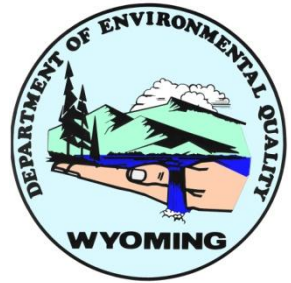


WDEQ Modeling 101

Upper Green River Basin Air Quality Citizens Advisory Task Force

March 21, 2012

Pinedale, WY



Air Quality Modeling

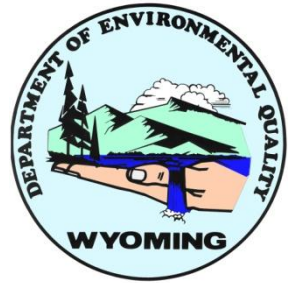
- ◆ Mathematical descriptions of pollution transport, dispersion and related processes in the atmosphere
 - Considers emissions and emission source information, meteorology, topography, land use, etc.
- ◆ Estimates air pollutant concentration at many locations
- ◆ Used to estimate impacts from single source or many sources
- ◆ Informs strategies for and effectiveness of air quality management



Common Models

- ◆ AERMOD
 - Near field model
 - Often used for single source or in-field impact analysis
 - Does not predict secondary pollutants (ozone & PM_{2.5})
- ◆ CALPUFF
 - Dispersion model
 - Used for regional (mid-field and far-field) analyses
 - Does not predict secondary pollutants (ozone & PM_{2.5})
- ◆ CMAQ, CAMx, CALGRID
 - Photochemical Grid Model (PGM)
 - Used for regional analyses
 - Considers chemical processes that lead to secondary pollutants (ozone and PM_{2.5})

UGRB Winter Ozone Modeling



Goal: To develop a winter ozone model configuration suitable for the Division's air quality management decisions

Modeling Completed or Underway:

- ◆ Meteorological Modeling Completed
 - Simulates meteorology of the 2008 winter ozone episodes
 - Drives meteorological inputs of dispersion and grid models
 - CALMET
 - WRF
- ◆ Completed Dispersion Modeling using CALPUFF
 - Used to inform conceptual understanding and inform decisions related to PGM
 - Analyzed vertical distribution of emissions from compressor stations and drilling rigs in the UGRB during 2008 winter ozone episode
- ◆ Underway PGM Analysis and Model Evaluation of CMAQ and CAMx
 - Base Case model performance evaluation focused on February and March 2008 (most data rich year)
 - Evaluation of both CMAQ and CAMx to determine best model for UGRB Winter Ozone Analysis
 - Better performing model used to inform control strategies and air quality management decisions for the UGRB
 - Target completion date of end 2012