Outline of Issues and Potential Approaches
FEJF De Minimis Task Team

Summary

Conduct an air quality and visibility source/impact analysis to assess de minimis levels for fire tracking. The study will be used to provide states and tribes with recommendations on de minimis levels for building as accurate fire emission inventories as possible (x emissions within y distance from Class I area).

Background

States and Tribes may choose to establish de minimis levels for fire tracking purposes (rule citation?). De minimis levels are those levels below which impacts are considered insignificant. While every single fire cannot be tracked due to limited technology and resources, there may be fires that don't need to be tracked due to their insignificant impact. A science-based de minimis level can provide a cutoff point below which fires do not need to be tracked.

Since fire emissions vary by vegetation and firing technique, emissions are the best metric to use for setting de minimis levels. An example of a de minimis level would be 50 tons per day of $PM_{2.5}$ emissions within 300 km of a Class I area or 150 km of a nonattainment area.

The main advantage of establishing de minimis levels is to reduce unnecessary workload and costs. For example, historic wildfire data indicate that 80 percent of the particulate emissions are caused by fires greater than 100 acres, while the number of fires less than 100 acres greatly exceed those greater than 100 acres. The workload and costs of tracking fires would be greatly reduced if a de minimis level could be determined for wildfire as well as for agricultural burning, prescribed fire, and wildland fire use fire.

Several states already use "de minimis" levels although they are not always identified as such (see table below). The parameters used are acres, tons of emissions, or tons of fuel per year, burn, or day. The southern forests focus on the existence of smoke sensitive areas downwind or down drainage. There is often a progression of additional requirements once the de minimis level has been exceeded such as permits, burn plans, fees, approval, etc. The requirements are generally minimal if any for the de minimis fires. It is likely that specific conditions would accompany the de minimis levels: For example, low threshold zones near smoke sensitive areas.

Established "De Minimis" Levels by States

State	De Minimis Level	Comments
AK	40 acres/year	
CA	10 acres/burn	WFU's only
CA-Northern Sierra	5 acres/burn	
MT	500 tons CO or 50 tons of any other pollutant/year	"minor burners"
NV	1 ton PM10/burn	
NM	1 ton PM10/day	draft
NM-Bernalillo Co.	¼ acre/burn	
Southern Forests	No SSA within 5-60 miles and no critical SSA within ½ - 3 miles of burn	
UT	20 acres or 0.5 tons PM/day	
WA	100 tons fuel/burn	

From: "Wildland Smoke Management Program Survey," EC/R 2001 (question #5) and "A guide for Prescribed Fire in Southern Forests," NWCG 1989.

Discussion

Class I Area Selection

Class I areas selection should rely on the following criteria:

- Availability of real fire activity data within 300km of the Class I area to construct realistic modeling scenarios.
- All fire types need to be represented, alone and in combination (wildfire, prescribed fire, wildland fire use fires, agricultural burning)
- Existence of nonattainment areas within 150km
- Cross-section of climatology, meteorology, topography

The data set from the "Causes of Haze" project being conducted by the Monitoring Forum could be used as a coarse indicator of the level of impact by fire on Class I areas through analysis of the carbon data.

The data set being developed by the In and Near Forum includes fire emissions within 50 km of Class I areas. This data could be used as a simple screening tool for selecting Class I areas for analysis.

Modeling Protocol

A plume-driven dispersion model such as CALPUFF is most appropriate to conduct a source/impact analysis. Selected de minimis scenarios will be used to analyze regional significance using a model such as CMAQ.

Modeling protocol should include:

- 1996 EI data
- 12km grid scale
- 1996 or 2002 meterological field (whichever is available at 12km)

- Format input data for use in regional model
- Model output would include surface concentrations of PM10, PM2.5, and deciviews (other pollutants such as CO and O3?)
- Model runs will represent winter, spring, summer, and fall meteorological conditions (poor/good ventilation conditions for each season?)

Building Model Scenarios

Model scenarios would include the following parameters and be constructed to be as realistic as possible using real fire activity data:

- Distance from Class I area (i.e. 10, 50, 100, 300 km)
- Distance from NAA (will depend on distance from Class I area)
- Fire size (i.e. 10, 50, 100 tons of emissions)
- Fire density (i.e. 10, 50, 100 fires)
- Fire duration (i.e. 1, 2, 3 days)

Products

The modeling results will be provided in a form that allows states and tribes an quick and easy method to determine which fires need to be tracked for emission inventories. This could be in the form of a simple model, formula, or nomagram. Below is an example of a nomagram.