

Western Air Quality Studies, 3-State Air Quality Pilot Study / Data Warehouse, and Western Regional Modeling Framework

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WESTAR Council

Phoenix, Arizona Meeting



Regional Organizations

- WESTAR = Western States Air Resources Council
 - 15 state air agencies are voting members, ex-officio membership includes FLMs, also open to local air agencies and tribes, EPA active participant but not a member
 - Incorporated non-profit, offices in Seattle, Portland, and Fort Collins
 - www.westar.org
- Purposes:
 - Exchange information related to air pollution control;
 - Develop processes and procedures to meet air quality objectives and to protect the environmental resources;
 - Discuss air quality issues and report on the status of efforts undertaken to achieve air quality objectives;
 - Establish work groups, task forces, as needed; and
 - Adopt resolutions and policy statements for implementation by Council members.

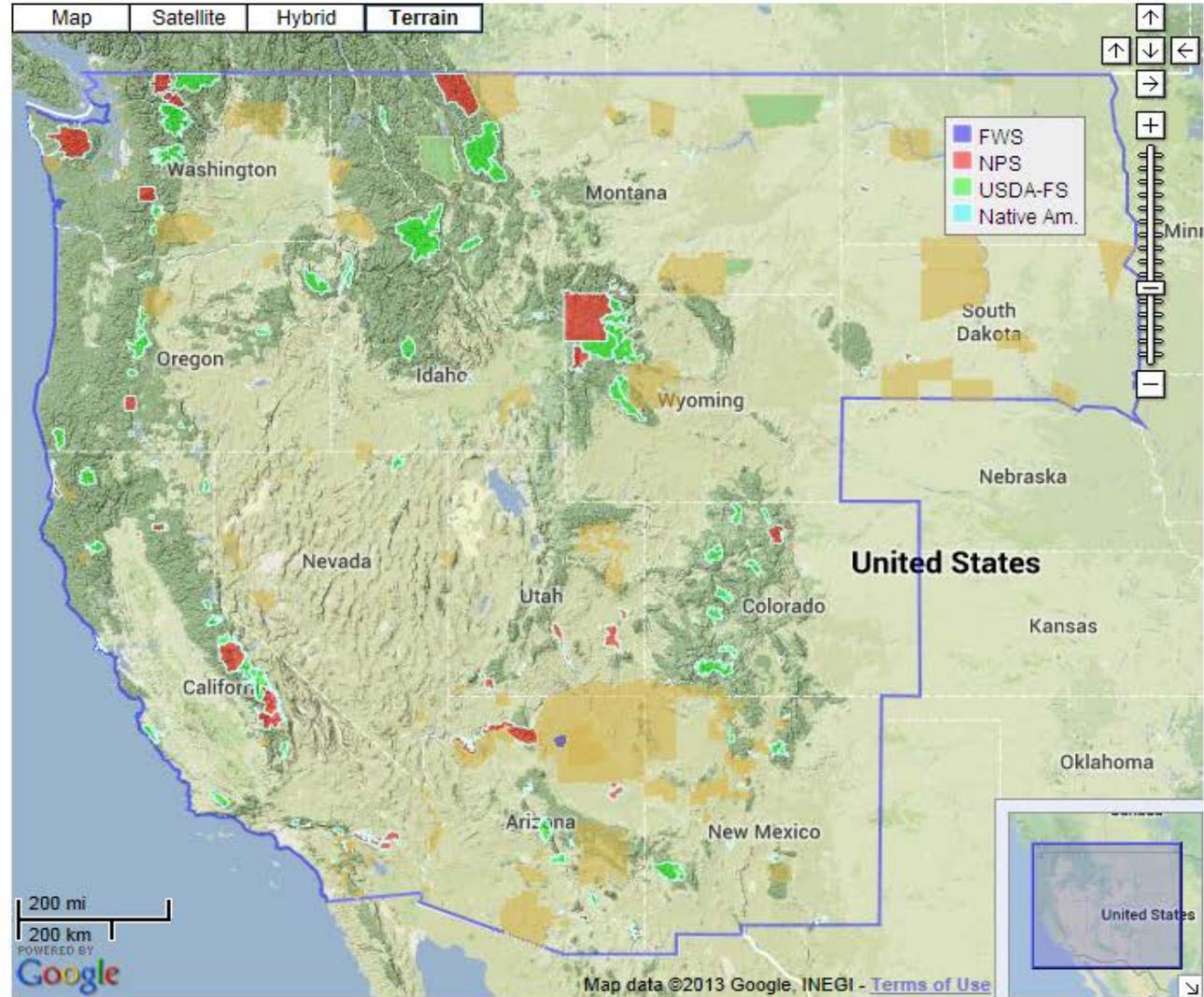
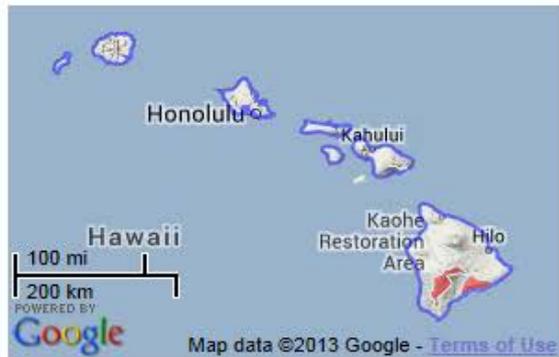
WESTAR / WRAP geographic region



Organizations, continued

- WRAP = Western Regional Air Partnership
 - www.wrapair2.org
 - Same 15-state region as WESTAR
 - Virtual organization, not incorporated
 - 60+ member agencies include 15 state air agencies, NPS, FWS, BLM, USFS, EPA, and interested tribes and local air agencies/districts in the WRAP region
 - Board has State and Tribal co-chairs, with representatives across states, tribes, federal, and local agencies.
 - Formed in 1997 to implement Grand Canyon Visibility Transport Commission recommendations
 - Led Regional Haze planning effort 1997-2009 for the West
 - 75 % of Class I areas in the WRAP region

WRAP Region Areas and Points of Interest



- 15 states, federal land managers and EPA, tribes, and local air districts
- Regional analyses for Western sources and air quality impacts

WRAP, continued

- Since 2010, WRAP working as regional technical center to support and coordinate Regional Analysis and Planning
- Develop and facilitate use of improved, consistent, comparable, transparent, and reproducible western air quality data
 - Interconnected series of regional technical projects
 - Management of ongoing emissions and modeling studies
 - Reviewed / coordinated with federal agencies, states, locals, tribes
 - External review by, and outreach to, industry and environmental groups
- Staff work for WESTAR - report to WRAP and WESTAR Boards, and WESTAR Executive Director

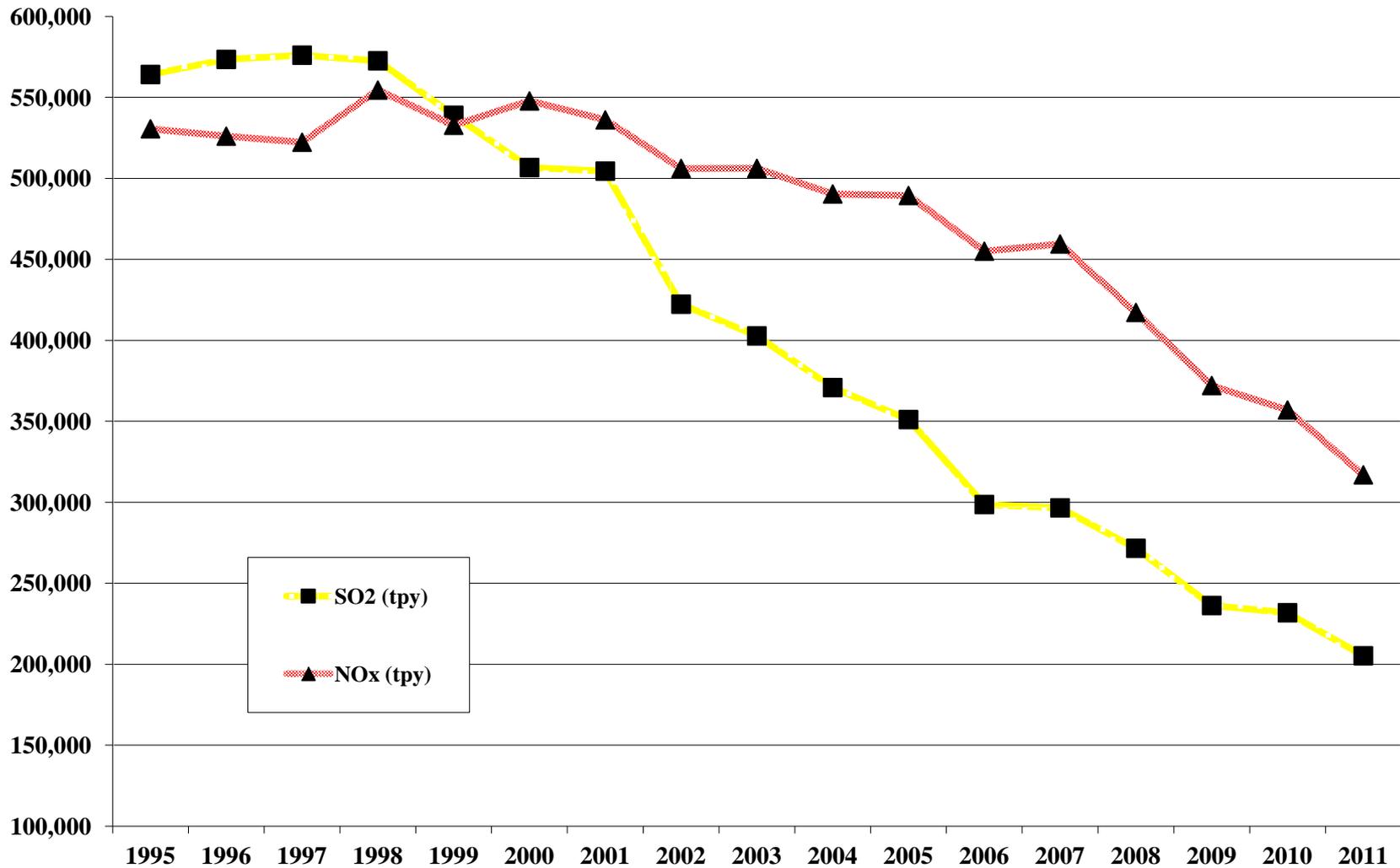
WRAP regional technical support

- NAAQS Implementation and Maintenance
 - Data for future infrastructure and transport SIPs
- Exceptional Events
 - Develop technical support data and analysis protocols
- Implementation of Regional Haze SIPs
 - Identify and execute technical work needed for 2018 plans
- Needs of sub-regional groups of states
 - Currently oil and gas
 - Similar efforts in past

Western ozone and PM precursors - key emissions sources

- Power plants decreasing markedly
- Mobile sources controlled and emission rates decreasing markedly through federal rules and state testing programs
- Fire activity and effects are huge, receiving intensive study
 - Deterministic & Empirical Assessment of Smoke's Contribution to Ozone ([DEASCO₃](#))
 - Prescribed and Other Fire Emissions: Particulate Matter Deterministic & Empirical Tagging & Assessment of Impacts on Levels ([PMDetail](#))
 - Others....
- Biogenics ([natural plant sources](#))
- Oil and gas (WRAP emissions inventories)
 - Emissions Inventories for Intermountain Basins with significant production
 - Currently completing [ND-MT Williston and MT North Central \(Great Plains\) Basins](#)
 - Coordination for 3-State Air Quality Study
- All sources studied in comprehensive regional modeling analysis
 - 2008 base year - West-wide Jumpstart Air Quality Modeling Study ([WestJumpAQMS](#))

Western Interconnect - Power Plant Emissions Trends



Data from EPA Clean Air Markets Division



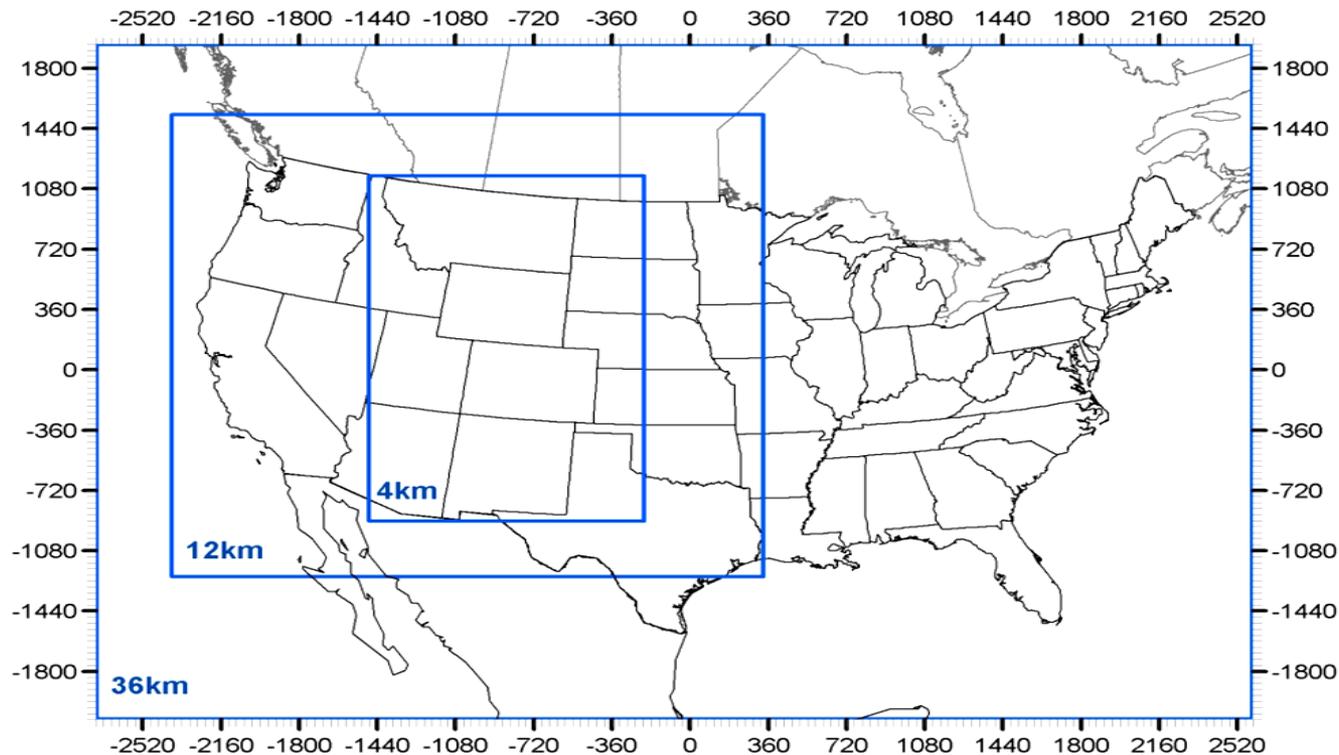
Western Regional Studies and Projects

West-Wide Jumpstart Air Quality Modeling Study

(funding by State of NM, BP, and BLM national air program)

- Regional results provide data and context for state and federal planning
 - Uses most current transport and background studies
 - Meteorological and emissions modeling
 - Regionally consistent, High resolution, Comprehensive
 - Photochemical modeling
 - 2008 base case model performance evaluation with Ozone / PM source apportionment
 - Most up-to-date and complete characterization of Western U.S. air quality available
- Study completed September 2013
 - Emissions and Modeling data foundation of 3-State Data Warehouse
 - All materials at: <http://www.wrapair2.org/WestJumpAQMS.aspx>
 - Advances goal to provide a regional modeling framework

WestJumpAQMS Area



Modeling Domain

36km: 148 x 112 (-2736, -2088) to (2592, 1944)

12km*: 227 x 230 (-2388, -1236) to (336, 1542)

04km*: 317 x 515 (-1480, -904) to (-212, 1156)

* includes buffer cells

Tracking and Managing Smoke

- Significant impacts to both local and regional air quality
 - Large summer wildfires
 - Prescribed and agricultural burns in spring and fall
- States & tribes manage both planned burns & wildfire impacts
 - FLM Joint Fire Science Program projects enable continuing operation of WRAP's Fire Emissions Tracking System (<http://www.wrapfets.org/>)
 - Used daily by western states, tribes, and federal agencies to track planned fire and manage smoke
 - FETS
 - Used by states and OAQPS to evaluate 2008 NEI
 - Fire activity and emissions data being sent to EPA for 2011 NEI

Fire's Effects on Elevated Regional Ozone & PM

Deterministic & Empirical Assessment of Smoke's Contribution to Ozone (DEASCO₃) – completed Summer 2013

and leveraged companion study underway:

Prescribed and Other Fire Emissions: Particulate Matter Deterministic & Empirical Tagging & Assessment of Impacts on Levels (PMDETAIL)

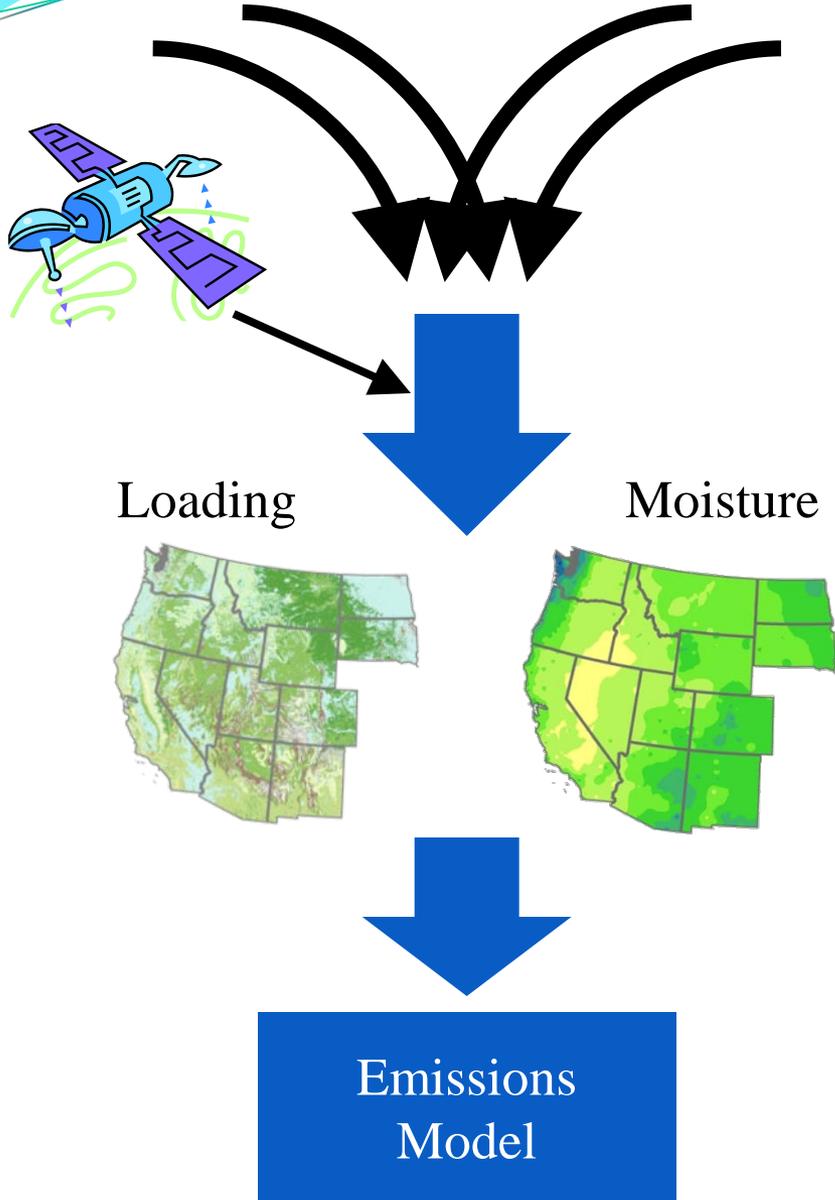
Funding for both from FLM Joint Fire Sciences Program

**Both projects, analysis toolbox / data, and FETS access at:
<http://wraptools.org/>**

New proposal under JFSP review:

Contribution of Smoke Emissions to Secondary Organic Aerosols (SOA): Real-World Evaluation of Fire SOA Emissions Factors from Fires in a Data Management System (REFERS-DMS)

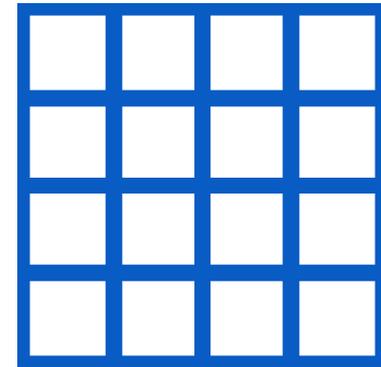
Fire Activity Data (acres/day)



FETS

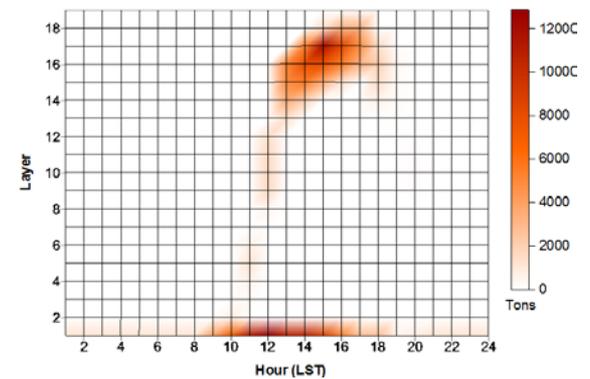
DEASCO₃ & PMDETAIL

distribute emissions



Chemical Profiles

loft emissions



Leveraging

EPA NEI &
WRAP Western Data

WestJumpAQMS

Improved AQ
Planning

DEASCO₃

Exceptional Event
applications

2008 WRAP Fire and
NEIv2 Fire data
(USFS collaboration)

PMDETAIL

Completed DEASCO₃ project - purpose & goals

- Assess fire's impact on elevated ozone episodes with retrospective studies
 - Studies of fire and ozone in 2002 through 2008
 - Tools and data at: <http://deasco3.wraptools.org/>
- Outcomes
 - Support future collaborative FLM-state ozone air quality planning
 - Developed “lessons learned”, basic analysis rules for fire-ozone episodes, and online tools for FLM-state air quality planning
 - Through WRAP FETS, prepared and implemented planning-grade fire emissions inventories in FETS suitable for SIP work by states & FLMs
 - Published data and analysis results in transparent and reproducible formats
 - Collaboration involved EPA western RO and FLM staff, leverages WestJumpAQMS
 - Products for FLMs and states to use in SIP process and Exceptional Events demonstrations

Regional Haze: Reasonable Progress Reports (EPA grant funds for contractor support)

- WRAP produced a comprehensive, regionally-consistent technical report – completed Summer 2013
 - Regional, state, and Class I area reports
 - Technical analyses required by Regional Haze Rule
 - Western states will use as a common basis in preparing individual SIP revisions
 - SIP revisions are due in the 2013-15 timeframe
- WRAP providing western 2008 emissions data
 - Leveraged from WestJumpAQMS
 - States will use to evaluate changes in monitored visibility
- Project reports at: <http://www.wrapair2.org/reghaze.aspx>

Oil & Gas: Emissions Inventories and Control Analysis

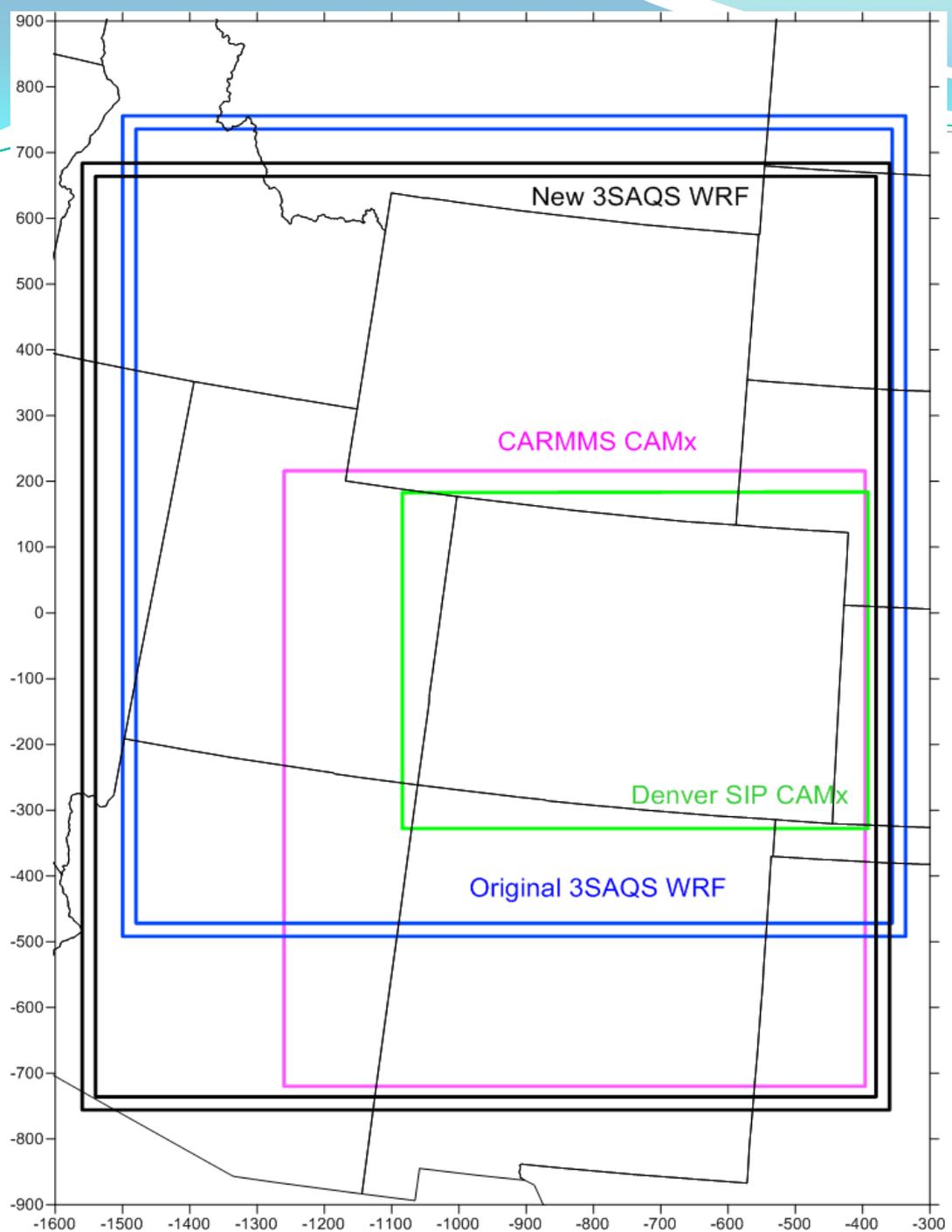
(funding by Western Energy Alliance , EPA, States of WY and ND, BLM)

- Key source for Ozone / PM standards, & Regional Haze
- Exploration and production activity continue to increase
- Data in use current OAQPS national & western modeling work
 - Significant funding and involvement by industry
 - Open review and discussion process with all interested stakeholders
- Linkages
 - WestJumpAQMS
 - 3-State Air Quality Study
 - O&G EI project funded by BLM MT-Dakotas office
 - 2011 base & projection years' EI for Williston & Montana Great Plains Basins



Federal Leadership Forum / 3-State Air Quality Study (funded by BLM, USFS, EPA, others in-kind)

- Steering committee of WY, CO, UT, EPA, BLM, NPS, and USFS
- Implementation of 3-State and national MOUs' objectives
- Planning for air quality impacts of energy development
 - Ozone focus, additional rural monitoring stations in oil & gas basins
 - Wintertime ozone nonattainment areas
 - Integrates results from WestJumpAQMS and Oil & Gas projects
 - Data warehouse to support future air quality modeling and other analyses



3SAQS 4km Modeling Domain – discussed and recommended at Oct. 31- Nov. 1 Technical Committee Workshop

3-State Air Quality Study - Objectives

- Facilitate more complete and consistent AQ Analysis for NEPA and other AQ decisions
- Improve timeliness and collaboration
- Reduce duplication of AQ analysis resulting in lower costs
- Improvements include or will include:
 - Six new monitoring sites
 - More region-specific modeled emissions
 - More current base case and better future case air quality modeling
 - A data warehouse to contain all this improved information and future data for access by agencies and those they approve to use it

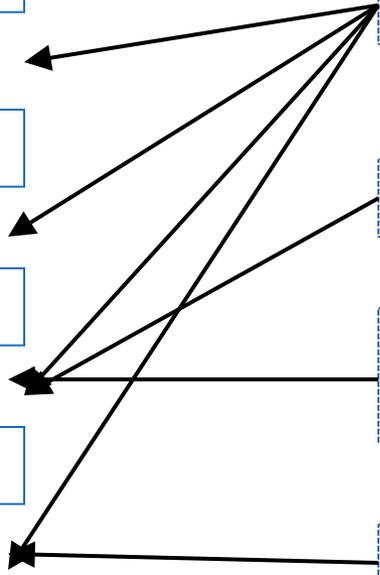
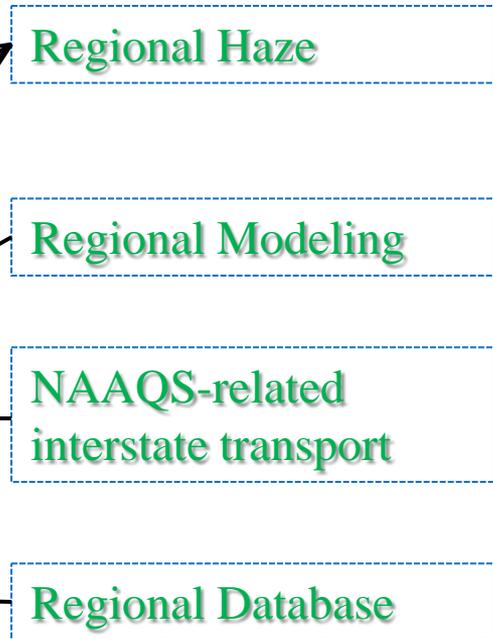
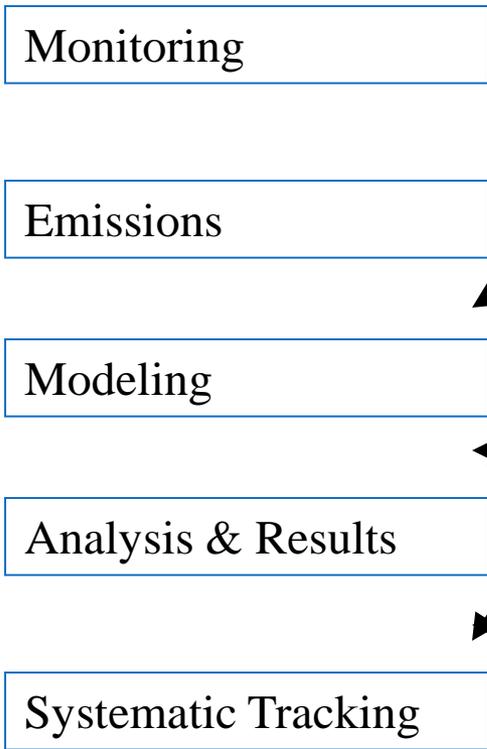
Opportunities for Data Warehouse and Applying Regional Modeling Results from Western Regional Technical Studies

- Leveraged studies address both regulatory planning needs and fill gaps where data are needed
 - Working for the users of the data
- Tracking key western source categories / source areas
 - Regionally consistent, comparable, transparent, and reproducible
- Modeling analyses of Ozone and PM background and transport on a routine basis and during elevated episodes
 - NEPA air quality studies
 - Background data for SIP planning
 - Impacts of fire on ozone and PM across West
- Better oil & gas, fire, biogenics emissions data
 - Improves assessment of natural vs. anthropogenic contributions
- Next Step – develop Western Air Quality Modeling Framework concept paper

3-State Data Warehouse

Western Regional Modeling Framework (future)

3-State Data Warehouse



Western Regional Modeling Framework