AERMOD Modeling System Update

Roger W. Brode
U.S. EPA/OAQPS
Air Quality Modeling Group
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Outline

- Recap of current AERMOD status
- Recent AERMOD developments
- Other AERMOD-related activities
- Clarification Memo regarding proprietary versions of AERMOD

Current AERMOD Status

- Significant updates to all AERMOD components released January 2007 (dated 06341), with limited update to AERMOD (dated 07026)
- AERMOD model changes include enhancements to improve support for urban-scale applications
  - Additional options to vary emissions by month, hour-of-day and day-of-week (MHRDOW, MHRDOW7)
  - Multiple urban areas in single model run
  - Improved memory management
- Updates to PM-2.5 processing in AERMOD
- Beta-test options for capped/horizontal releases

AERMOD Status (cont.)

- AERMET updates included significant changes to processing of NWS Integrated Surface Hourly Data (ISHD) surface data (TD-3505)
  - Selection of which record to process for hours with multiple records
  - Processing of cloud cover codes
  - Identify “variable” winds as missing WD and non-missing WS rather than calm
- Several additional bug fixes in AERMET
- Single AERMET executable

AERMOD Status (cont.)

- Significant changes in AERMAP related to datum (NAD) conversion process
  - Previous version did not account for shift due to UTM-Lat/Lon conversion
  - Error typically about 200m in Northing coordinate
  - Incorporated NAD conversion for DOMAIN extent
  - Clarified and simplified treatment of DEM file gaps
- Corrected bug with method to optimize hill height scale calculation by skipping adjacent DEM files
- Enhanced debug output options, fixed several bugs, and incorporated additional optimizations

AERMOD Recent Developments

- Updates to all three AERMOD components nearly complete – to be released ASAP
  - Miscellaneous bug fixes in all components
  - Improvements in code portability across compilers and platforms (Windows/Linux) for all AERMOD components
  - Update to Intel Fortran Compiler (about 40% runtime improvement)
  - User's Guides being updated to incorporate Addenda & corrections
- AERMOD updates include:
  - Modified optional urban roughness length to be non-DEFAULT for values other than 1.0 meter (per discussion in Section 5.3 of *AERMOD Implementation Guide*)
  - Added options to vary emissions by hour-of-day and day-of-week (HRDOW and HRDOW7)
  - Improved efficiency of storage allocation (especially for AREAPOLY)
  - Potential option to optimize AERMOD for some applications with modified meander approach (more about this later)

AERMOD Recent Developments

- AERMAP updates include:
  - Support for Alaska DEM files (1-deg, 15-min and 7.5-min data)
  - Support for National Elevation Dataset (NED), available from USGS Seamless Data Server in GeoTIFF format
  - Use of “mixed” DEM files (1-deg & 7.5-min); can be used to fill gaps in 7.5-min coverage, such as over water grids; no support for mixed DEM/NED data
  - Domain keywords (DOMAINXY/DOMAINLL) will be optional; will use all available data if omitted
  - Support for INCLUDED keyword on RE and SO pathways
  - Minor adjustments to improve applicability beyond U.S.

AERMOD Recent Developments

- AERMAP updates include:
  - Oh, I almost forgot . . .
    - Allocatable arrays!

AERMOD Recent Developments

- AERMET updates include:
  - Corrected cosmetic bug with user-specified station elevation (incorrectly reported as 100m in report files)
  - Make broader use of station elevations from data files (ISHD & SAMSON) or user-specified elevations
  - Corrected problems with time zone adjustments for cases with surface and onsite stations in different zones
  - Added optional user-specified upper air sounding window, currently hardwired to 11-13Z
  - Incorporated changes to handle ISHD files with “problem” addressed on interim basis by *FIXISHD* utility

Proprietary AERMOD Memo

- Clarification Memo issued regarding regulatory status of proprietary versions of AERMOD
  - Issue highlighted by proliferation of “parallelized” versions of AERMOD (yes, we know it’s slow)
  - Appendix W explicit that EPA-preferred model cannot be proprietary
  - Requirements for acceptance of results from these products are straight-forward; requires equivalency demonstration
  - Memo expresses expectation that outputs from these proprietary products be easily distinguishable from official EPA version of AERMOD

Questions?