

# ***Regional Scale Analysis of Gas and Aerosol Distributions in Support of the ARCTAS Mission***

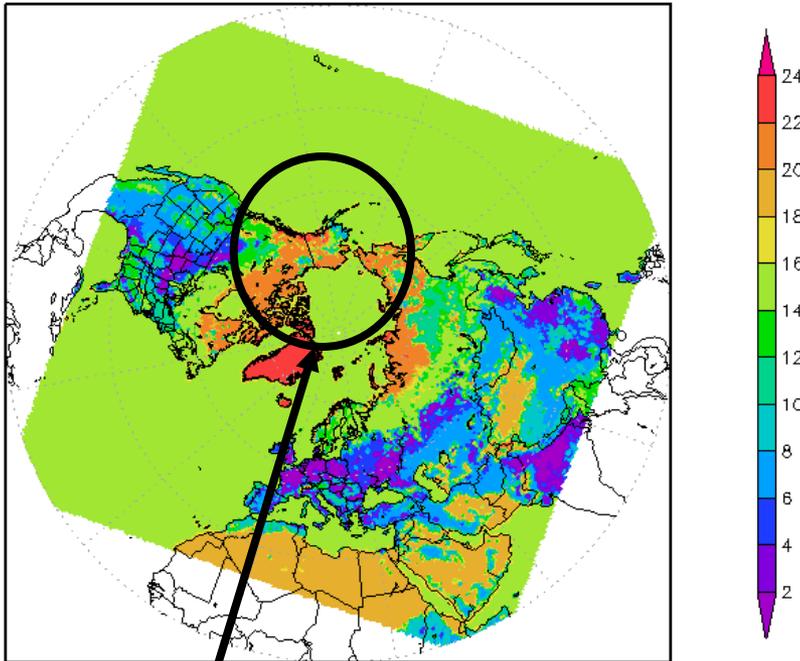
**University of Iowa & Argonne National Laboratory**

The major activities are to:

- [provide high resolution 3-D regional-scale forecasts](#) of trace gas and aerosol distributions, and meteorological fields in support of the intensive aircraft measurements;
- [develop gridded emission inventories](#) of all major pollutants of interest to the ARCTAS mission for the time period of the mission, 2008, needed to support all chemical transport modeling activities of ARCTAS, including mission flight planning and post-mission analysis of observations; and
- [perform ARCTAS data analysis](#), with emphasis on quantification of the pathways of long range transport of pollution to the Arctic of aerosols, ozone and mercury; with additional activities including the calculation of aerosol fields constrained by formal integration (assimilation) of observations (remote-sensed and in-situ) for use in aerosol radiative forcing analysis, and analysis of aerosol, ozone, and mercury interactions.

# ***Illustrative domain for the regional-scale analysis using WRF-STEM.***

Proposed 340x340 50km domain over Arctic



***Zoom domain (higher resolution) encompassing the aircraft operations areas for the various stages of the experiment***

**Final domains and parameters to include will be based on discussions with the science team - input needed and welcomed!**

**New features of the model to be utilized in the forecasts and analysis will include:**

- ✓ the extension of the model domain to cover much of the northern hemisphere;
- ✓ increased vertical resolution to support mission planning and better characterize transport pathways;
- ✓ the addition of mercury and other species to support hemispheric analysis of source/receptor relationships of ozone, aerosols (e.g., and mercury to the Arctic; and
- ✓ additional aerosol components, including optical properties to support flight planning and interpretation of the aerosol radiative forcing aspects of the mission.

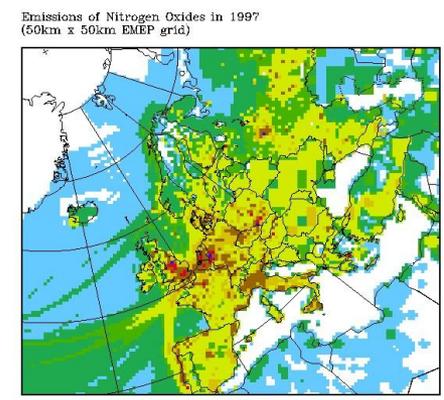
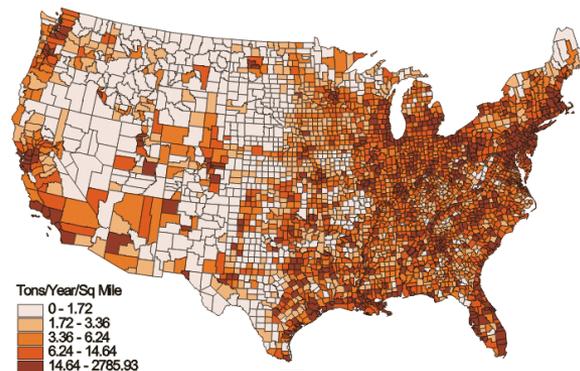
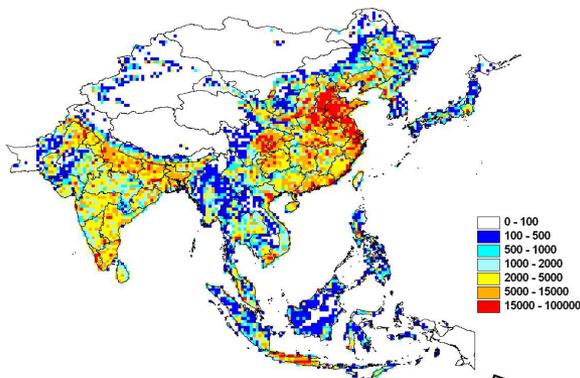
# Components of the ARCTAS emission inventory

*David Streets will provide further details*

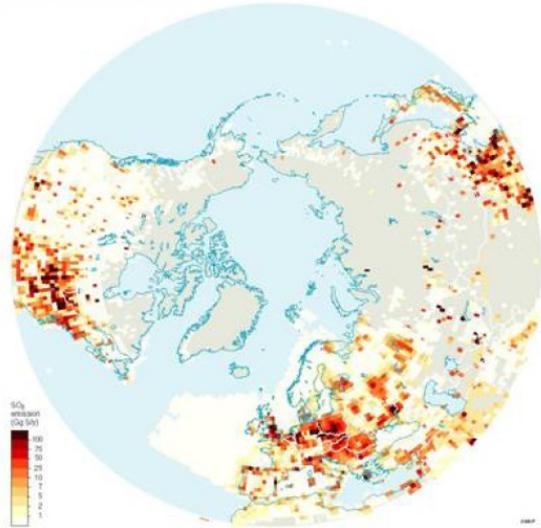
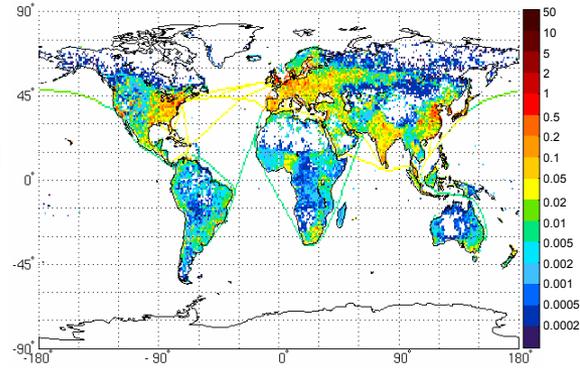
US NEI

EMEP

INTEX-B Asia 2006



EDGAR, GEIA (global defaults)



Detailed and updated data for Canada, Mexico, and Russia

