Introduction to the Emissions Modeling Framework



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## **Course Overview**

#### Slides

- Purpose
- EMF components
- Status and Schedule
- Installation

#### Hands-on

- We'll go through main components of EMF
- You can follow me through "point and click" steps or work ahead
- Please ask questions or ask to change pace (faster/slower)
- Break for 10 minutes at 9:20 and 10:50

## **Purpose of the EMF**

- Improve timeliness and quality of data used in air quality models
- Provide transparency & tracking
  - Data with versions, metadata, QA status
  - Emissions modeling applications and associated data
- Make it easier to run SMOKE and other emissions modeling tools
- Support multi-pollutant modeling: criteria & toxics
- Create tools that can be used by EPA and others (e.g., RPOs, states)

## Components of the EMF (1)

#### Data Manager

 Stores and organizes input and output data. Includes metadata (Data Properties), Data Viewer, and Data Editor. Keeps both old and new versions of datasets for better tracking.

#### Case Manager

 Stores and organizes software runs for SMOKE, Surrogate Tool, and Speciation Tool. Provides graphical user interface (GUI) for SMOKE or other emissions modeling tools.

#### QA Manager

 Includes QA Templates, QA Steps and status. Runs SQL queries. Users defines steps and records progress. Separate parts for QA of Data and Cases.

#### EMF Database

 PostgreSQL heart of EMF. Contains actual emissions data, metadata, and information needed to drive EMF interface.

## Components of the EMF (2)

#### Control Strategy Tool (CoST)

- Users can build control strategies and create controlled SMOKE inputs.
- Contains control measures database
- More information in next training
- Surrogate Tool
  - Creates spatial surrogate SMOKE input file from Geographic Information System (GIS) Shapefiles using Java and MIMS Spatial Allocator.

#### Speciation Tool

 Creates speciation profile SMOKE input files for userdefined chemical mechanisms using PostgreSQL and PERL. Supports CMAQ toxic mechanism and CAP/HAP VOC integration.

## Components of the EMF (3)



# **Steps for Using the EMF**

**QA Manager** 

Import Define metadata Edit data Share data

**Data Manager** 

Create QA lists Share QA lists QA data Run SQL Set status Case Manager Define runs Set data to use Define settings Run SMOKE Run other

## **EMF Status and Schedule**

- EPA is using Data Manager for its current 2002 modeling. QA Manager use is being phased in gradually.
- Case Management partially completed
  - Not yet running SMOKE
  - We want to have in trial use at EPA summer 2007
  - Goal to use in Final Ozone NAAQS RIA Modeling
- Final Spatial Surrogate Tool available, but not yet from EMF
- Beta Speciation Tool available, but not yet from EMF
- CoST development ongoing
- Beta public release in early June, 2007
- More complete release by August 15<sup>th</sup>

## Installing EMF

Both Server and Client need to be installed
 Require PostgreSQL 8.2, Java 6, and Tomcat 5.5

- Instructions available at: http://www.ie.unc.edu/cempd/projects/emf/install/
- Server: install 1 per site (shared database)
  Mailing list will notify site admins of server updates
- Client: install 1 per user computer
  - EMF "Installer" handles initial install and updates. Simply double-click on icon and installation runs.
  - EMF Client tells you when its inconsistent with the version of the server.

## Installer in action

🛎 EMF Client Ins	taller 6/26/2006	
EMF Download URL http://www.cep.unc.edu/empd/projects/emf/install/		
Java Home Direc		wse
Input F	The Client Home Directory already exists. Would you like to reinstall or update?	wse
Output F	Update	wse
Client Hor	OK Cancel	wse
Server Address http://emf.rtp.epa.gov:8080/emf/services		
	Install	

# Special notes for this training

- Your computer is running both the client and the server
- Ground rules for proceeding
  - You can follow me through "point and click" steps
  - You can move ahead if you like
  - Please ask questions or ask to change pace (faster/slower)
  - Optional exercises at end for those who move ahead

# Hands-On Training

# Extra slides for later

# **EMF QA Approach**



#### **Case Management Overview**

RUN



SMOKE datasets in PostgreSQL

**Case Manager** 

Case

**Jobs: Run scripts** 

**Inputs:** Datasets to use for runs

Parameters: SMOKE and script settings

**Outputs:** List of results (e.g., AQ model inputs)

History: Who, when, what run & status Tell Dataset Manager to export Inputs as ASCII SMOKE files

Generate wrapper scripts with Inputs and Parameters defined as Environment Variables

Submit Job to a run queue on a UNIX/Linux computer Run scripts

**SMOKE** 

EMF utility to register outputs

Completed

### **Case Management Overview**

