1.0	-17%
Worst 20% Days	---	---	16.5	17.2	16.6	15.4	15.2	14.8	15.2	15.4	14.2	-0.3	0.1	16.7	15.2	-1.5	-9%
All Days	---	---	11.4	11.6	11.7	11.1	10.6	10.2	10.4	10.4	9.1	-0.2	0.0	11.6	10.5	-1.1	-10%
Total Extinction (Mm-1)																	
Best 20% Days	---	---	17.6	18.3	19.4	18.3	17.0	16.7	16.7	15.2	14.2	-0.4	0.0	18.4	16.8	-1.6	-9%
Worst 20% Days	---	---	53.1	56.5	53.2	47.0	46.3	44.1	46.1	47.5	41.9	-1.5	0.1	54.3	46.2	-8.1	-15%
All Days	---	---	33.7	34.4	34.4	31.9	30.8	29.3	30.2	30.7	26.6	-0.7	0.0	34.2	30.6	-3.6	-11%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	---	2.6	2.6	2.9	2.8	2.0	2.1	2.6	2.0	1.4	-0.1	0.2	2.7	2.3	-0.4	-15%
Worst 20% Days	---	---	16.9	16.7	16.4	16.3	15.6	13.7	14.5	19.1	15.2	-0.3	0.1	16.7	15.8	-0.9	-5%
All Days	---	---	9.6	9.3	9.2	9.5	9.1	7.7	8.9	9.6	7.4	-0.1	0.1	9.4	9.0	-0.4	-4%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	---	1.0	1.4	1.4	1.1	0.8	0.9	0.7	0.7	0.5	-0.1	0.0	1.2	0.8	-0.4	-33%
Worst 20% Days	---	---	9.3	8.2	7.4	5.7	6.5	7.2	7.2	4.6	5.2	-0.5	0.0	8.3	6.2	-2.1	-25%
All Days	---	---	4.2	4.2	4.0	3.5	3.1	3.3	3.3	3.0	2.6	-0.2	0.0	4.1	3.2	-0.9	-22%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	---	1.6	1.9	2.2	1.4	1.1	1.3	1.2	0.6	0.5	-0.2	0.0	1.9	1.1	-0.8	-42%
Worst 20% Days	---	---	10.9	14.0	11.2	8.8	7.5	7.0	8.3	7.5	5.2	-0.7	0.0	12.1	7.8	-4.3	-36%
All Days	---	---	5.4	6.0	5.9	4.4	3.8	3.8	3.9	3.8	2.7	-0.3	0.0	5.8	3.9	-1.9	-33%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	---	0.6	0.6	0.8	0.5	0.5	0.5	0.4	0.2	0.3	0.0	0.0	0.6	0.4	-0.2	-33%
Worst 20% Days	---	---	2.6	3.1	2.5	2.6	2.2	2.3	1.8	1.4	1.2	-0.2	0.0	2.7	2.1	-0.6	-22%
All Days	---	---	1.5	1.6	1.5	1.5	1.3	1.3	1.0	1.0	0.8	-0.1	0.0	1.6	1.2	-0.4	-25%
Soil Extinction (Mm-1)																	
Best 20% Days	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0%
Worst 20% Days	---	---	0.4	0.2	0.3	0.2	0.3	0.2	0.4	0.3	0.4	0.0	0.5	0.3	0.3	0.0	0%
All Days	---	---	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.0	0.3	0.2	0.2	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	---	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.0	0.0	0.3	0.3	0.0	0%
Worst 20% Days	---	---	1.7	1.7	1.9	1.4	2.1	1.4	1.5	1.6	1.5	0.0	0.4	1.8	1.6	-0.2	-11%
All Days	---	---	1.2	1.1	1.1	0.9	1.0	0.8	0.8	0.9	0.8	0.0	0.0	1.1	0.9	-0.2	-18%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	---	0.4	0.6	0.9	1.2	1.2	0.6	0.5	0.5	0.2	0.0	0.6	0.6	0.8	0.2	33%
Worst 20% Days	---	---	0.3	1.6	2.5	1.0	1.1	1.2	1.4	2.0	2.2	0.1	0.1	1.4	1.4	0.0	0%
All Days	---	---	0.6	1.0	1.6	1.1	1.4	1.2	1.1	1.3	1.2	0.0	0.1	1.1	1.2	0.1	9%

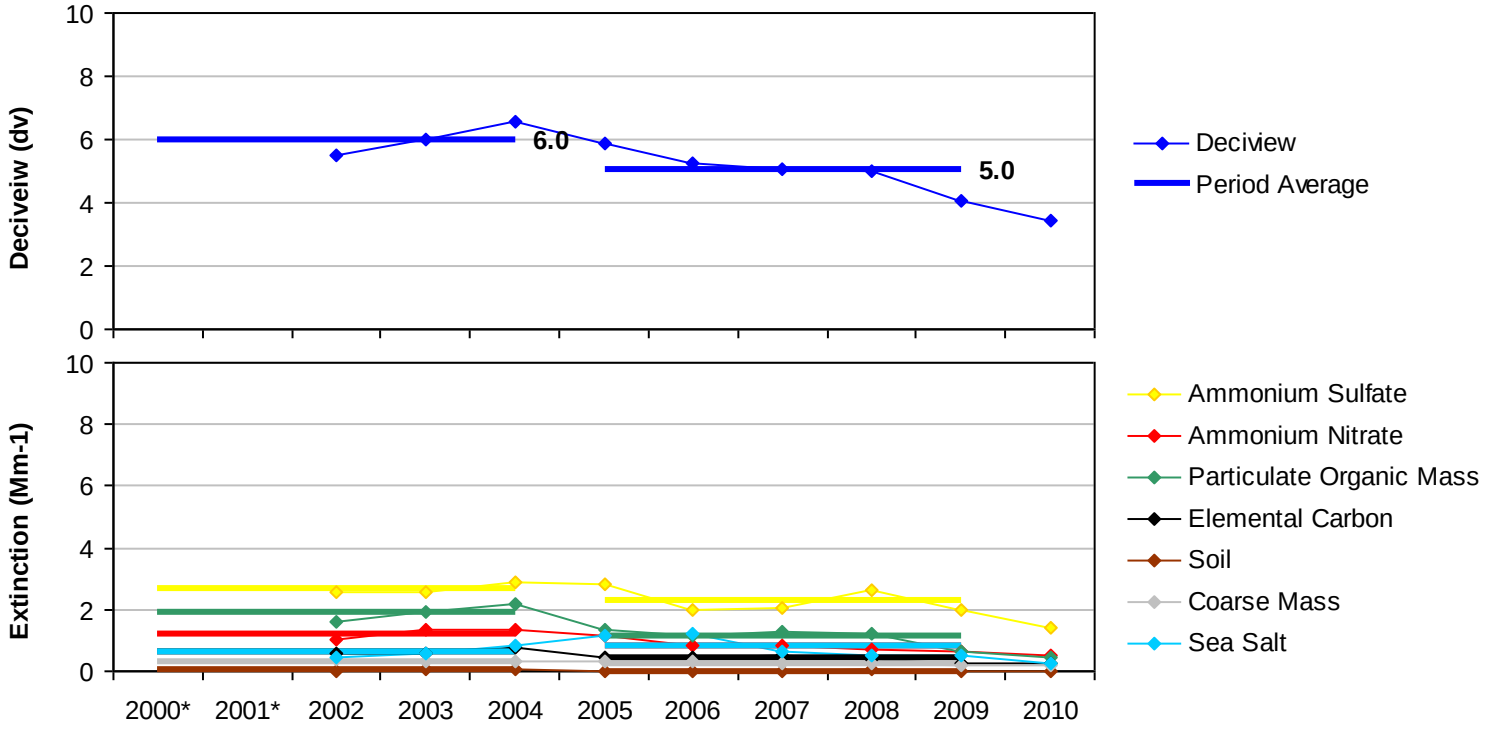
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure N.3-1
Olympic NP, WA (OLYM1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



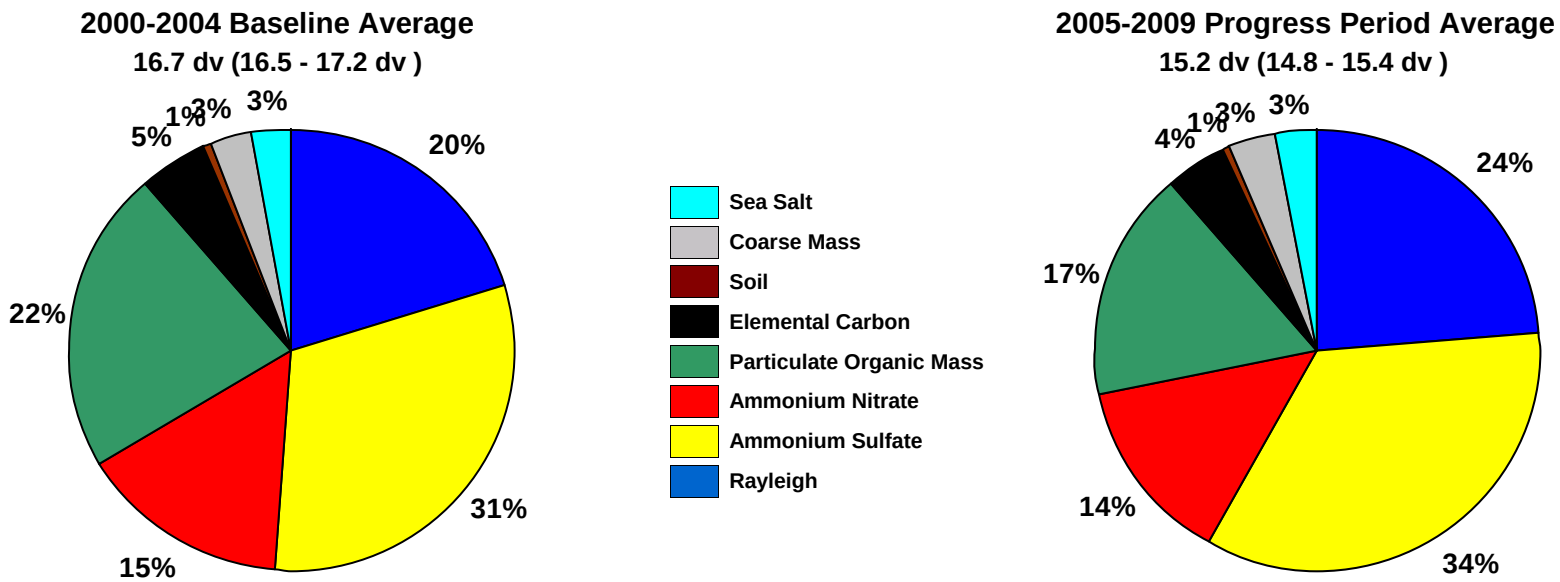
*Missing years did not meet RHR data completeness criteria.

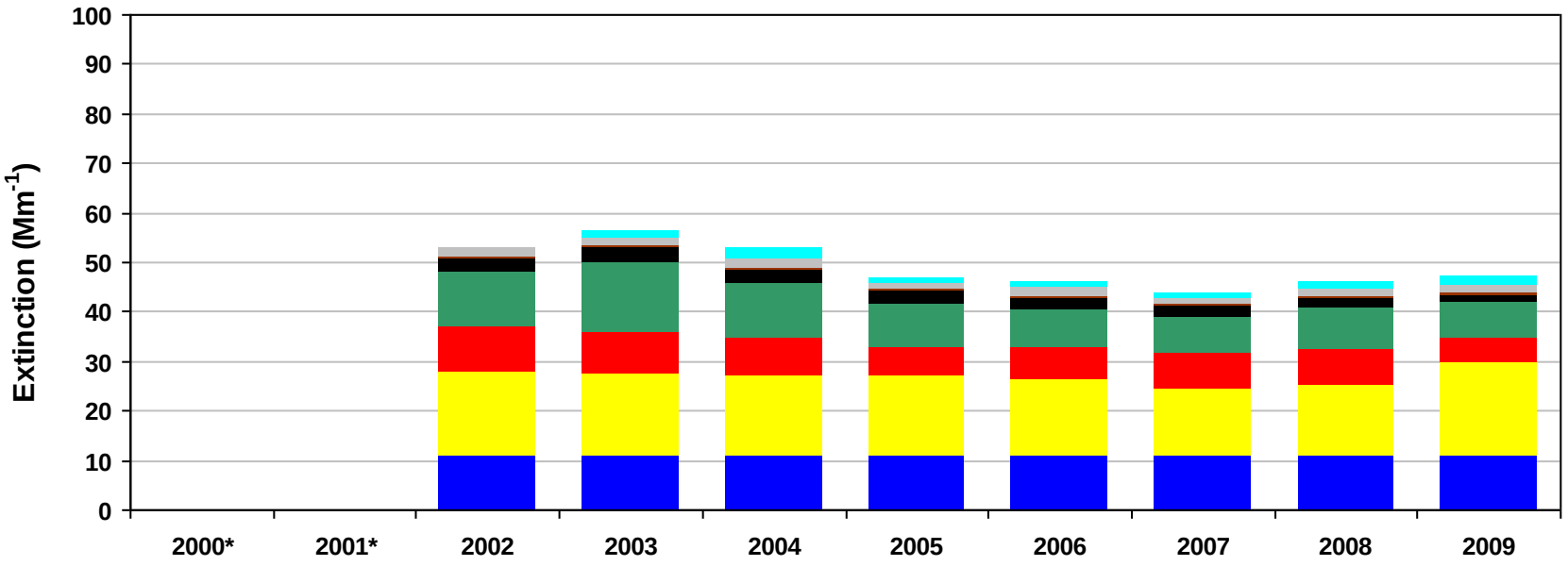
Figure N.3-2
Olympic NP, WA (OLYM1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

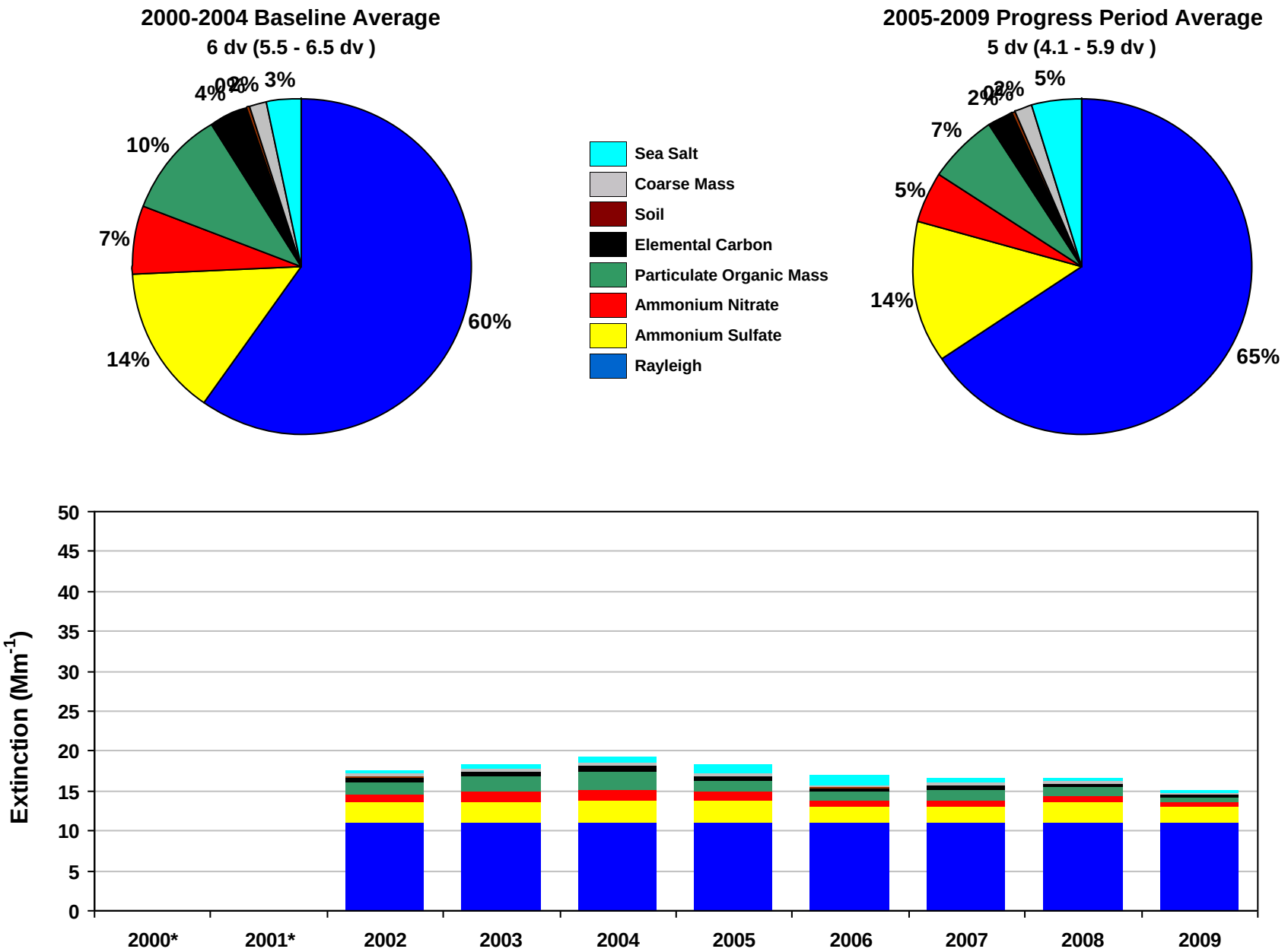
Figure N.3-3
Olympic NP, WA (OLYM1 Site)
20% Most Impaired Visibility Days





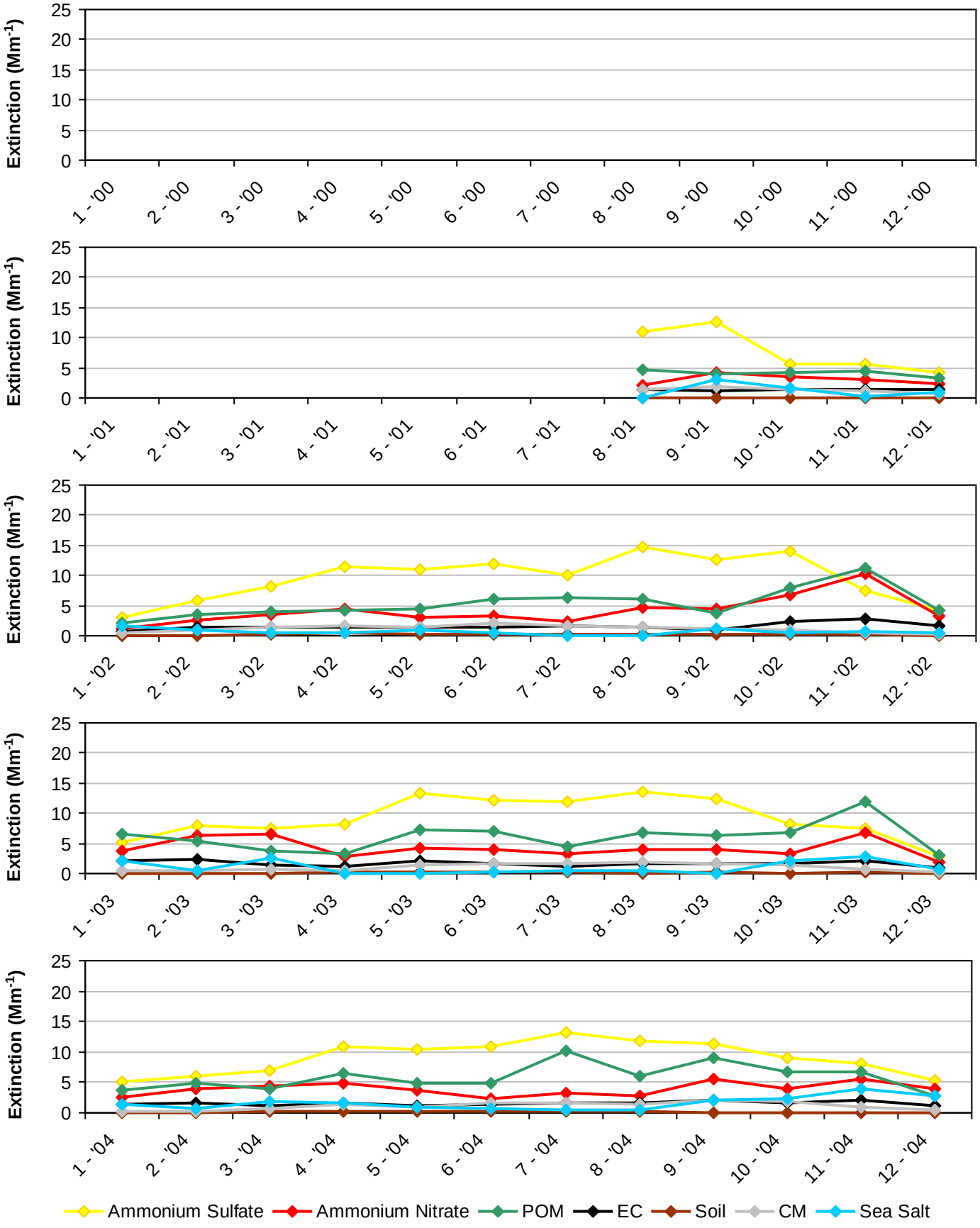
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure N.3-4
Olympic NP, WA (OLYM1 Site)
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure N.3-5
Olympic NP, WA (OLYM1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure N.3-6
Olympic NP, WA (OLYM1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

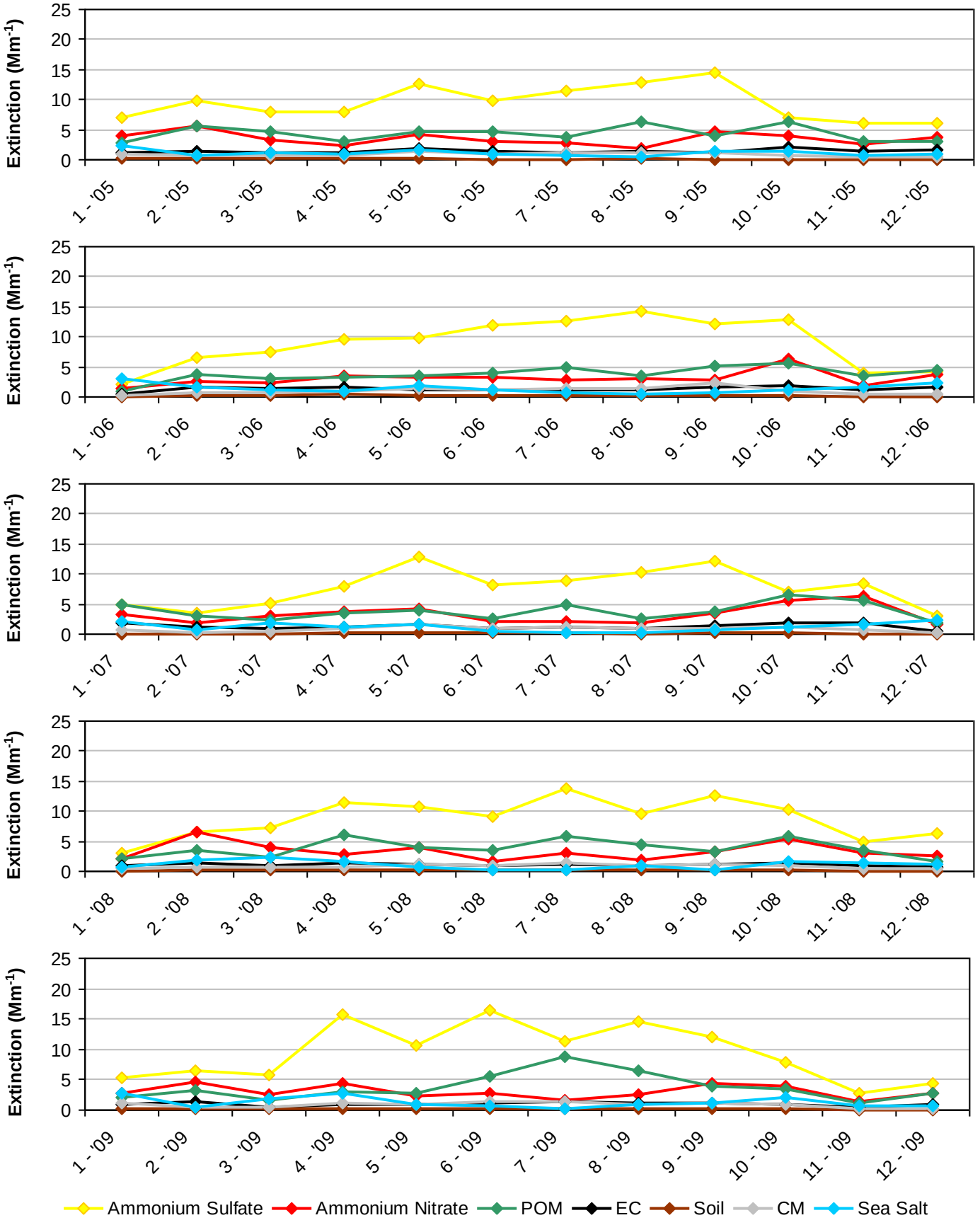
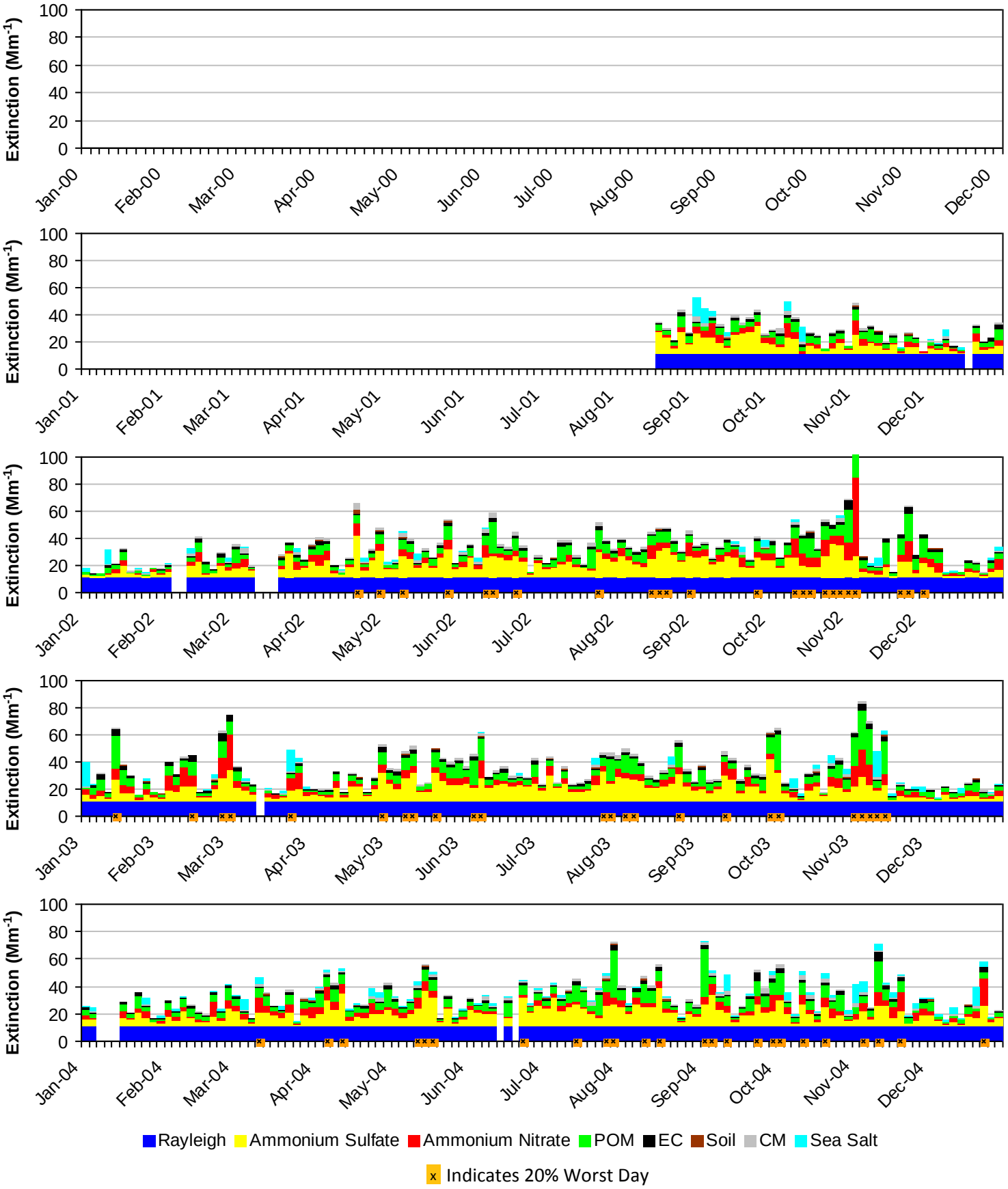
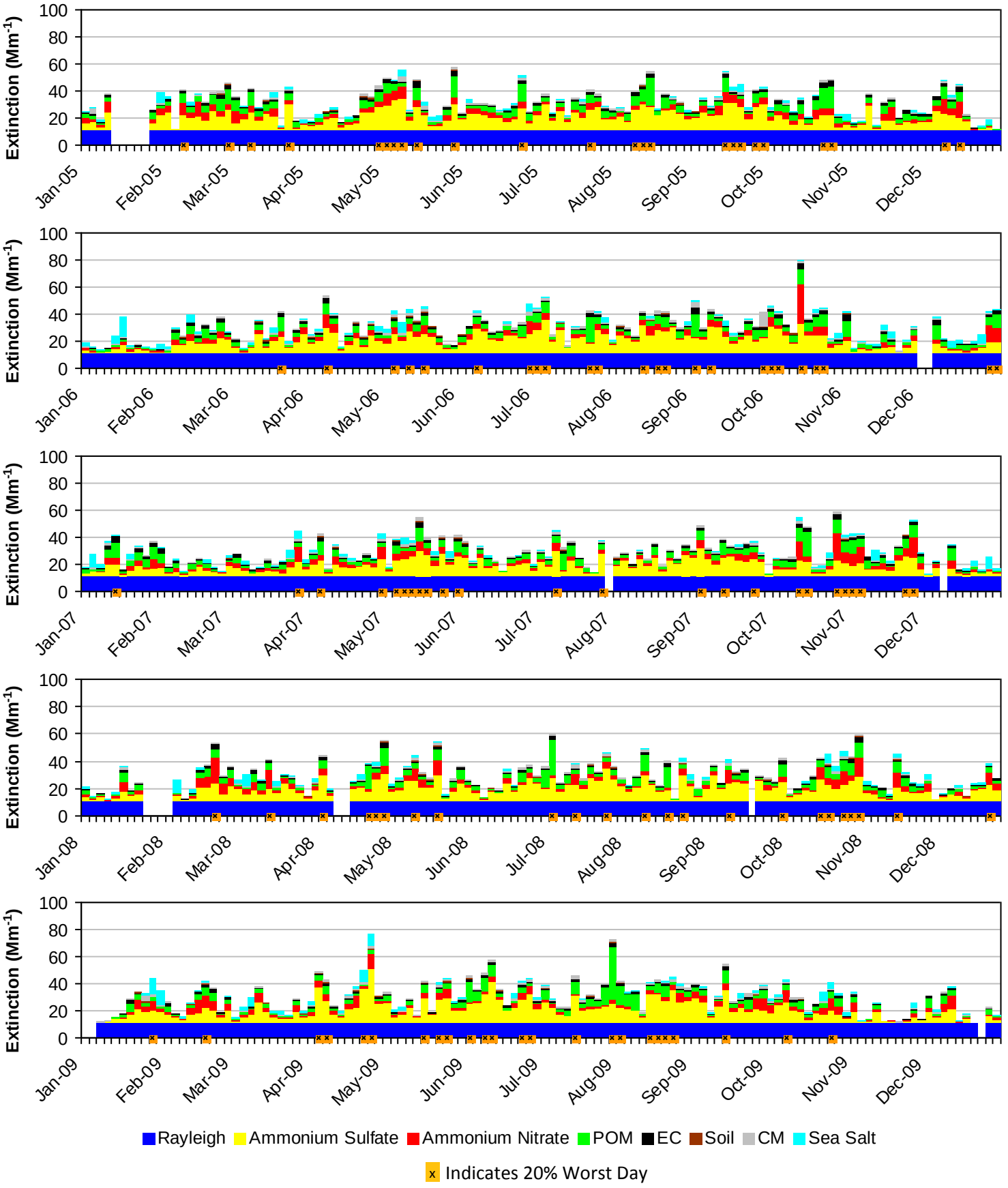


Figure N.3-7
Olympic NP, WA (OLYM1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure N.3-8
Olympic NP, WA (OLYM1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



N.4. PASAYTEN WA (PASA1)

The following tables and figures are presented in this section for the Pasayten WA represented by the PASA1 IMPROVE Monitor:

- **Table N.4-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure N.4-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure N.4-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure N.4-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure N.4-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure N.4-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure N.4-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure N.4-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

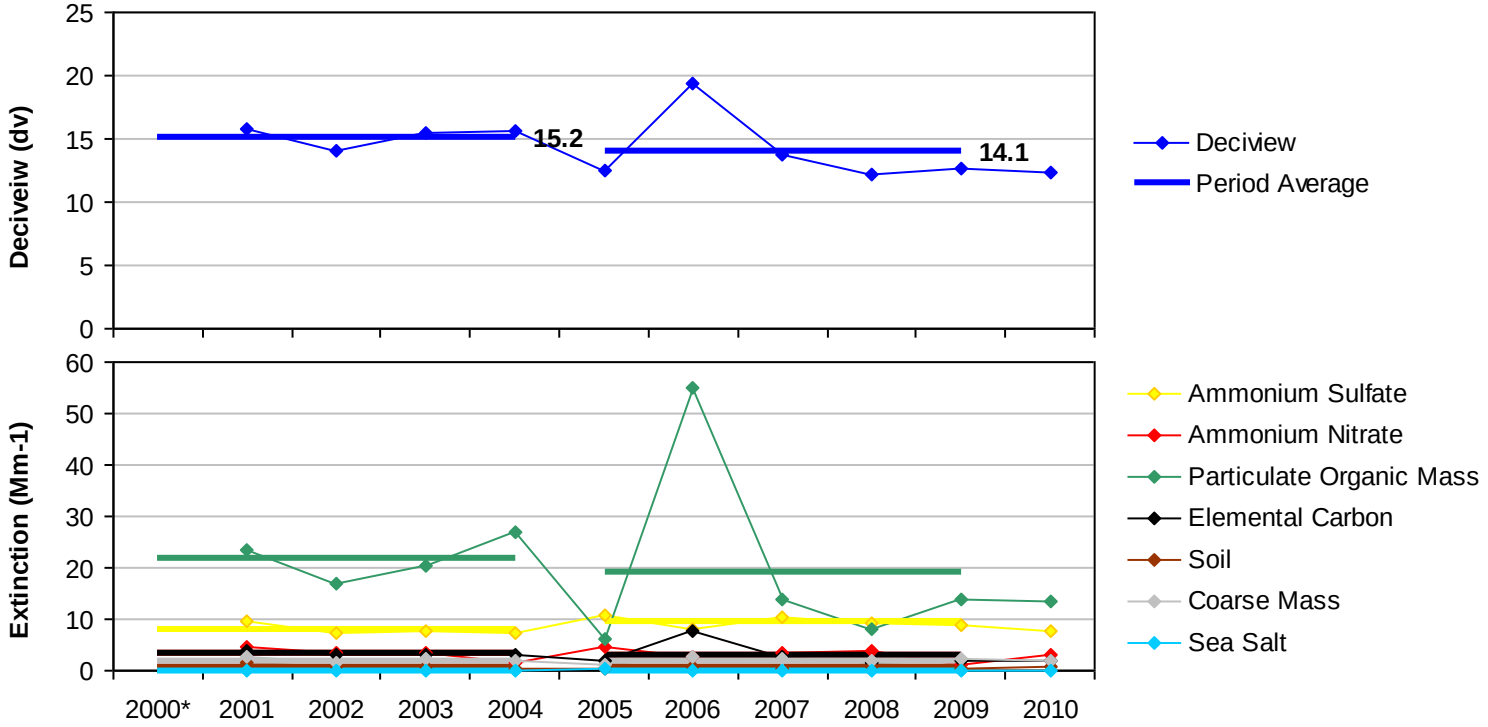
- **Figure N.4-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table N.4-1
Pasayten WA, WA (PASA1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	2.9	2.6	2.5	2.9	3.2	2.0	2.4	2.7	2.3	1.5	0.0	0.1	2.7	2.5	-0.2	-7%
Worst 20% Days	---	15.7	14.1	15.4	15.7	12.4	19.4	13.8	12.2	12.7	12.4	-0.4	0.1	15.2	14.1	-1.1	-7%
All Days	---	8.1	7.8	7.9	7.9	7.3	8.6	6.9	6.9	7.1	6.0	-0.1	0.1	7.9	7.4	-0.5	-6%
Total Extinction (Mm-1)																	
Best 20% Days	---	13.5	13.1	12.8	13.3	13.9	12.3	12.7	13.1	12.7	11.7	-0.1	0.1	13.2	12.9	-0.3	-2%
Worst 20% Days	---	55.9	42.9	47.8	51.6	35.6	87.2	43.0	35.1	38.6	38.7	-1.8	0.1	49.5	47.9	-1.6	-3%
All Days	---	26.6	24.1	24.8	25.4	22.0	32.8	22.4	21.4	22.4	20.4	-0.5	0.1	25.2	24.2	-1.0	-4%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	1.7	1.4	1.4	1.6	1.9	1.1	1.4	1.9	1.4	0.9	0.0	0.5	1.5	1.5	0.0	0%
Worst 20% Days	---	9.7	7.1	7.9	7.5	10.9	8.1	10.3	9.3	8.8	7.6	0.2	0.2	8.1	9.5	1.4	17%
All Days	---	5.4	4.4	4.3	4.4	5.4	4.6	4.5	5.1	4.9	3.6	0.1	0.2	4.6	4.9	0.3	7%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.6	0.6	0.4	0.5	0.5	0.3	0.5	0.4	0.5	0.3	0.0	0.0	0.5	0.4	-0.1	-20%
Worst 20% Days	---	4.8	3.5	3.5	1.3	4.7	2.8	3.3	3.8	1.3	2.9	-0.2	0.1	3.3	3.2	-0.1	-3%
All Days	---	2.1	1.6	1.5	1.2	1.9	1.6	1.5	1.4	1.3	1.3	-0.1	0.0	1.6	1.5	-0.1	-6%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	0.6	0.5	0.6	0.6	0.6	0.4	0.3	0.4	0.2	0.2	0.0	0.1	0.5	0.4	-0.1	-20%
Worst 20% Days	---	23.3	16.9	20.3	27.1	6.2	55.1	13.9	7.9	13.8	13.6	-1.3	0.2	21.9	19.4	-2.5	-11%
All Days	---	6.3	5.8	6.5	7.4	2.8	13.1	4.2	3.1	4.1	3.8	-0.3	0.2	6.5	5.5	-1.0	-15%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.1	-0.1	-50%
Worst 20% Days	---	3.9	3.0	3.2	3.2	1.8	7.5	2.5	1.4	1.9	2.0	-0.2	0.1	3.3	3.0	-0.3	-9%
All Days	---	1.3	1.1	1.2	1.1	0.8	2.0	0.9	0.6	0.7	0.7	-0.1	0.0	1.2	1.0	-0.2	-17%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.2	0.1	0.1	0.0	0%
Worst 20% Days	---	1.4	0.7	0.6	0.5	0.5	0.8	0.6	0.7	0.5	0.7	0.0	0.1	0.8	0.6	-0.2	-25%
All Days	---	0.5	0.3	0.3	0.2	0.2	0.3	0.2	0.3	0.3	0.2	0.0	0.2	0.3	0.3	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.0	0.2	0.2	0.2	0.0	0%
Worst 20% Days	---	2.6	1.6	2.2	1.9	1.3	2.8	2.2	1.9	2.2	1.9	0.0	0.5	2.1	2.1	0.0	0%
All Days	---	1.0	0.9	0.9	0.8	0.6	1.0	0.9	0.9	1.0	0.8	0.0	0.5	0.9	0.9	0.0	0%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.2	0.1	0.1	0.3	0.1	0.3	0.1	0.1	0.1	0.0	0.4	0.1	0.2	0.1	100%
Worst 20% Days	---	0.2	0.0	0.1	0.0	0.2	0.0	0.1	0.1	0.2	0.0	0.0	0.4	0.1	0.1	0.0	0%
All Days	---	0.1	0.0	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.0	0.0	0.2	0.1	0.2	0.1	100%

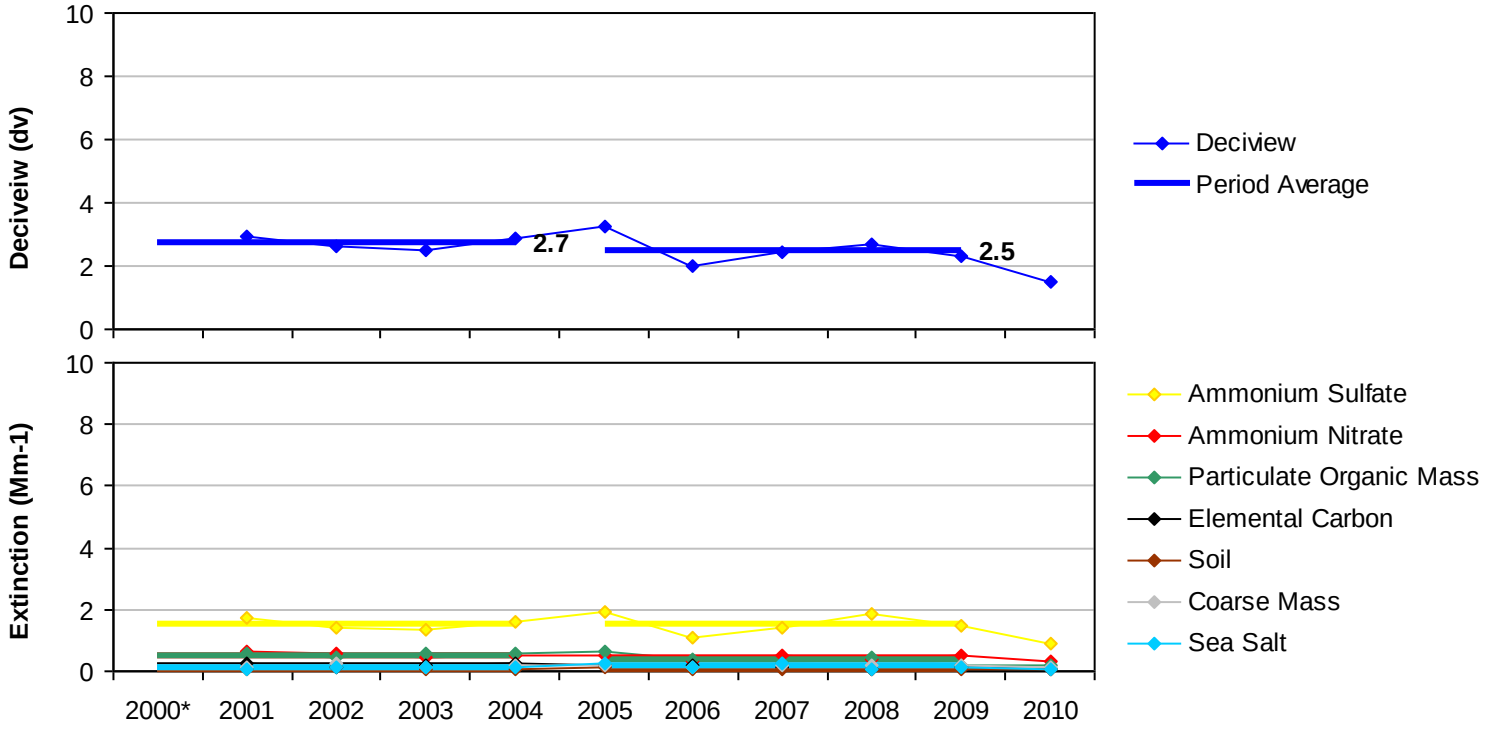
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure N.4-1
Pasayten WA, WA (PASA1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



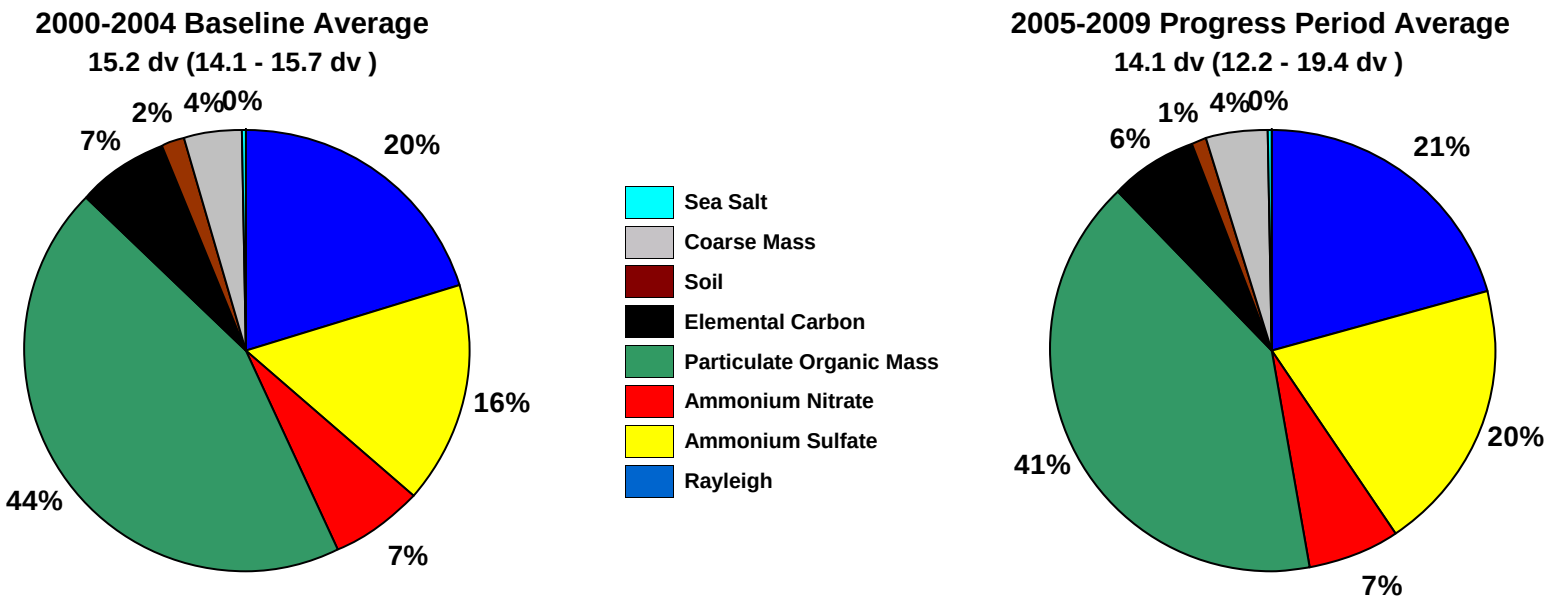
*Missing years did not meet RHR data completeness criteria.

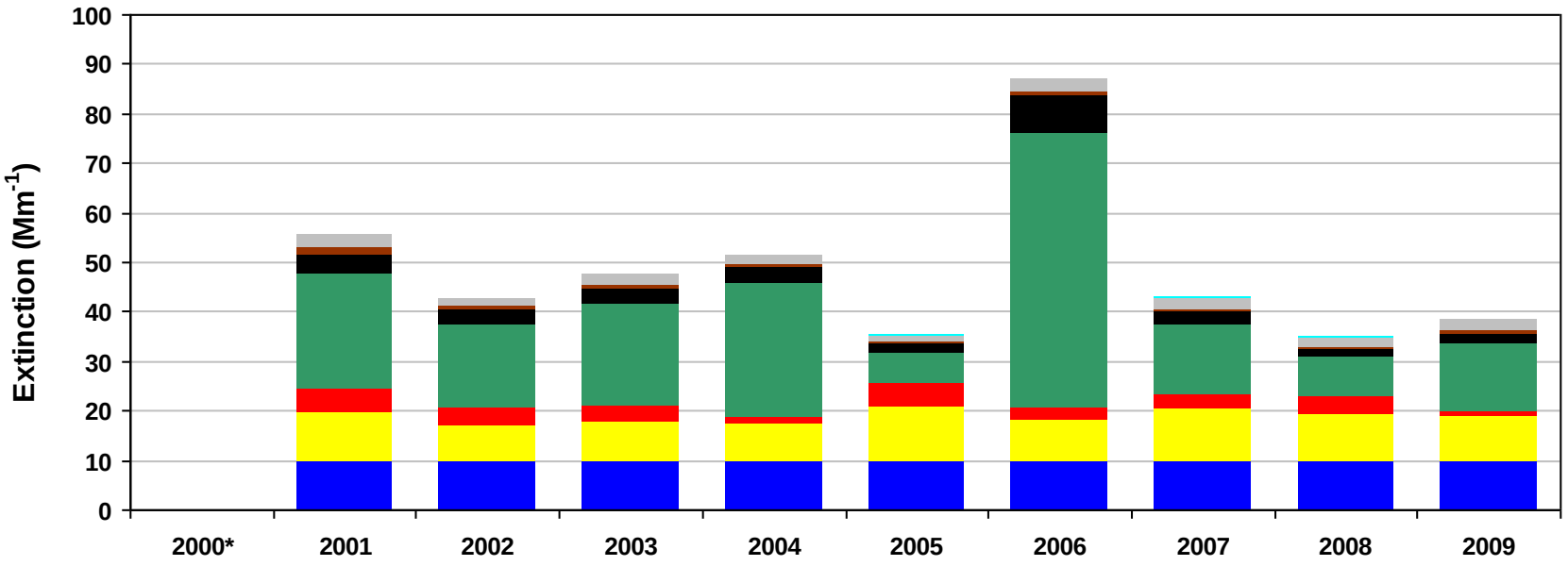
Figure N.4-2
Pasayten WA, WA (PASA1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

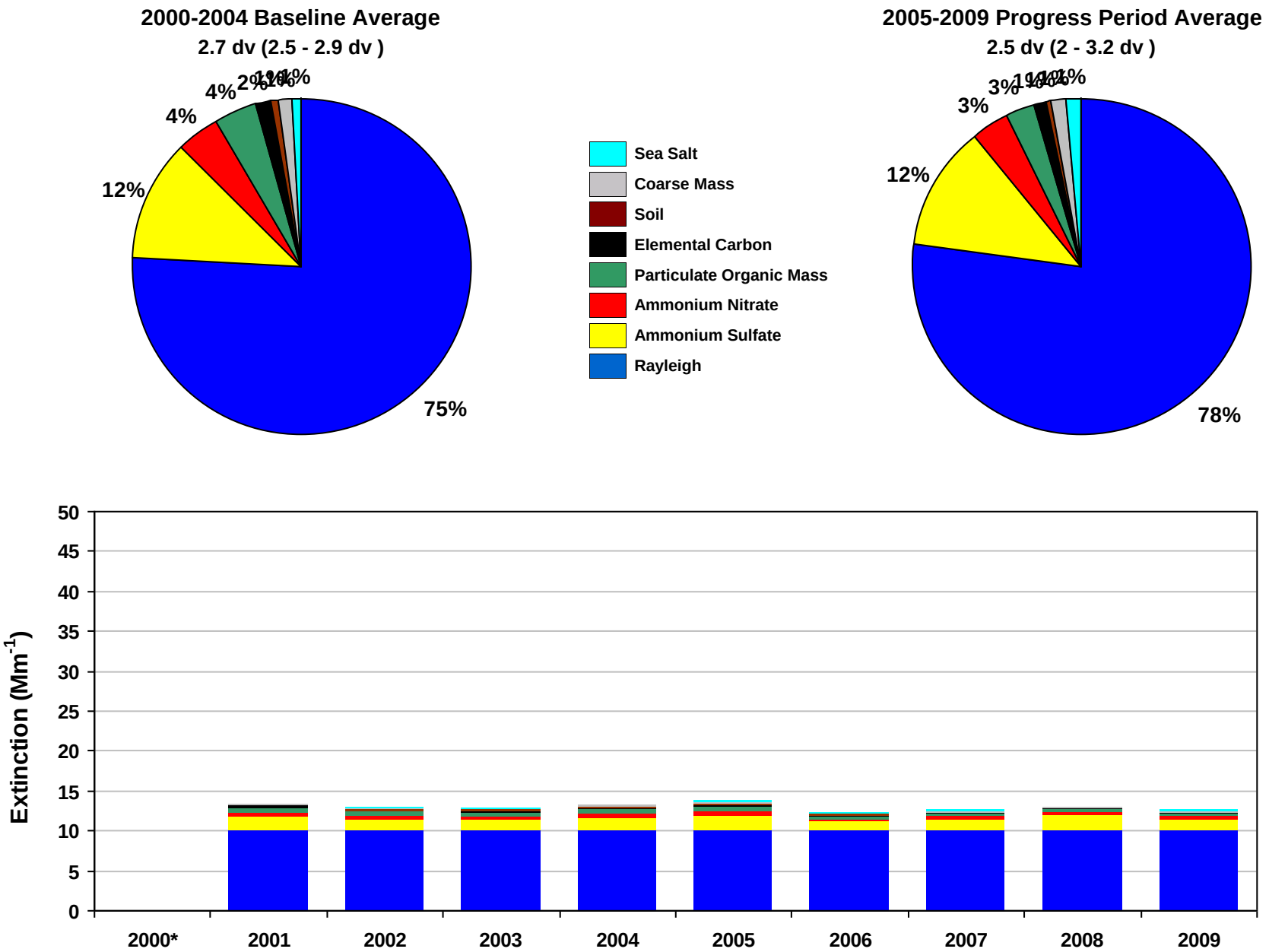
Figure N.4-3
Pasayten WA, WA (PASA1 Site)
20% Most Impaired Visibility Days





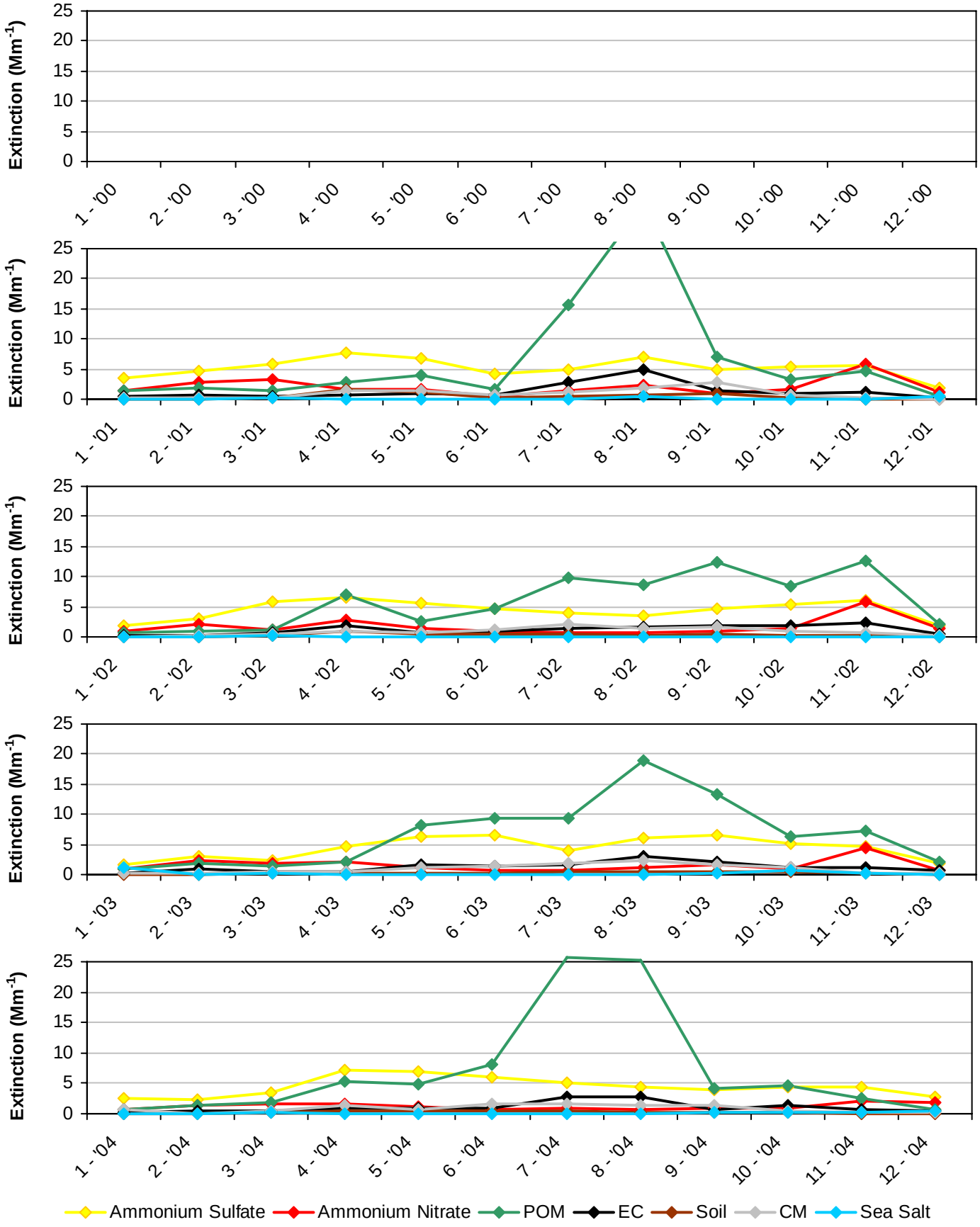
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure N.4-4
Pasayten WA, WA (PASA1 Site)
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure N.4-5
Pasayten WA, WA (PASA1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure N.4-6
Pasayten WA, WA (PASA1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

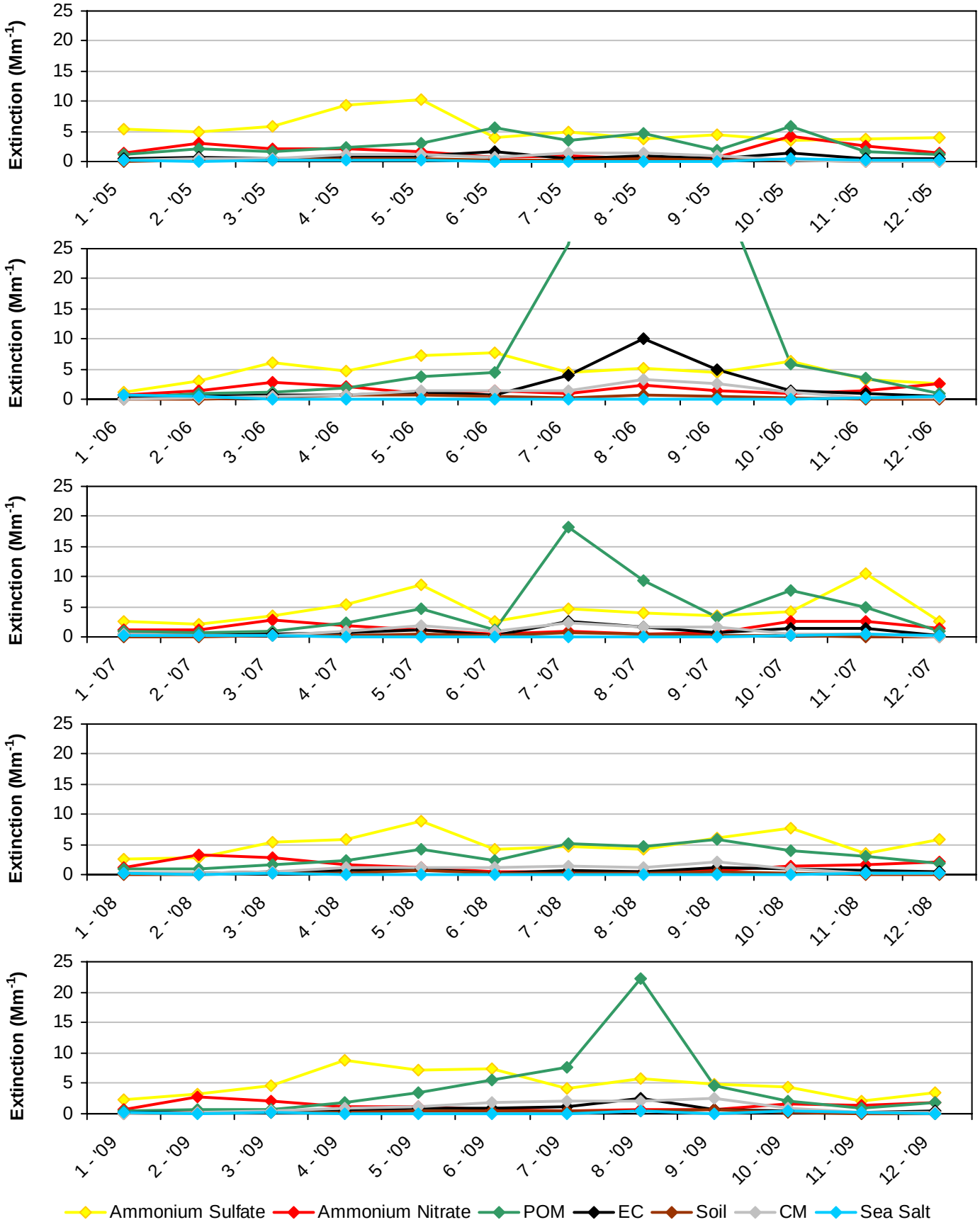
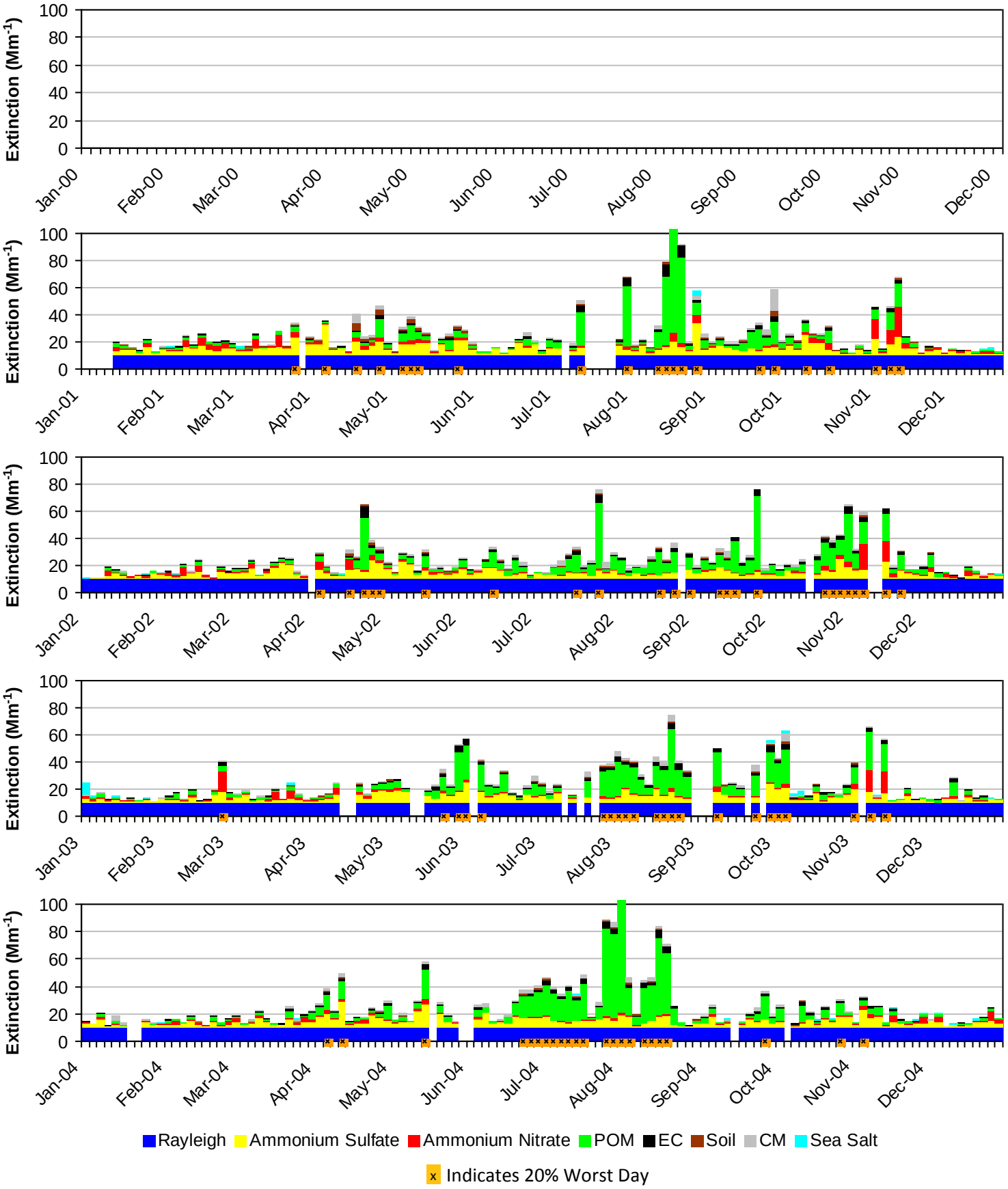
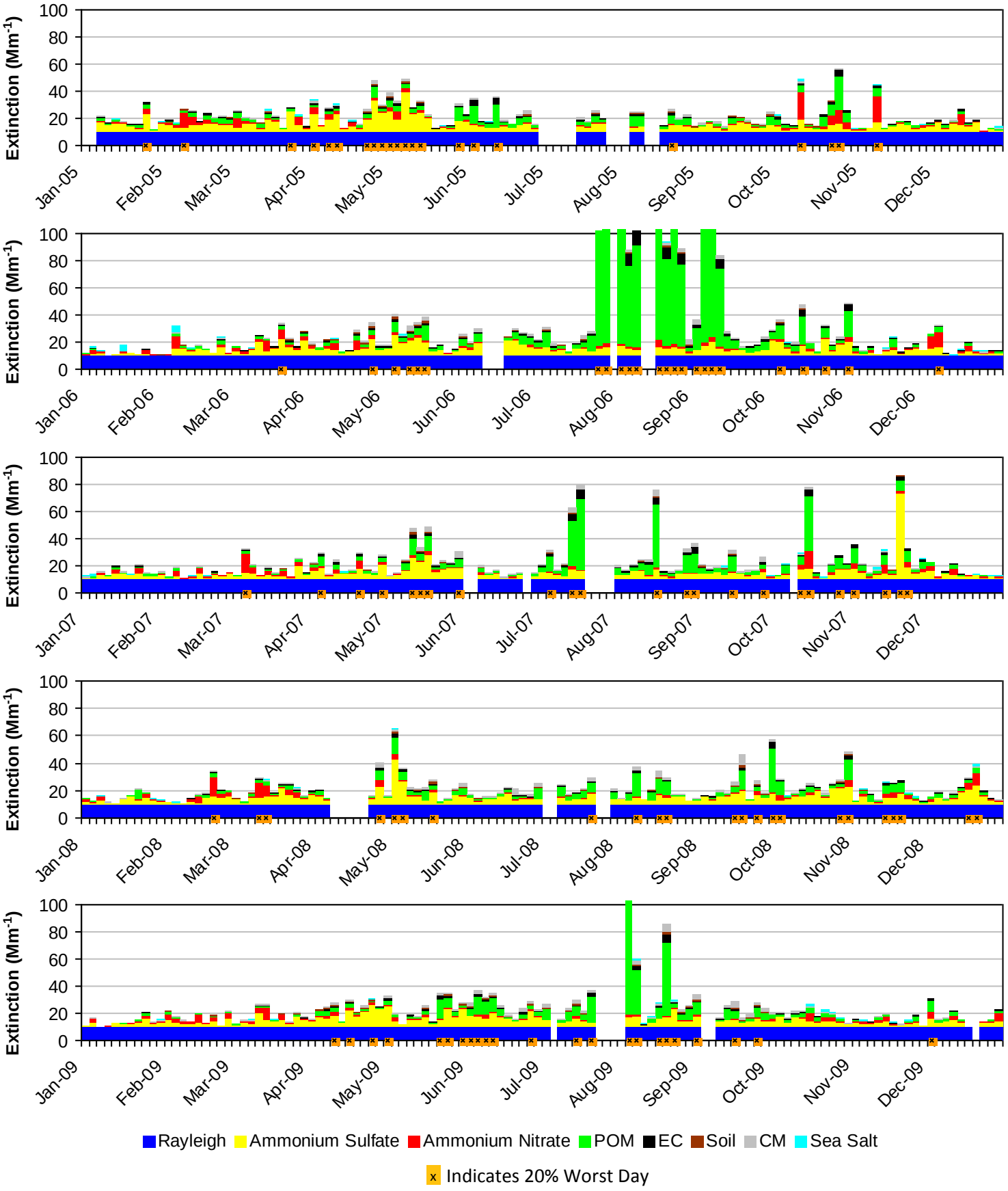


Figure N.4-7
Pasayten WA, WA (PASA1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure N.4-8
Pasayten WA, WA (PASA1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



N.5. ALPINE LAKES WA (SNPA1)

The following tables and figures are presented in this section for the Alpine Lakes WA represented by the SNPA1 IMPROVE Monitor:

- **Table N.5-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure N.5-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure N.5-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure N.5-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure N.5-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure N.5-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure N.5-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure N.5-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

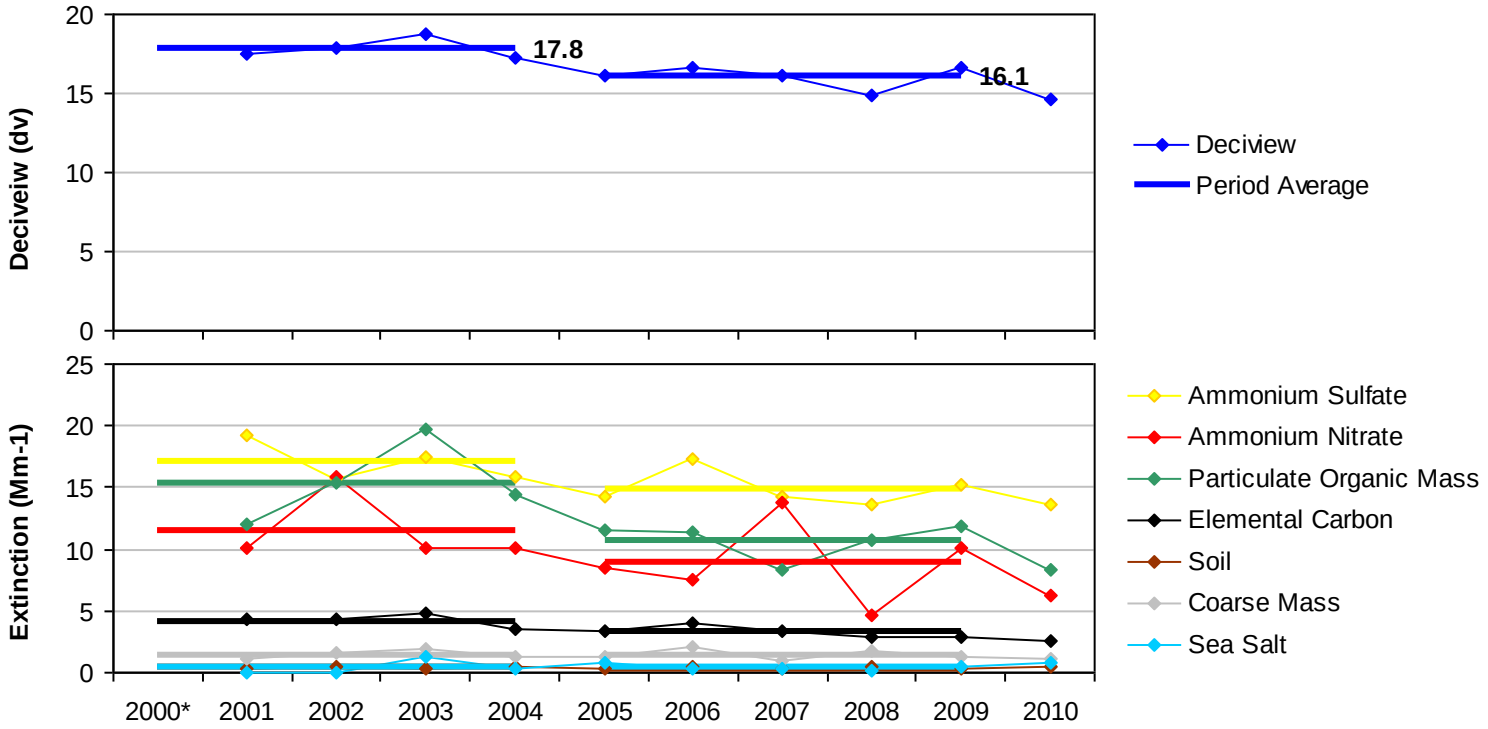
- **Figure N.5-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table N.5-1
Alpine Lakes WA, WA (SNPA1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	6.5	5.4	4.7	5.4	5.4	4.9	4.9	4.5	4.9	3.3	-0.1	0.0	5.5	4.9	-0.6	-11%
Worst 20% Days	---	17.5	17.9	18.7	17.2	16.1	16.7	16.2	14.9	16.6	14.6	-0.3	0.0	17.8	16.1	-1.7	-10%
All Days	---	11.8	11.6	11.2	11.1	10.7	10.5	10.0	9.6	10.6	8.6	-0.3	0.0	11.5	10.3	-1.2	-10%
Total Extinction (Mm-1)																	
Best 20% Days	---	19.2	17.3	16.2	17.2	17.3	16.5	16.3	15.8	16.5	14.0	-0.2	0.0	17.5	16.5	-1.0	-6%
Worst 20% Days	---	58.2	64.5	66.7	57.0	51.2	54.1	52.5	45.5	53.4	44.3	-1.7	0.0	61.6	51.3	-10.3	-17%
All Days	---	35.2	36.1	34.9	33.3	31.6	31.2	30.0	28.1	31.6	25.9	-1.1	0.0	34.9	30.5	-4.4	-13%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	3.6	2.5	1.9	2.3	2.6	1.9	1.9	2.2	2.0	1.3	-0.1	0.1	2.6	2.1	-0.5	-19%
Worst 20% Days	---	19.3	15.8	17.4	15.8	14.3	17.3	14.2	13.7	15.3	13.7	-0.5	0.0	17.1	15.0	-2.1	-12%
All Days	---	10.8	9.2	8.5	8.1	8.4	8.1	7.0	7.7	8.3	6.2	-0.3	0.0	9.1	7.9	-1.2	-13%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	1.5	1.2	0.9	1.0	1.3	1.2	1.0	0.5	0.9	0.6	-0.1	0.0	1.2	1.0	-0.2	-17%
Worst 20% Days	---	10.1	15.8	10.1	10.2	8.4	7.5	13.8	4.7	10.1	6.3	-0.7	0.1	11.6	8.9	-2.7	-23%
All Days	---	5.2	6.3	4.6	4.8	4.2	3.5	5.0	2.3	4.3	3.0	-0.3	0.0	5.2	3.8	-1.4	-27%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	1.3	0.9	0.9	1.1	0.8	0.9	0.7	1.0	0.8	0.3	0.0	0.0	1.1	0.8	-0.3	-27%
Worst 20% Days	---	12.0	15.4	19.8	14.5	11.6	11.4	8.4	10.8	11.9	8.3	-0.5	0.0	15.4	10.8	-4.6	-30%
All Days	---	4.6	6.0	6.8	5.7	4.3	4.4	3.7	4.2	4.7	3.0	-0.2	0.1	5.8	4.3	-1.5	-26%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	1.1	0.7	0.8	1.0	0.7	0.7	0.8	0.6	0.5	0.5	0.0	0.0	0.9	0.7	-0.2	-22%
Worst 20% Days	---	4.3	4.4	4.7	3.5	3.4	3.9	3.4	2.9	2.9	2.6	-0.2	0.0	4.2	3.3	-0.9	-21%
All Days	---	2.1	2.3	2.4	1.9	1.9	2.0	1.8	1.6	1.6	1.3	-0.1	0.0	2.2	1.8	-0.4	-18%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.1	0.0	-0.1	-100%
Worst 20% Days	---	0.4	0.5	0.4	0.4	0.3	0.5	0.3	0.5	0.4	0.5	0.0	0.5	0.4	0.4	0.0	0%
All Days	---	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.0	0.2	0.2	0.2	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.1	-0.1	-50%
Worst 20% Days	---	1.2	1.6	1.9	1.3	1.4	2.1	1.0	1.7	1.4	1.2	0.0	0.4	1.5	1.5	0.0	0%
All Days	---	0.8	0.8	0.8	0.7	0.7	0.9	0.5	0.7	0.8	0.6	0.0	0.2	0.8	0.7	-0.1	-13%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.6	0.5	0.6	0.7	0.6	0.8	0.3	1.0	0.2	0.1	0.1	0.5	0.7	0.2	40%
Worst 20% Days	---	0.0	0.1	1.3	0.3	0.9	0.3	0.3	0.2	0.5	0.8	0.0	0.3	0.4	0.4	0.0	0%
All Days	---	0.4	0.3	0.6	0.8	0.9	1.1	0.9	0.4	0.8	0.6	0.1	0.1	0.5	0.8	0.3	60%

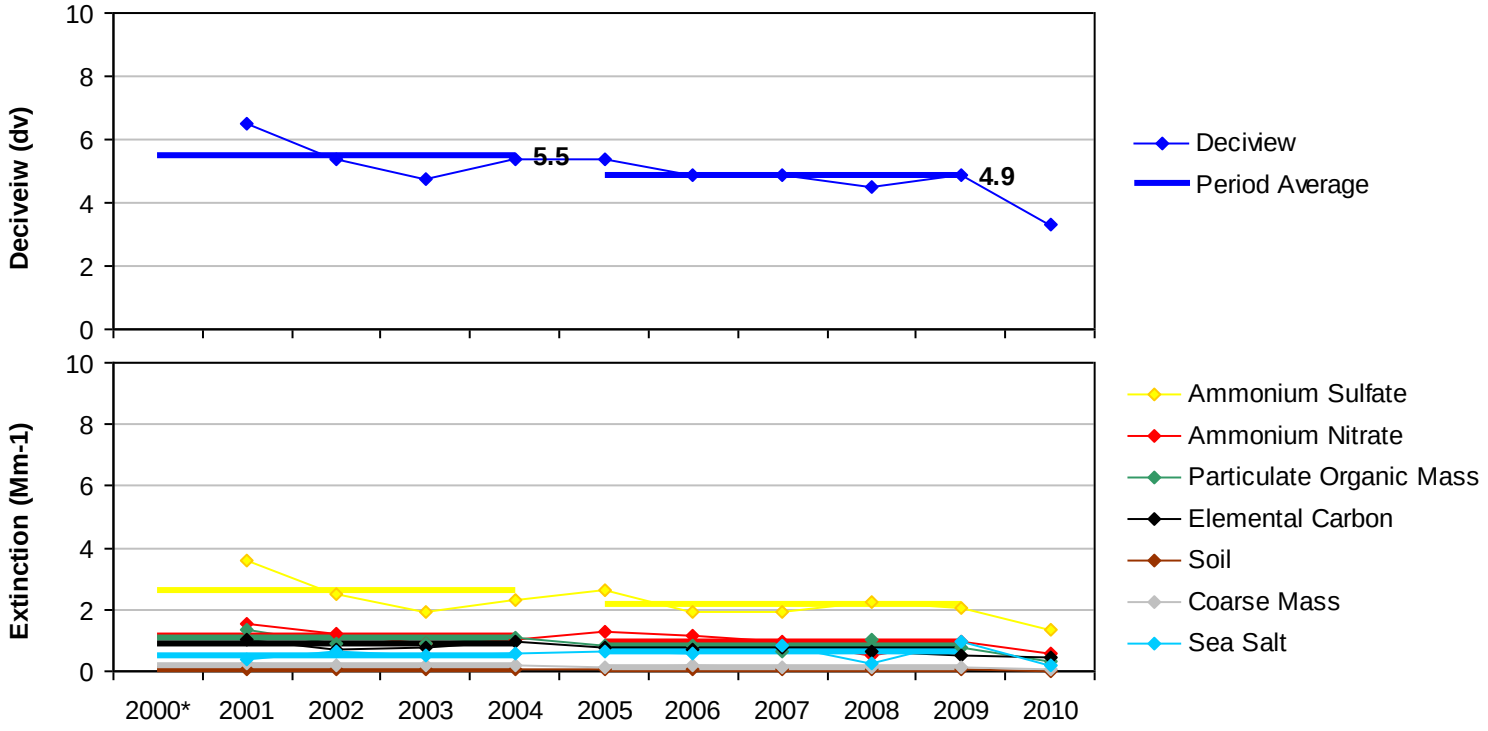
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure N.5-1
Alpine Lakes WA, WA (SNPA1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



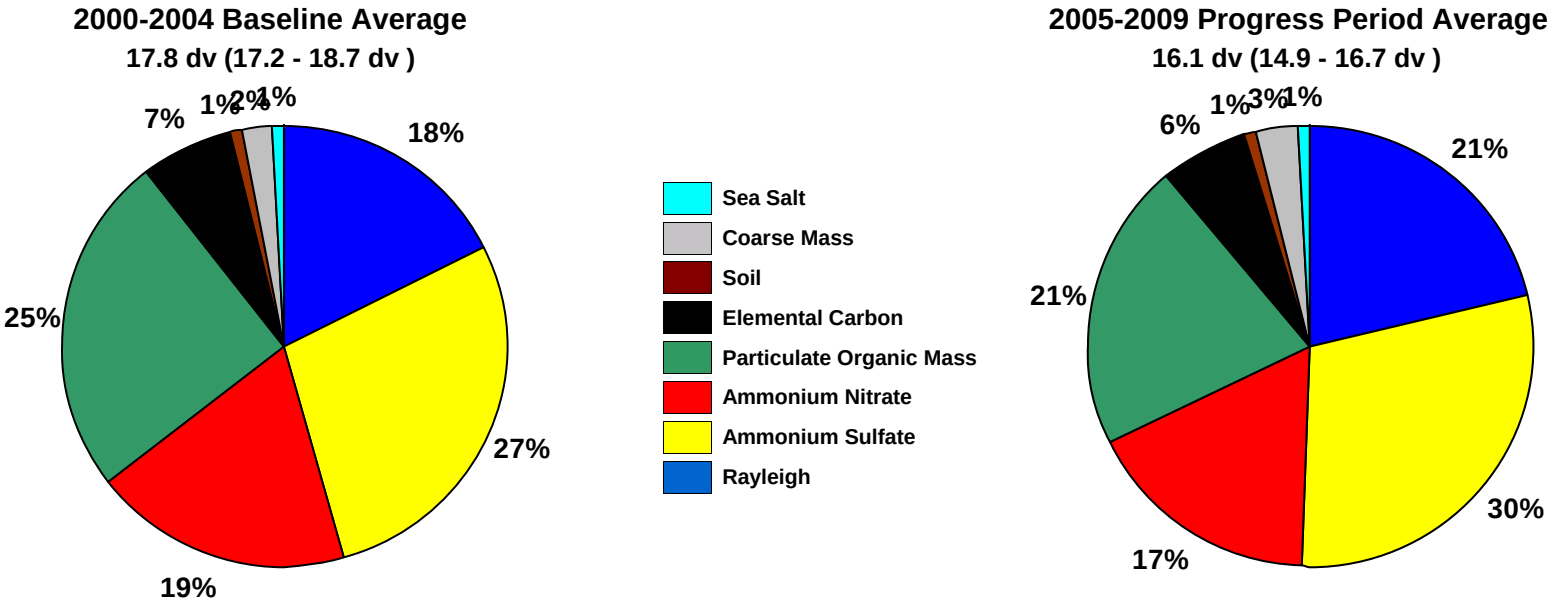
*Missing years did not meet RHR data completeness criteria.

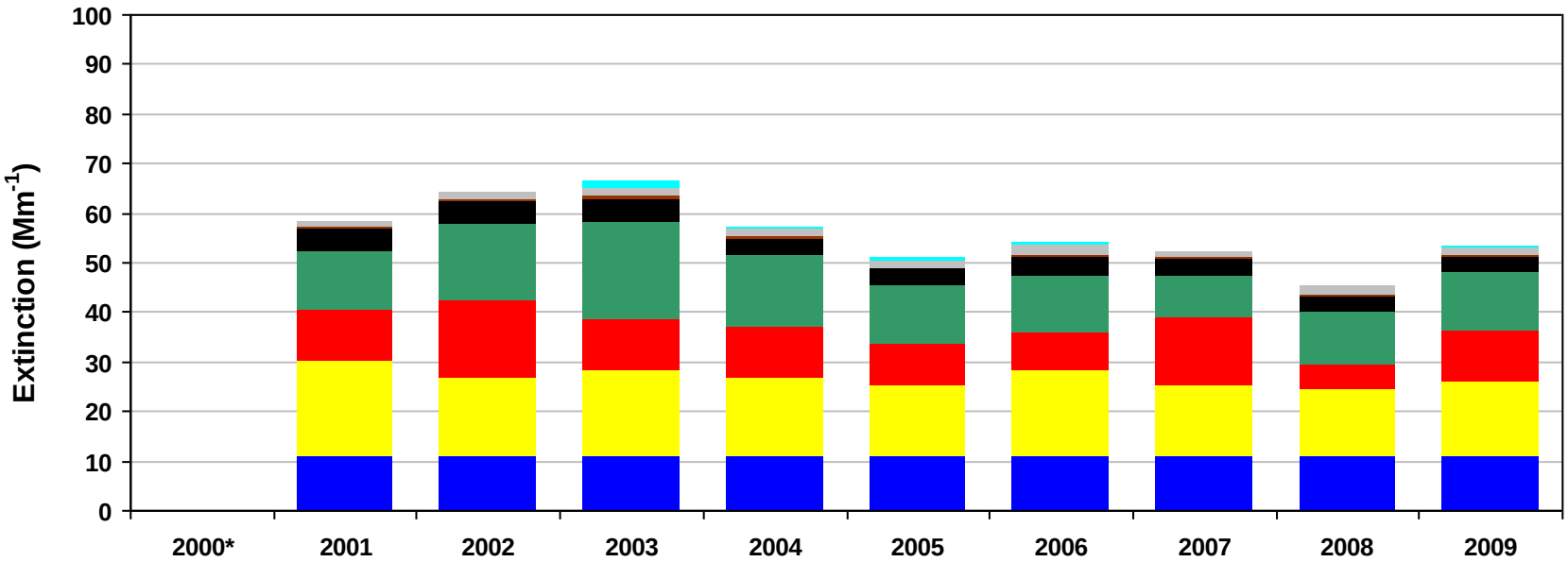
Figure N.5-2
Alpine Lakes WA, WA (SNPA1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

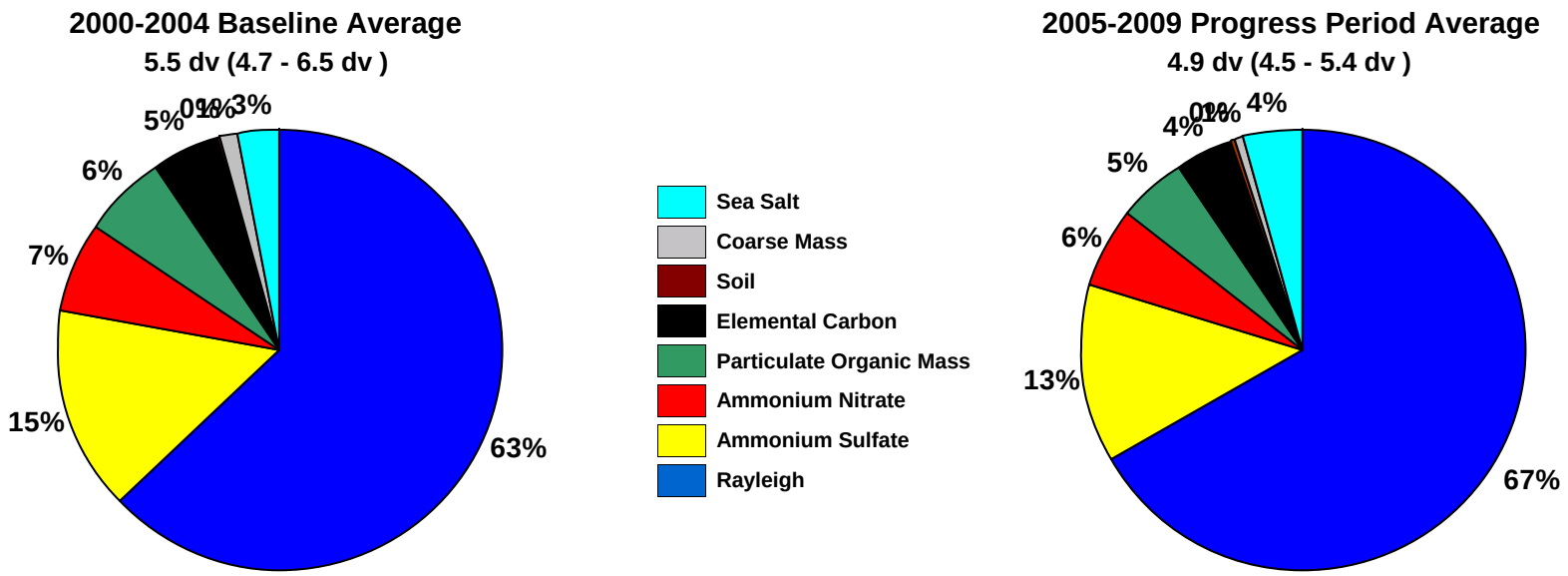
Figure N.5-3
Alpine Lakes WA, WA (SNPA1 Site)
20% Most Impaired Visibility Days

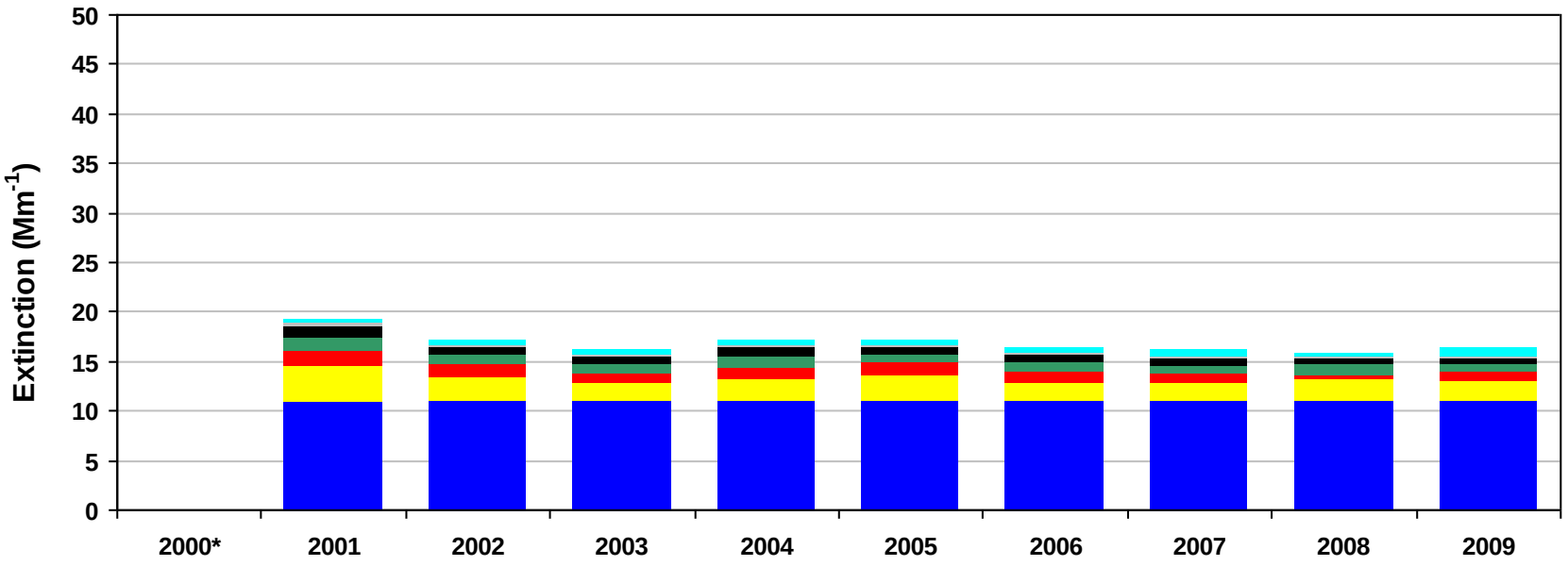




*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

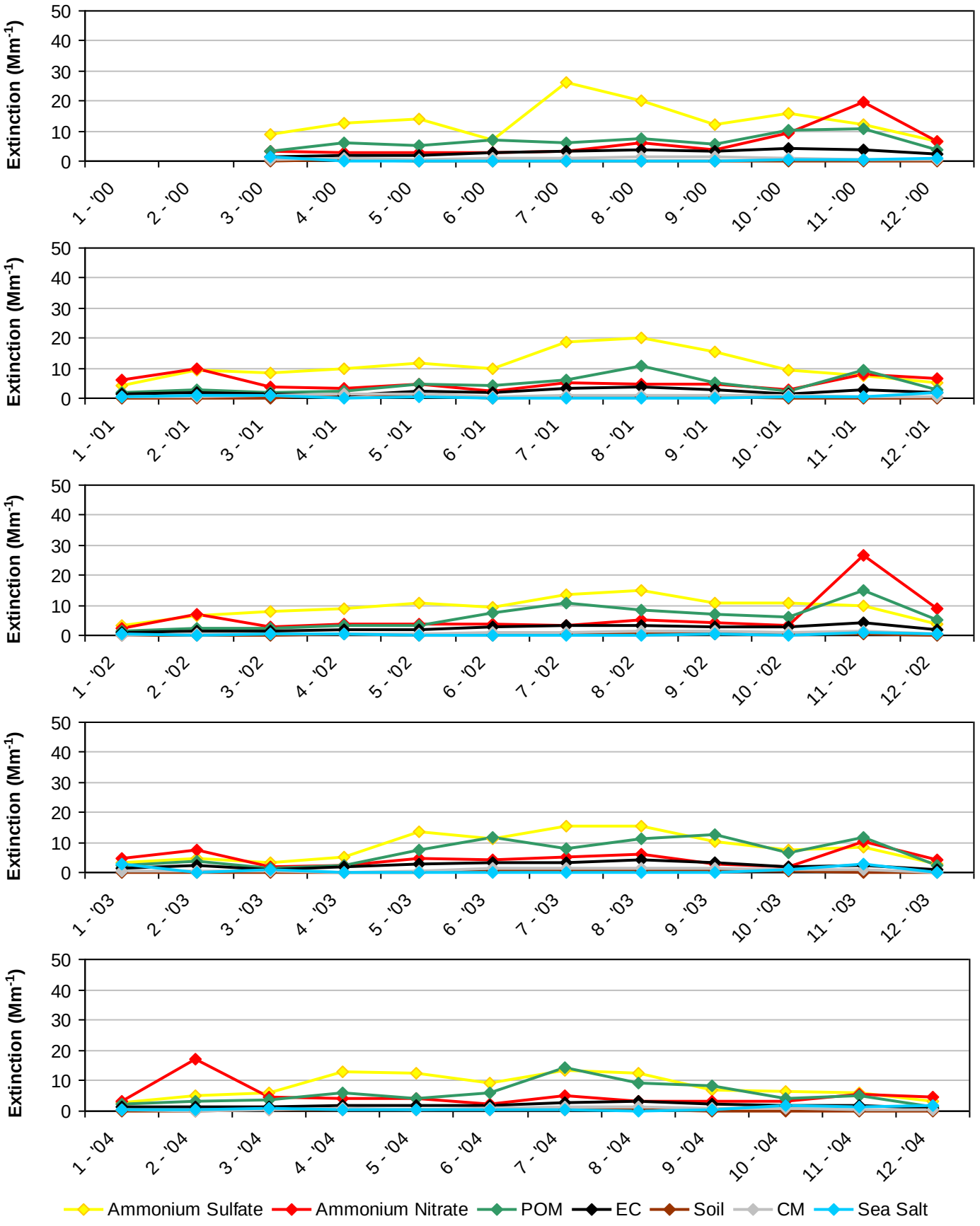
Figure N.5-4
Alpine Lakes WA, WA (SNPA1 Site)
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure N.5-5
Alpine Lakes WA, WA (SNPA1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure N.5-6
Alpine Lakes WA, WA (SNPA1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

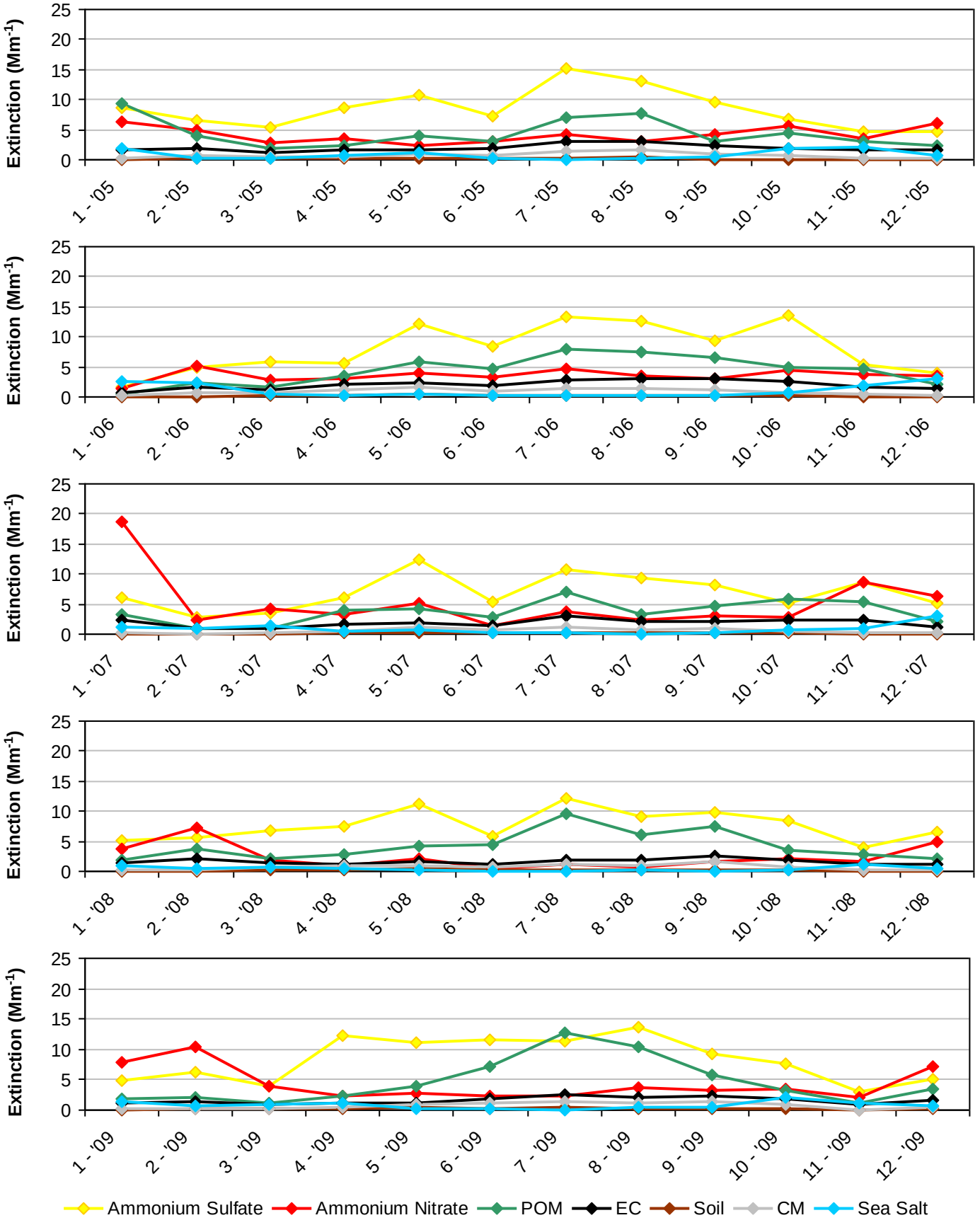
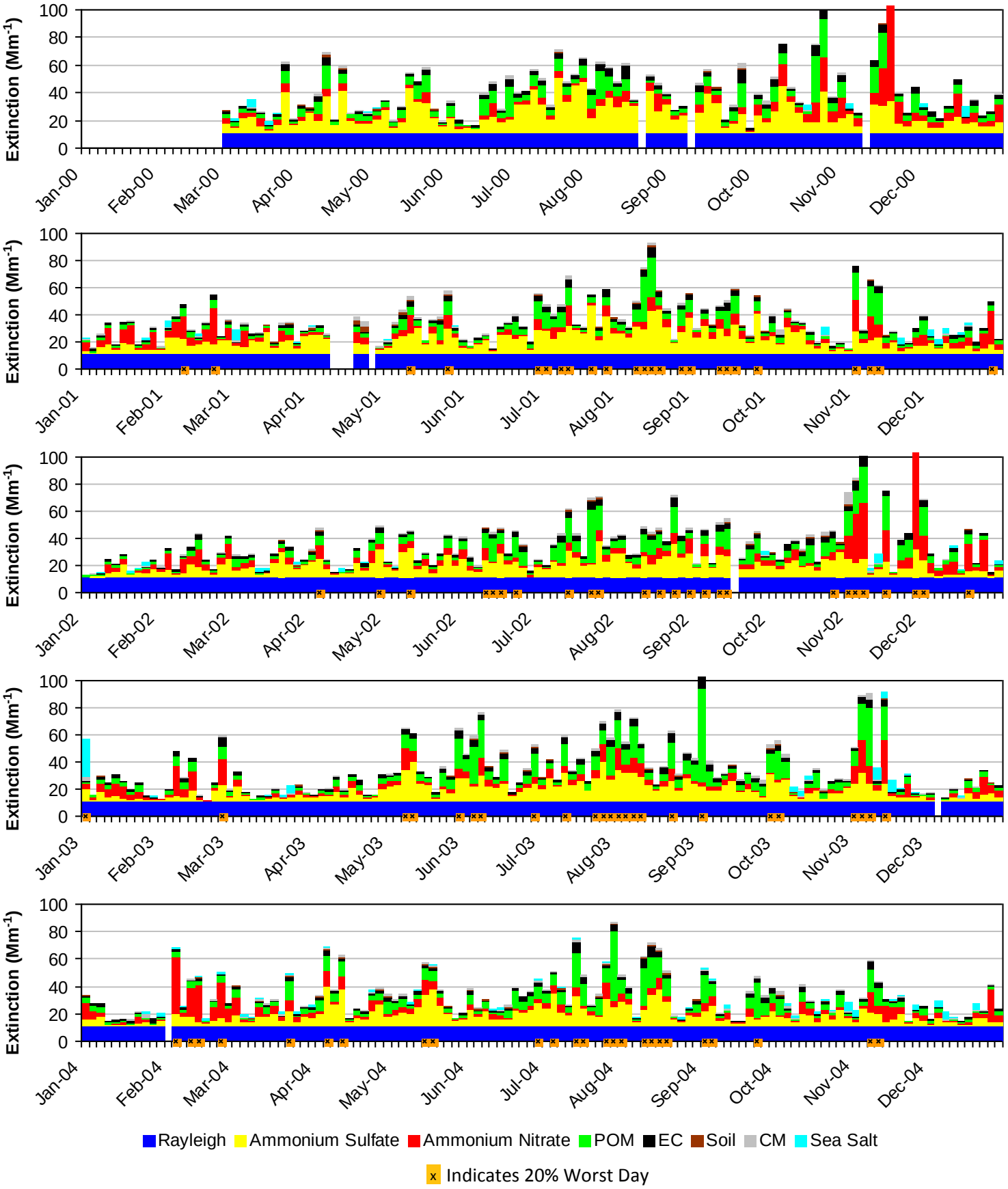
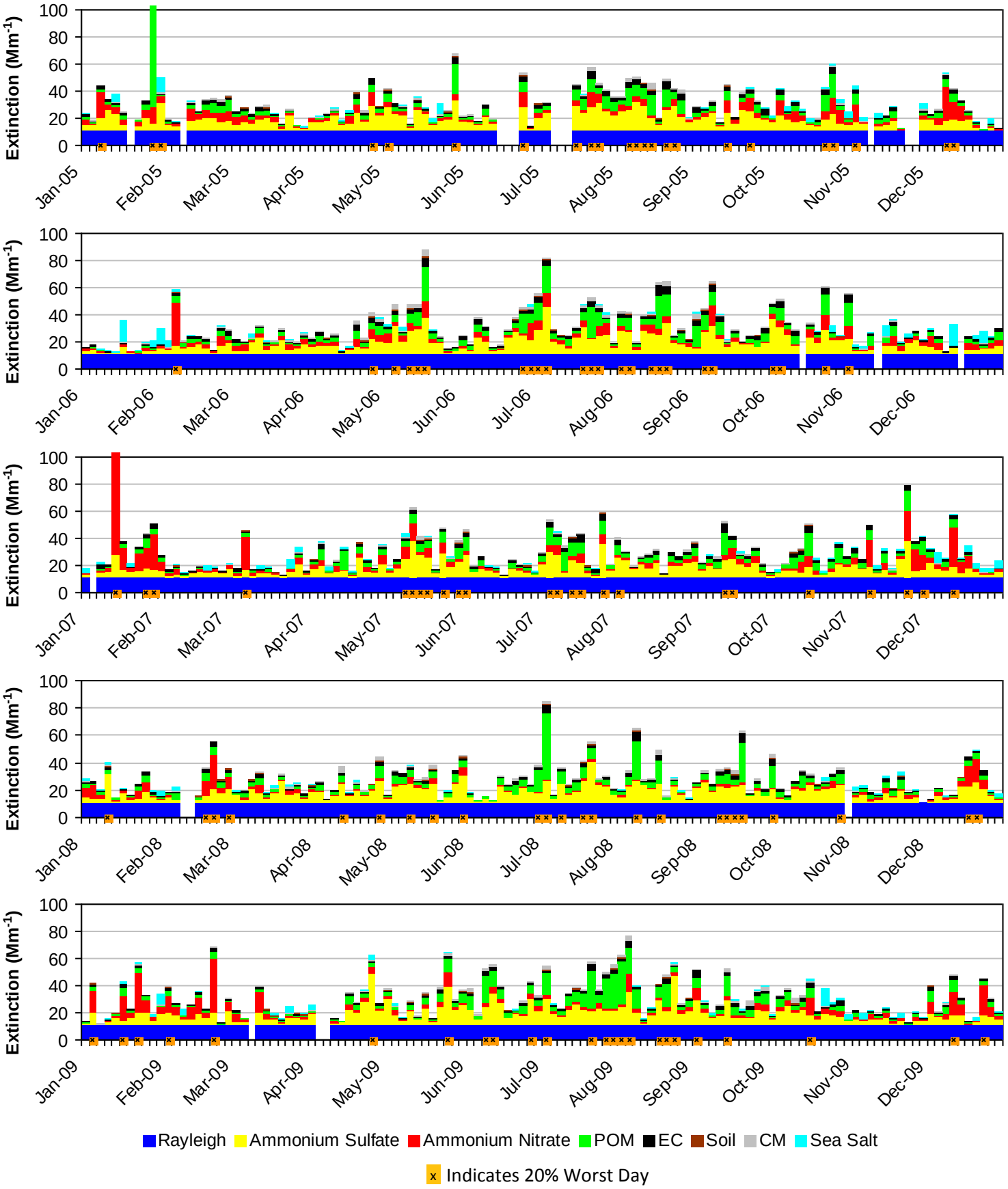


Figure N.5-7
Alpine Lakes WA, WA (SNPA1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure N.5-8
Alpine Lakes WA, WA (SNPA1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



N.6. GOAT ROCKS WA AND MOUNT ADAMS WA (WHPA1)

The following tables and figures are presented in this section for the Goat Rocks WA and Mount Adams WA represented by the WHPA1 IMPROVE Monitor:

- **Table N.6-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure N.6-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure N.6-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure N.6-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure N.6-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure N.6-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure N.6-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure N.6-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

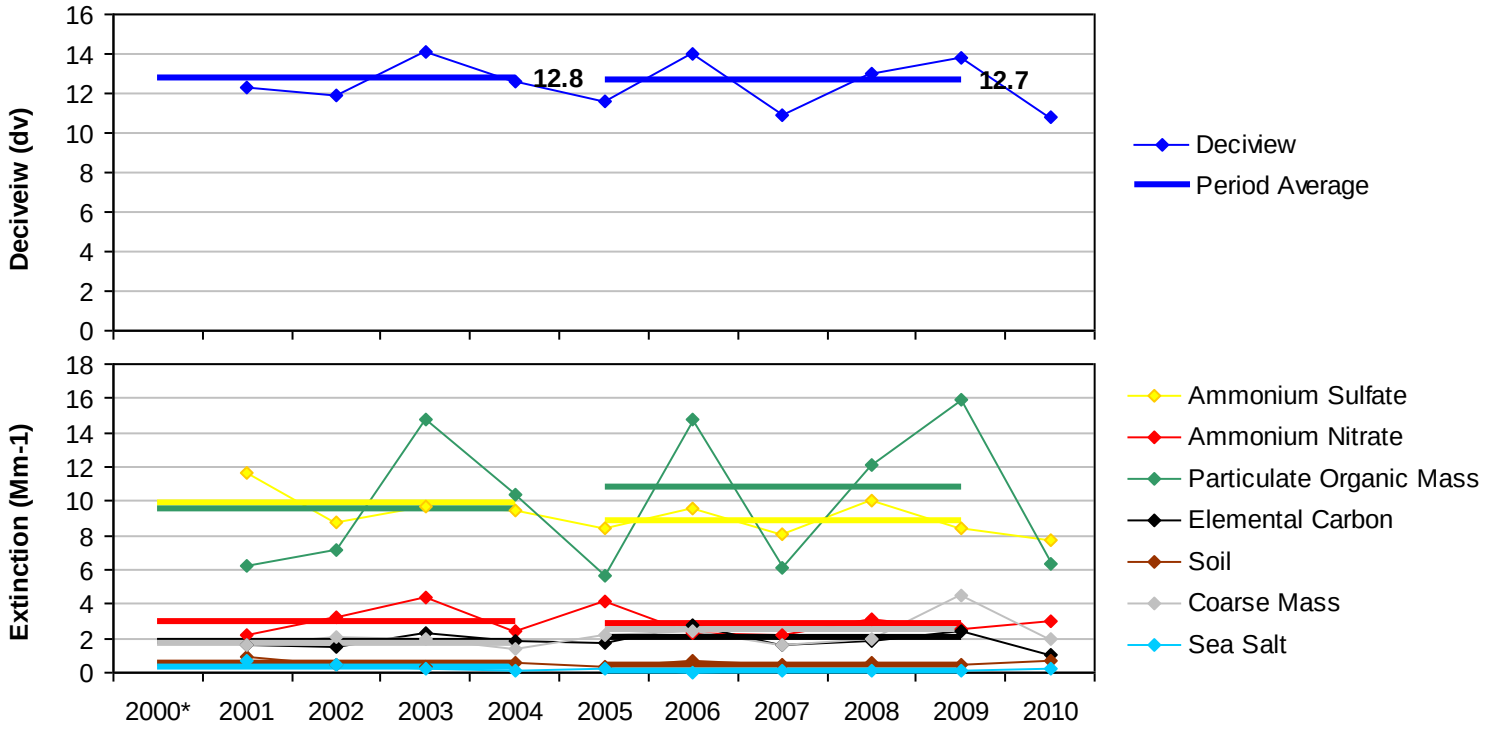
- **Figure N.6-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table N.6-1
Goat Rocks WA and Mount Adams WA, WA (WHPA1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period						2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	2.2	1.9	1.1	1.5	1.9	1.8	1.8	1.5	1.7	0.8	0.0	0.2	1.7	1.8	0.1	6%
Worst 20% Days	---	12.3	11.9	14.1	12.6	11.6	14.0	10.9	13.0	13.8	10.8	0.1	0.5	12.8	12.7	-0.1	-1%
All Days	---	6.8	6.3	6.6	6.5	6.4	6.9	5.6	6.4	7.2	5.0	0.0	0.5	6.5	6.5	0.0	0%
Total Extinction (Mm-1)																	
Best 20% Days	---	12.5	12.1	11.2	11.6	12.2	12.0	12.0	11.6	11.9	10.9	0.0	0.2	11.8	11.9	0.1	1%
Worst 20% Days	---	34.8	33.6	43.8	36.1	32.7	42.5	30.2	39.9	44.4	30.9	0.7	0.3	37.1	37.9	0.8	2%
All Days	---	21.1	20.1	22.2	20.9	20.1	22.3	18.6	21.3	23.7	18.0	0.2	0.2	21.1	21.2	0.1	1%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	1.4	1.0	0.5	0.6	1.4	0.9	1.1	0.9	1.0	0.5	0.0	0.5	0.9	1.1	0.2	22%
Worst 20% Days	---	11.7	8.8	9.7	9.5	8.4	9.5	8.1	10.1	8.4	7.7	-0.2	0.2	9.9	8.9	-1.0	-10%
All Days	---	5.7	4.3	4.3	4.5	4.8	4.7	4.0	4.9	4.7	3.4	0.0	0.4	4.7	4.6	-0.1	-2%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	0.4	0.3	0.1	0.2	0.3	0.1	0.2	0.1	0.2	0.1	0.0	0.1	0.2	0.2	0.0	0%
Worst 20% Days	---	2.2	3.3	4.4	2.4	4.1	2.3	2.2	3.1	2.5	3.0	0.0	0.5	3.1	2.9	-0.2	-7%
All Days	---	1.2	1.4	1.6	1.3	1.5	1.2	0.9	1.1	1.2	1.1	0.0	0.2	1.4	1.2	-0.2	-14%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.4	0.2	0.2	0.2	0.3	0.2	0.3	0.1	0.1	0.0	0.5	0.3	0.2	-0.1	-33%
Worst 20% Days	---	6.2	7.1	14.8	10.4	5.6	14.7	6.1	12.1	16.0	6.3	0.8	0.2	9.6	10.9	1.3	14%
All Days	---	2.1	2.5	4.3	3.3	1.9	4.0	2.0	3.5	4.4	1.8	0.2	0.2	3.0	3.2	0.2	7%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.5	0.1	0.1	0.0	0%
Worst 20% Days	---	1.6	1.5	2.3	1.8	1.8	2.8	1.6	1.9	2.4	1.1	0.1	0.1	1.8	2.1	0.3	17%
All Days	---	0.7	0.7	0.8	0.7	0.7	1.0	0.6	0.6	0.8	0.4	0.0	0.5	0.7	0.7	0.0	0%
Soil Extinction (Mm-1)																	
Best 20% Days	---	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0%
Worst 20% Days	---	0.9	0.4	0.4	0.5	0.4	0.7	0.4	0.6	0.5	0.6	0.0	0.5	0.6	0.5	-0.1	-17%
All Days	---	0.4	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.0	0.5	0.2	0.2	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.4	0.1	0.0	0.4	0.1	0.2	0.1	100%
Worst 20% Days	---	1.6	2.0	2.0	1.4	2.2	2.4	1.6	2.0	4.5	1.9	0.1	0.1	1.7	2.5	0.8	47%
All Days	---	0.8	0.7	0.7	0.7	0.9	0.9	0.7	0.8	2.0	0.8	0.0	0.2	0.7	1.0	0.3	43%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	0.2	0.1	0.1	0.2	0.1	0.3	0.2	0.1	0.1	0.0	0.0	0.5	0.1	0.2	0.1	100%
Worst 20% Days	---	0.7	0.5	0.3	0.1	0.3	0.0	0.1	0.2	0.1	0.3	-0.1	0.0	0.4	0.1	-0.3	-75%
All Days	---	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.2	0.3	0.2	0.0	0.3	0.3	0.2	-0.1	-33%

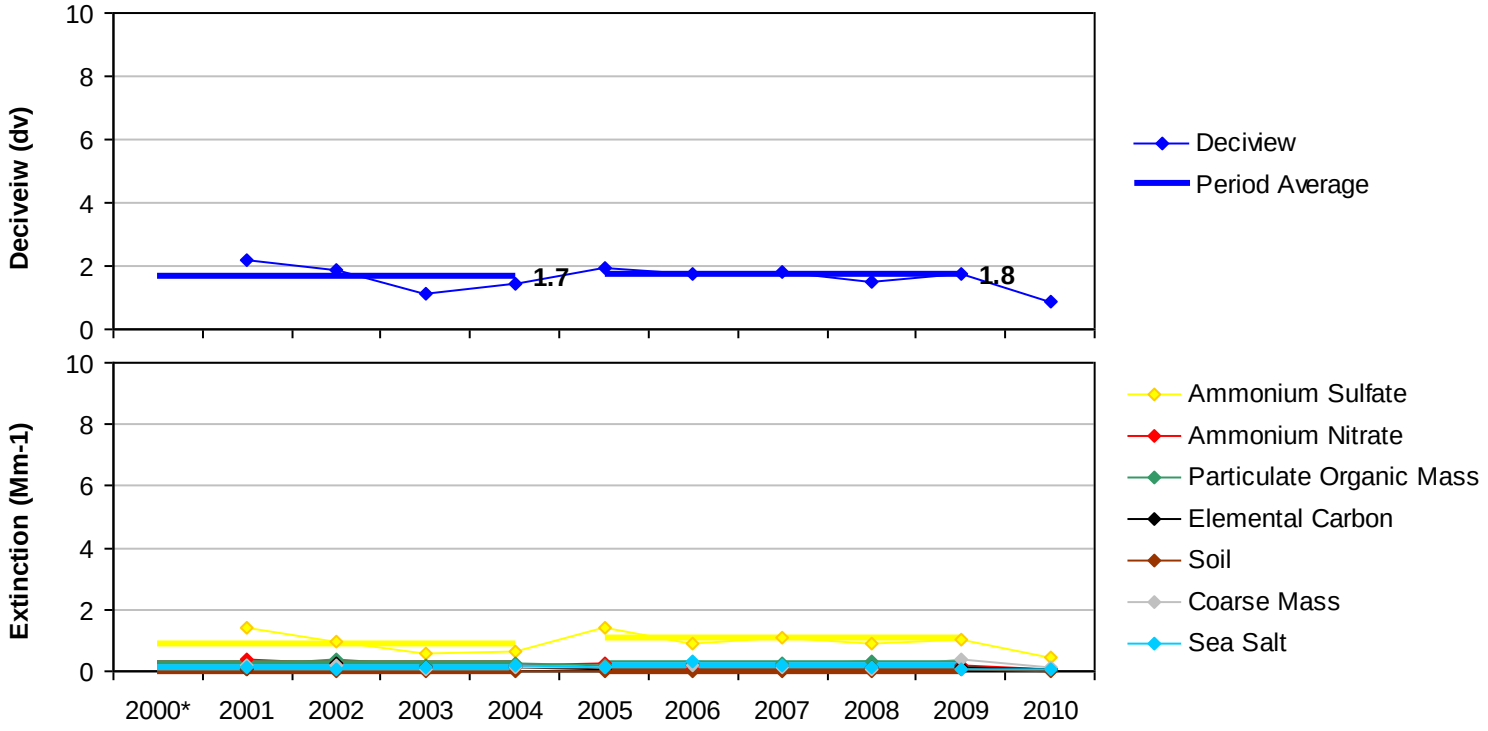
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure N.6-1
Goat Rocks WA and Mount Adams WA, WA (WHPA1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure N.7-2
Goat Rocks WA and Mount Adams WA, WA (WHPA1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

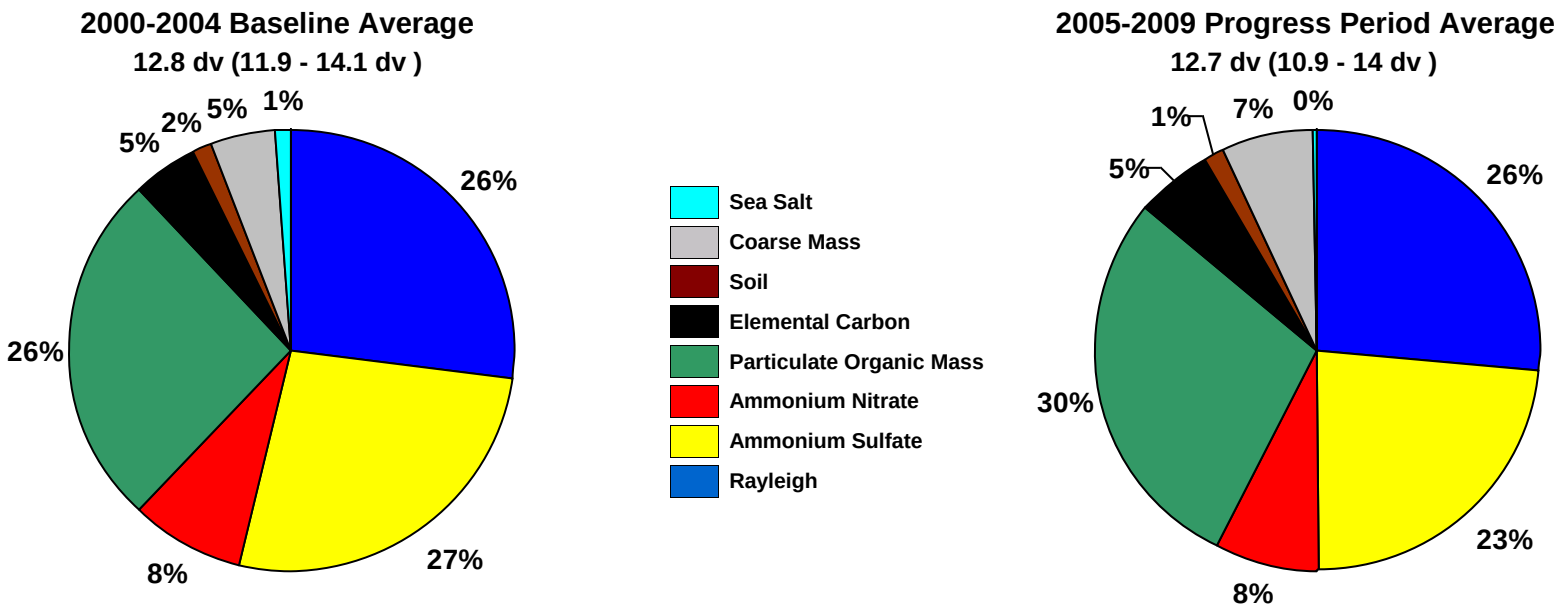


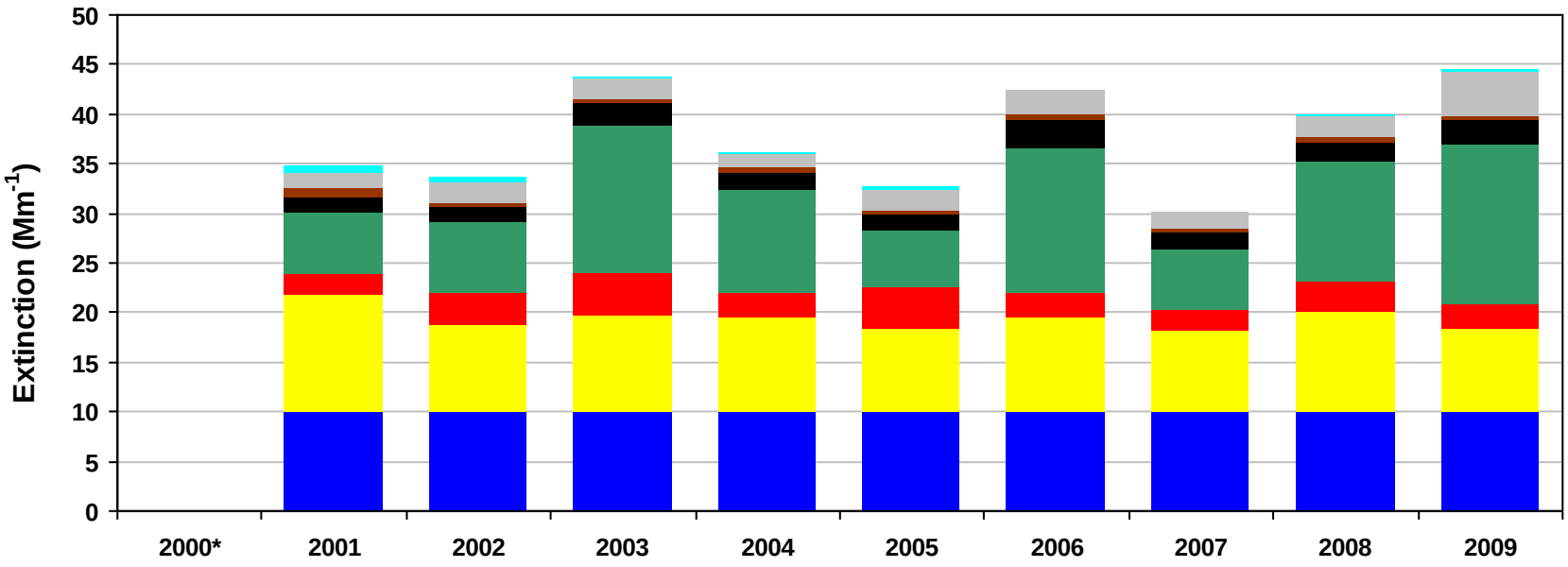
*Missing years did not meet RHR data completeness criteria.

Figure N.6-3

Goat Rocks WA and Mount Adams WA, WA (WHPA1 Site)

20% Most Impaired Visibility Days



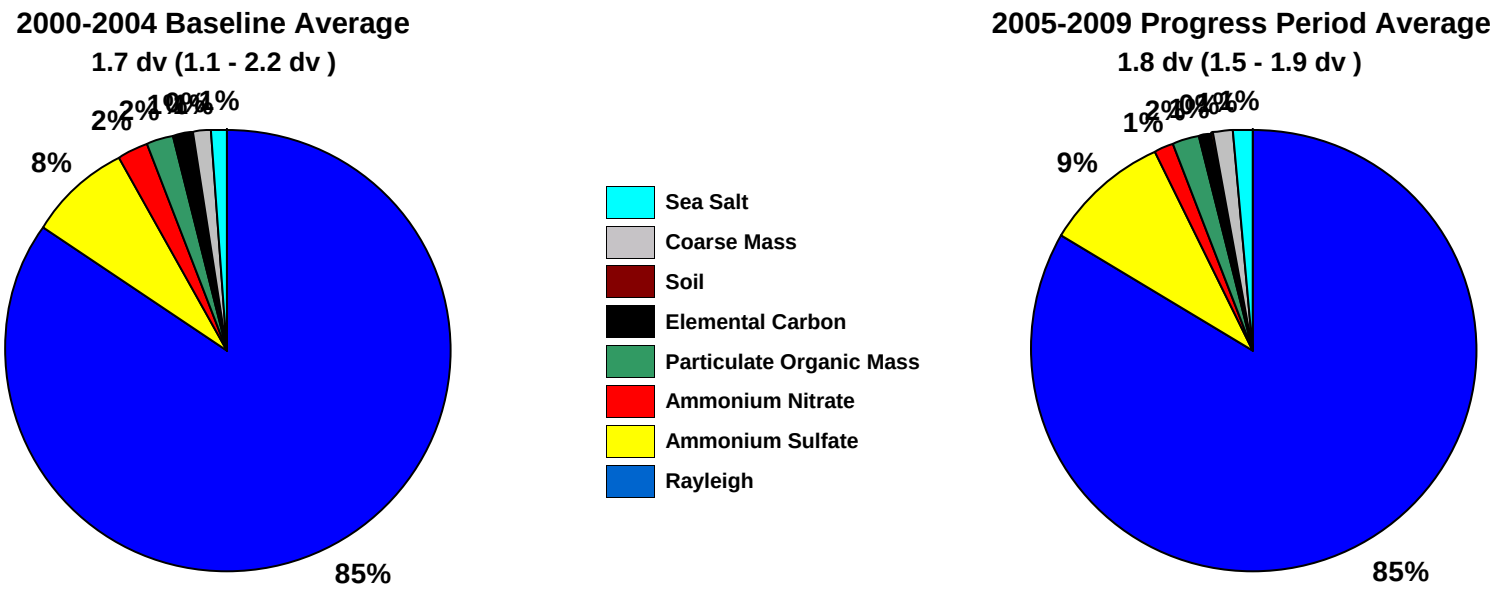


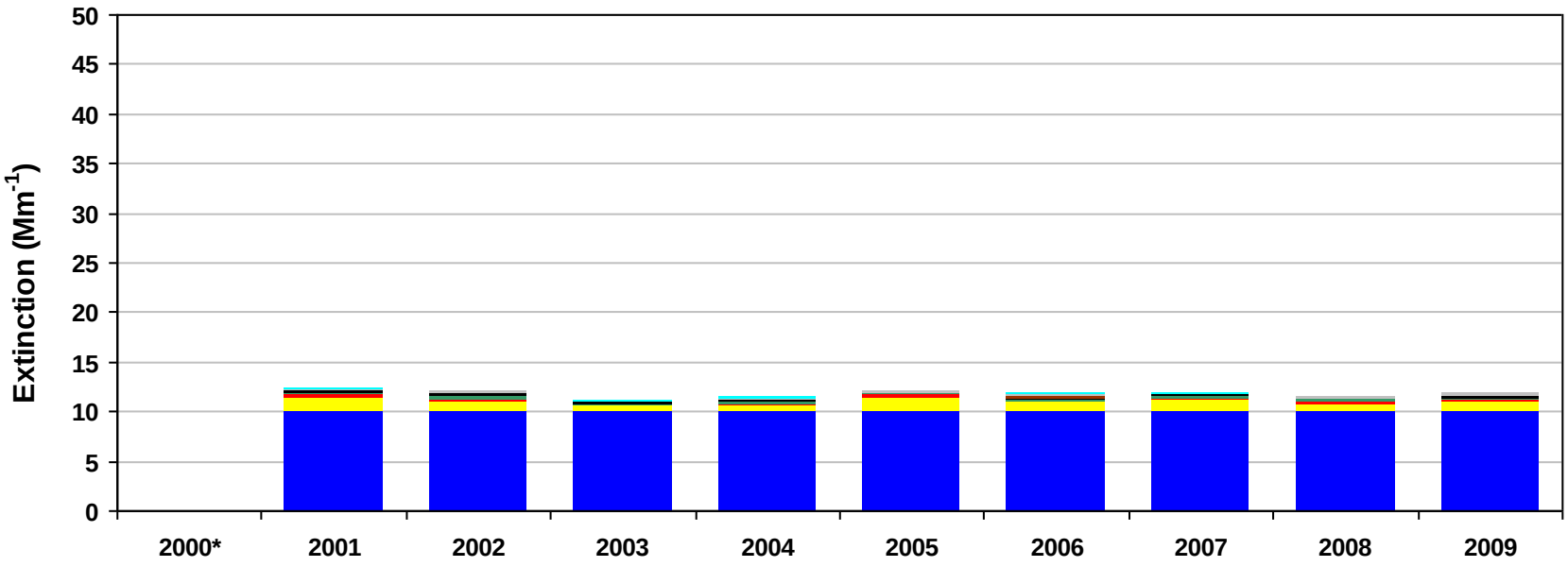
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure N.6-4

Goat Rocks WA and Mount Adams WA, WA (WHPA1 Site)

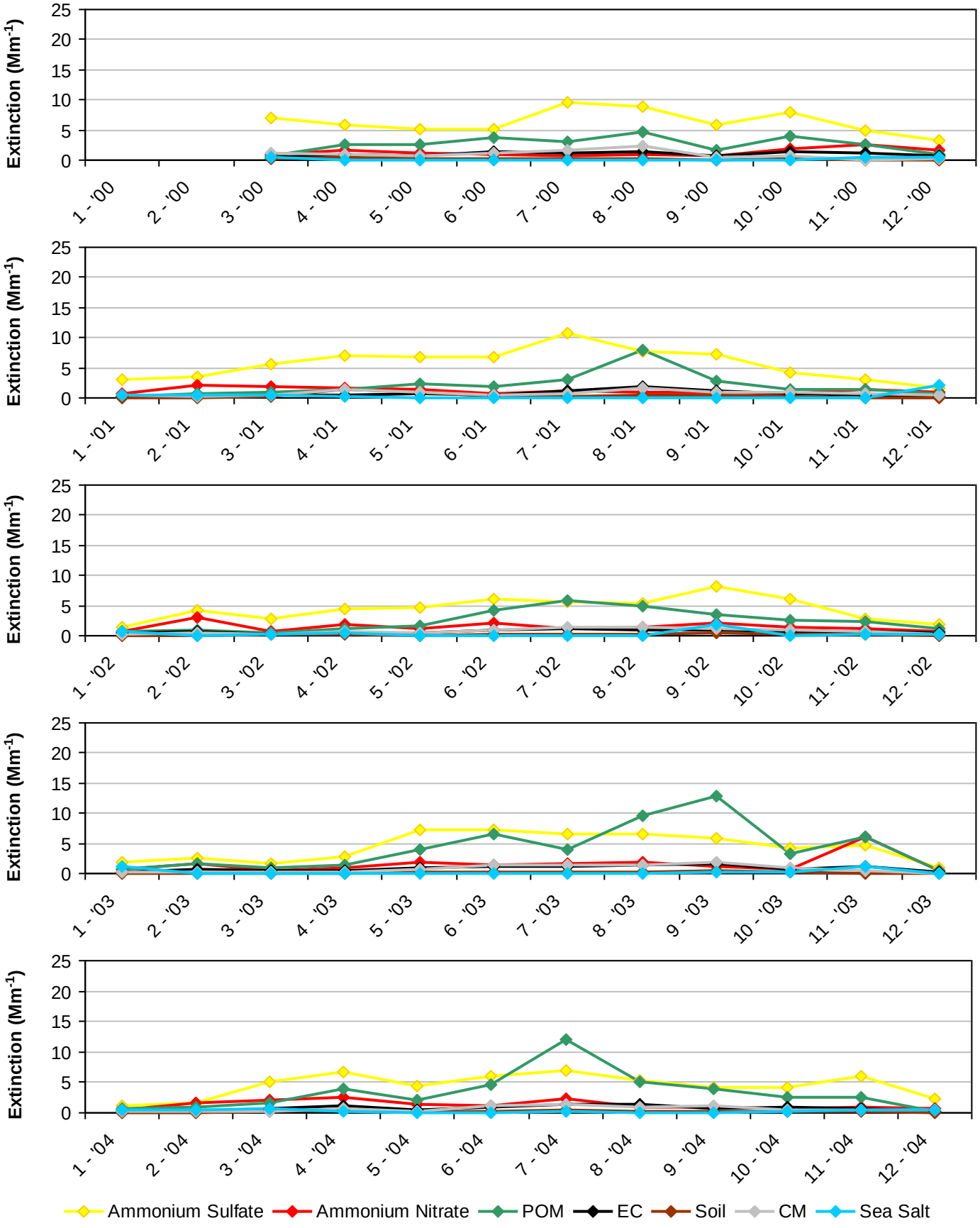
20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure N.6-5
Goat Rocks WA and Mount Adams WA, WA (WHPA1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



*Note that monthly averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure N.6-6
Goat Rocks WA and Mount Adams WA, WA (WHPA1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

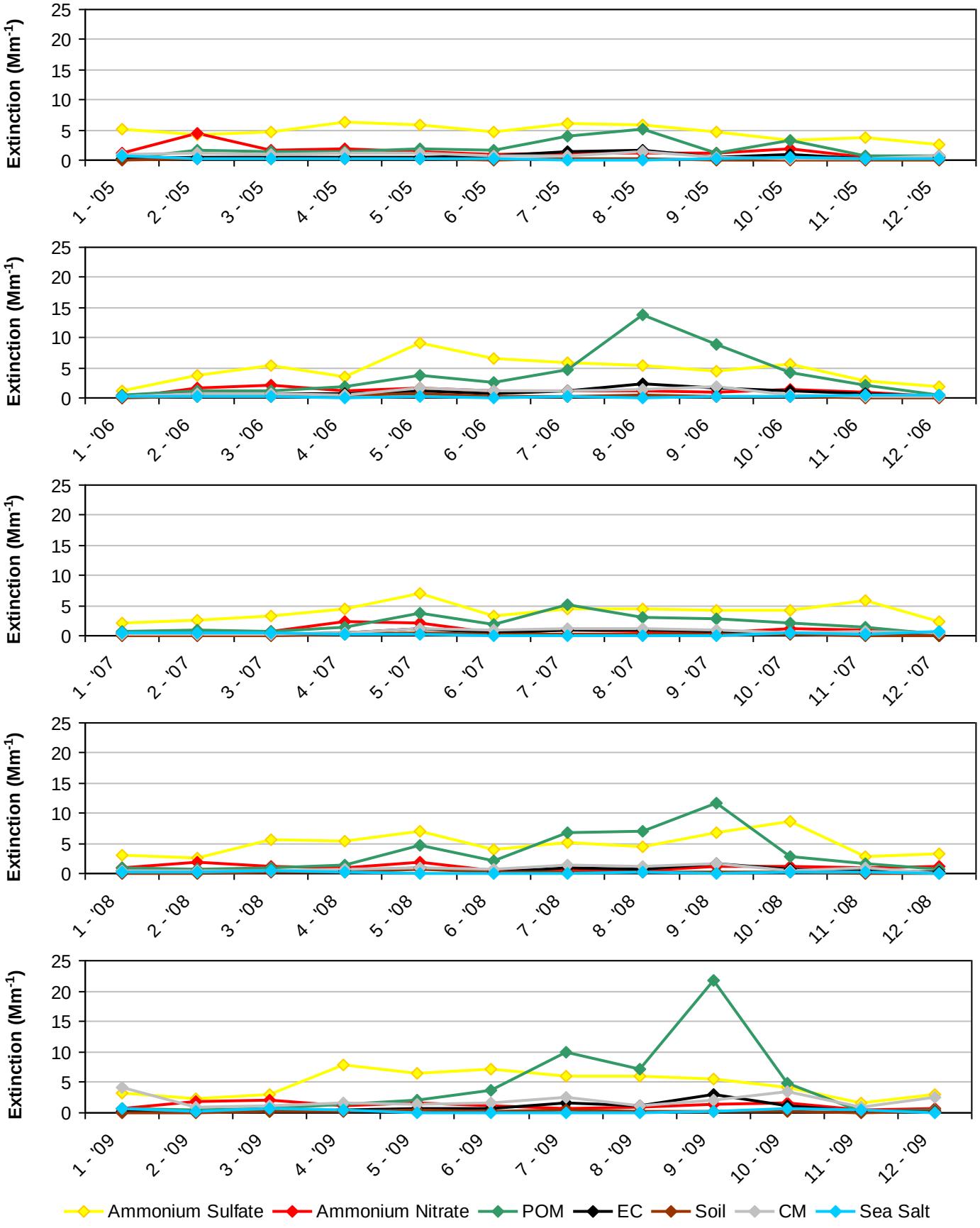
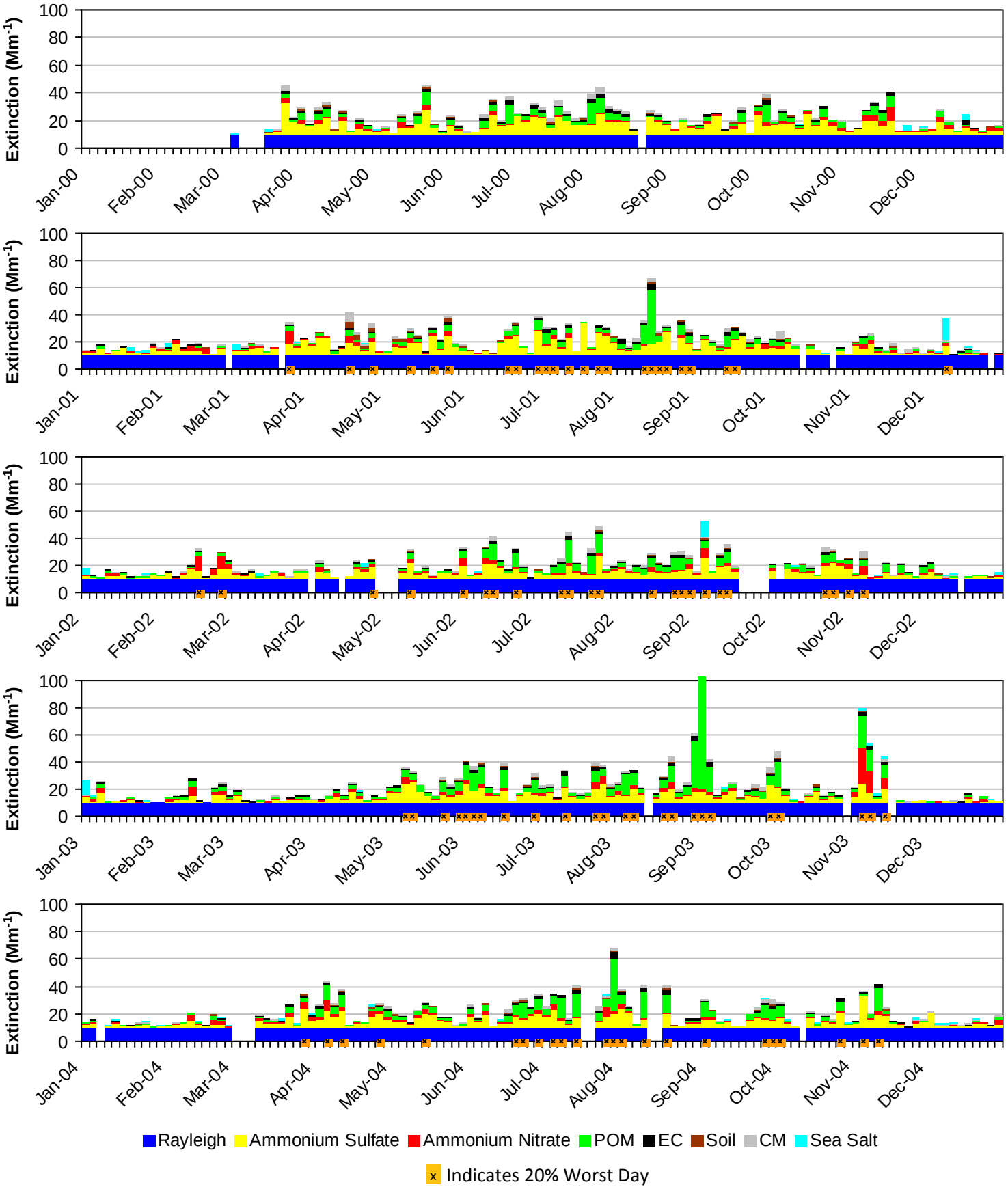
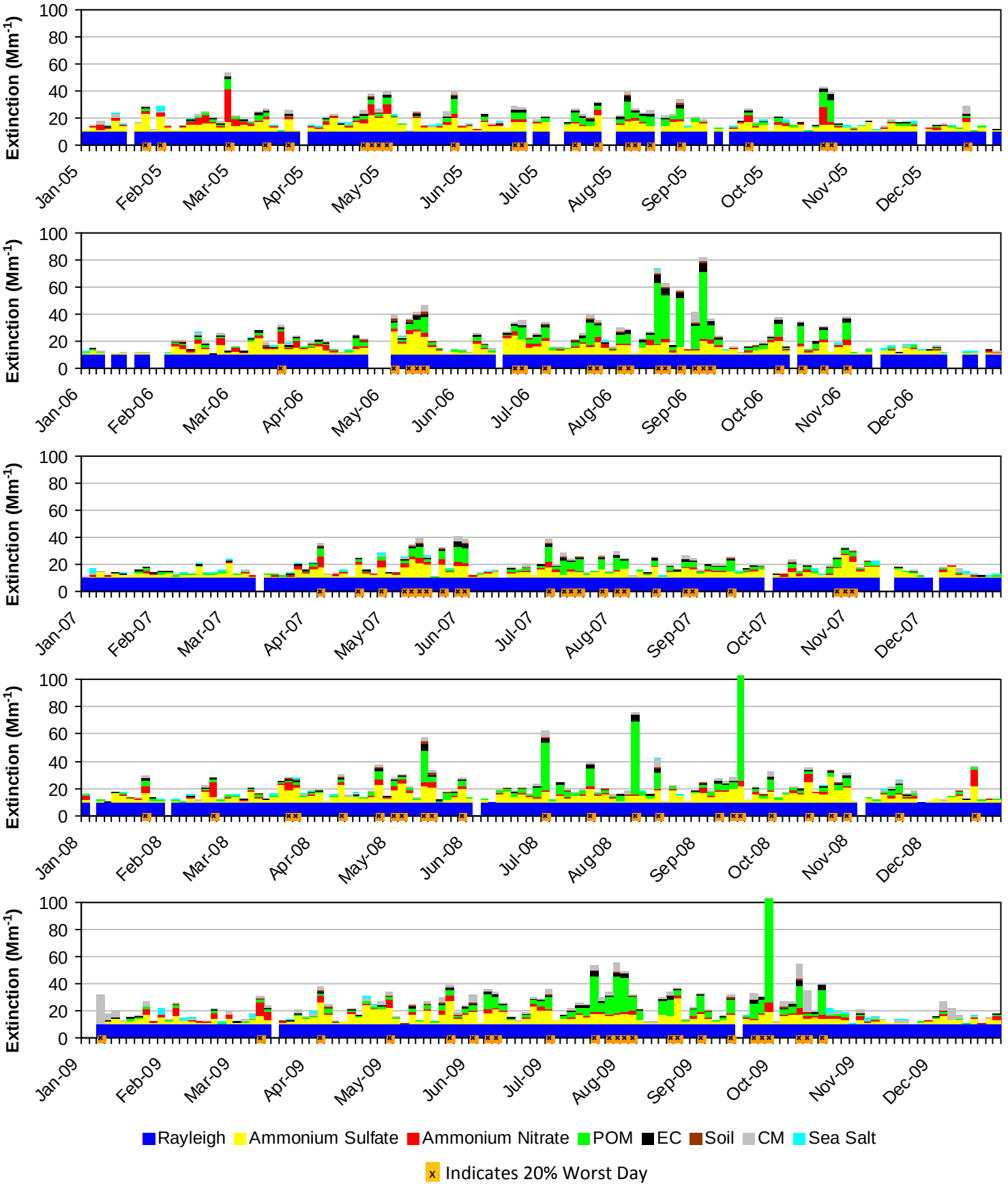


Figure N.6-7
Goat Rocks WA and Mount Adams WA, WA (WHPA1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the year 2000 are shown here, but this year did not meet RHR data completeness criteria.

Figure N.6-8
Goat Rocks WA and Mount Adams WA, WA (WHPA1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



APPENDIX O:

Wyoming Class I Area Monitoring Data Summary Tables and Charts

Includes the following subsections:

Subsection	IMPROVE Monitor	Class I Area(s) Represented
O.1	BRID1	Bridger WA and Fitzpatrick WA
O.2	NOAB1	North Absaroka WA and Washakie WA
O.3	YELL2	Yellowstone NP, Grand Teton NP, Red Rock Lakes WA, and Teton WA

O.1. BRIDGER WA AND FITZPATRICK WA (BRID1)

The following tables and figures are presented in this section for the Bridger WA and Fitzpatrick WA represented by the BRID1 IMPROVE Monitor:

- **Table O.1-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure O.1-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure O.1-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure O.1-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure O.1-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure O.1-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure O.1-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure O.1-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure O.1-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table O.1-1
Bridger WA and Fitzpatrick WA, WY (BRID1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	2.5	2.5	2.1	1.6	1.8	1.6	1.5	2.0	1.3	1.3	0.7	-0.1	0.0	2.1	1.5	-0.6	-29%
Worst 20% Days	11.0	10.9	12.1	11.4	10.2	9.1	11.9	11.0	12.5	8.8	8.6	-0.1	0.4	11.1	10.7	-0.4	-4%
All Days	6.3	6.4	6.5	6.0	5.6	5.2	6.2	6.0	6.0	4.7	4.6	-0.1	0.0	6.2	5.6	-0.6	-10%
Total Extinction (Mm-1)																	
Best 20% Days	12.9	12.9	12.3	11.8	12.0	11.8	11.6	12.2	11.4	11.4	10.8	-0.2	0.0	12.4	11.7	-0.7	-6%
Worst 20% Days	31.1	30.0	34.6	34.0	28.3	25.3	34.2	30.9	42.8	25.3	24.0	-0.1	0.4	31.6	31.7	0.1	0%
All Days	19.9	19.9	20.5	19.8	18.4	17.4	20.2	19.4	21.2	16.9	16.5	-0.1	0.2	19.7	19.0	-0.7	-4%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	1.9	1.6	1.4	1.1	1.3	1.3	1.1	1.3	1.1	1.2	0.9	-0.1	0.0	1.5	1.2	-0.3	-20%
Worst 20% Days	4.5	5.9	4.3	4.9	5.3	6.3	5.0	5.1	5.4	4.1	4.5	0.0	0.4	5.0	5.2	0.2	4%
All Days	3.4	3.8	3.1	2.9	3.2	3.5	3.5	3.3	3.3	2.8	2.7	0.0	0.3	3.2	3.3	0.1	3%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.4	0.5	0.5	0.3	0.4	0.2	0.3	0.4	0.4	0.3	0.2	0.0	0.3	0.4	0.3	-0.1	-25%
Worst 20% Days	1.3	1.5	1.7	1.1	1.6	0.8	1.2	1.4	1.4	0.9	1.2	0.0	0.2	1.4	1.1	-0.3	-21%
All Days	0.9	1.0	1.2	0.9	0.9	0.7	0.8	1.0	0.9	0.7	0.7	0.0	0.1	1.0	0.8	-0.2	-20%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.0	0.7	0.7	0.8	0.7	0.7	0.6	0.8	0.5	0.4	0.3	-0.1	0.0	0.8	0.6	-0.2	-25%
Worst 20% Days	10.3	7.6	13.8	14.1	6.9	5.0	13.1	10.0	20.3	7.3	5.0	0.0	0.5	10.5	11.1	0.6	6%
All Days	4.0	3.2	4.4	4.7	3.1	2.4	4.3	3.6	5.6	2.6	2.1	0.0	0.4	3.9	3.7	-0.2	-5%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.3	0.6	0.4	0.3	0.2	0.3	0.2	0.3	0.1	0.1	0.1	0.0	0.0	0.4	0.2	-0.2	-50%
Worst 20% Days	2.6	1.5	2.4	2.1	1.4	1.3	2.5	1.9	2.5	1.3	1.3	0.0	0.2	2.0	1.9	-0.1	-5%
All Days	1.1	1.0	1.2	1.0	0.7	0.7	1.0	0.8	0.8	0.5	0.6	0.0	0.0	1.0	0.8	-0.2	-20%
Soil Extinction (Mm-1)																	
Best 20% Days	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0%
Worst 20% Days	0.9	1.5	1.1	0.7	1.3	0.8	1.1	0.9	1.4	0.9	1.1	0.0	0.4	1.1	1.0	-0.1	-9%
All Days	0.4	0.6	0.5	0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.5	0.0	0.5	0.5	0.4	-0.1	-20%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.1	0.0	0.2	0.2	0.2	0.0	0%
Worst 20% Days	2.5	3.0	2.2	2.1	2.7	2.1	2.3	2.5	2.6	1.8	1.9	-0.1	0.2	2.5	2.3	-0.2	-8%
All Days	1.1	1.3	1.1	1.0	1.1	0.9	1.1	1.2	1.1	0.8	0.9	0.0	0.1	1.1	1.0	-0.1	-9%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0%
Worst 20% Days	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0%
All Days	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure O.1-1
Bridger WA and Fitzpatrick WA, WY (BRID1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

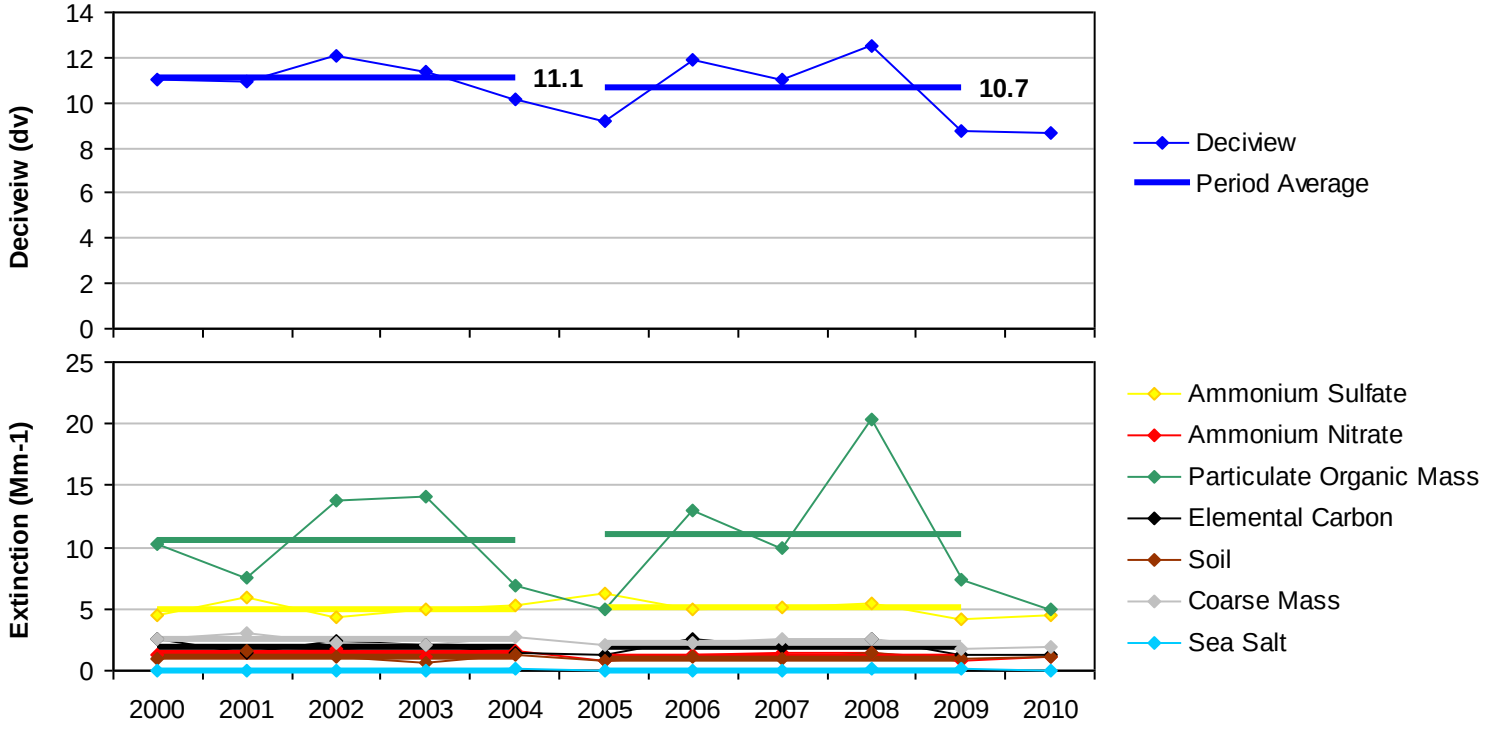


Figure O.1-2
Bridger WA and Fitzpatrick WA, WY (BRID1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

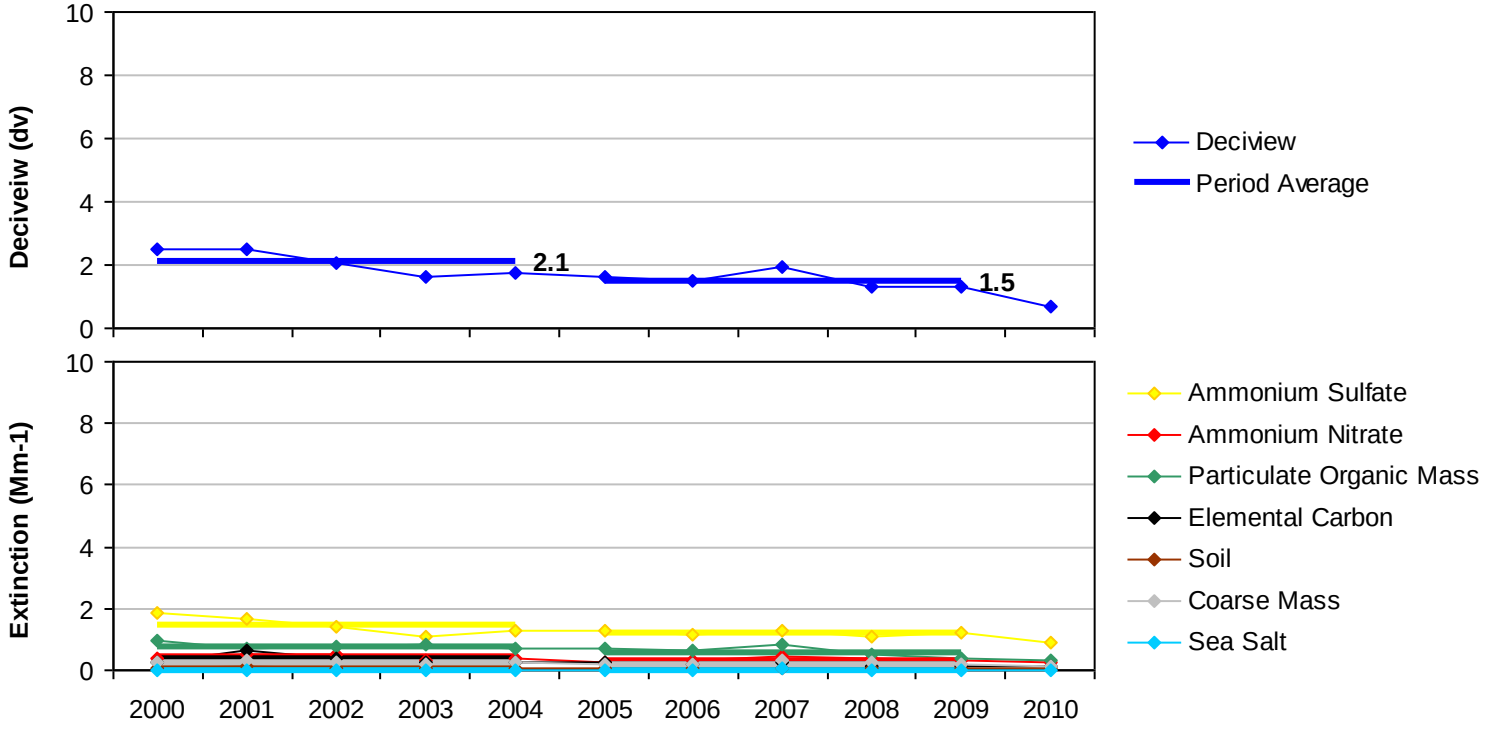


Figure O.1-3
Bridger WA and Fitzpatrick WA, WY (BRID1 Site)
20% Most Impaired Visibility Days

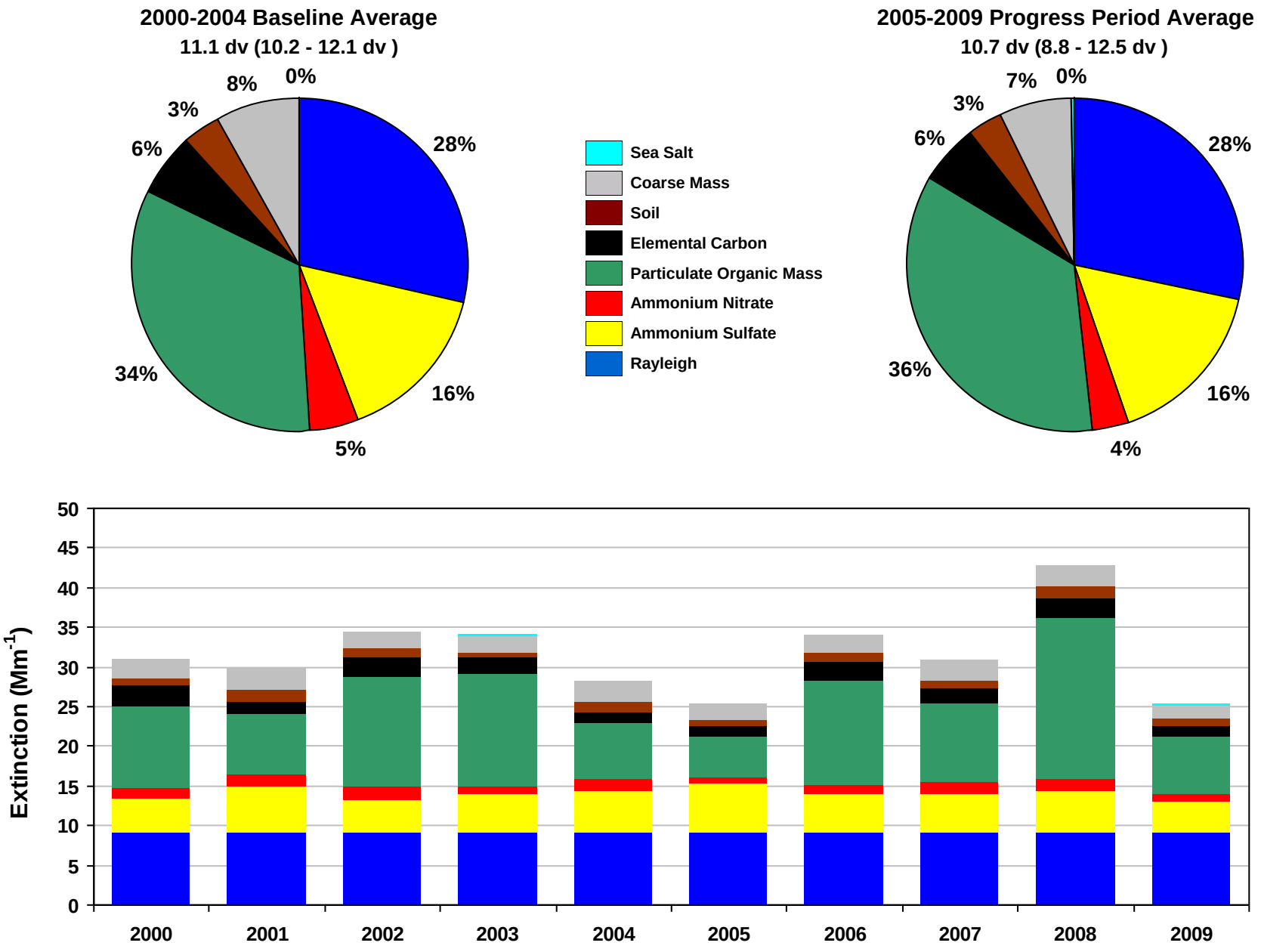


Figure O.1-4
Bridger WA and Fitzpatrick WA, WY (BRID1 Site)
20% Least Impaired Visibility Days

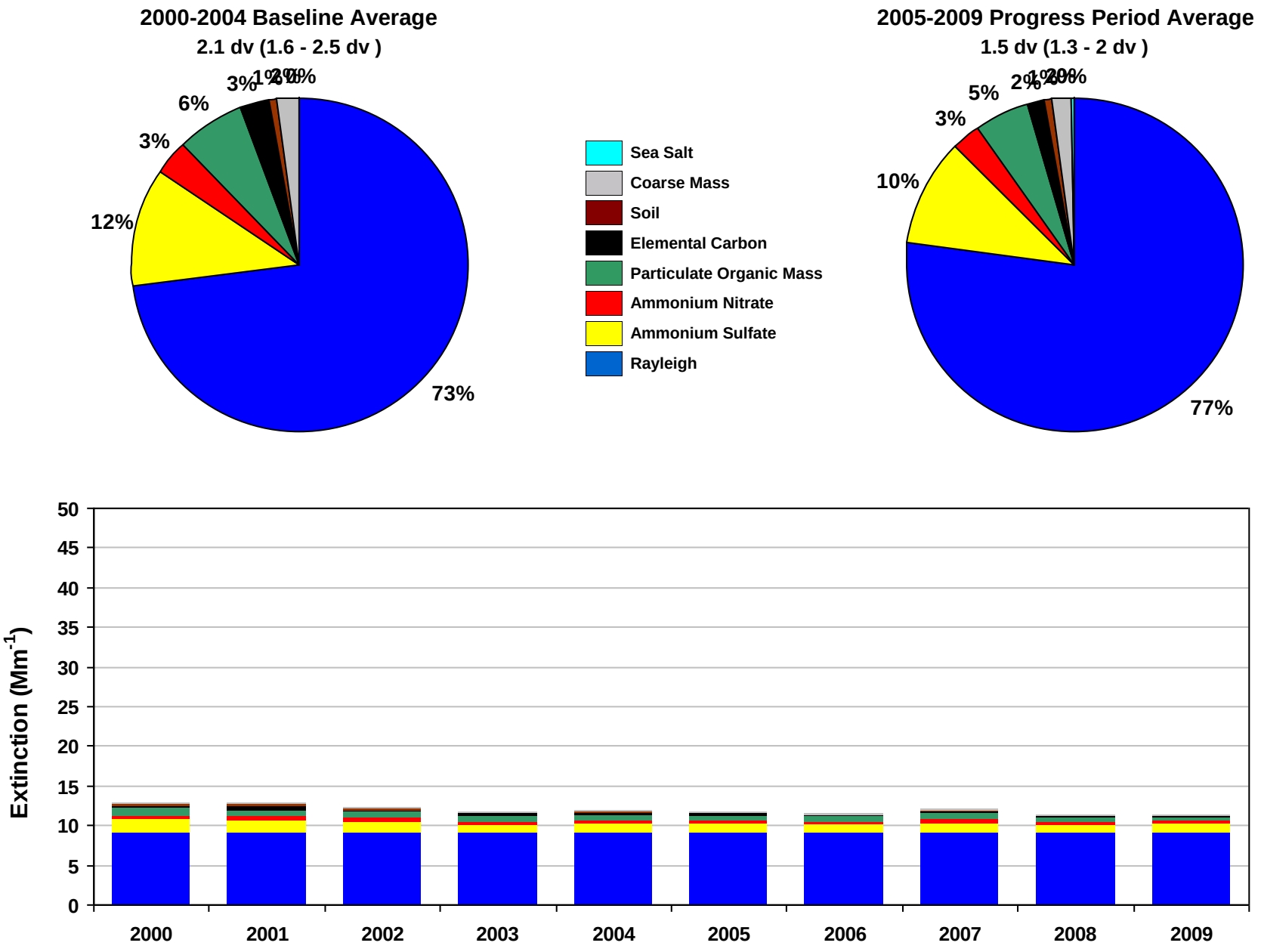


Figure O.1-5
Bridger WA and Fitzpatrick WA, WY (BRID1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

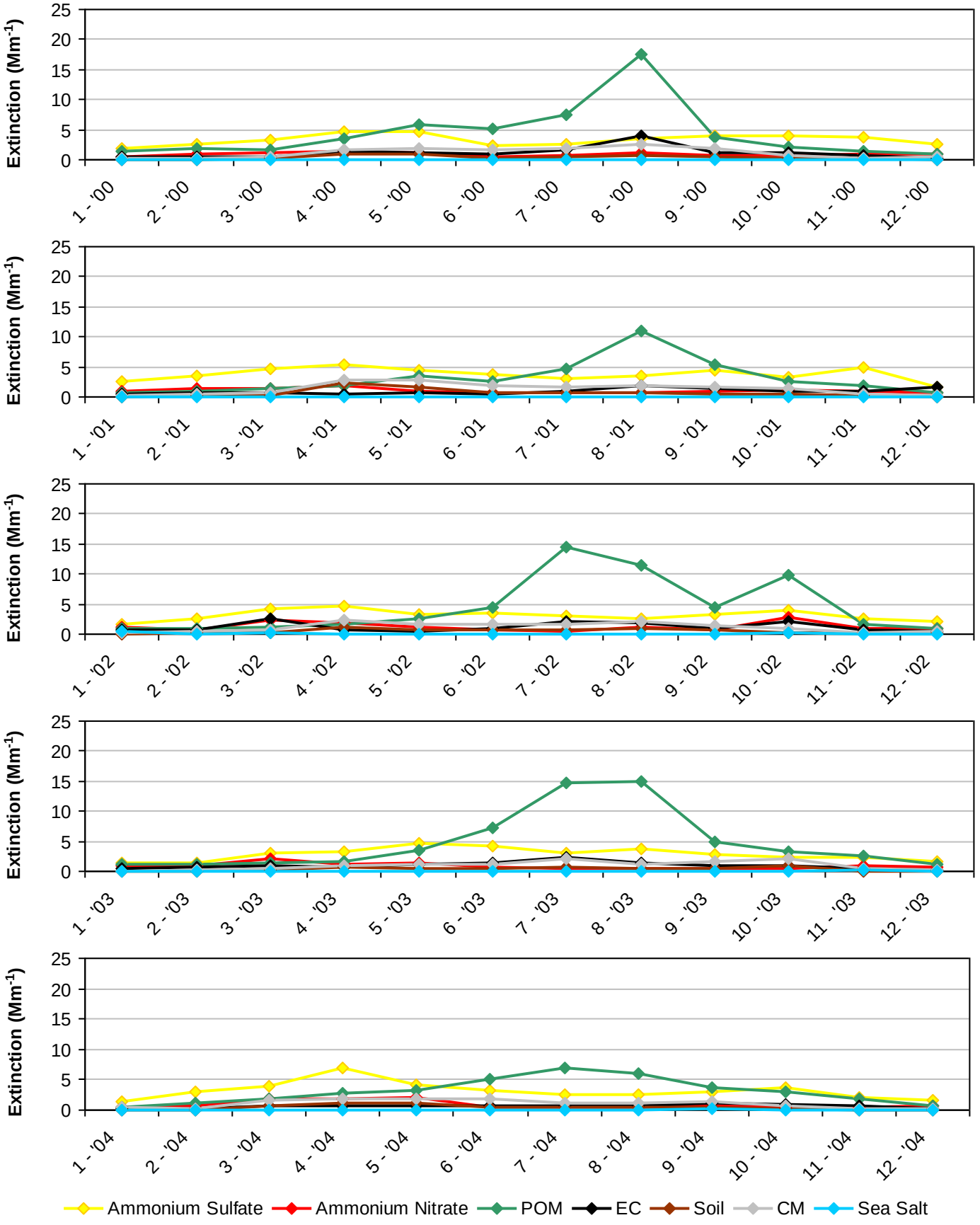


Figure O.1-6
Bridger WA and Fitzpatrick WA, WY (BRID1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

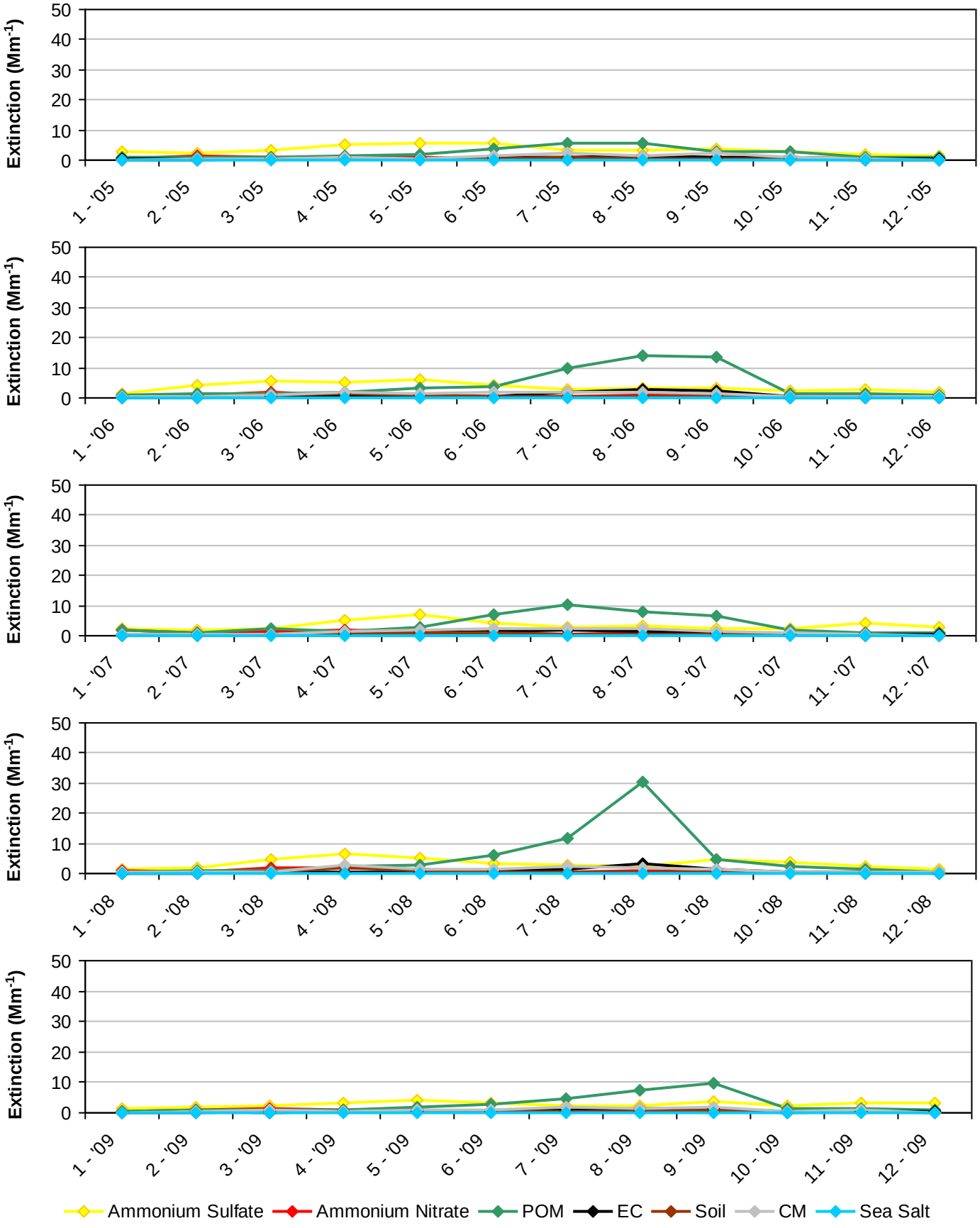


Figure O.1-7
Bridger WA and Fitzpatrick WA, WY (BRID1 Site)
2000-2004 Progress Period Extinction, All Sampled Days

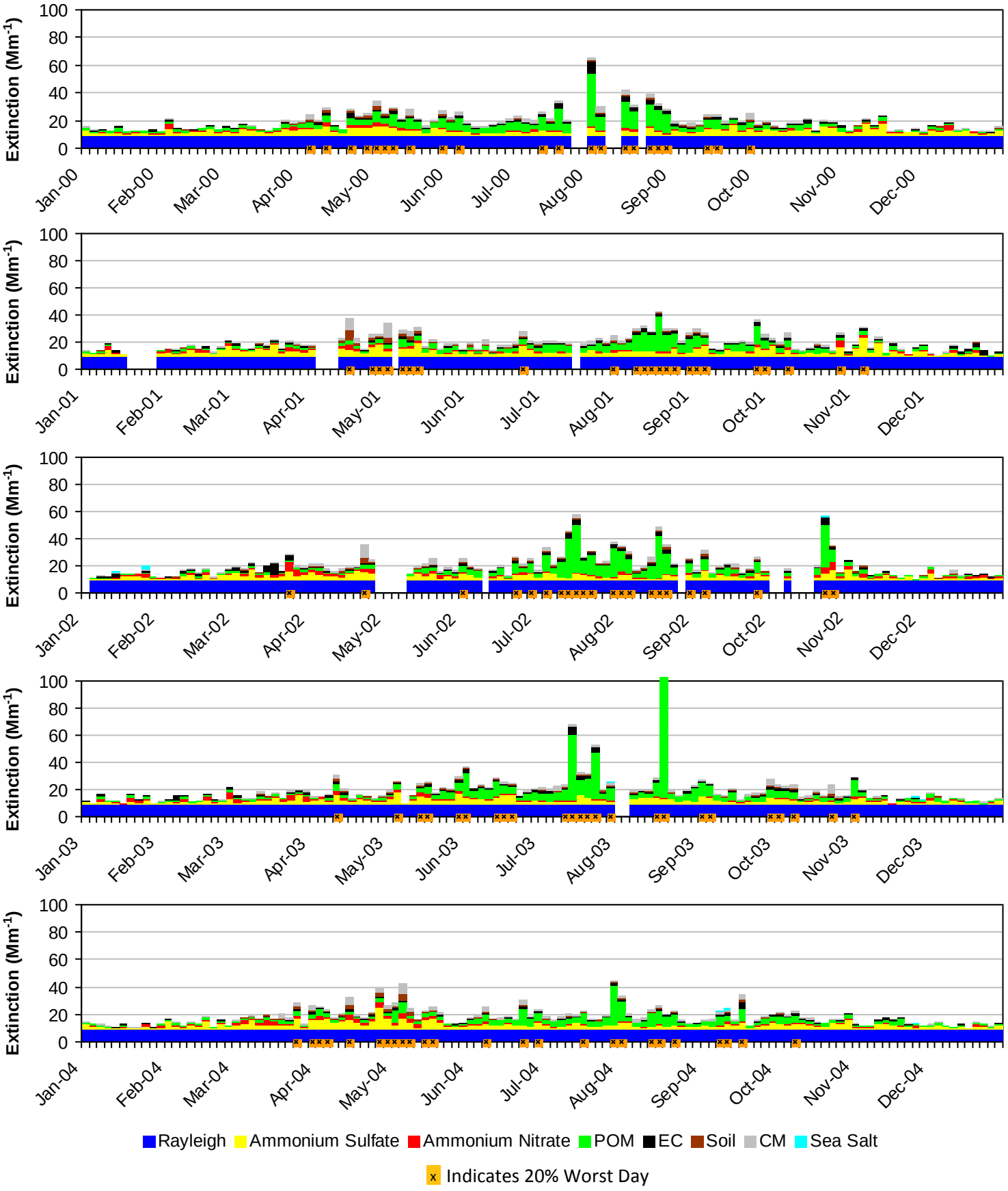
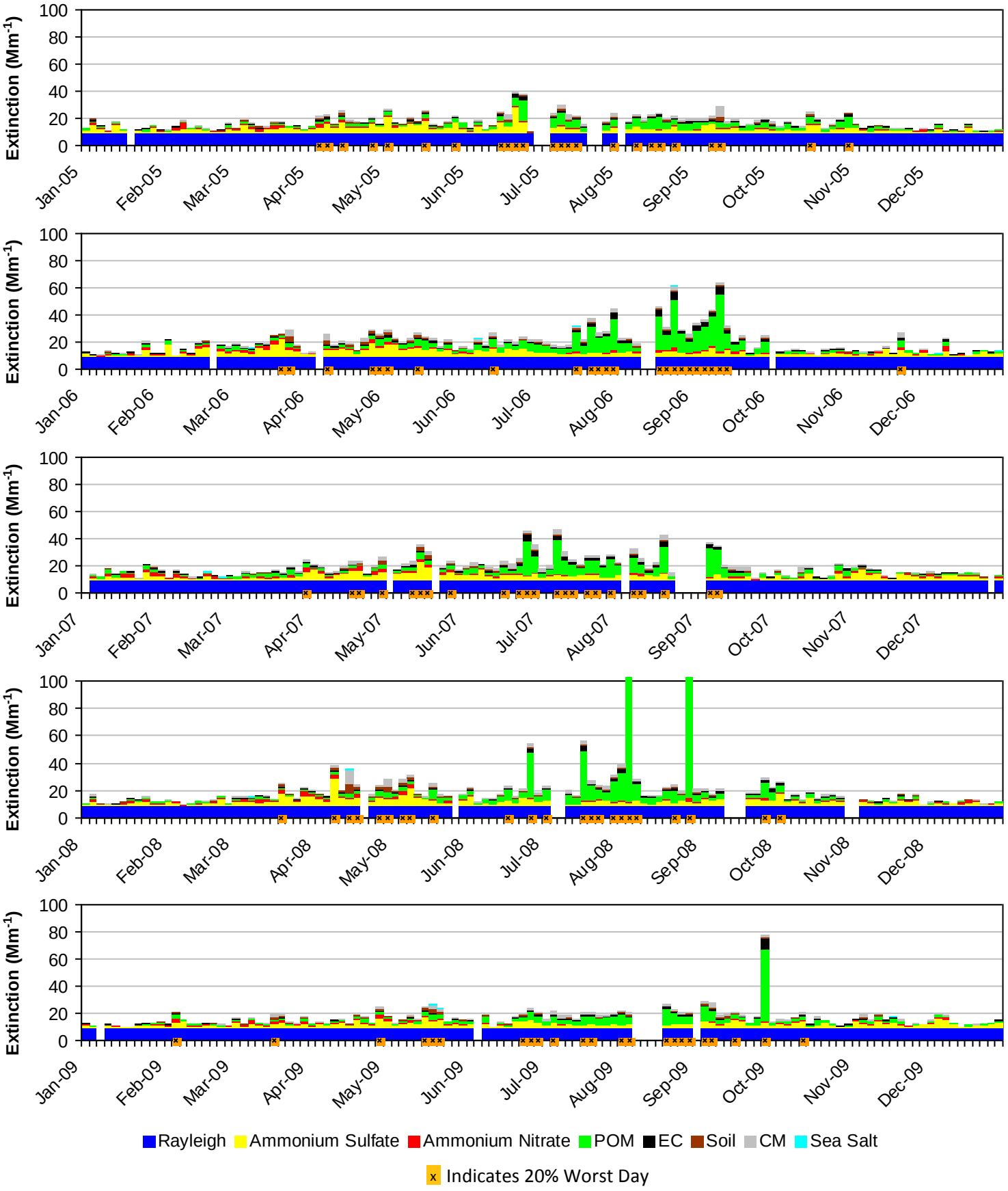


Figure O.1-8
Bridger WA and Fitzpatrick WA, WY (BRID1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



O.2. NORTH ABSAROKA WA AND WASHAKIE WA (NOAB1)

The following tables and figures are presented in this section for the North Absaroka WA and Washakie WA represented by the NOAB1 IMPROVE Monitor:

- **Table O.2-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure O.2-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure O.2-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure O.2-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure O.2-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure O.2-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure O.2-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure O.2-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

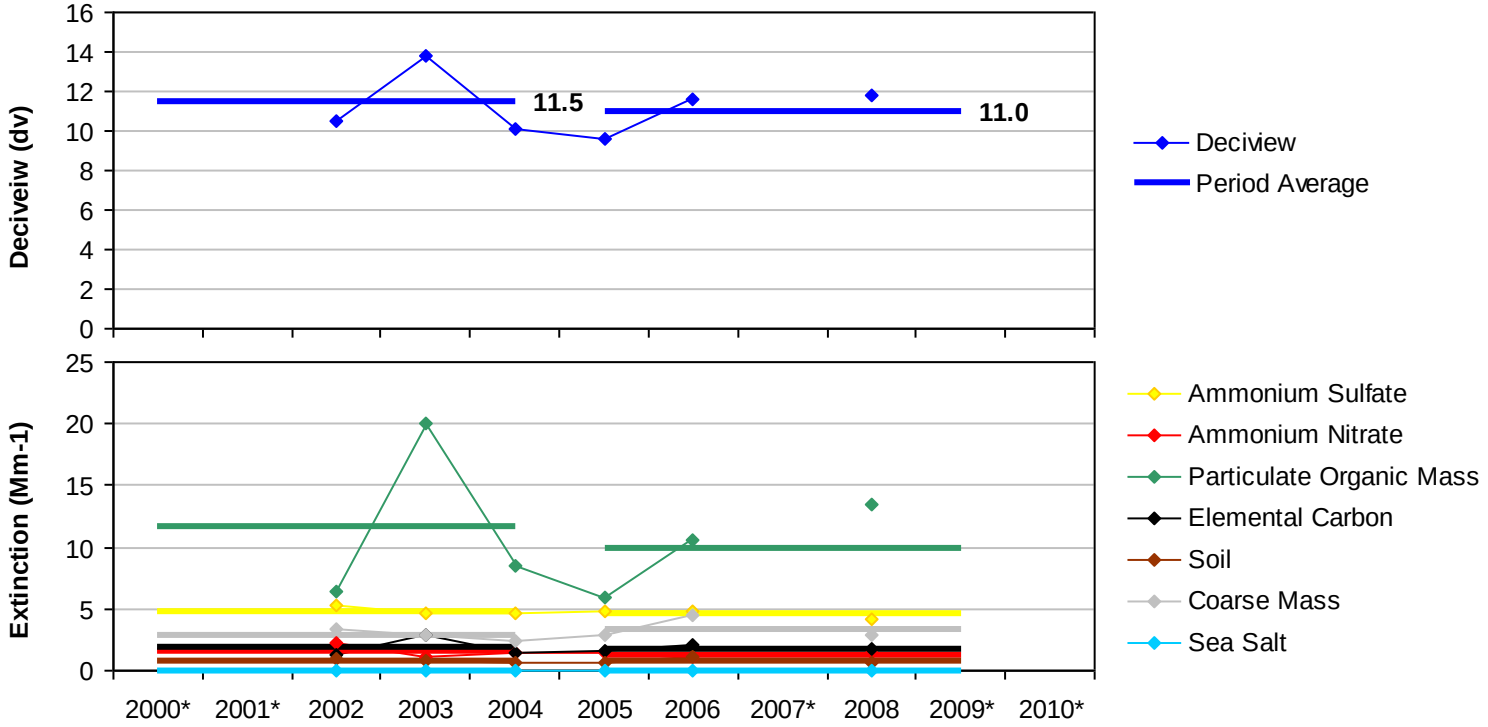
- **Figure O.2-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table O.2-1
North Absaroka WA and Washakie WA, WY (NOAB1 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period					2010	2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	---	---	2.2	1.9	2.0	1.3	1.1	---	1.3	---	---	-0.2	0.1	2.0	1.2	-0.8	-40%
Worst 20% Days	---	---	10.5	13.8	10.1	9.6	11.6	---	11.8	---	---	0.1	0.5	11.5	11.0	-0.5	-4%
All Days	---	---	6.3	6.8	5.7	5.4	6.0	---	5.8	---	---	-0.1	0.2	6.2	5.7	-0.5	-8%
Total Extinction (Mm-1)																	
Best 20% Days	---	---	12.6	12.1	12.2	11.4	11.2	---	11.4	---	---	-0.2	0.1	12.3	11.3	-1.0	-8%
Worst 20% Days	---	---	28.7	41.4	28.0	26.4	33.3	---	33.5	---	---	0.1	0.5	32.7	31.0	-1.7	-5%
All Days	---	---	19.6	22.0	18.5	17.9	19.8	---	19.4	---	---	-0.2	0.4	20.0	19.1	-0.9	-5%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	---	---	1.3	0.9	1.1	1.0	0.9	---	1.2	---	---	0.0	0.4	1.1	1.0	-0.1	-9%
Worst 20% Days	---	---	5.3	4.7	4.6	4.8	4.8	---	4.2	---	---	-0.1	0.2	4.9	4.6	-0.3	-6%
All Days	---	---	3.2	2.8	2.8	2.9	3.2	---	3.0	---	---	0.1	0.4	2.9	3.0	0.1	3%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	---	---	0.5	0.3	0.4	0.2	0.2	---	0.3	---	---	0.0	0.1	0.4	0.2	-0.2	-50%
Worst 20% Days	---	---	2.3	1.1	1.5	1.4	1.1	---	1.5	---	---	0.0	0.4	1.6	1.4	-0.2	-13%
All Days	---	---	1.2	0.9	0.9	0.9	0.9	---	0.9	---	---	0.0	0.1	1.0	0.9	-0.1	-10%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	---	---	0.8	0.8	0.9	0.5	0.3	---	0.3	---	---	-0.1	0.0	0.8	0.4	-0.4	-50%
Worst 20% Days	---	---	6.5	20.1	8.4	6.0	10.5	---	13.5	---	---	1.0	0.4	11.6	10.0	-1.6	-14%
All Days	---	---	3.0	5.9	3.3	2.6	3.6	---	3.9	---	---	0.1	0.4	4.1	3.4	-0.7	-17%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	---	---	0.2	0.2	0.2	0.2	0.2	---	0.1	---	---	0.0	0.4	0.2	0.2	0.0	0%
Worst 20% Days	---	---	1.3	2.9	1.4	1.6	2.1	---	1.7	---	---	0.1	0.2	1.9	1.8	-0.1	-5%
All Days	---	---	0.7	1.0	0.6	0.8	0.9	---	0.6	---	---	0.0	0.4	0.8	0.8	0.0	0%
Soil Extinction (Mm-1)																	
Best 20% Days	---	---	0.1	0.1	0.1	0.1	0.1	---	0.1	---	---	0.0	0.1	0.1	0.1	0.0	0%
Worst 20% Days	---	---	1.0	0.8	0.7	0.6	1.2	---	0.7	---	---	-0.1	0.2	0.8	0.8	0.0	0%
All Days	---	---	0.5	0.4	0.4	0.3	0.5	---	0.3	---	---	0.0	0.1	0.4	0.4	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	---	---	0.7	0.8	0.6	0.4	0.5	---	0.4	---	---	-0.1	0.1	0.7	0.4	-0.3	-43%
Worst 20% Days	---	---	3.4	2.9	2.4	2.9	4.4	---	2.9	---	---	0.0	0.5	2.9	3.4	0.5	17%
All Days	---	---	1.9	1.9	1.5	1.4	1.9	---	1.6	---	---	-0.1	0.2	1.8	1.6	-0.2	-11%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	---	---	0.0	0.0	0.0	0.0	0.0	---	0.0	---	---	0.0	0.5	0.0	0.0	0.0	0%
Worst 20% Days	---	---	0.0	0.0	0.0	0.0	0.0	---	0.0	---	---	0.0	0.0	0.0	0.0	0.0	0%
All Days	---	---	0.0	0.0	0.0	0.0	0.0	---	0.0	---	---	0.0	0.5	0.0	0.0	0.0	0%

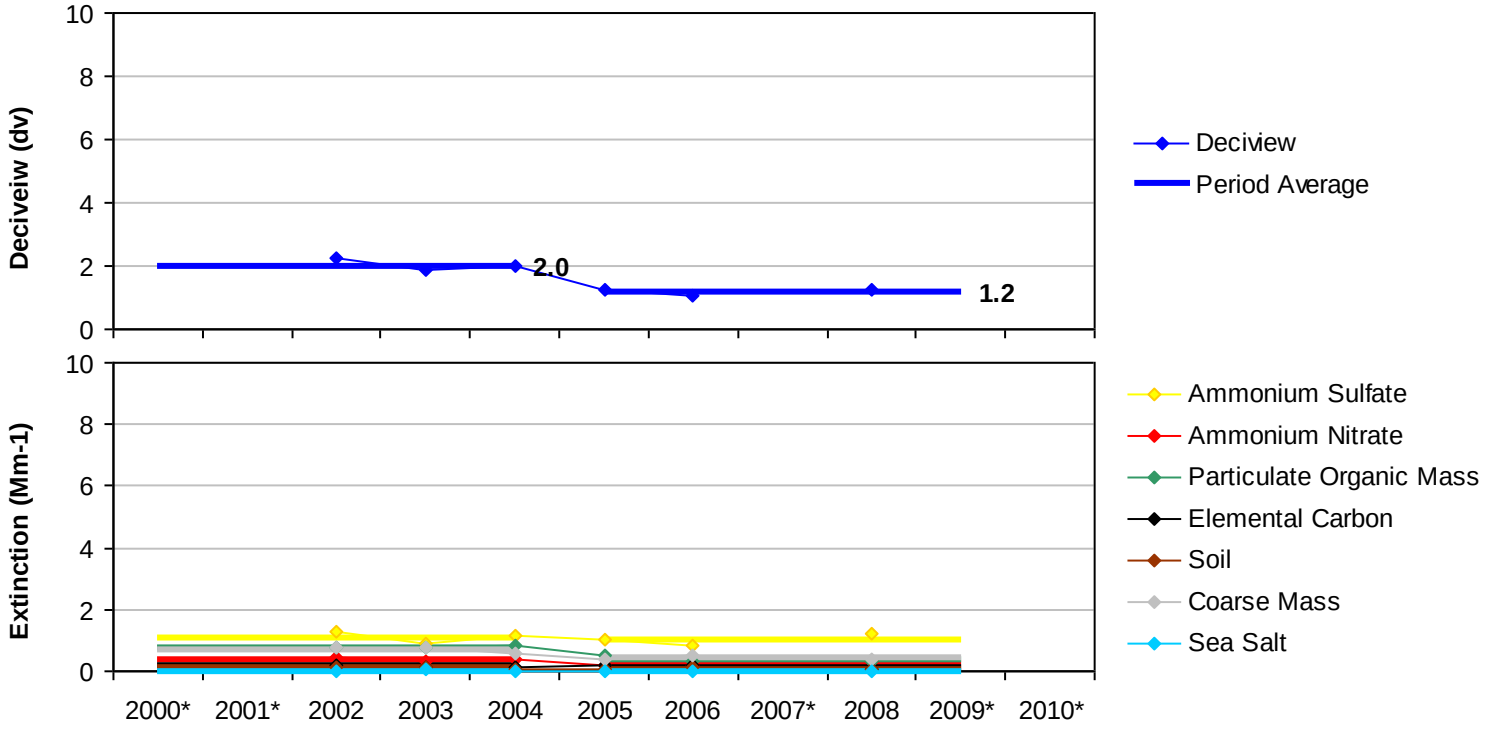
*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure O.2-1
North Absaroka WA and Washakie WA, WY (NOAB1 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days



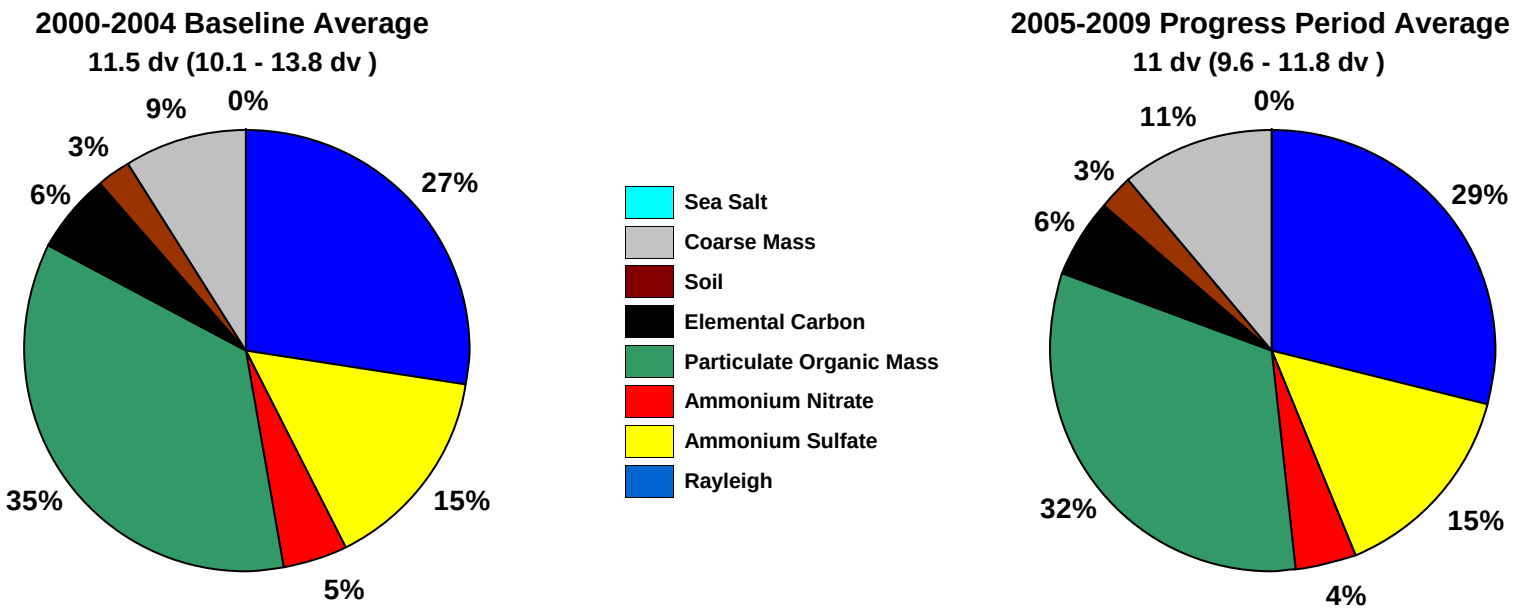
*Missing years did not meet RHR data completeness criteria.

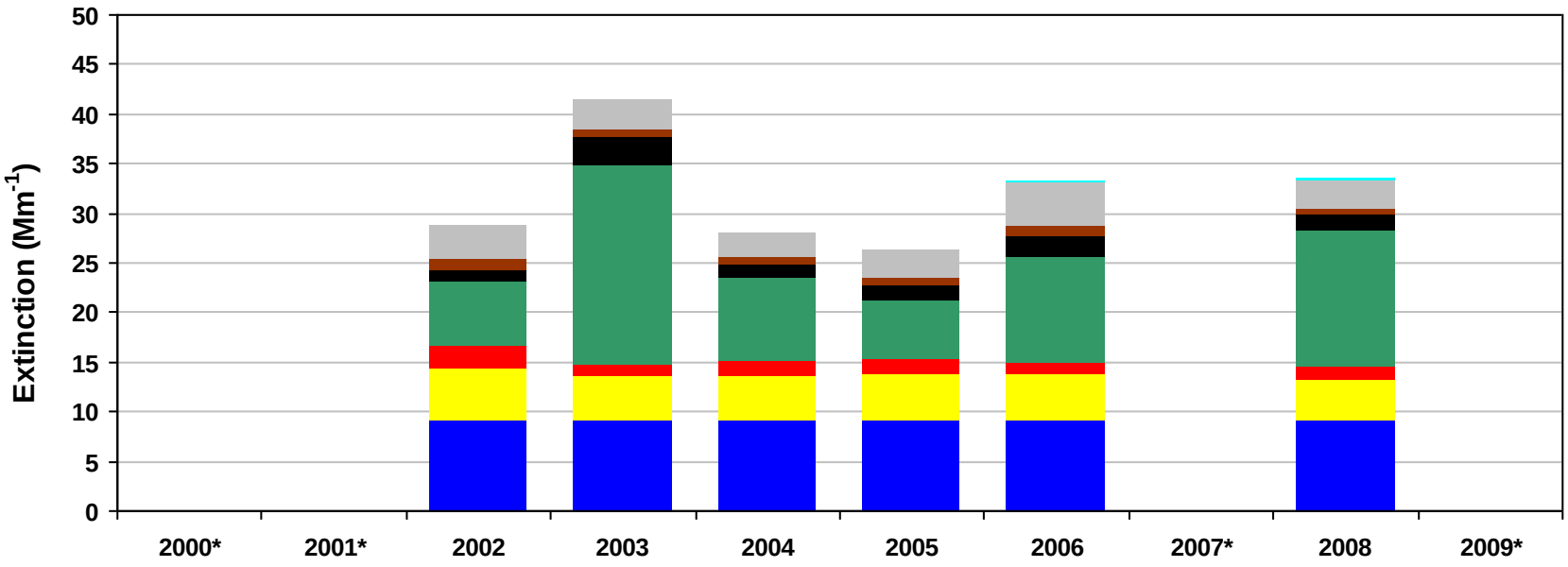
Figure O.2-2
North Absaroka WA and Washakie WA, WY (NOAB1 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days



*Missing years did not meet RHR data completeness criteria.

Figure O.2-3
North Absaroka WA and Washakie WA, WY (NOAB1 Site)
20% Most Impaired Visibility Days



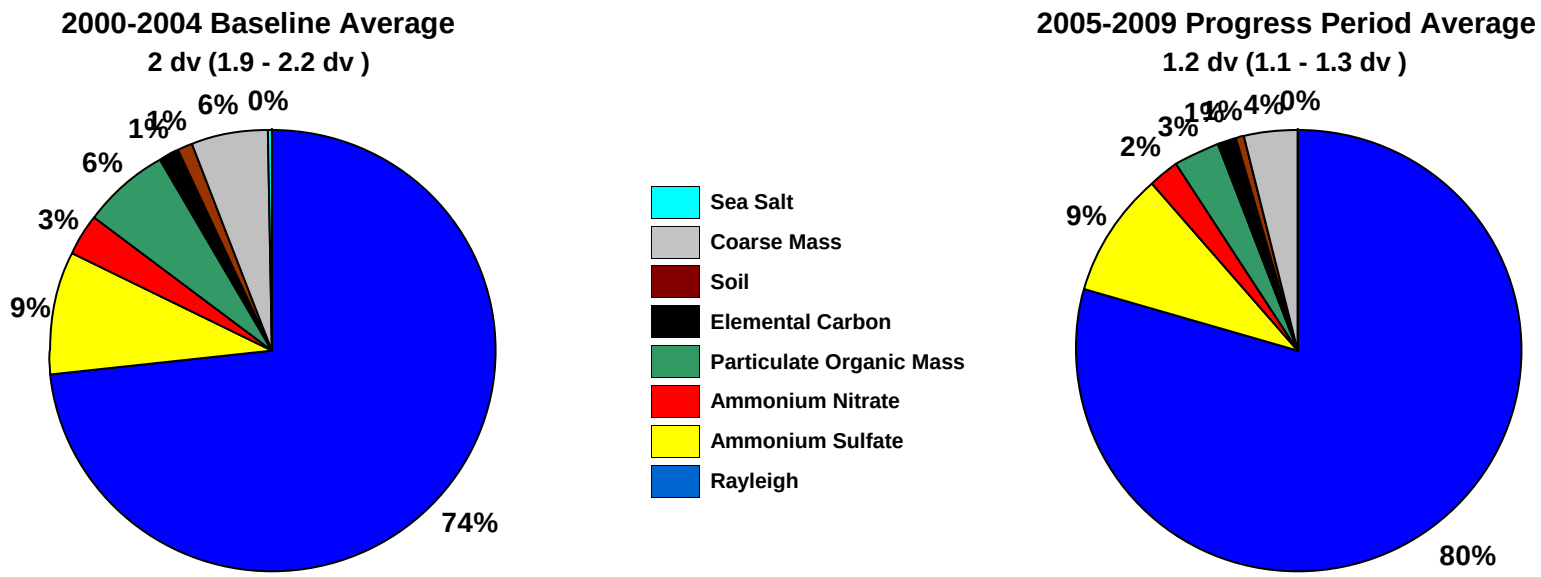


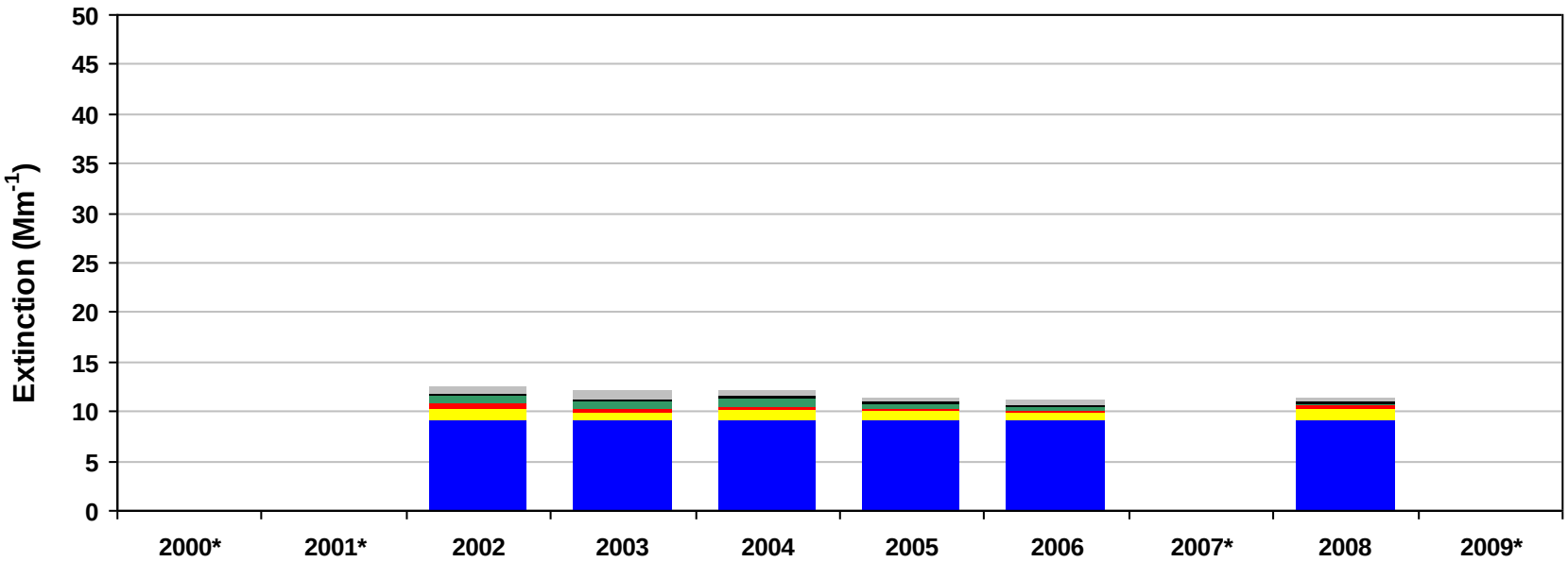
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure O.2-4

North Absaroka WA and Washakie WA, WY (NOAB1 Site)

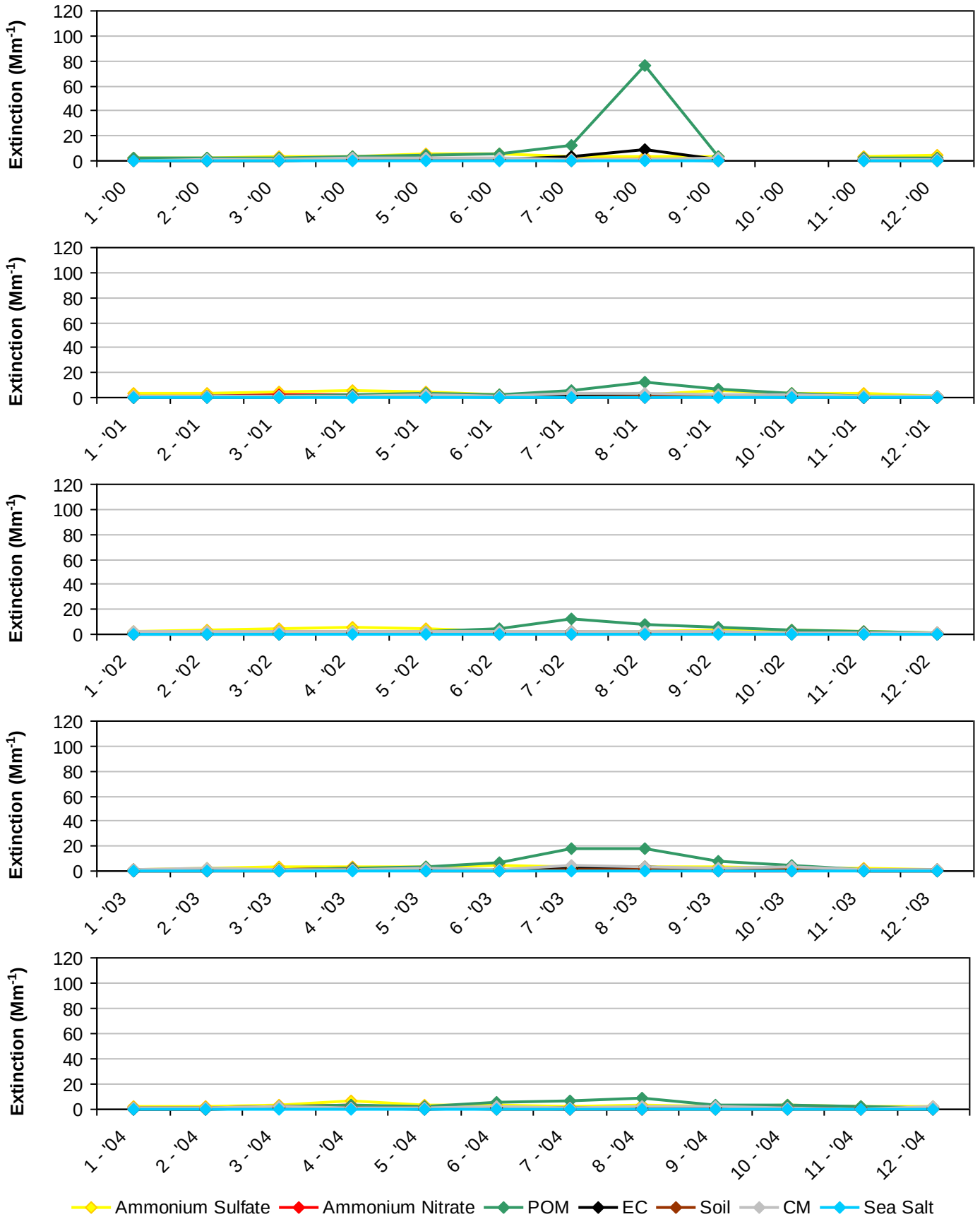
20% Least Impaired Visibility Days





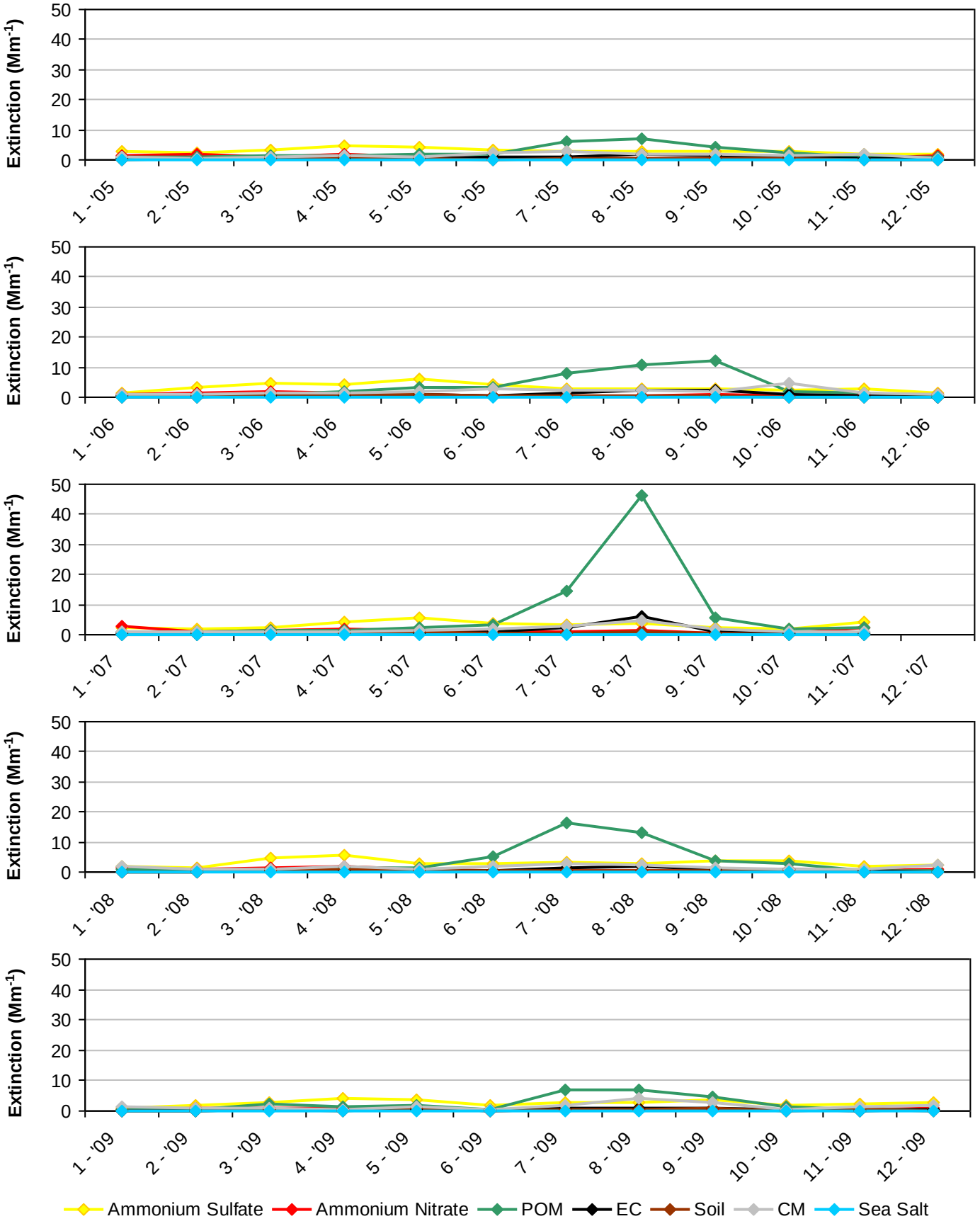
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure O.2-5
North Absaroka WA and Washakie WA, WY (NOAB1 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days



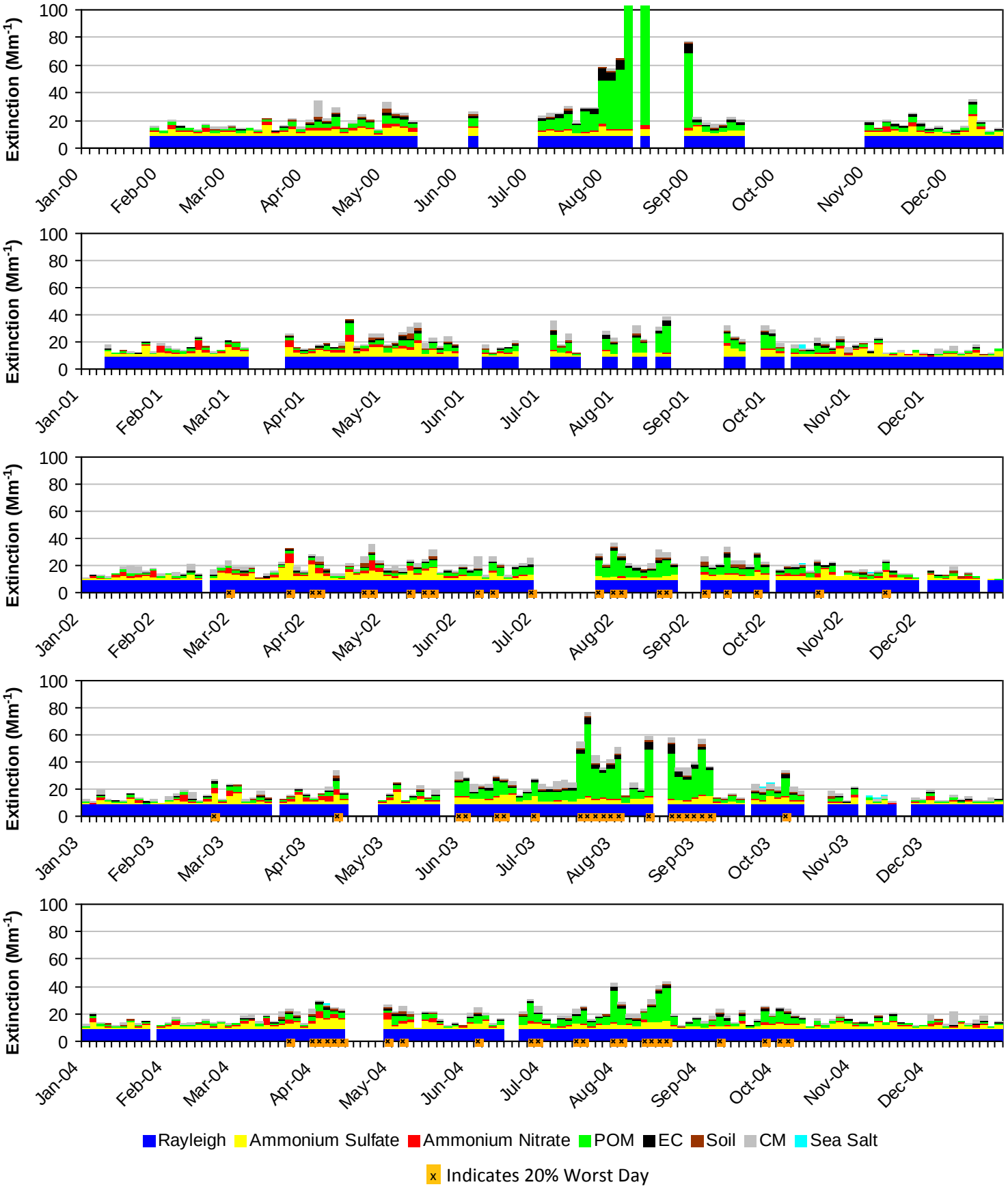
*Note that monthly averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure O.2-6
North Absaroka WA and Washakie WA, WY (NOAB1 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days



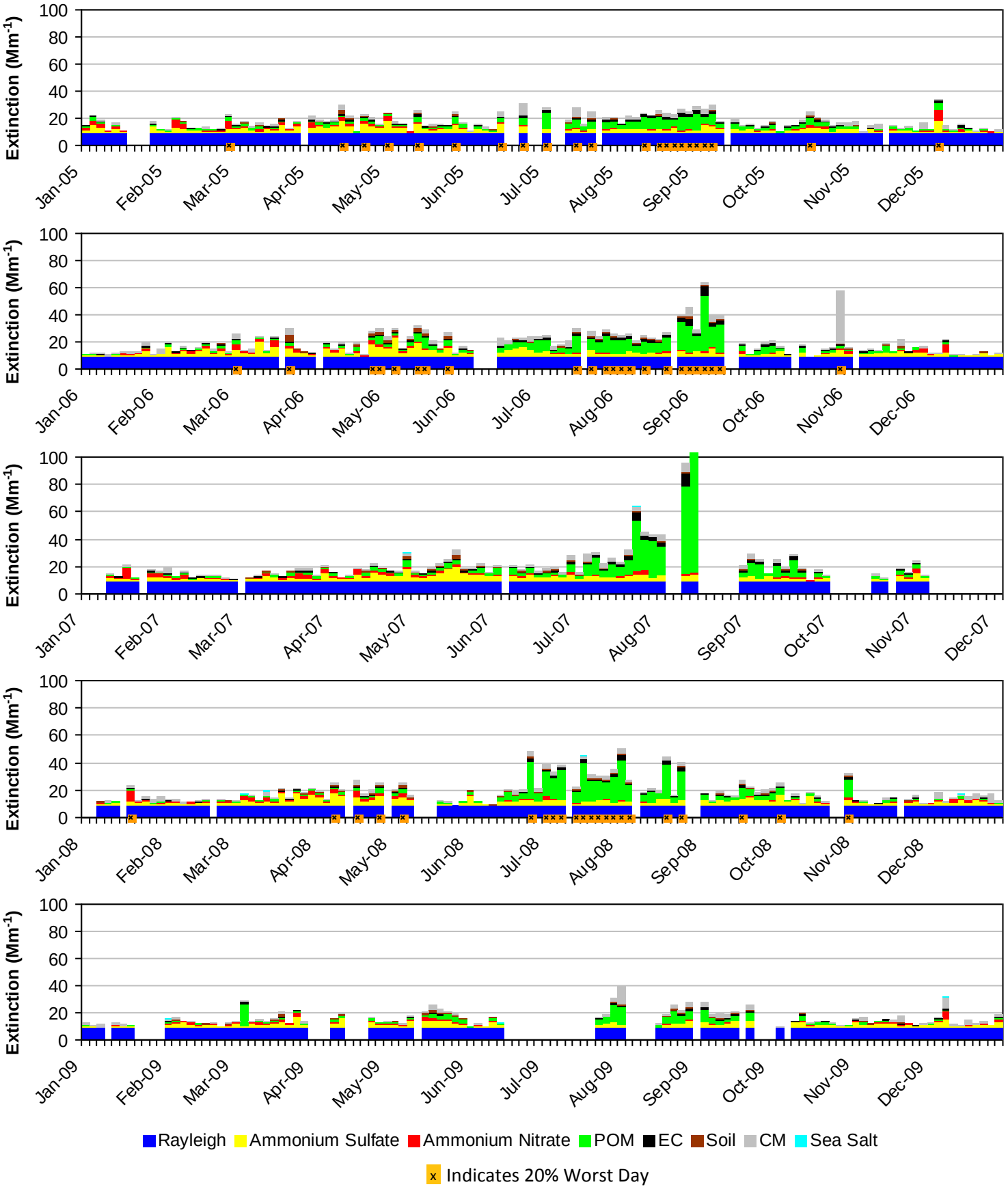
*Note that monthly averages for the years 2007 and 2009 are shown here, but these years did not meet RHR data completeness criteria.

Figure O.2-7
North Absaroka WA and Washakie WA, WY (NOAB1 Site)
2000-2004 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2000 and 2001 are shown here, but these years did not meet RHR data completeness criteria.

Figure O.2-8
North Absaroka WA and Washakie WA, WY (NOAB1 Site)
2005-2009 Progress Period Extinction, All Sampled Days



*Note that daily averages for the years 2007 and 2009 are shown here, but these years did not meet RHR data completeness criteria.

O.3. YELLOWSTONE NP, GRAND TETON NP, RED ROCK LAKES WA, AND TETON WA (YELL2)

The following tables and figures are presented in this section for the Yellowstone NP, Grand Teton NP, Red Rock Lakes WA, and Teton WA represented by the YELL2 IMPROVE Monitor:

- **Table O.3-1: Annual Averages, 5-Year Period Averages, and Trends:** Table of averages and other metrics for the 20% least impaired days, the 20% most impaired days, and all sampled days is presented.

- **Figure O.3-1: Annual and 5-Year Period Averages for the 20% Most Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure O.3-2: Annual and 5-Year Period Averages for the 20% Least Impaired Visibility Days:** Line graphs depicting annual and period averages by component are presented.

- **Figure O.3-3: 20% Most Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component for the 20% most impaired days are presented.

- **Figure O.3-4: 20% Least Impaired Visibility Days:** Pie charts depicting period averages and stacked bar charts depicting annual averages by component are presented.

- **Figure O.3-5: 2000-2004 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the baseline period are presented.

- **Figure O.3-6: 2005-2009 Monthly Average Aerosol Extinction, All Monitored Days:** Line graphs depicting monthly averages by year and component for the progress period are presented.

- **Figure O.3-7: 2000-2004 Progress Period Extinction, All Sampled Days:** Stacked bar charts depicting daily averages by year and component for the baseline period are presented.

- **Figure O.3-8: 2000-2004 Progress Period Extinction, All Sampled Days**: Stacked bar charts depicting daily averages by year and component for the progress period are presented.

Table O.3-1
Yellowstone NP, Grand Teton NP, Red Rock Lakes WA and Teton WA, WY (YELL2 Site)
Annual Averages, 5-Year Period Averages and Trends

Group	Baseline Period					Progress Period						2000-2009 Trend Statistics*		Period Averages**			
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Slope (change/yr.)	p-value	Baseline (B)	Progress (P)	Difference (P -B)	Percent Change
Deciview (dv)																	
Best 20% Days	2.8	3.0	2.6	1.9	2.6	2.1	2.3	2.2	1.8	1.9	0.9	-0.1	0.0	2.6	2.0	-0.6	-23%
Worst 20% Days	12.9	12.6	11.4	11.2	10.8	9.6	11.8	12.6	14.0	9.6	9.9	-0.2	0.2	11.8	11.5	-0.3	-3%
All Days	7.1	7.1	6.8	6.1	6.5	5.8	6.6	6.8	6.7	5.4	4.8	-0.1	0.1	6.7	6.3	-0.4	-6%
Total Extinction (Mm-1)																	
Best 20% Days	13.3	13.6	13.0	12.2	13.0	12.3	12.6	12.5	12.0	12.2	10.9	-0.1	0.0	13.0	12.3	-0.7	-5%
Worst 20% Days	40.9	38.9	31.8	31.4	29.8	26.3	36.2	36.3	47.6	34.1	27.4	-0.5	0.4	34.5	36.1	1.6	5%
All Days	22.5	22.2	20.7	19.7	20.0	18.5	21.3	21.4	23.1	19.4	17.1	-0.2	0.3	21.0	20.7	-0.3	-1%
Ammonium Sulfate Extinction (Mm-1)																	
Best 20% Days	1.7	1.9	1.3	1.1	1.3	1.5	1.6	1.2	1.1	1.4	1.0	0.0	0.2	1.5	1.4	-0.1	-7%
Worst 20% Days	4.2	4.7	3.8	4.1	4.6	4.8	5.1	4.3	5.0	3.5	3.4	0.1	0.3	4.3	4.6	0.3	7%
All Days	3.1	3.6	3.0	2.5	3.1	3.3	3.5	3.1	3.1	2.7	2.4	0.0	0.5	3.1	3.2	0.1	3%
Ammonium Nitrate Extinction (Mm-1)																	
Best 20% Days	0.9	0.8	0.8	0.5	0.6	0.3	0.4	0.7	0.6	0.6	0.2	0.0	0.1	0.7	0.5	-0.2	-29%
Worst 20% Days	2.0	2.4	1.6	1.4	1.5	1.6	0.9	2.4	1.7	1.6	1.2	0.0	0.3	1.8	1.6	-0.2	-11%
All Days	1.5	1.5	1.6	1.2	1.3	1.1	1.1	1.7	1.3	1.1	0.8	0.0	0.2	1.4	1.2	-0.2	-14%
Particulate Organic Mass Extinction (Mm-1)																	
Best 20% Days	1.1	1.2	1.1	0.9	1.3	1.1	0.8	1.0	0.8	0.5	0.3	-0.1	0.0	1.1	0.8	-0.3	-27%
Worst 20% Days	18.4	16.1	11.2	12.8	8.9	6.7	15.1	14.7	25.6	15.2	6.8	0.0	0.5	13.5	15.5	2.0	15%
All Days	6.0	5.3	4.4	4.7	4.0	3.1	5.1	4.8	7.2	4.4	2.4	-0.1	0.3	4.9	4.9	0.0	0%
Elemental Carbon Extinction (Mm-1)																	
Best 20% Days	0.2	0.4	0.3	0.2	0.5	0.3	0.4	0.3	0.1	0.2	0.1	0.0	0.2	0.3	0.3	0.0	0%
Worst 20% Days	3.7	2.6	1.9	2.3	1.9	1.8	2.3	2.4	2.6	1.7	1.6	0.0	0.2	2.5	2.2	-0.3	-12%
All Days	1.3	1.1	1.0	1.0	1.0	0.9	1.1	1.0	0.9	0.7	0.6	0.0	0.0	1.1	0.9	-0.2	-18%
Soil Extinction (Mm-1)																	
Best 20% Days	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0%
Worst 20% Days	0.8	1.4	1.2	0.4	0.9	0.6	1.1	0.8	1.0	0.6	1.3	0.0	0.3	1.0	0.8	-0.2	-20%
All Days	0.4	0.6	0.5	0.3	0.4	0.3	0.4	0.5	0.4	0.3	0.5	0.0	0.4	0.4	0.4	0.0	0%
Coarse Mass Extinction (Mm-1)																	
Best 20% Days	0.3	0.2	0.3	0.2	0.3	0.1	0.2	0.2	0.3	0.3	0.1	0.0	0.5	0.2	0.2	0.0	0%
Worst 20% Days	2.8	2.7	3.1	1.3	2.9	1.8	2.6	2.6	2.6	2.3	4.2	0.0	0.1	2.6	2.4	-0.2	-8%
All Days	1.2	1.2	1.3	0.9	1.1	0.8	1.1	1.4	1.0	1.2	1.4	0.0	0.3	1.1	1.1	0.0	0%
Sea Salt Extinction (Mm-1)																	
Best 20% Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0%
Worst 20% Days	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0%
All Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0%

*Values highlighted in blue (red) indicate statistically significant decreasing (increasing) annual trend. Significance is measured at the 85% confidence level (p-value ≤0.15).
**Values highlighted in blue indicate a decrease in the 5-year average, values highlighted in red indicate an increase.
"---" Indicates a missing year that did not meet RHR data completeness criteria.

Figure O.3-1
Yellowstone NP, Grand Teton NP, Red Rock Lakes WA and Teton WA, WY (YELL2 Site)
Annual and 5-Year Period Averages
20% Most Impaired Visibility Days

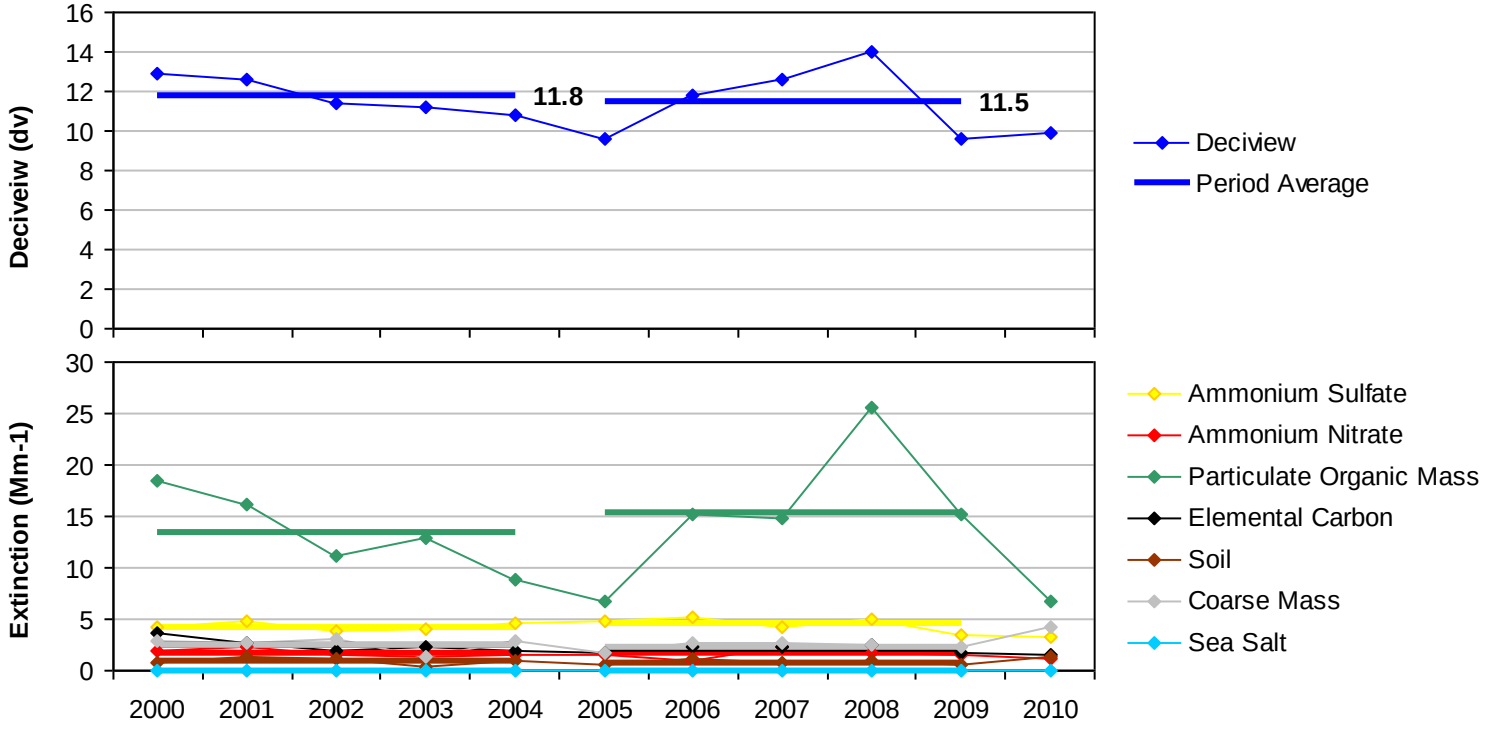


Figure O.3-2
Yellowstone NP, Grand Teton NP, Red Rock Lakes WA and Teton WA, WY (YELL2 Site)
Annual and 5-Year Period Averages
20% Least Impaired Visibility Days

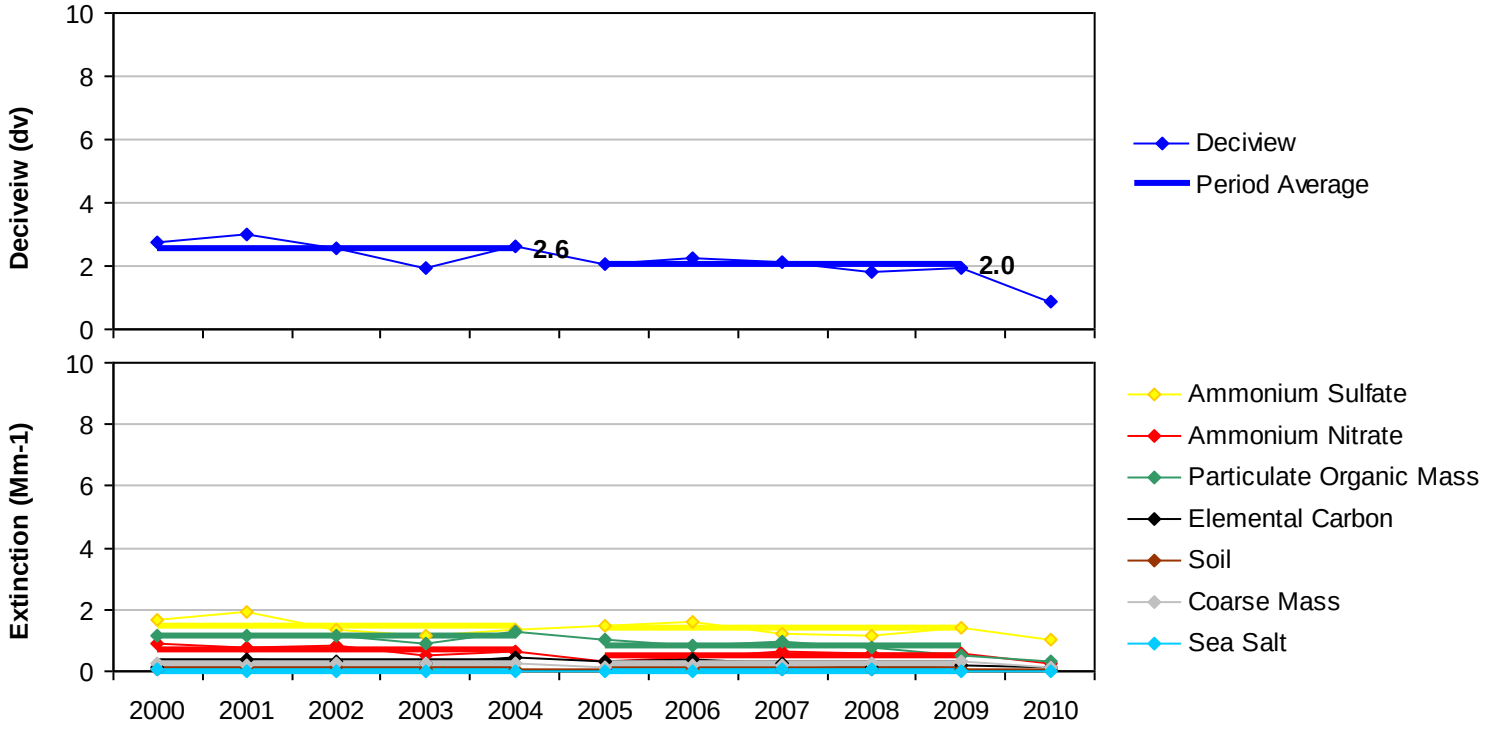
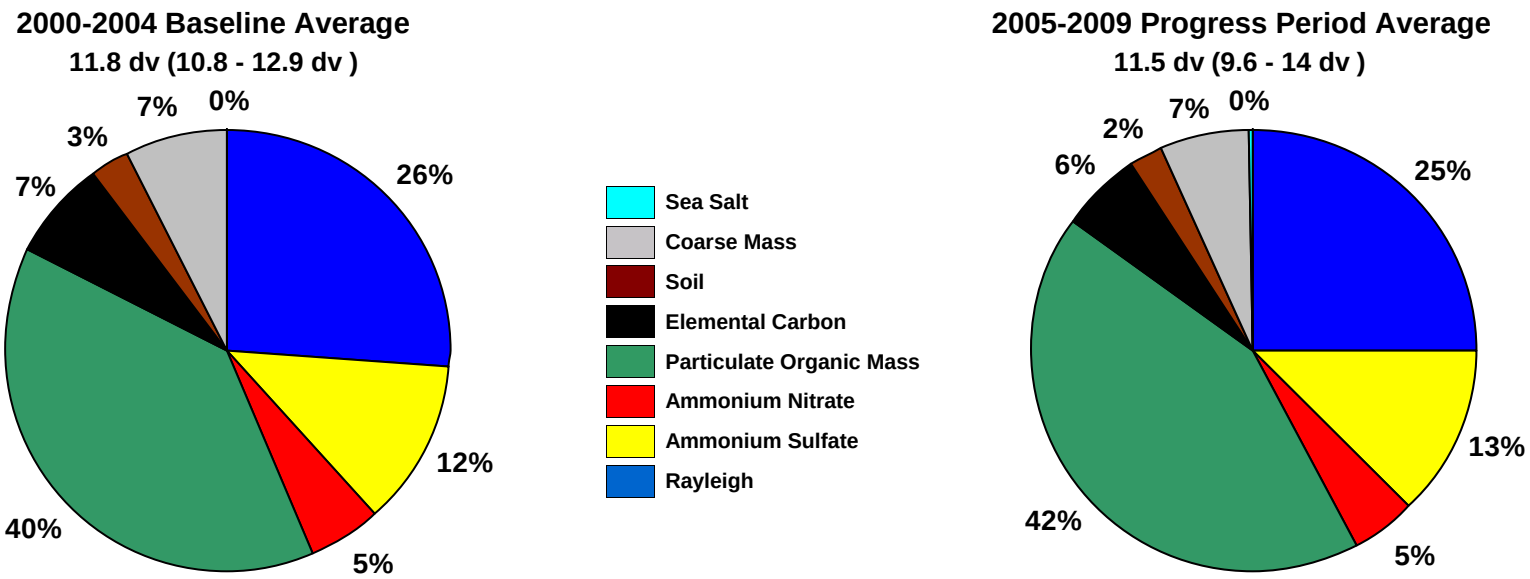
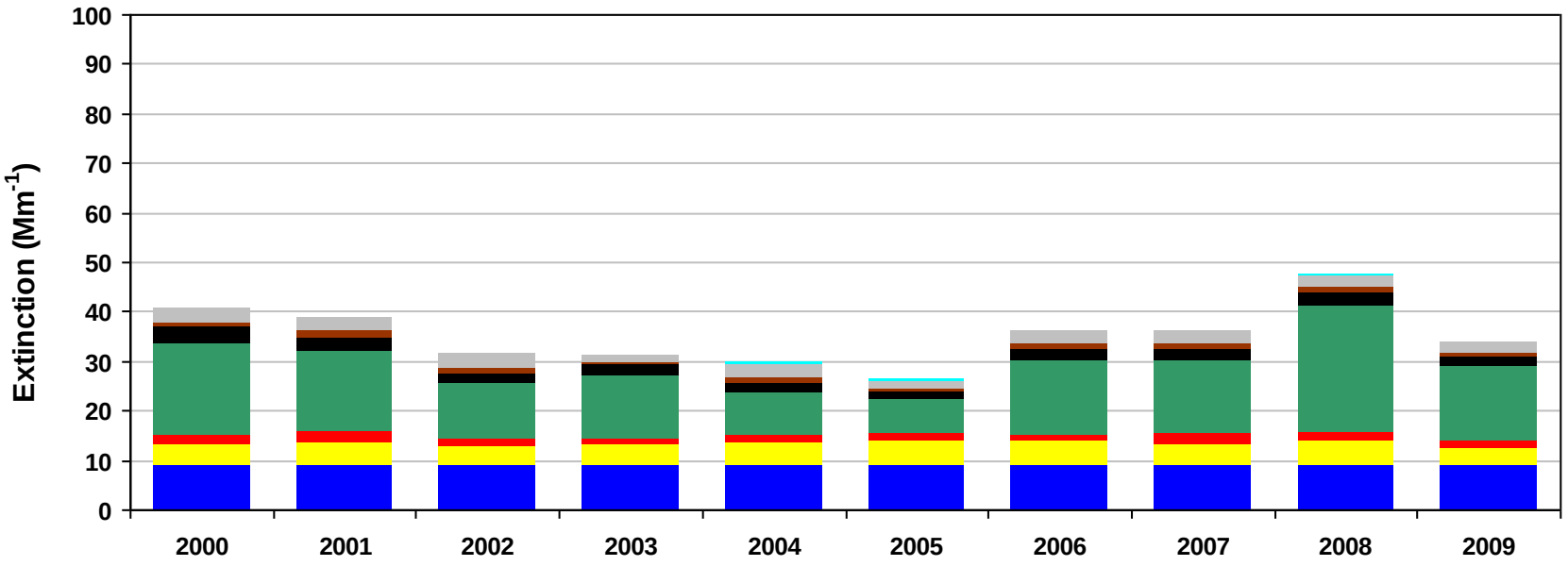


Figure O.3-3

Yellowstone NP, Grand Teton NP, Red Rock Lakes WA and Teton WA, WY (YELL2 Site)

20% Most Impaired Visibility Days



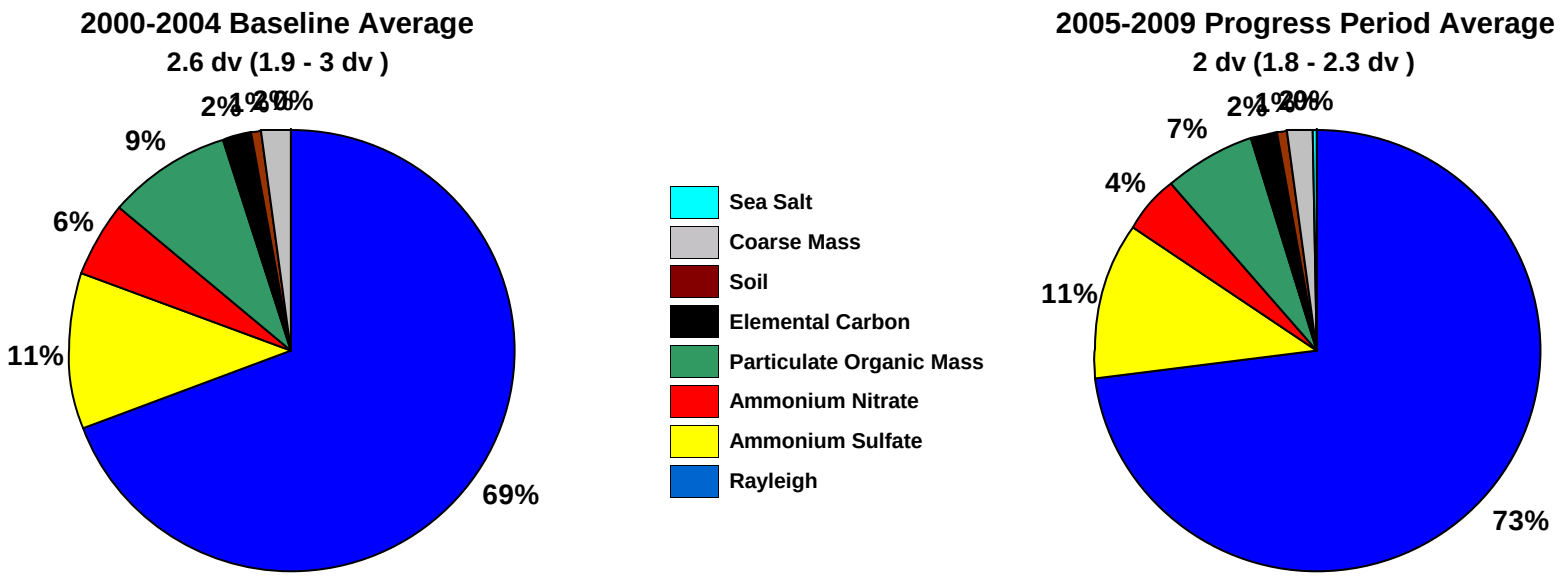


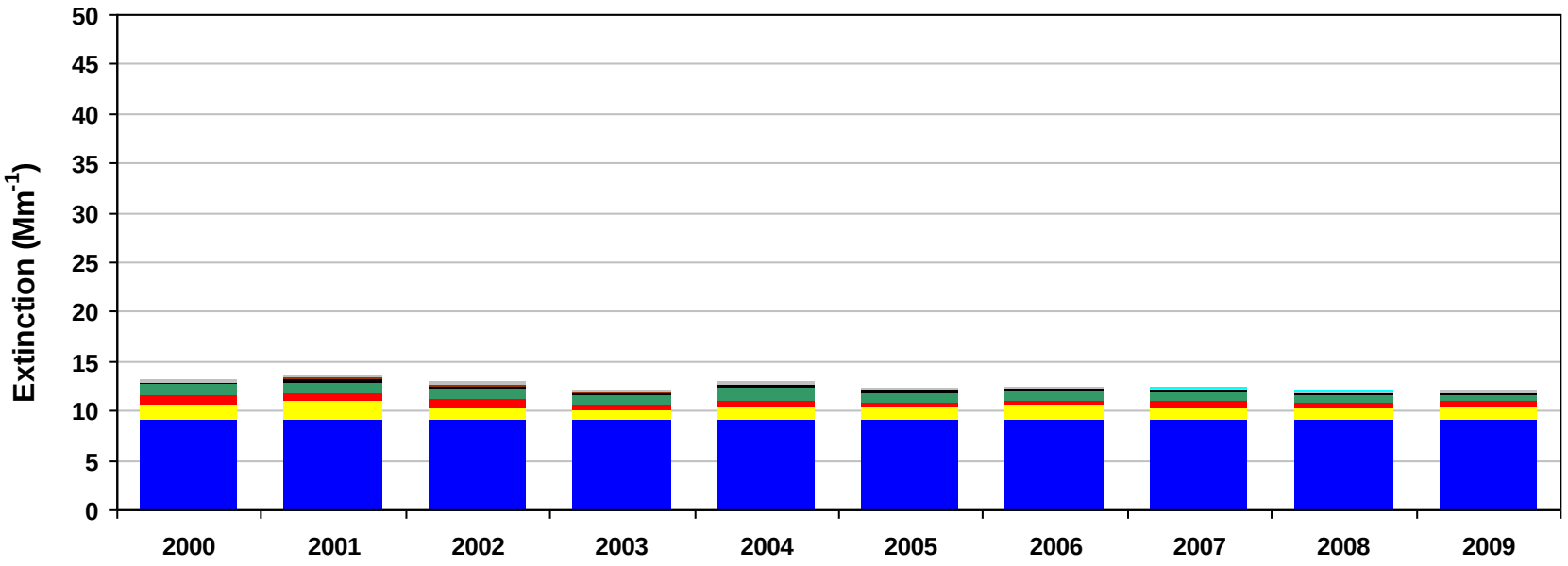
*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure O.3-4

Yellowstone NP, Grand Teton NP, Red Rock Lakes WA and Teton WA, WY (YELL2 Site)

20% Least Impaired Visibility Days





*Missing years did not meet RHR data completeness criteria. Only complete years are included in 5-year average pie charts.

Figure O.3-5
Yellowstone NP, Grand Teton NP, Red Rock Lakes WA and Teton WA, WY (YELL2 Site)
2000-2004 Monthly Average Aerosol Extinction, All Monitored Days

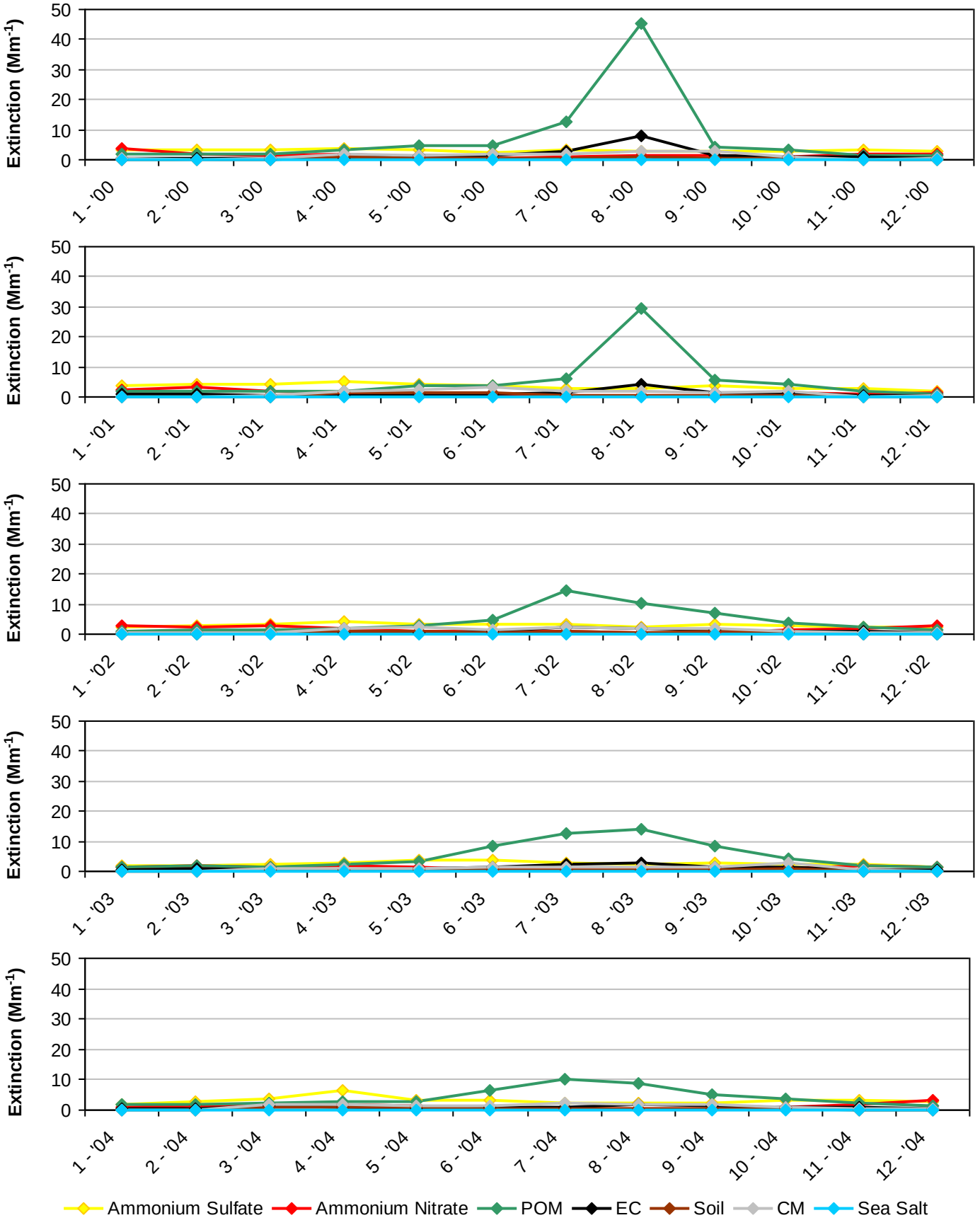


Figure O.3-6
Yellowstone NP, Grand Teton NP, Red Rock Lakes WA and Teton WA, WY (YELL2 Site)
2005-2009 Monthly Average Aerosol Extinction, All Monitored Days

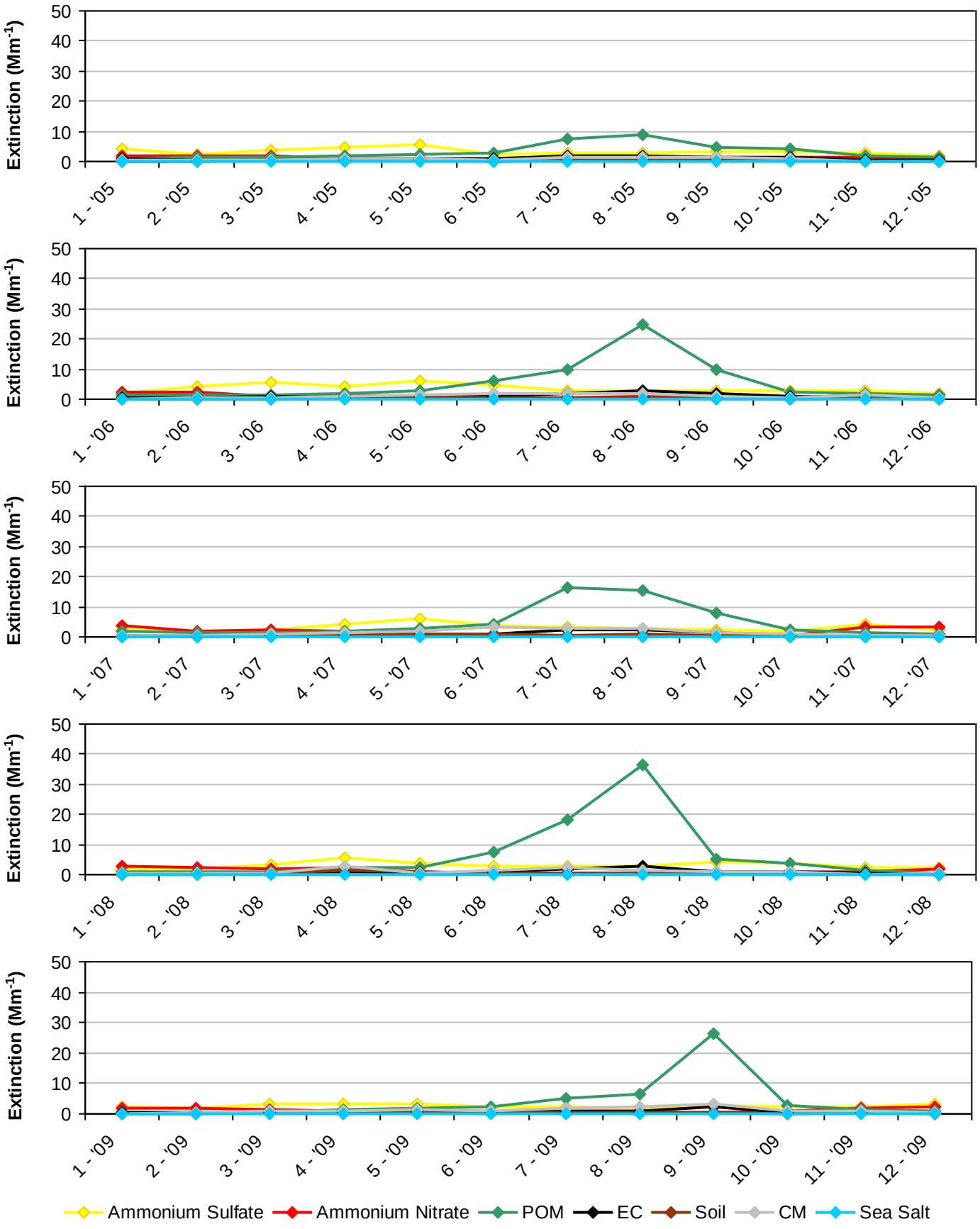


Figure O.3-7
Yellowstone NP, Grand Teton NP, Red Rock Lakes WA and Teton WA, WY (YELL2 Site)
2000-2004 Progress Period Extinction, All Sampled Days

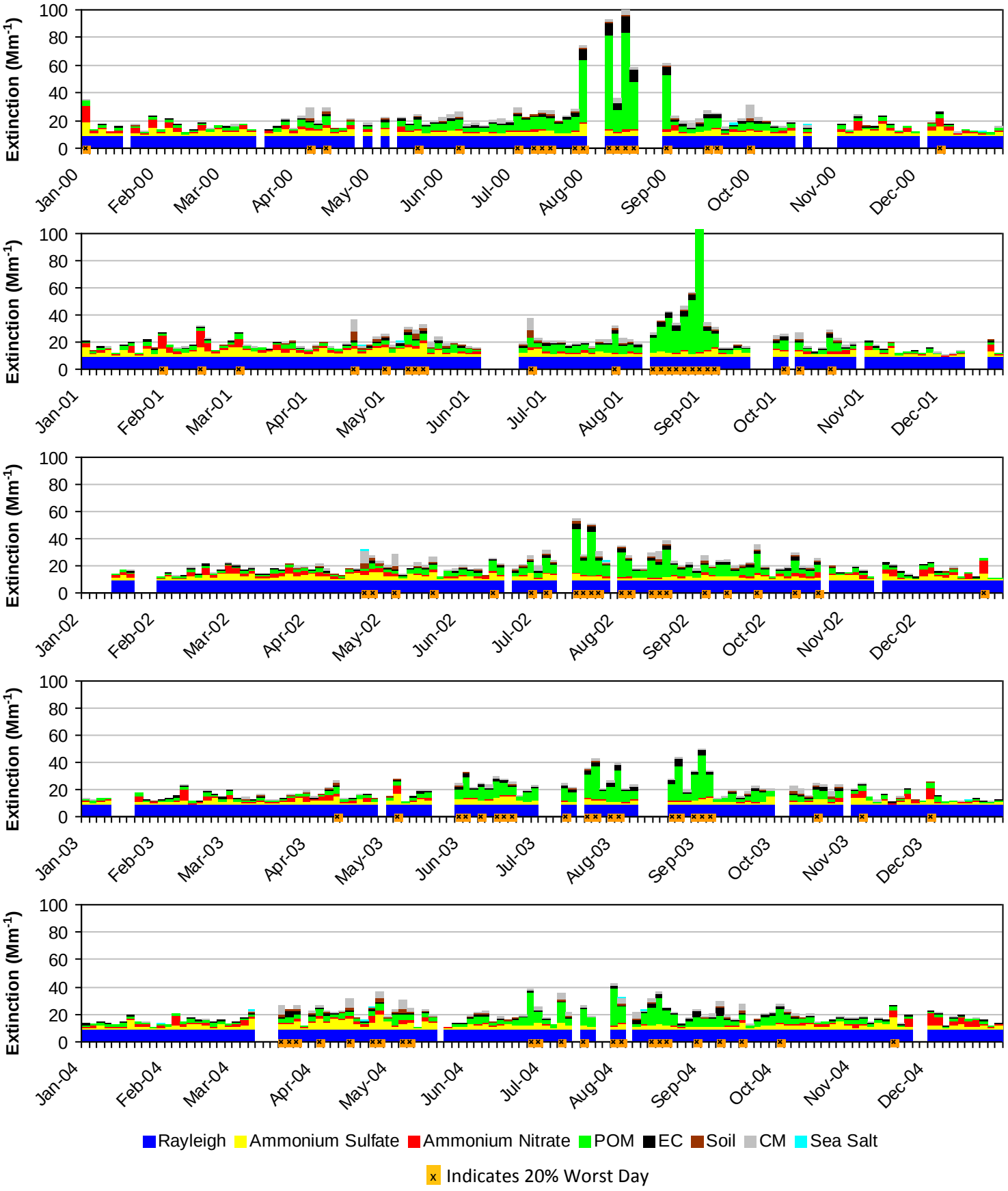
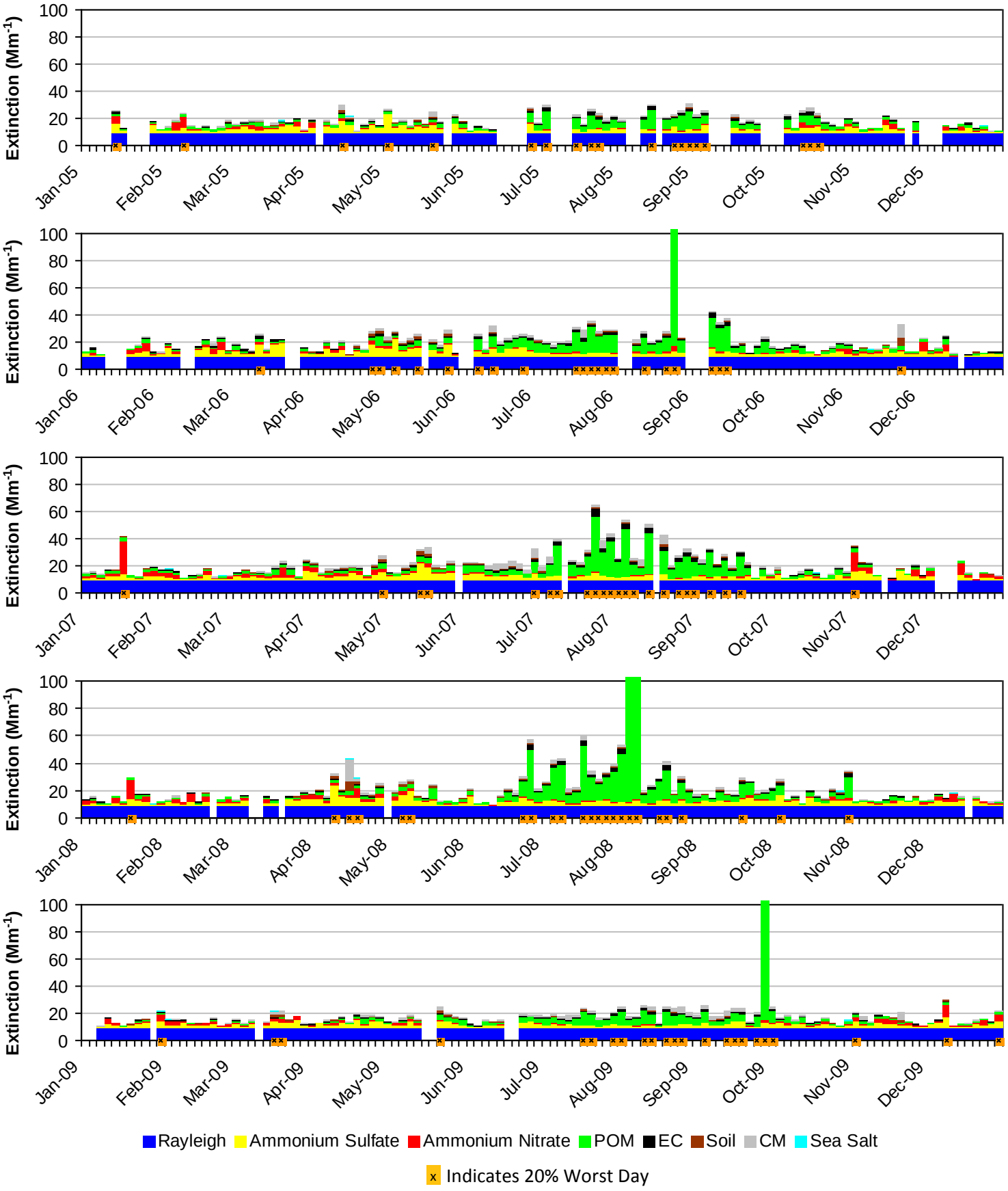



Figure O.3-8
Yellowstone NP, Grand Teton NP, Red Rock Lakes WA and Teton WA, WY (YELL2 Site)
2005-2009 Progress Period Extinction, All Sampled Days