AIRPACT Emissions Inventory Workgroup

Annual Meeting

Boise, ID - June 18 - 20, 2014

Workgroup Members and Contributors

- Jen Cole, IDEQ
- Mary Fauci, Nez Perce Tribe
- Farren Herron-Thorpe, WAECY
- Bob Kotchenruther, EPA
- Rick Hardy, IDEQ
- Sim Larkin, USFS
- Warren McCormick, BC Ministry of Envir.
- Robert Nissen, Envir. Canada
- Sally Otterson, WAECY

- Miyoung Park, ODEQ
- Janice Peterson, USFS
- Gary Reinbold, IDEQ
- Wes Risher, ODEQ
- Erik Saganic, PSCAA
- Sara Strachan, IDEQ
- Stephanie Summers, WAECY
- Chris Swab, ODEQ
- Joe Vaughan, WSU
- Wei Zhang, IDEQ

Task: Update Emissions Inventory and Supporting Information for AIRPACT

- Develop inventory preparation and quality assurance plan.
- Create and compile emissions estimates for counties and provinces in the modeling domain.
- Allocate emissions to 4-km grids by hour.
- Speciate emissions into model species.
- Format data for SMOKE emissions processor.
- Design reports and other data outputs.
- Implement quality control/assurance procedures.
- Documentation

Inventory Pollutants

Model Pollutants

- CO
- NH3
- NOx
- PM10
- PM2_5
- SO2
- VOC

Tracers - CAPs

- DSPM2_5
- GASPM2_5
- WSPM2_5

Tracers - Toxics

- 1,3-Butadiene
- Acetaldehyde
- Acrolein
- Arsenic
- Benzene
- Chromium
- Dichloromethane
- Ethylbenzene
- Formaldehyde
- Lead
- Manganese
- Mercury
- Naphthalene
- PAH
- Toluene
- Xylene

County Emissions Estimates

- 2011 Inventories are the starting point
- Point
  - Traditional point sources, some livestock operations, airports, rail yards
- Nonpoint
  - Also includes locomotives and ships
- Nonroad 2014 emissions from EPA's NONROAD model
- Onroad 2014 emissions using the SMOKE-MOVES model processing
- Fire and Biogenic emissions are provided by WSU.

Canadian Emissions

- Agency supplying data
  - Environment Canada
- Mike Moran and Qiong Zheng at EC / Ontario can provide SMOKE-ready files and ancillary data for all of Canada
  - so far we have received the 2006 datasets
  - we will receive 2010 datasets later this year (after EC provides them to EPA)

Emissions Processing – Missing Data

- PM2.5 = PM10, if missing.

- PM10 = PM2.5, if missing.

- PMx = the greater of PMx-primary and (PMx-filterable + PM condensable).

- PM2.5 tracers for diesel, gasoline, and woodsmoke are calculated using PM2.5 with source classification codes.

- Missing stack parameters are filled with defaults by source classification code.

Allocate emissions to 4-km grids by hour

- Spatial Surrogates to allocate emissions to grids
  - Population, households, household fuel source, land cover, railroad track/activity, vehicle miles traveled, ship paths, ports.
- Temporal Profiles to allocate emissions by hour
  - Updating to latest EPA modeling platform profiles for month, day of week, and hour of day.
- Residential Wood Combustion Temperature Adjustment and Spatial Allocation
  - Spatial surrogate experimentation: blend of total households and household heating source; other options
  - Adjust for hourly or daily forecast temperature.

Quality Assurance

- Default Stack Parameter Updates in AIRPACT
  - used surrogates and similar SCCs to determine appropriate defaults (pstk)
  - over 200 point sources are now using SCC-specific defaults rather than fugitive default
- Next Steps
  - Process the new EI with SMOKE for map-making
    - any suspicious high volume sources?
    - any inconsistencies across borders?

Emissions Outputs for Reports and Maps

- Create monthly AIRPACT emissions reports by grid cell by SCC that can be used for QA/QC and SIP development
  - Use the built-in "SMKREPORT" program that exists in SMOKE
  - Generate separate daily reports for point, non-road, area, and mobile sources
  - Sum daily emissions to monthly totals
  - Provide monthly emissions reports on AIRPACT website

Documentation

- Documentation will include:
  - Agencies supplying emissions and supporting data
  - How missing data was treated
  - Spatial surrogates and assignment to source categories
  - Temporal profiles and assignment to source categories
  - QA/QC performed and results
  - Reports and other data outputs
- Documentation will not include information on development of the emissions estimates. This information can be requested from the agencies providing the data.