NWCG Smoke Committee

2014 EPA National Emission Inventory for Wildland Fire **March 13, 2014**

Topic: 2014 is an EPA National Emission Inventory (NEI) Year. The NEI is a national inventory of air pollutants, emitted from all sources. EPA compiles a NEI every three years from information submitted by State/Local/Tribal (SLT) agencies. Prescribed fire, wildfire and crop residue burning are included in the NEI. ***State Forestry agencies can provide critical information that will improve the quality of the NEI significantly.***

2011 NEI Results: In the 2011 NEI, biomass burning (wildfire, prescribed fire, and crop-residues) accounted for 37% of the fine particulate matter ($PM_{2.5}$) emitted in the U.S. Biomass burning also releases hazardous air pollutants such as formaldehyde, and is a source of ozone precursor gases. Approximately 22.7 million acres were estimated to have burned in 2011; 12.5 million acres of prescribed fire and 10.2 million acres of wildfire. See Table 1 and Figure 1 for a summary of these emission estimates nationally and by state.

The 2011 NEI Process: Fire activity and/or emission data were submitted by 24 state and local air quality and forestry agencies for processing in the 2011 NEI. Federal prescribed fire and wildfire databases were also submitted. Processing was accomplished by correlating the ground-based information with satellite fire detections, and EPA contractors worked closely with the submitting agencies in order to obtain a final best-estimate of fire activity and emissions across the U.S. If the state/local agency preferred that their emission estimates be used as-is, then EPA would honor that request. See U.S. EPA (2013) for further details.

What we need from you: A key element to this process is the ground-based information. Area burned and fire type (prescribed, wild, or crop) can be difficult or impossible to obtain from satellite data, especially for the thousands of smaller fires. Furthermore, ground-based/local information about the fuels and how a fire burned can be critical, such as in the case of the Pagami Creek Wildfire that occurred September 2011 in northern Minnesota.

> *Pagami Creek Wildfire*: Initial wildfire emission estimates included 24 inches of duff consumption making the wildfire the largest single source of PM2.5 in the state (exceeding twice the 2008 total state industrial emissions). The land manager reviewing the emission estimates had local knowledge of the fuels and fire behavior and realized that the emissions were far too large. Modifications were made, and emission estimates were reduced to approximately 1/3 of the original estimate to reflect burning of surface fuels and canopy, and 6-8 inches of duff.

Land Managers need to work with EPA and air quality agencies to create a realistic depiction of fire activity and emissions. In the 2011 NEI, 24 States reported information.

Why is the NEI Important? Emission inventories are used to simulate the chemistry of our atmosphere and are *applied for research, policy and regulatory purposes*. The NEI represents differences between wildfire emissions versus prescribed across the US. EPA uses the data to evaluate impacts of reducing or increasing certain pollutant sources to evaluate compliance with air quality standards. Policy makers and researchers can use EIs to estimate contributions and feedback between emissions and climate. Given that fire is a natural part of our ecology and that it is an important emission source, it is critical to have a realistic representation of fire emissions so that informed decisions can be made.

References

U.S. Environmental Protection Agency, 2013. 2011 National Emission Inventory, Version 1, Technical Support Document. November 2013 – Draft.
http://www.epa.gov/ttn/chief/net/2011nei/2011_neiv1_tsd_draft.pdf

Table 1. 2011 EPA NEI emission estimates of carbon monoxide (CO), volatile organic compounds (VOC), oxides of nitrogen (NOx), PM2.5, PM10, and total hazardous air pollutants (HAP) from crop residue burning, prescribed fire and wildfire. Units are in 1000s short tons. Source U.S. EPA, 2013.

Sector	CO	VOC	NOx	PM2.5	PM10	Total HAP
Crop Residue Burning	1,443	112	65	141	225	80
Prescribed Fire	10,308	2,375	171	921	1,085	261
Wildfire	14,494	3,302	195	1,267	1,493	322
Total Fire	26,245	5,789	431	2,329	2,803	663
(% Fire/All Sources[1])	(35%)	(32%)	(3%)	(37%)	(13%)	(18%)
Total All Sources[1]	75,971	18,264	15,684	6,342	20,946	3,643

[1]Excluding vegetation and soil.

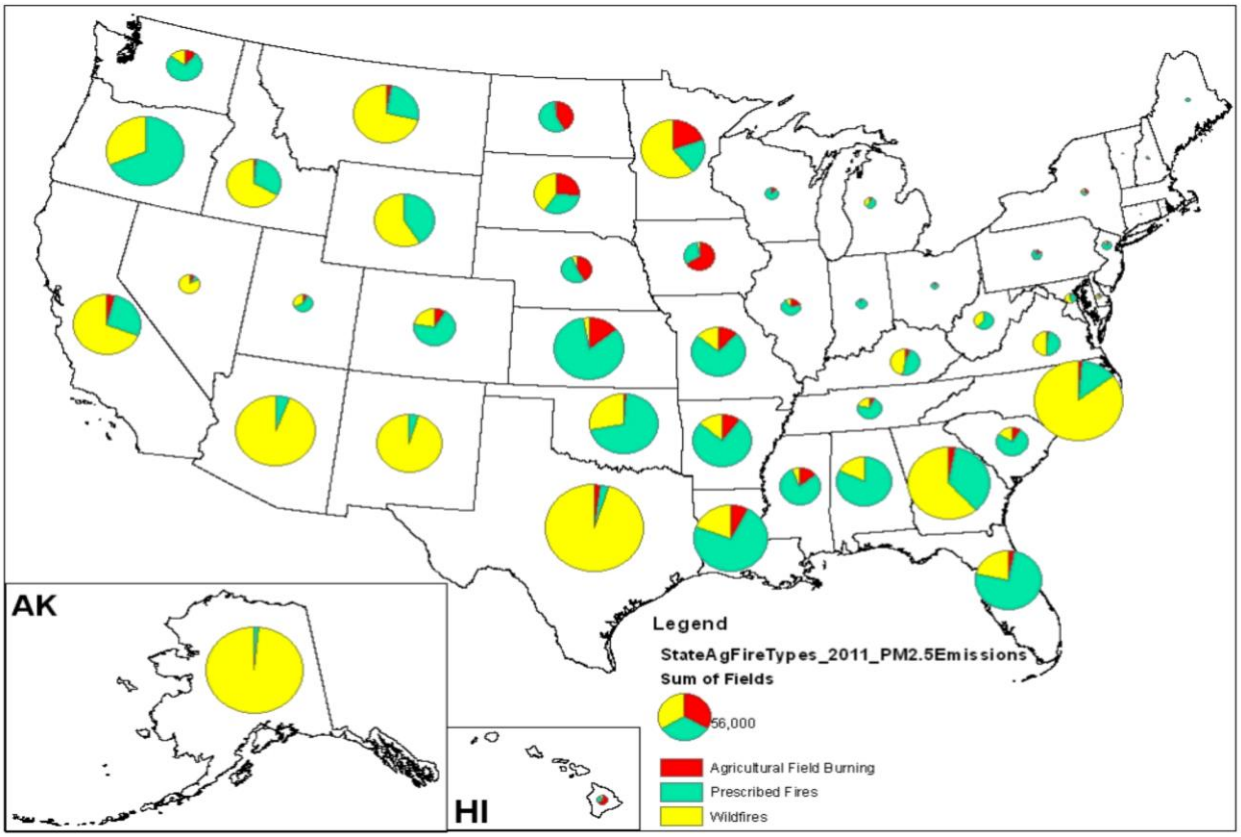

Figure 1. Percentage of PM2.5 fire emissions assigned to wildfires, prescribed fires and crop residue burning in the 2011 EPA National Emission Inventory (from U.S. EPA, 2013).

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