

# NW-AIRQUEST Speciation Data Workgroup

**Co-chairs:**

**Robert Kotchenruther, EPA**

**Rick Hardy, Idaho DEQ** (replaced Kathy Himes)

**Activity Report for the  
NW-AIRQUEST Annual Meeting**

**March 31 – April 2, 2010  
Portland, OR**



# Workgroup Membership (~40 people)

## Federal

- U.S. EPA
- Environment Canada

## State & Provincial:

- Idaho Department of Environmental Quality
- Washington Department of Ecology
- Oregon Department of Environmental Quality
- British Columbia Ministry of Environment

## Local

- Puget Sound Clean Air Agency
- Yakima Regional Clean Air Agency
- Southwest Clean Air Agency
- Lane Regional Air Protection Agency

## University

- Washington State University
- University of Washington

## Speciation data?

- Chemically speciated PM<sub>2.5</sub>
- Air toxics

## Workgroup goals for calls and meetings

- Inform each other about current projects and results
- Share information about:
  - Data issues/problems
  - Data analysis techniques
- Standardize practices
  - Data processing methods (MDL treatment)
  - Receptor modeling
- Facilitate collaboration

# Workgroup Activity Since Last NW-AIRQUEST Meeting

- **5 Workgroup conference calls**
  - **Roughly 1 per quarter**
  - **Call agendas**
    - **Round-robin updates on current work**
    - **More in-depth presentations of work**
- **Highlights from the last year or so .....**

**Early 2009 ....**

**Ranil Dhammapala (WA DOE)  
lead several discussions on data  
quality control for data in EPA's  
AQS system.**



- Discovered for the group that chemically speciated data for STN sites (mostly urban PM<sub>2.5</sub> speciation samplers) in AQS is *not* blank corrected. Showed workgroup how to obtain blank information from AQS to manually blank correct data.
- Analyzed OC data from various sites in the Puget Sound for artifacts based on sampling methods. Found that artifacts ranged from +2.99 ug/m<sup>3</sup> to -0.45 ug/m<sup>3</sup> and showed workgroup a site specific method estimating OC artifacts.

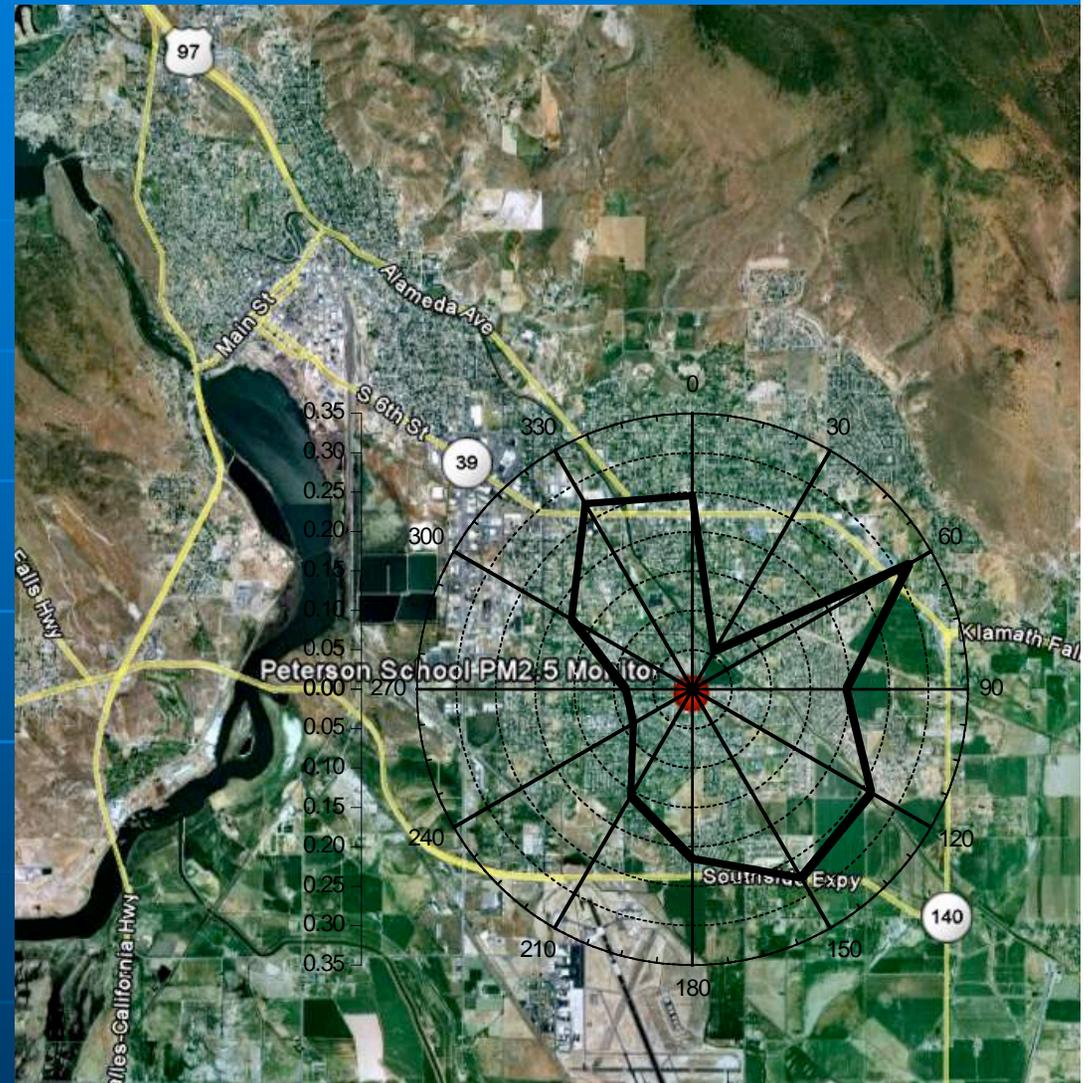
Mid 2009 ....

David Ogulei (WA DOE) introduced the workgroup to **Conditional Probability Function (CPF)** analysis during a presentation on Tacoma, WA receptor modeling.

- CPF combines on-site wind data with measurements (or model results) to show the wind direction of data that exceeds a threshold value.
- Suggests most likely direction of significant sources.
- Example of CPF for top 25% of NO<sub>3</sub> measurements in Klamath Falls, OR.

## CPF For NO<sub>3</sub> in Klamath Falls OR

(analysis by R. Kotchenruther)



## End of 2009 ....

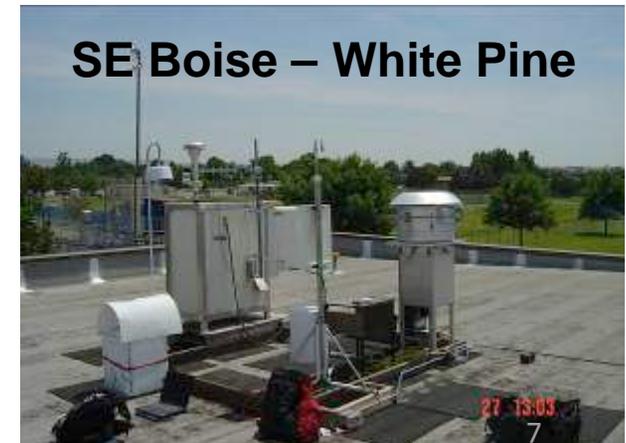
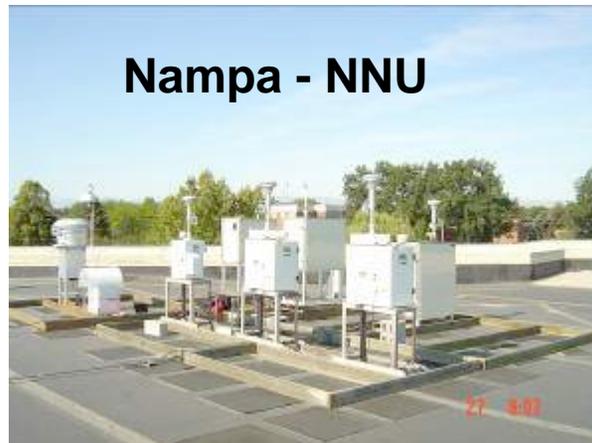
(slide adapted from Dong & Hardy presentation on 12/1/2009)

# 2007 Treasure Valley Community-Scale Air Toxics Monitoring Study

Idaho Department of Environmental Quality



- Found PCA and PMF analysis were consistent on identifying major sources
- PMF modeling identified 7 source categories
  - Photochemical
  - Biomass burning
  - Solvents
  - Mixed Sources during Stagnation
  - Isopropanol
  - Geologic
  - Mobile



**End of 2009 / Early 2010 ....**

**Robert Kotchenruther, EPA R10, worked with the workgroup to publish a guidance document: EPA Region 10 Guidance for the Use of Receptor Models to Support Policy and Regulatory Decisions**

11 Page Document  
Topics Covered

- Important considerations prior to running receptor models.
- EPA accepted receptor models (CMB, UNMIX, & PMF)
- Model advantages and disadvantages
- Model assumptions
- Where to get model input data
- Data requirements
- Preparing model input data
- Interpreting model results
- Reporting results

## Future Plans for Workgroup Activity ...

- **Continue with quarterly calls.**
- **Next up – An intro to EPA PMF 4.0  
Tuesday April 6, 8-9 am Pacific**
  - **Our workgroup has the opportunity to test out EPA's latest version for the PMF receptor model.**
  - **While not yet publically available, it is past beta testing and in limited distribution for user feedback to EPA.**
  - **The new version has some significant advances that address previous PMF shortcomings**
    - **Better uncertainty estimates**
    - **More realistic source profiles by using measured source profiles to constrain model results.**

**Thank you for your attention!**

**Questions?**