

# Multiscale Atmospheric Dispersion

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## Application User Requirements

- Credible Models are Required by the Energy Industry and the Energy Policy Communities, for Prediction, Assessment, and Strategic Purposes
- Energy Policy in the Context of Air Quality Standards
- Energy Policy in the Context of Economic, Human Health, and Technological Impacts

## Research User Requirements

- Sophisticated Models Required to Understand and Quantify the Complex Interactions among Meteorology, the Atmospheric Chemistry of Gases, and Aerosol Chemistry and Physics
- Because Dispersion is an Important Factor in this Mix, we need Models that describe it well over a Variety of Scales, from tens of meters or less up to hundreds of kilometers or more
- Sophisticated or Research Models can then be used to develop Parameterizations for Application Models

- Research Requirements in Atmospheric Chemistry
  - Understanding the Atmospheric Photochemistry of VOCs
  - Understanding of Heterogeneous Reactions
  - Understanding of Co-pollutant Relationships
  - Better Characterization of Wet- and Dry- Deposition Processes
  - Better Emission Inventories for PM and Ozone Precursors
  
- Research Requirements in Environmental Meteorology
  - Urban- and Regional-Scale Transport
  - Transport of Pollutants Across Borders
  - Transport by Mean Winds
  - Diffusion Through Turbulence
  - Vertical Transport and Mixing
  
- Current Program ~ \$ 12m per year

## Additional Requirements

- Improved Understanding and Model-Based Description of the Loading and Properties and Transport of Atmospheric Aerosols in Relation to Sources
  - Air Quality and Climate Change Drivers
  - Meeting PM 2.5 and PM 10 Standards
  - Atmospheric Processes in the Context of Human Health and Exposure