The 2014 National Emission Inventory for Rangeland Fires and Crop Residue Burning

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Background

• Biomass burning is an important contributor to the degradation of air quality because of its impact on ozone, particulate matter and Hazardous Air Pollutants (HAPS).
• Crop residue burning characterization in previous emission inventories has been difficult to stabilize
• Feedback from the states has been inconsistent with remote observations
• A more robust method is needed for the National Emission Inventory (NEI).

Previous NEI Methods

• 2002 NEI: 23 states reported emissions for this sector, no satellite information was used.
• 2005 NEI: This sector was not estimated, 2002 estimates used.
• 2008 NEI: SMARTFIRE/Hazard Mapping System (HMS) fire detections used one fixed field size, emission factors all mapped to one SCC.
• 2011 NEI: J. McCarty satellite-based procedure used based on changes in the land surface over an 8 day period plus updates from the states, McCarty (2011)

Disclaimer: Although this poster has been peer-reviewed, it does not necessarily reflect the views or policies of the U.S. Environmental Protection Agency.

State Submitted Estimates for 2014

Summary and Future Directions

• 2014 NEIv1 for crop residue and rangeland burning used data from multiple sources and addressed some of the shortcomings in previous methods for this sector
• Improve the geolocation of crop residue fires and identification
• Testing method for other years 2013, 2015, 2016
• Incorporate into the SMARTFIRE system to avoid double counting and undercounting
• Update Emission Factors with latest available measurements
• Understand differences between EPA and state submittals

Example: HMS Fire Detections Oct 30, 2014

Example: Cropland Data Layer (2010)

Example: Cropland Data Layer (2010)

Table 1

<table>
<thead>
<tr>
<th>Year</th>
<th>Source</th>
<th>PM2.5 (Tons/Year)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>NEI</td>
<td>224,684</td>
<td>23 states reported only</td>
</tr>
<tr>
<td>2008</td>
<td>NEI</td>
<td>49,653</td>
<td>HMS data, Smart Fire Based</td>
</tr>
<tr>
<td>2011</td>
<td>NEI</td>
<td>141,184</td>
<td>based on McCarty &amp; states</td>
</tr>
<tr>
<td>2014</td>
<td>NEIv1</td>
<td>28,927</td>
<td>State submitted data</td>
</tr>
<tr>
<td>2014</td>
<td>NEIv1</td>
<td>64,994</td>
<td>Final version 1</td>
</tr>
</tbody>
</table>

2014 Method

• Hazard Mapping System (HMS) daily operational satellite product
• Year-specific National Agricultural Statistics Service (NASS) cropland data layer product
• Emission factors (same as in 2011)
• Average field size by state
• Grassland/Pasture separated from crop
• No double counting with other parts of the fire inventory (wildfires & prescribed fires)
• State review of data with additional filtering
• Daily snow cover used to filter out fire detections in the winter
• Crop residue emissions: day-specific, county level, by crop type emission inventory for 2014
• State specific inputs replace EPA estimates

2014 Timeline

• May 2015: EPA-based draft emission estimates posted on CHIEF for review by the states
• May 2015-Dec 2015: State/Local/Tribal (SLT) review of EPA estimates
• Jun 2015-Jan 2016: SLT submittals
• Feb 2016-May 2016: Review of SLT submittals and revisions to EPA estimates based on comments received from SLTs
• Sep 2016: Final NEI v1
• Aug 2017: Expected Final NEI v2

2014 EPA estimate of PM2.5 from Crop Residue and Rangeland Fires

Sources: