Issues Paper
FEJF De Minimis Task Team

Summary

Develop a source/impact analysis on visibility and criteria pollutants to assist states and tribes with assessing de minimis levels for fire tracking purposes.

Background

The Regional Haze Rule requires states to periodically monitor progress towards meeting the national visibility goal by tracking pollutant emissions and monitoring visibility. States must show visibility improvement on the worst days and no degradation on the best days. De minimis levels are those levels below which impacts are considered insignificant. While it is not possible to track every fire, it is also a waste of resources to track fires that are insignificant. A science-based de minimis level can provide a cutoff point below which fires do not need to be tracked.

The WRAP FEJF Fire Tracking Systems policy states:

> "… the WRAP recognizes that the unique air quality circumstances of states/tribes may call for excluding some fires from tracking by the establishment of a de minimis level, based on number of acres, tons of fuel, or tons of emissions. The spatial and temporal variability of fire and the significance of visibility impacts is highly dependent upon a number of factors such as size, fuel consumption, meteorology, climate and proximity to a Class I area. The WRAP FTS Policy *does not* prescribe a de minimis level to exclude fires from tracking. States or tribes may wish to establish de minimis levels, which should be defined in the SIP/TIP and be based on a source-impact relationship. The FEJF will be assessing potential de minimis levels based on source/impact relationships to assist states and tribes in this endeavor." (2002)

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.

There are many potential uses for de minimis levels:

- Reducing model run time
- Streamlining smoke management programs and regulations
- Interpreting source apportionment results
- Integrating with de minimis levels for other sources (road dust, BART, Alaska haze sources)
- Developing regulations
- Enforcing becomes more reasonable/feasible

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. The levels can be set using a variety of methods. For example, Arizona bases its level on data availability. California bases its level on a similar requirement for stationary sources. There is often a progression of additional requirements once the de minimis level has been exceeded such as permits, burn plans, fees, burn authorization, etc. The requirements are generally minimal, if any, for de minimis fires. It is likely that specific conditions would accompany the de minimis levels. For example, low threshold zones near smoke sensitive areas.

State "De Minimis" Levels

State	De Minimis Level	Comments
AK	40 acres/year	
CA	10 acre burn	WFU's only
CA-Northern Sierra	5 acre burn	
CO	10 acre grass burn 50 small piles (out before sunset) <5 acre other type burn	draft
MT	500 tons CO or 50 tons of any other pollutant/year	"minor burners"
NV	1 ton PM_{10}/burn	
NM	1 ton PM_{10}/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 acre burn or 0.5 tons PM/day	
WA	100 tons fuel/burn 10 acre field burn	

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

Discussion

Modeling Protocol

A diagnostic dispersion model is most appropriate to conduct a source/impact analysis on visibility and criteria pollutants including ozone to the extent applicable. Two scales of modeling would be used - fine and regional.

A fine scale approach would be at the sub-state geographic area (~300km) over a 3-5 day period. A plume-based model such as Calpuff would be used to model de minimis fire scenarios. Geographic areas would be selected to represent the major climates of the WRAP region (i.e., NW, SW, coastal, intermountain).

A regional scale approach would be at the WRAP geographic area and include chemistry. Model runs would compare the 1996 base CMAQ model runs to a set of model runs with the addition of de minimis fires. Thus, the analysis of these modeling runs is concentrated around the new fires, and neighboring grid cells. This provides flexibility in selecting different fire locations that represent varying fuel models and terrain complexity.

Model Specifics:

- Full WRAP modeling domain
- 1996 wildfire and prescribed fire emission inventory data
- 1996 or 2002 meteorological field for 2-3 week period (whichever is available at 12km)
- 12km grid scale
- Base CMAQ runs from 1996
- Location on de minimis fires, using fire size or emissions

De Minimis Scenarios

De minimis scenarios would be built for specific regions and fire types. Due to lack of historic field burning data, a conceptual scenario would likely need to be built for field burning. The scenarios would need to look at typical fire activity scenarios and determine which fires singly and collectively can be considered de minimis.

De Minimis scenarios would include the following parameters and be constructed to be realistic using real fire activity data:

- Fire size (acres or emissions)
- Fire density (number of fires)
- Fire duration (days or weeks)
- Fire or fuel type
- Terrain (coastal, complex, flat)
- Dispersion conditions (poor, moderate, good)

Add list of scenarios here…

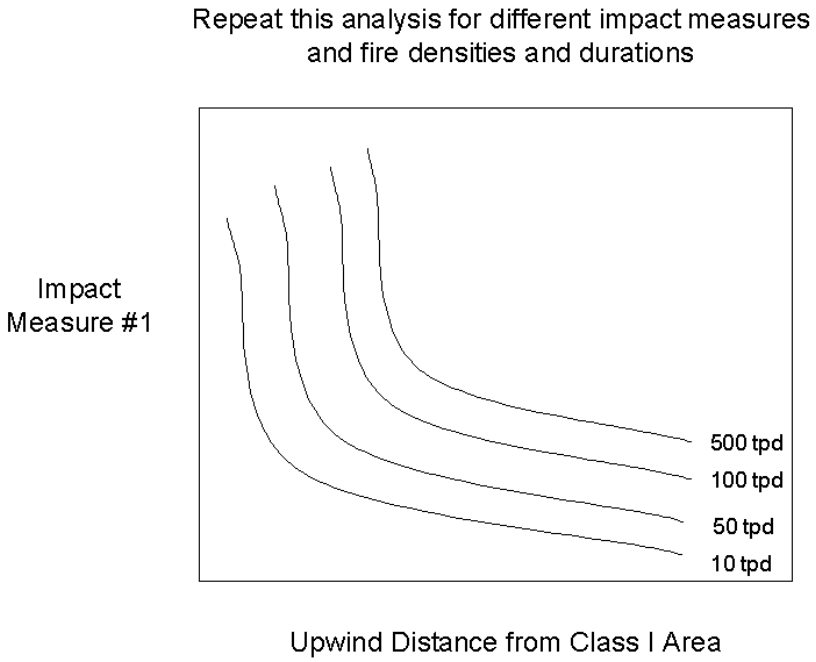
Products

The following products would be provided:

1. Detailed documentation of methodology used
2. De minimis fire scenario results

1. The methodology would include a detailed description of the procedures and how the results were interpreted.

3. De minimis fire scenario results would be provided in a form that allows a quick and easy method to determine which fires need to be tracked for emission inventory purposes. This could be in the form of a simple model, formula, or graphic. Below is one possible example. (need more detail on expected product)



Maps of threshold zones are another possible product. Using Wyoming as an example, the picture below indicates areas of increasing de minimis levels with distance from nonattainment area (N) and Class I area (I).