2011 National Emissions Inventory for Fires: EPA process, Comments, and a look forward to the 2014 cycle

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Outline of This Talk

- Other talks this morning
- General information on NEI (National Emissions Inventory)
- 2011 NEI process for Wildland (wild and prescribed) and agricultural fires
- 2011 SLT comments on wild, prescribed and agricultural fire emission inventories developed by EPA
- Summary of proposed 2014 process
  - How can we make process improvements to enhance review?
- What we hope to accomplish today/this morning

Nomenclature:

NFEI = National Fire Emissions Inventory (wild, prescribed, and agricultural fires)

WildLand Fires (WLFs) = Wild and prescribed fires

Other talks in this morning's session

- Tom will summarize Fires Summit survey results
- Sonoma Technology (Sean) will review EPA's 2011 methodology for wild and prescribed fires
- US Forest Service (Sim and Roger) will provide information on current state of tools used to estimate fire emissions and upcoming changes/improvements to those tools
- EPA (George)will provide an update to methods for agricultural burning emission estimates, possibly for use in 2014 NEI
- States will provide comments on 2011 NFEI process and estimates
- Forestry will provide an overview of fire data availability (??)
- Group discussion to follow these presentations, including what improvements can be made to the 2014 NEI proposed processes

National Emissions Inventory (NEI)

- The full NEI is on a 3-yr cycle (e.g. 2008, 2011, 2014)
  - Point sources (facility-process for ~100,000 facilities)
  - Nonpoint and mobile sources (county-process)—Agricultural Burning
  - Fires (daily/point)—Includes Wild and Prescribed Fires
  - Biogenic soil and vegetation (county)
- States, locals, and tribes are required to submit CO, SO_X, NO_X, VOC, PM_{10}, $PM_{2.5}$, NH_3, and Lead.
  - Basis is National Ambient Air Quality Standards (NAAQS) parts of the Clean Air Act
  - Use CAA-based emissions thresholds for “point”. States can go lower.
- Hazardous Air Pollutants (HAPs) and GHGs can also be voluntarily submitted
  - EPA augments the data to make HAPs more complete
  - Toxics Release Inventory helps (but only as facility-total, not process)

NEI Categories

- All emissions to the atmosphere included, whether regulated or unregulated, all counties
  - Electric power plants and industrial sources
  - Universities, hospitals, landfills, other commercial sources
  - Residential heating, gasoline fueling stations, dry cleaners, household solvent use, agricultural burning—County-based reporting (annual totals)
  - Farm animal waste, fertilizer, and agricultural burning
  - On-road vehicles – exhaust, evaporative, brake and tire wear, paved and unpaved road dust
  - Non-road engines – e.g., farm equipment, mining equipment
  - Aircraft, Ships, Railroads
  - Wildfires and prescribed burning—Day-specific emission estimates
  - Biogenics – soil and vegetation
- Some not included, notably:
  - Volcanos and other natural geothermal (SO2, PM)
  - Lightning NOx

Four Key NEI Goals

- Complete
- Represents the year of the inventory
- Uses best available information
- Transparent—includes the emissions origin
  - Who provided, factor, activity, method

NEI Uses

- A critical input for many EPA analyses
  - Inputs for detailed air quality and risk modeling at national, regional, and local levels
  - EPA NAAQS-related rules and Regulatory Impact Assessments (RIAs)
  - Planning ambient monitoring network locations
  - Factor in designations of non-attainment areas
  - Large scale summaries and trends assessments
- A resource to many outside EPA
  - Upholding international reporting treaties
  - Research

Role of states versus EPA

- The presumption of the NEI program is that states are responsible for the emissions estimates; derived from NAAQS/CAA
- While EPA can create and promote emissions factors & methods, states choose the methods to apply
- We allow states to meet their obligations by accepting EPA estimates where we have them
  - Emission estimates can be improved with local inputs
- While we ask for some “method” information from states, we do not always get it (e.g., activity and emission factors)
- For WLFs, most states decide to choose our data (exceptions in 2011 were GA and DE for wild and prescribed fires and WA for prescribed fires)

2011 NEI v1 Fire Inventory Process

- EPA posted draft estimates
- States reviewed these estimates and had the option of submitting activity and other data or actual emissions
  - For WLFs, EPA discouraged states from submitting actual emissions and suggested instead they submit activity data, which some did
    - Mostly data on acres burned, location and type of fires
    - Limited amount of fuel information—not used
    - Big thanks to WRAP for FETS data
  - For Ag fires, some states (12) submitted their own emissions data
- EPA provided states with a cleansed version of the activity data they submitted, with indication of which data can be used for processing
- EPA then used these data to generate final emissions
  - Default activity data were used to generate emission estimates for states that did not submit activity data of their own
- It should be noted that EPA got resources later in the process than we had hoped, which caused delays in progress.
- There may be a need for more review and "back and forth" time with the last two steps listed above. In 2014, we hope to be able to build that extra time into the process of developing a v1 inventory.

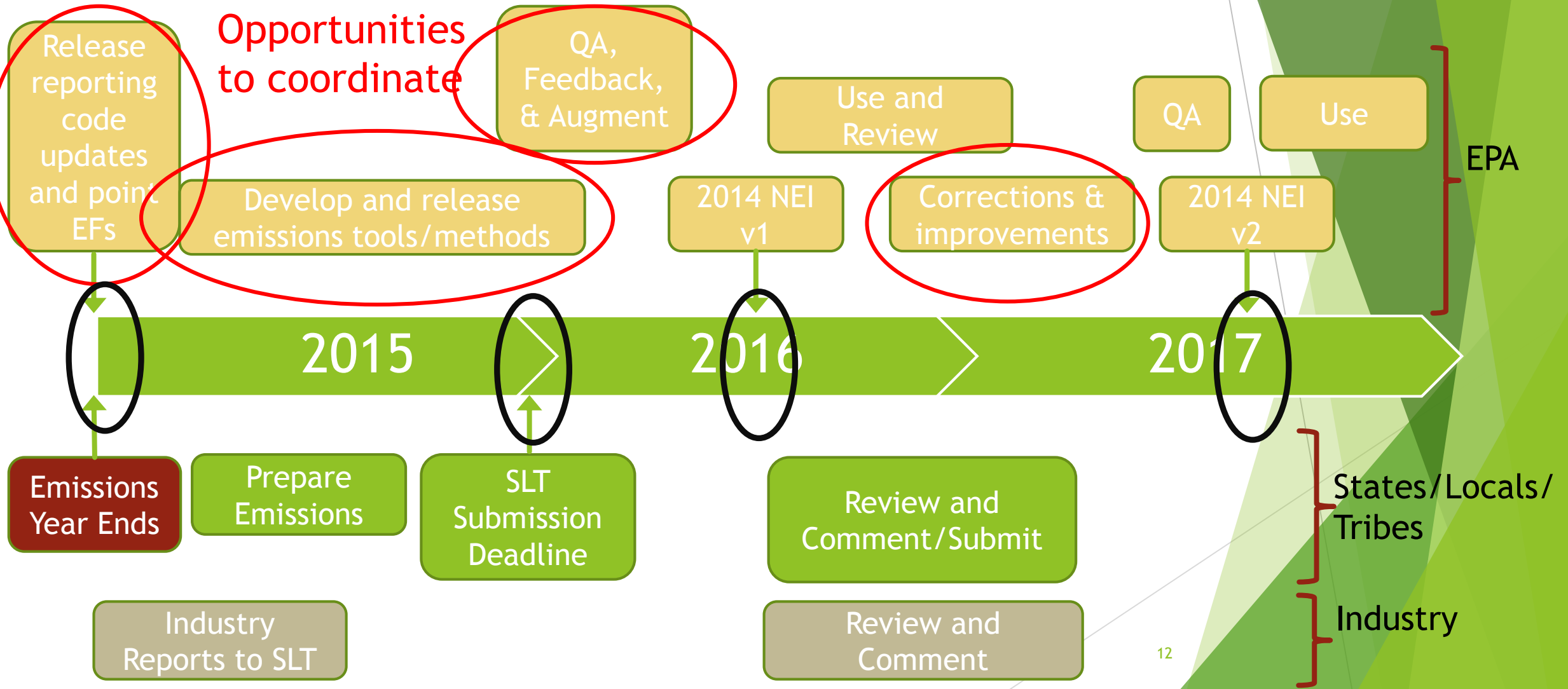
General comments received on 2011 NFEI

- Agricultural fire emissions/activity too high, especially in Midwestern States
- In the Southeast, VOC emissions too high from WLFs
- In the Northwest, EFs of SO2, NH3, and VOC need to be reviewed for WLFs
- Misclassified fires using EPA's methods
- Possibility of using region-specific inputs to estimate emissions (fuel loading, emission factors, fuel consumption…)
- Possible to have resources to do re-running of emission estimates between v1 and v2 NEI?
- More details on some of this will be given by the states this morning

Resource issues with development of emission estimates and NEI version roll-outs

- EPA needs to develop a national database of fire emission estimates with limited resources
  - Preserves methodology
  - Preserves pollutant coverage (including HAPs)
  - In 2011, we used a consistent emissions estimation methodology augmented with activity data obtained from local agencies
- In 2011, USFS helped greatly by funding the NEI process for fires by collecting local activity data and processing it for use in our emission estimating process
- We hope to do this again in 2014
- Often we receive comments after the inventories have been finalized (made public via a version release)
  - Difficult to re-run emission estimates “after the fact”
  - Lots of overhead required to release new versions of an inventory to the public, usually we do a v1, and then a v2 that takes into account comments made on the v1 release

NEI Timeline – example 2014 NEI



NEI 2014 Timeline, applied to Prescribed and Wild Fire Inventories developed by EPA

- Current Proposal
  - Fire activity due: 5/15/2015
    - EPA needs to supply information on formats
    - EPA needs to supply information on changes from what was submitted in 2011
  - Review of Fire Activity data with those that submitted it and a buy-off on final useable data: 7/15/2015
  - Post DRAFT EPA's Fire Emission Estimates on NEI website: 9/15/2015
  - Review period for EPA Fire Estimates: 10/15/2015
  - Corrections re-run through model, including processing of any new data we receive: 11/30/2015 (we have never done this before)
  - Review of corrections (back and forth with SLTs and others): 11/30/2015-1/1/2016
  - EPA-estimated EVENT emissions (final) available in EIS: 1/20/2016
  - Download and review of EPA fire estimates: through end of February 2016
  - Develop v1

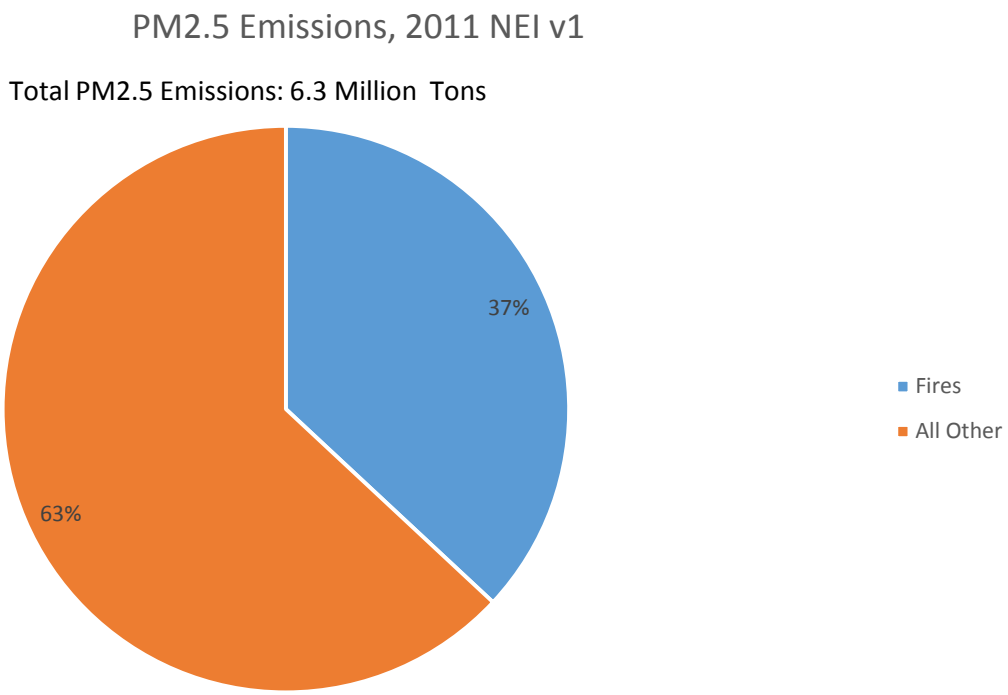
This proposed process is open to discussion. How do we build in max time for review and back and forth to arrive at an inventory we can all be happy with? Limited resources prevent re-running of corrections through model.

Planned new items for 2014 WLF Inventories

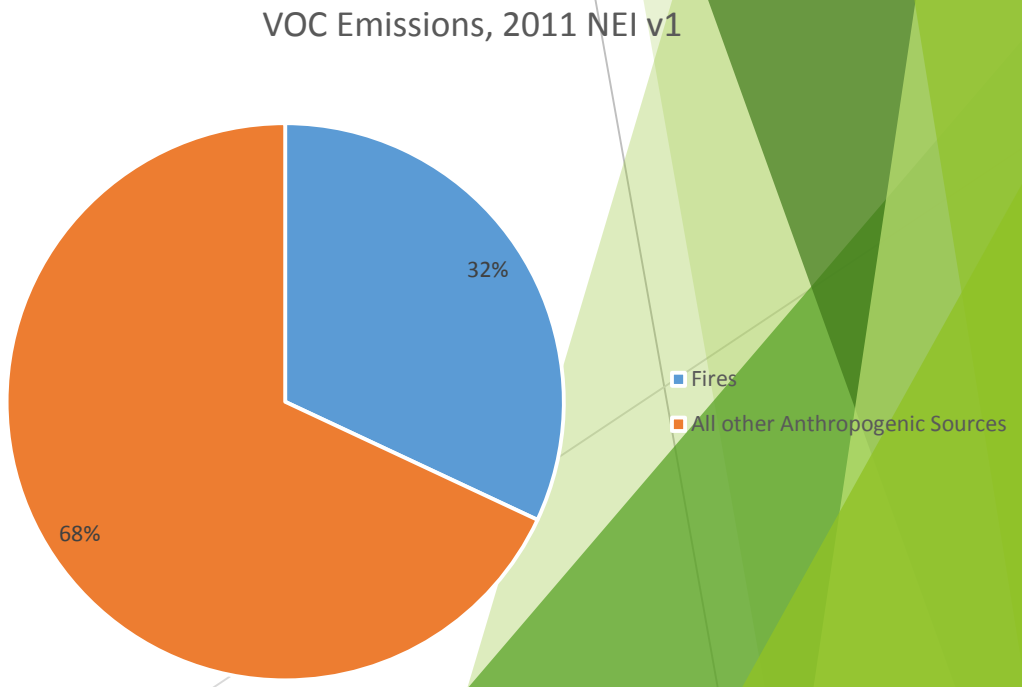
- Inclusion of smoldering and flaming emissions separately
- Inclusion of Pb as a pollutant from WLFs
- Inclusion of Hg as a pollutant from WLFs—still in discussion phase
- Splitting Prescribed Fires into “forested” and “rangeland” (if possible)
- Updating some of the HAP EFs, introducing some new ones
  - Literature review and archive

What about NFEI beyond v1

- V1 of the NEI generally undergoes review, and once those comments are addressed, EPA develops a final v2 of the NEI
- In 2011, for fires, v1 was the final inventory
  - Due to resources, EPA could not re-run anything for v2
  - Some states did submit their own emission estimates between v1 and v2, that we used in v2
  - Some states also asked for some rescaling/reassigning to be done based on misclassified fires
- In 2014, unless we can save some resources (or get additional resources) for re-running the model, it's likely we will follow the same path as 2011



- Fires significant contributors to PM2.5 emissions, VOC emissions, and several Air Toxics in v1 of the 2011 NEI



Afternoon Session

- Will be coordinated by Tom Moore
- Talks center on GHGs and uses of fire emissions inventories
  - OAP will discuss GHG Emissions from Biomass Burning
  - ORD will discuss their perspectives on Fire Emissions and their use
  - OAQPS/EIAG will discuss emissions modeling perspectives
  - State of GA will discuss future projections of fire emissions
  - ARB will discuss Regional Haze implications of fires
  - OAQPS/AQPD will discuss Exceptional Events