Northern Eurasia Earth Science Partnership Initiative

- International, multi-agency program for Earth science research in northern Eurasia focused on ecosystem-climate interactions

- Almost a quarter of the global land, representing most of the existing geo-botanic zones except for tropical

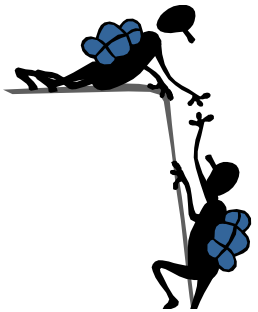
- Challenges: many countries, many languages, different mentalities, remote locations

- Advantages: plenty of data, talents; existing scientific infrastructure

NEESPI's Functions:

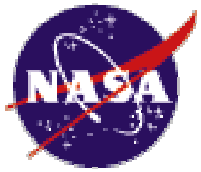
- Coordinate ongoing scientific activities in Northern Eurasia by international teams; facilitate scientific networking

- Expedite regional data exchange; provide assistance with logistics in international scientific collaborations
- Match scientific research partners from North America, Europe and Japan with regional NEESPI in-country scientists
- Utilizing corporate knowledge and scientific infrastructures in the region; involve young talents in the scientific regional research



Opportunities

- Existing infrastructure
  - Data rescue
  - Data- and talent-rich geographic area
    - Legacy of the USSR (in a positive sense) - century-old science, observational networks and long-term data records
- EU, Russia, China, Japan: Active contributors in the Earth research from space
  - Long history of remote sensing (including classified/declassified information)
- New age of communications
  - Opportunities in fast electronic communications and data exchange
- Open interactions
  - Interactions with in-country scientists are really possible as compared to 15 years ago
  - Existing infrastructure for doing cal/val work still solid but, if not supported, may gradually loose its functionality

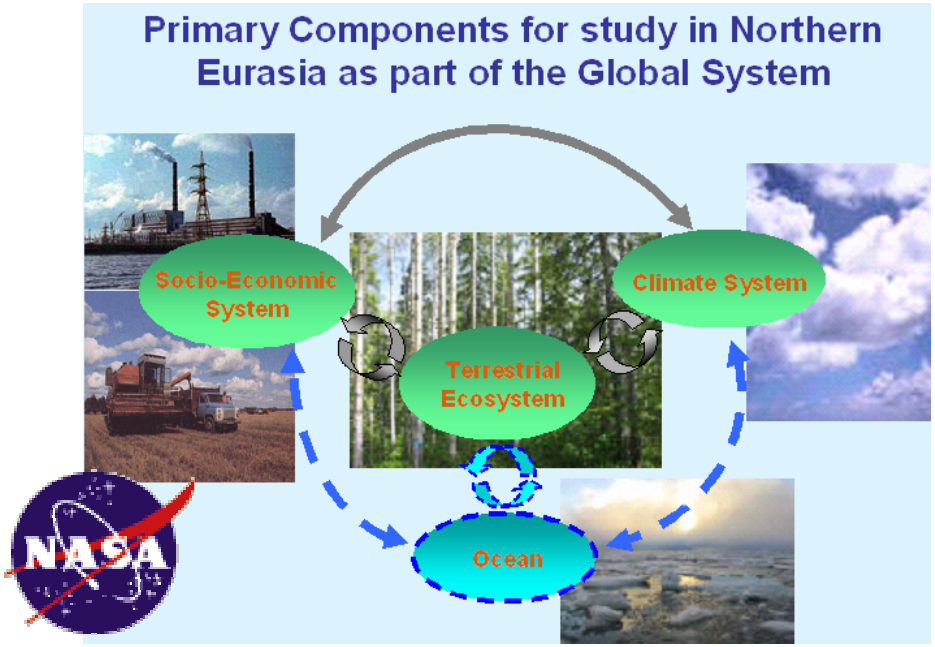


NEESPI Science Agenda

Focus on climate-ecosystem interactions and societal impacts in boreal and non-boreal zones of Northern Eurasia

Goal:

- To evaluate the role of anthropogenic impacts on the regional ecosystems and climate and how it may affect the global climate
- To evaluate the consequences of global changes for regional environment, the economy and the quality of life in the region



Unique features of Northern Eurasia:

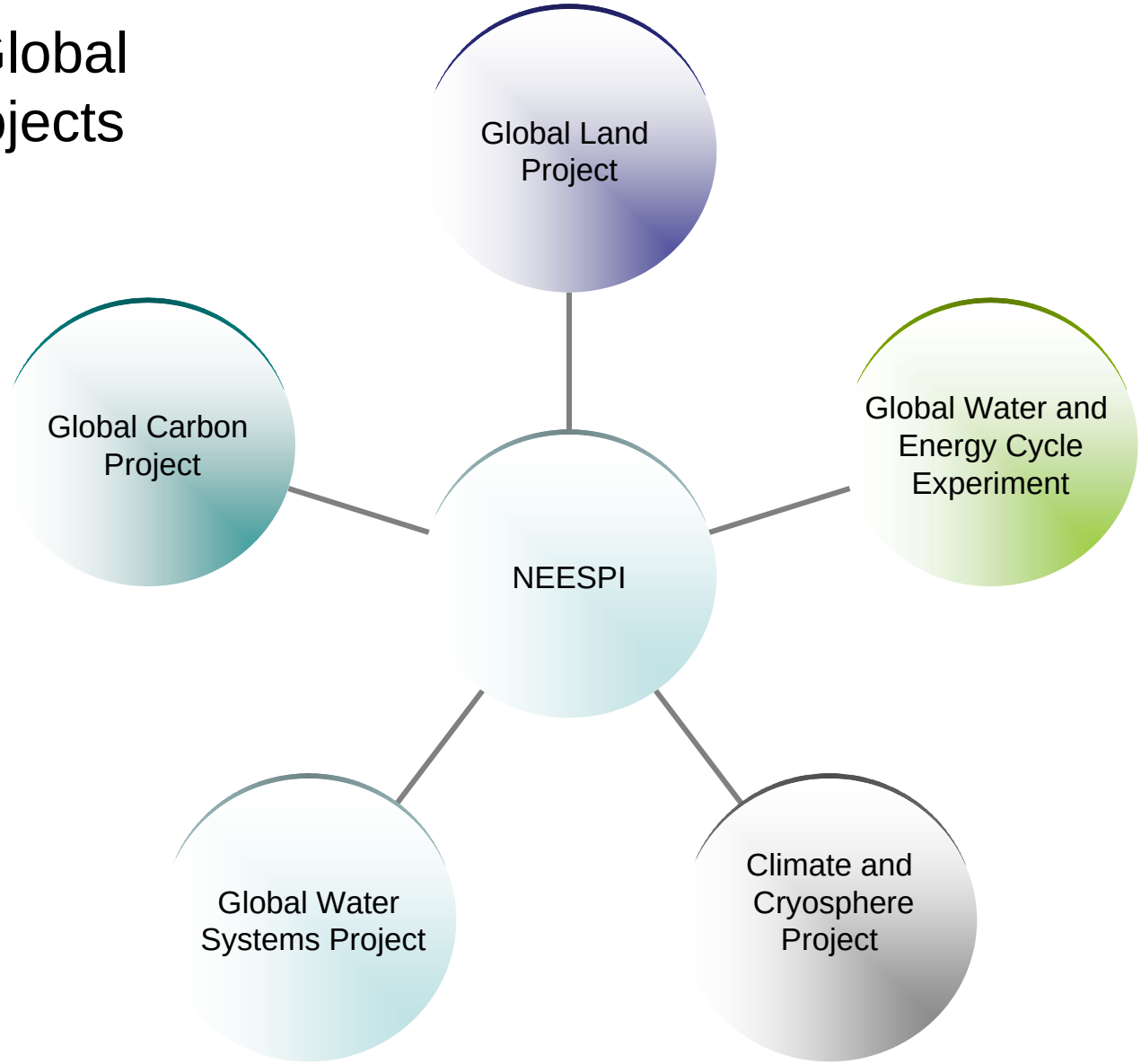
- **World's largest cold region.**
  - 2/3 of global permafrost =10M sq.km.
- **World's largest forest *with unique Larch dominance***

14% of global organic terrestrial carbon

25% of world forests

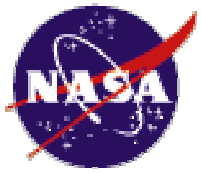
- **World's largest carbon pool (about 1/2 of global terrestrial carbon, especially in peatlands, representing up to 70% of Northern Eurasia wetlands)**
- **Extensive wildfires**
  - potential for large climate change feedback
  - Large source of atmospheric carbon
- **Extensive, variable dry land areas**
  - Largest source of dust in the extratropics
  - Water resources - critical for the region
- **Rapid LCLUC, especially due to socio-economic changes in the past 15 years**

Links to Global ESSP Projects



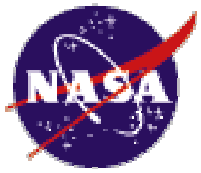
NEESPI's 5 Focus Research Areas

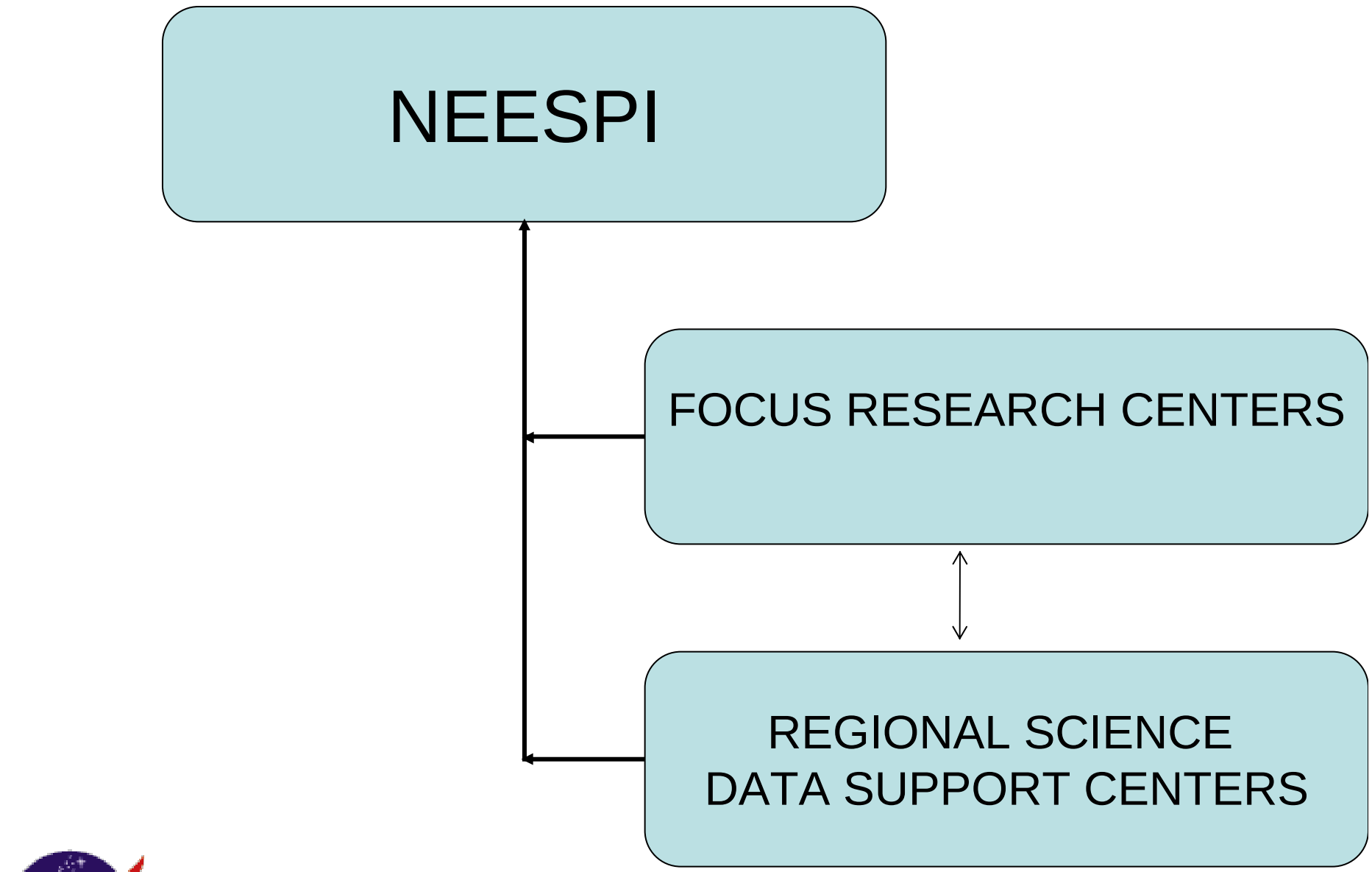
- Carbon Cycle processes as part of the Global Carbon Project (GCP under ESSP)
- Water Quantity and Quality as part of the Global Water System Project (GWSP under IGBP/IHDP)
- Land Use-Ecosystems Interaction as part of the Global Land Project (GLP under IGBP/IHDP)
- Water Cycle and Aerosol Interactions with Climate as part of the WCRP Global Water and Energy Cycle Experiment (GEWEX under WCRP)
- Permafrost and Cold Land Processes as part of the Climate and Cryosphere Program (CliC under WCRP)



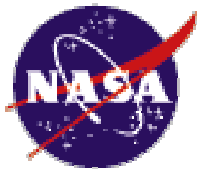
Focus Research Centers

- Max Planck Institute, Germany
  - Carbon Cycle
- University of New Hampshire
  - Water Resources
- Colorado State University
  - LCLUC
- Georgia Technological Inst
  - Climate-Aerosol
- University of Alaska Fairbanks
  - Climate- Permafrost



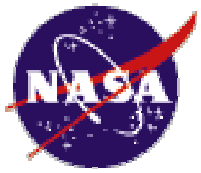

NEESPI
FOCUS RESEARCH CENTERS
REGIONAL SCIENCE
DATA SUPPORT CENTERS

- REGIONAL SCIENCE SUPPORT CENTERS
  - @ ScanEx (Moscow, remote sensing data over NEESPI domain)
  - @ Beijing Climate Center for East Asia
  - More to be established



NASA Role in NEESPI

- Lead the NEESPI remote sensing component
  - Develop and maintain a regional satellite data base with raw data and products
  - Develop and distribute special remote-sensing based datasets useful for climate modeling
  - Facilitate access to satellite data and products by NEESPI investigators
  - Support regional calibration/validation activities
- Contribute to the support of Focus Research Centers and other NEESPI logistics
- Support regional network activities
- Support projects with remote sensing component that were peer-reviewed and selected for funding by NASA



NASA NEESPI Support

- LCLUC Pilot Projects
  - Biomass Burning
  - Landcover Dynamics
  - Reindeer Mapper
  - Biodiversity in Eastern Europe
- Carbon Cycle/LCLUC Processes
  - 9 projects funded (started Jan ’05)
- Water Cycle/LCLUC Processes
  - 7 projects funded (start June ’05)

Total about $3.5 M

- Surface Hydrology
  - A few projects to be funded (anticipated start July ’05)
- LCLUC (Climate, Monitoring, Impacts)
  - more projects anticipated (will start Jan ’06)

Carbon Cycle Science and LCLUC

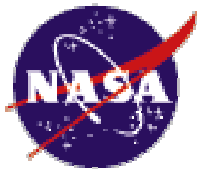
Funded NEESPI Projects (started January, 2005)

BOREAL (Partners: Russia, China and Germany)

- Modeling the Carbon Dynamics of the Eurasian Boreal Forest
- An Integrated Analysis of Flux Tower Data, Remote Sensing Data and Biogeochemical Modeling
- Comparative Studies on Carbon Dynamics in Disturbed Forest Ecosystems
- Quantifying Effects of Fire Intensity/ Severity/ Burning Conditions on Carbon Stocks and Exchanges
- Impacts of Lake and Wetland Extent on the Regional Carbon Balance
- Land-Use and Land-Cover Dynamics of China

NON-BOREAL (Partners: Ukraine, IIASA, Kazakhstan, Uzbekistan, Mongolia)

- Carbon, Climate and Managed Land in Ukraine: Integrating Data and Models of Land Use
- Quantifying the Effects of Land Use Change on Carbon Budgets in the Black Sea Region
- Northern Eurasian Carbon-Land Use-Climate Interaction in the Semi-Arid Regions



About $1.7 M per year for 3 years

Hydrology and LCLUC

Funded NEESPI Projects (start in June, 2005)

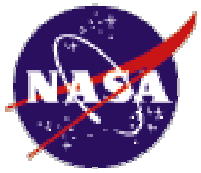
Arid (Partners: Russia, Kazakhstan, Uzbekistan, China)

- Impacts of Glacial Area Changes in Central Asia During on LCLUC
- Role of LCLUC in Water Budget and Water Use Across Central Asia
- Assessing the vulnerability of the Eurasian semi-arid grain belt
- Ecological Monitoring in Semi-Arid Central and West Asia
- Effects of Land Use Change on the Energy and Water Balance of the Semi-Arid Region of Inner Mongolia
- Linking Biophysics and Socio-economics for Addressing Water Vulnerability in Central Asia

NON-Arid (Partners: Ukraine)

- Exacerbation of Flooding Responses Due to LCLUC in Carpathian region

About $1.3 M per year for 3 years



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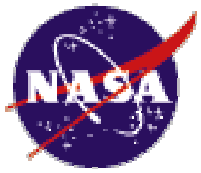

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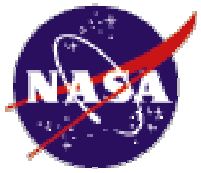

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