

Other existing and projected NEESPI Focus Research Centers

Brief information

Existing NEESPI Focus Research Centers

NEESPI Focus Research Center on Aerosol Studies:

- **Venue:** School of Earth and Atmospheric Sciences (EAS)
Georgia Institute of Technology, Atlanta, USA
- **Objectives:** conduct, facilitate, and promote research aimed at improved understanding of interactions between changing aerosols and the earth systems in Northern Eurasia
- * **Links to International Projects:** GEWEX, GCP
- **Leaders:** Sokolik, Curry, Dickinson
- **Current science foci:**
 - Impact of aerosols on variations in the Arctic hydrological cycle
 - Impact of wind-blown desert dust on ecosystem functioning, precipitation, and energy budget
 - Climate forcing of urban industrial pollutants and biomass-burning smoke
- **Pending proposals to the NSF Arctic System Program, NASA, NOAA, and to IPY**
- **Other relevant activities:**
 - ✓ Georgia Tech is applying for a NOAA Cooperative Institute
 - ✓ Georgia Tech is seeking to establish the DOE Southeast Regional Center for the National Institute for Climatic Change Research

Diverse sources of aerosols in Northern Eurasia affect, climate, ecosystems, economy, and human health



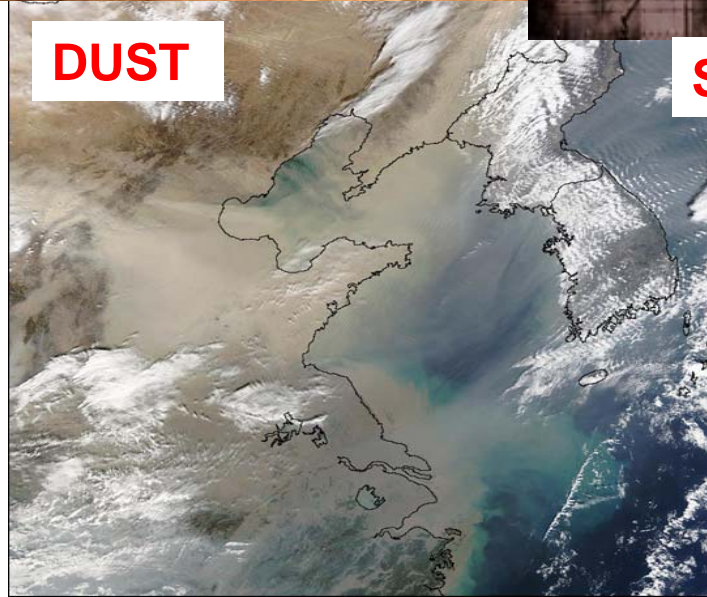
DUST



SULFATES



SMOKE



There is a clear need for improved knowledge of interactions between changing atmospheric aerosols and the Earth System to increase confidence in our understanding of how and why the climate and environment have changed

What is proposed to address the problems within NEESPI and NEESPI-related projects

Current Projects:

- Evaluation and forecasting of the atmospheric concentrations of allergenic pollen in Europe, POLLEN, *Finnish Academy of Sciences* in collaboration with seven institutions from EU and Russia.

• Pending Projects:

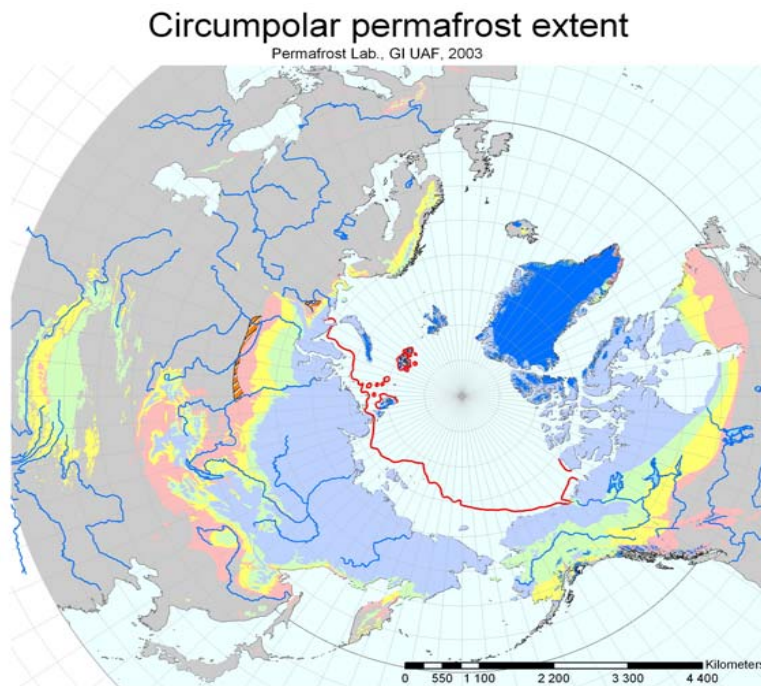
- Impact of Aerosols on Variations in the Arctic Hydrological Cycle, *NSF (pending)*
- Understanding the role of changes in land-use/land-cover and atmospheric dust loading and their coupling on climate change in the NEESPI study domain drylands, *NASA (pending)*
- Atmosphere aerosol/dust composition and loading for the last two hundreds years derived from snow/ice core records, surface meteorological and lidar aerosol monitoring data throughout central and eastern Asia calibrated with NASA remote sensing data, *NASA (pending)*

NEESPI Focus Research Center for Cold Land Processes and Arctic Coastal Studies

- **Venue:** International Arctic Research Center, University of Alaska Fairbanks, Alaska
- **Objectives:** conduct, promote, and facilitate research aimed at improved understanding and modeling of the cold land processes in the Earth System focusing on Northern Eurasia and its coastal zone
- **Links to International Projects:** CliC
- **Leaders:** Romanovsky, Walsh, Walker, Sergienko
- **Current Science foci:**
 - Permafrost
 - Cold land hydrology and global biogeochemical cycles
 - Cryosphere interactions with climate, biota, and environment
 - Humans in the Arctic
- **Funded and pending proposals to NSF, NOAA, NASA, JAMSTEC, JAXA, Far Eastern Branch of Russian Academy of Sciences, DOE, and to IPY.**
- **Other relevant activities:**
 - ✓ The Focus Research Center is going to serve as one of the base institutions for CliC studies in Northern Eurasia and Alaska

Changes in terrestrial cryosphere are among the strongest contemporary environmental changes.

However, these changes as well as their associated feedbacks and impacts are still inadequately described within the contemporary Earth System Models.



The stability of the ecosystems in more than a half of Northern Eurasia and north North America relies on the stability of ice that, so far, holds these systems together.

During the 20th century, we observed snow cover and glaciers' retreat and permafrost thaw affecting water supply, land cover, and the carbon cycle

Cold Land problems are currently addressed within NEESPI and NEESPI-related projects

- **Current projects:**

- Permafrost/Frozen Soil Models and Observations, IARC/NSF
- Biogeochemistry of the Laptev and East Siberian Seas, IARC/Far East Branch of the Russian Academy of Sciences
- Circumpolar Vegetation Map, NSF

- **Pending proposals:**

- Thermal State of Permafrost (TSP): The U. S. Arctic Contribution to the International Network of Permafrost Observatories, NSF
- Current climate changes over Eastern Siberia and their impact on permafrost landscapes, ecosystem dynamics, and hydrological regime, NASA
- Permafrost Dynamics within the Northern Eurasia Region and Related Impacts on Surface and Sub-Surface Hydrology, NASA
- Permafrost Ground Ice as a Potential Freshwater Source in the Arid Regions of Central Asia, NASA
- Application of space-based technologies to examine land-cover/land-use change along a transect on the Yamal Peninsula and Novaya Zemlya, Russia, NASA

Projected NEESPI Focus Research Centers

NEESPI Focus Research Center for Biogeochemical Cycle Studies

- **Suggested Venue:** Max Planck Institute for Biometeorology, Jena, Germany
- **Objectives:** conduct, promote, and facilitate research aimed at improved understanding and modeling of biogeochemical cycle processes in the Earth System focusing on Northern Eurasia
- **Links to International Projects:** GCP, IGBP
- **Leaders:** Heimann, Schultze,
- **Current Science foci:**
 - ...
 - ...

NEESPI Focus Research Center for Integration of the NEESPI Results and Modeling Studies

- **Suggested Venue:** TBD
- **Objectives:** conduct, promote, and facilitate research aimed at integration of the NEESPI studies into a suite of global and regional models that seamlessly incorporate all regionally specific feedbacks associated with terrestrial processes in Northern Eurasia
- **Links to International Projects:** WCRP, IGBP
- **Leaders:** Shugart, Isaev, Kotlyakov, Lettenmaier, Wood, Kattsov, Mokhov, Schmullius, + TBD
- **Current Science foci:**
 - ...
 - ...
- **Funded and pending proposals to RAS, NASA, EC, NSF, and NOAA**