

Deterministic & Empirical Assessment of Smoke's Contribution to Ozone (DEASCO₃) Project

Online Technical Tool Development

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Matthew Mavko
971-271-5315
mmavko@airsci.com

David Randall
303-988-2960
drandall@airsci.com

Ralph Morris
415-899-0700
rmorris@environcorp.com

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Tom Moore
Air Quality Program Manager
Western Governors' Association



DEASCO₃ project - purpose & goals

- **Assess fire's impact on elevated ozone episodes with retrospective studies in the West and Southeastern U.S., using empirical and photochemical modeling analyses**
- **Studies of fire and ozone in 2002 through 2008**
- **Outcomes**
 - Support future collaborative FLM-state ozone air quality planning
 - Develop “lessons learned”, basic analysis rules for fire-ozone episodes, and online tools for FLM-state air quality planning
 - Through the WRAP Fire Emissions Tracking System ([FETS](#)), prepare and implement planning-grade fire emissions inventories in the FETS suitable for SIP work by states and FLMs
 - Publish data and analysis results in transparent and reproducible formats

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Tool Purpose

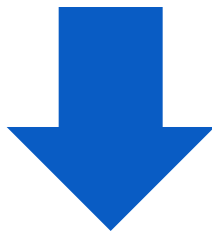
- Present results of the study
 - Case Studies
 - Lessons Learned
 - Areas most impacted by fires' contribution to ozone
- Allow access to datasets (Modeling, Emissions)
- Facilitate analysis of fires' contribution to ozone for events outside of the study

Tool Foundation

- CAMx modeling results (2002, 2008)
- WRAP Fire Emissions Tracking System (FETS) data (2002, 2003-2007, 2008)
- Observed Ozone data (WRAP FED database)
 - AQS
 - EPA, NPS Sites
- Supporting spatial data
 - Ecological, political boundaries
 - Ozone NAAs
 - Class I Areas

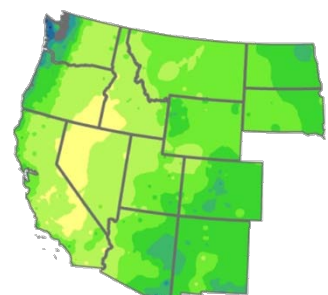


Fire Activity Data (acres/day)



Loading

Moisture

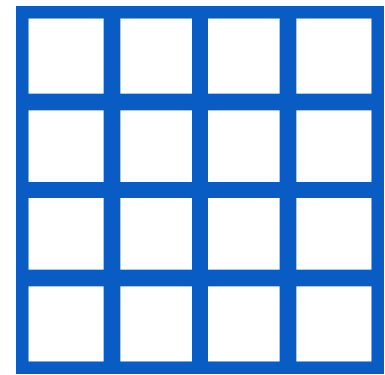


Emissions Model

FETS

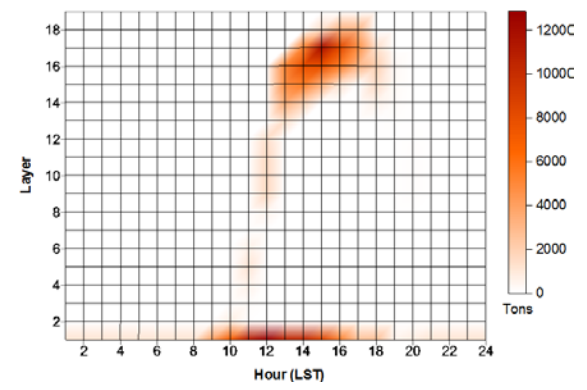
DEASCO₃

distribute emissions



Chemical Profiles

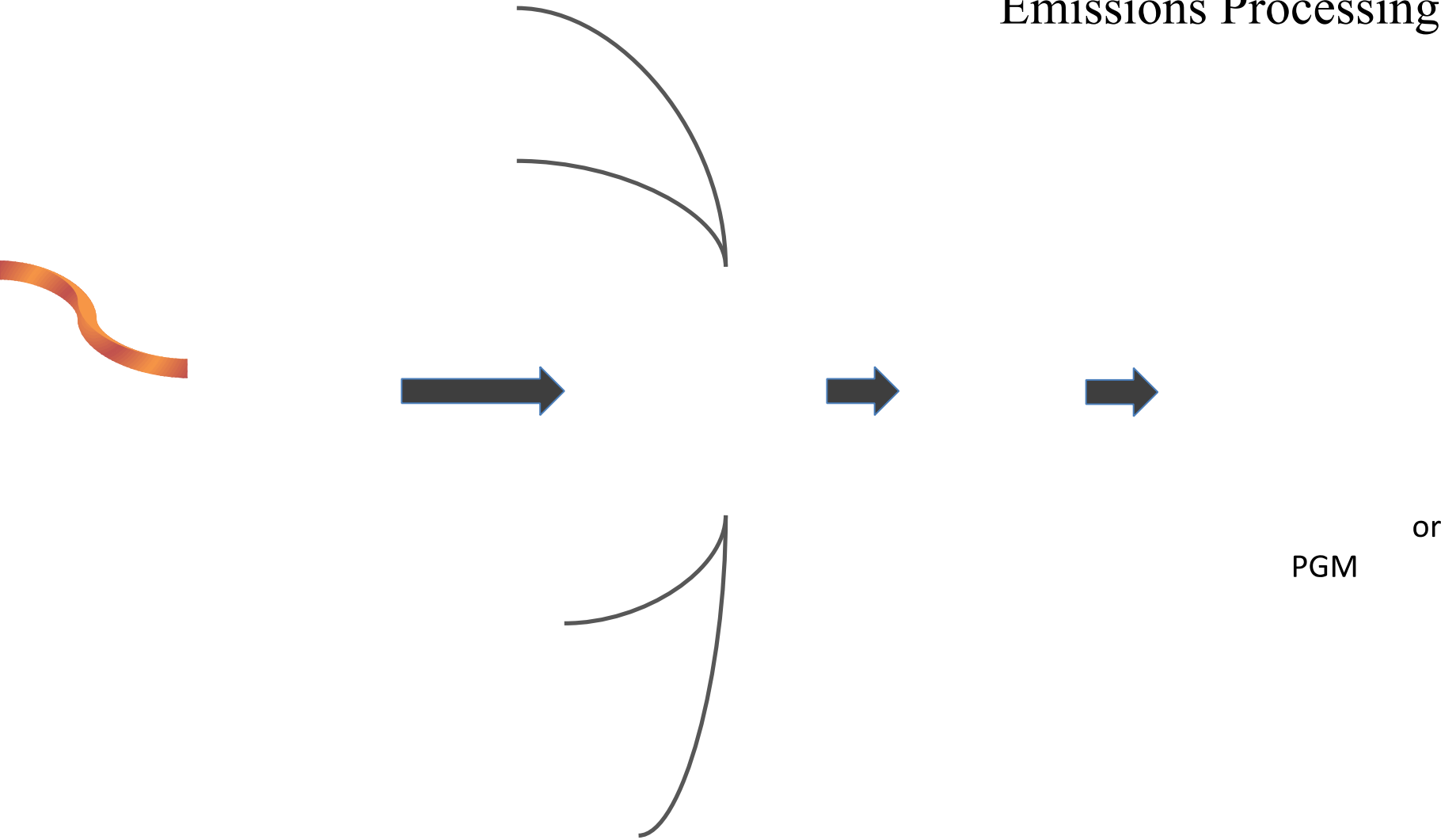
Loft emissions



DEASCO₃ Activity Data Processing



DEASCO₃ Emissions Processing




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Case Study Objectives

- Identify apparent relationships between fire incidents and observed (especially elevated) ambient ozone concentrations
- identify instances and locations when emissions from fires have likely contributed to elevated ozone concentrations
- Use experiential knowledge of team to identify areas of interest.

Tool Objectives

- Deliver the science and technical results of the DEASCO₃ project to field managers and other interested end users.
- Provide a screening tool to evaluate fire's contribution to ozone levels for incidents outside of the chosen modeling years (2002 and 2008).
- Produce map-based tools, plots, and tabular reports based on rule-sets developed from the empirical assessment task.



DEASCO₃ Hypotheses

Technical

Ho1 – Smoke from fire contributes to background concentrations of O₃ in large areas of the U.S.

Ho2 – Fire/Smoke management can affect formation of O₃.

Ho3 – Fire(s) cause/contribute to O₃ exceedances.

Policy

Ho4 – Better quantitative information will help FLMs to assess the use of smoke management techniques to address nonattainment issues.

Ho5 – The Rank Order(s) in the Online Tool will help FLMs to be more effective in the air quality planning processes.

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Toolbar approach

- *What questions do we need to address to perform case study analyses?*
- *What data are available to us?*
- *How do we organize results to accommodate differing analysis types?*
- Start with basic criteria from user: time, space
- Build a set of modular tools that produce analysis results from available data
- Build a one-page “workspace” and plug in tool results, add commentary, publish.

Web demo

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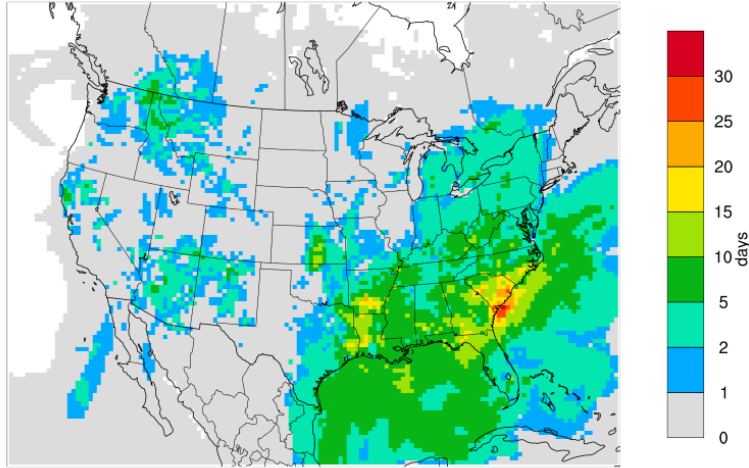
More Tool Ideas

- Particulate/filter data from FED database
- Load-your-own modeling and observational data
- HYSPLIT analysis
- Others??

#Days Planned Fire Cont. to O₃ > 60, 65, 70 and 76 ppb

Contrib. to CAMx Daily Max 8-Hour Ozone >= 60 ppb

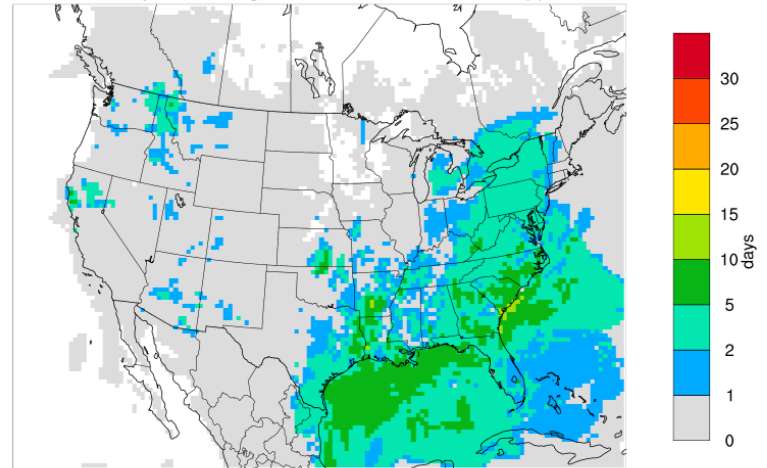
of Days where Ag + Rx Burns Contrib. >= 0.5 ppb



Max(120,39) = 31

Contrib. to CAMx Daily Max 8-Hour Ozone >= 65 ppb

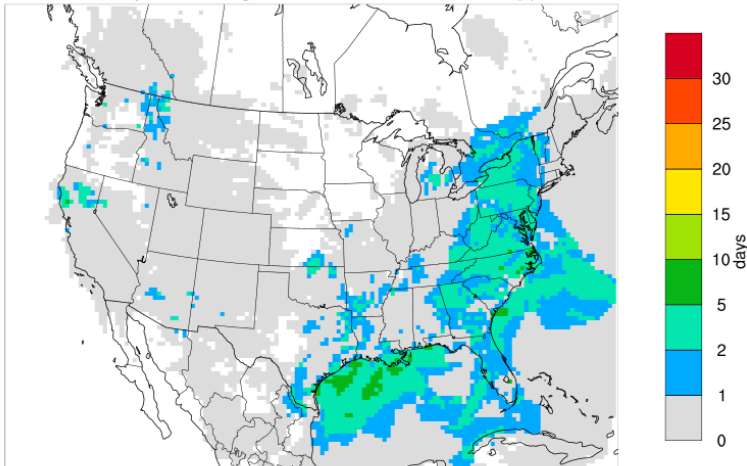
of Days where Ag + Rx Burns Contrib. >= 0.5 ppb



Max(120,39) = 13

Contrib. to CAMx Daily Max 8-Hour Ozone >= 70 ppb

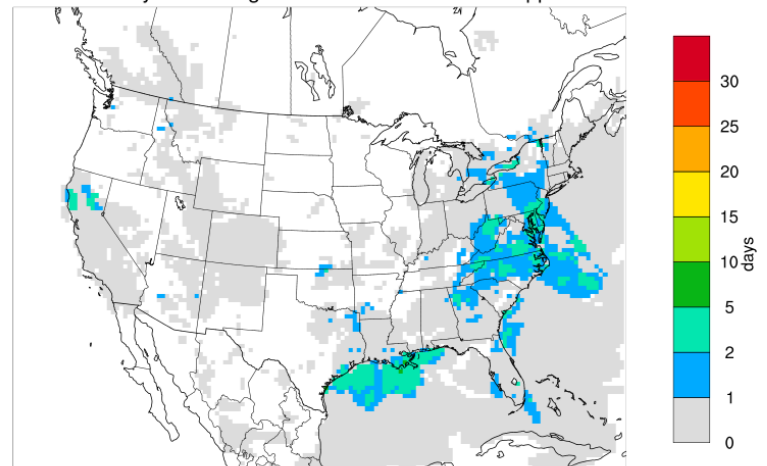
of Days where Ag + Rx Burns Contrib. >= 0.5 ppb



Max(120,39) = 7

Contrib. to CAMx Daily Max 8-Hour Ozone >= 76 ppb

of Days where Ag + Rx Burns Contrib. >= 0.5 ppb



Max(76,21) = 5

WRAP Projects Timeline

Summer/Fall 2013

July

Final DEASCO₃ Deliverables

- Final Report
- Public Website

August

Webinar to roll out DEASCO₃ Project
August 22nd 1200 MDT

September

2011 FETS Fire EI v1
end of September

October

<http://www.wraptools.org>