



Northern Eurasia Earth Science Partnership Initiative (NEESPI): Update

Pavel Groisman

**UCAR at NOAA National Climatic Data Center,
Asheville, North Carolina, USA**





The NEESPI Study Area

<http://neespi.org>

NEESPI CONCEPT

We are living in the epoch of large changes in:

- Climate**
- Environment**
- Human Activities.**

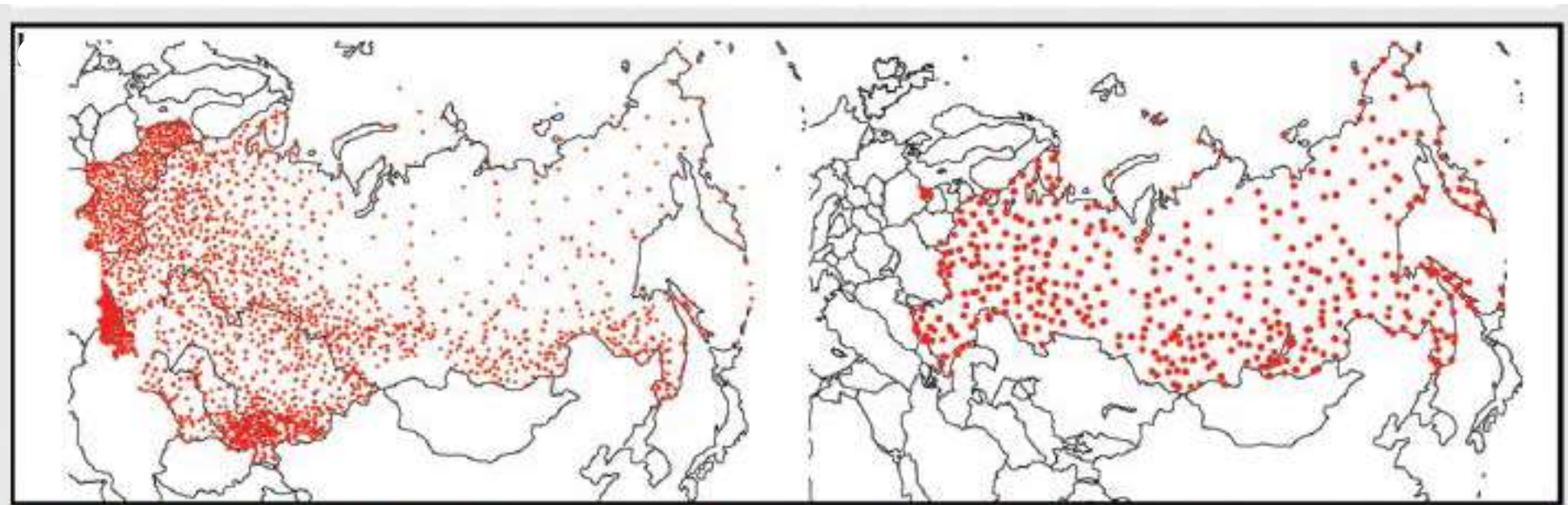
**ALL THESE CHANGES NOW HAVE BECOME
INTERTWINED AND AFFECT EACH OTHER**



**THEY HAVE TO BE STUDIED IN A SYNERGETIC
MANNER AND NEESPI SEARCHED SUPPORT,
ENDORCEMENTS, and COLLABORATION FROM ALL
ESSP PROGRAMS AND PROJECTS**

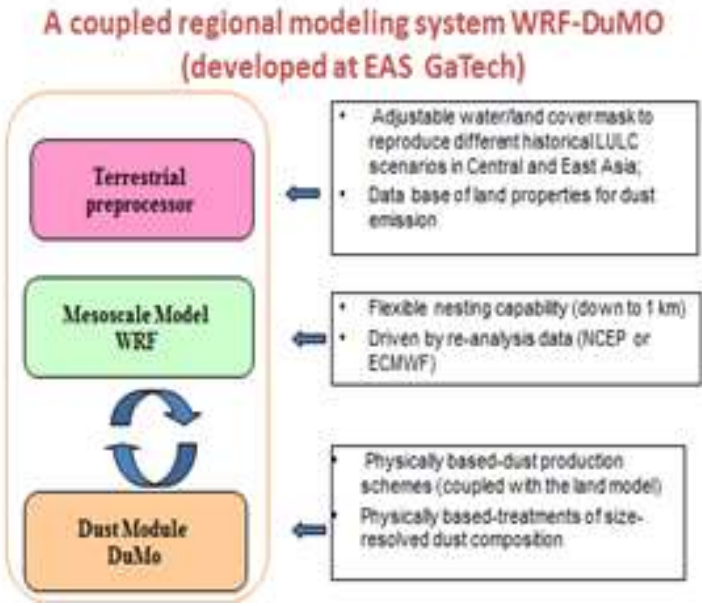
NEESPI's facilitating role has been in promoting international large-scale regional studies and framing the diverse individual projects into a 3-phase balanced Programme

- **The first phase** of NEESPI projects has focus on documenting, monitoring and analyses of climatic changes, biogeochemical cycles, land use, and land

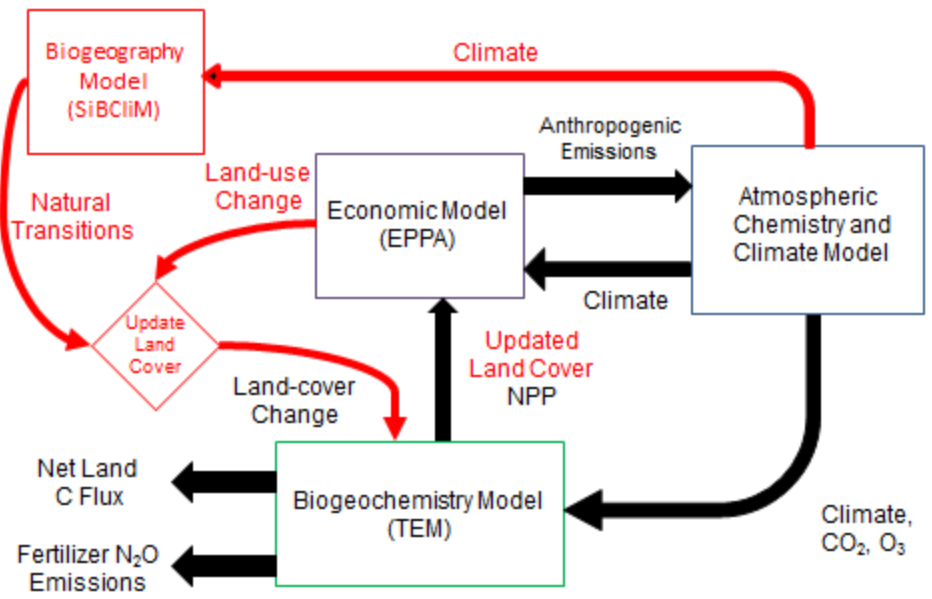


Synoptic datasets released for international research community by NOAA (2006) and Roshydromet (2014)

- The second NEESPI phase** (launched circa 2007) put forward environmental modeling with the major focus on blending regional climate, vegetation, carbon flux, permafrost, hydrological, and dust production models within a Northern Eurasia modeling suite to be linked to (embedded in) the state of the art Earth System models.



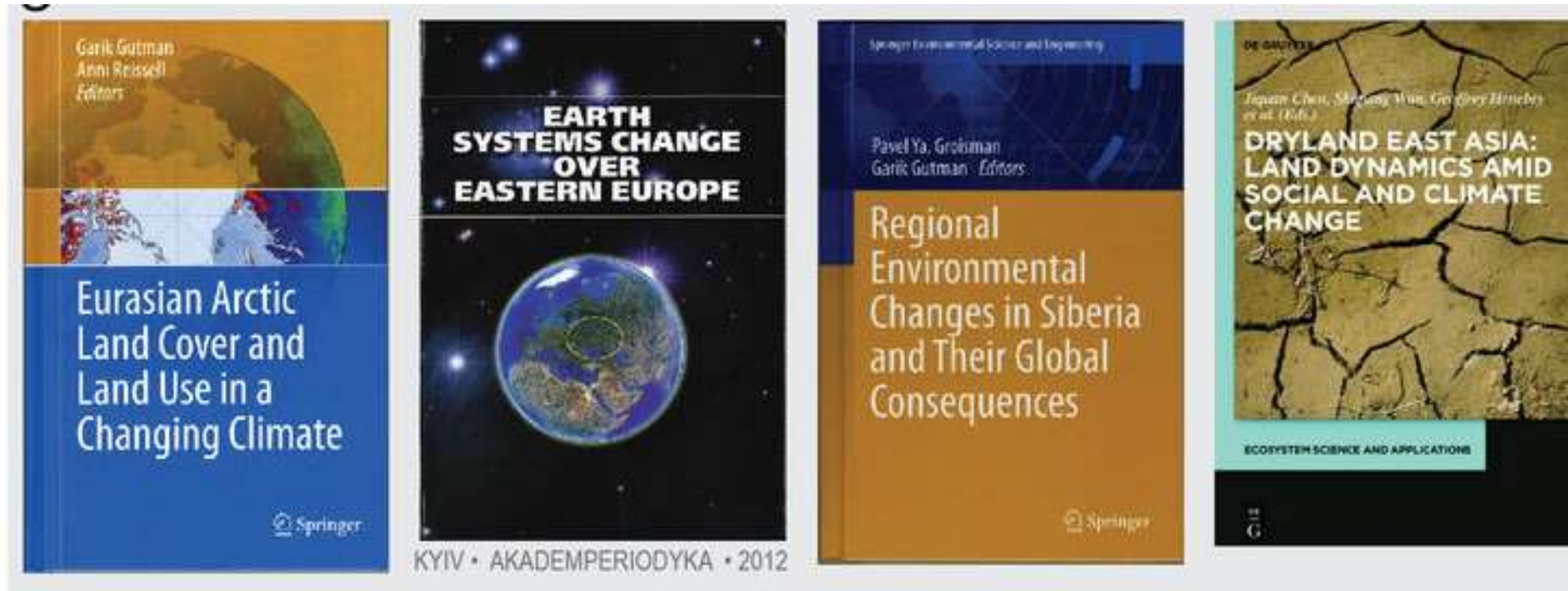
Darmenova et al. 2009; *JGR*.



Kicklighter et al. 2014; *ERL*.

The latest (present phase 3) NEESPI research foci consist from integrated assessments and projections

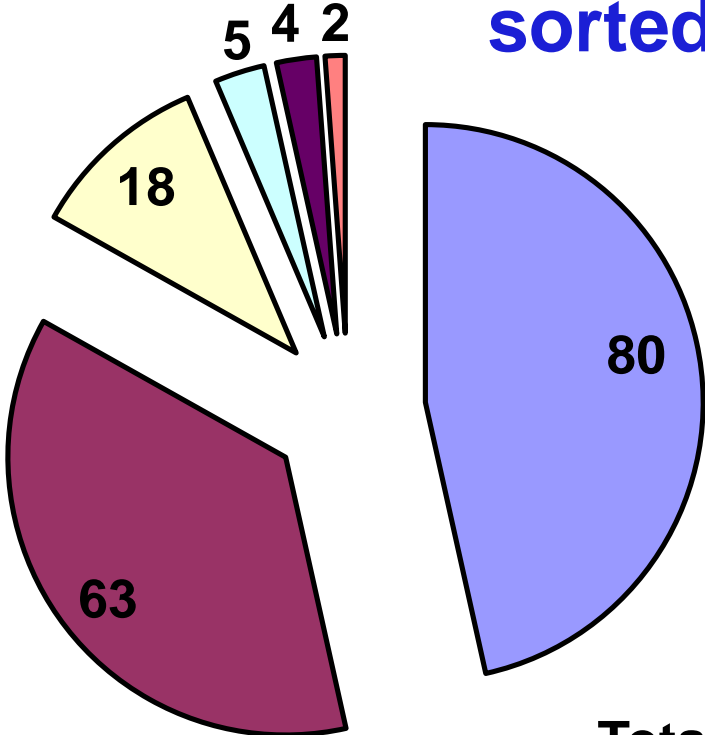
In particular, in the last 3 years, four review books summarized knowledge of the regional Earth System status and dynamics.



Three more overview books are in preparation (on Central Asia, Eastern Europe, and East Asia) and one more is planned.

Completed and ongoing NEESPI Projects by country (or group of countries), December 2014

sorted by funding source



Total 172 Projects

■ All US Agencies

■ All EU Agencies

■ All Chinese Agencies

■ All Russian Agencies

■ All Japanese Agencies

■ Canada

New projects/activities put in place and/or join to NEESPI in the last year

Evaluating critical thresholds of climate change impacting major regional environmental systems in Russia for developing adaptation strategies. PI: **Oleg Anisimov**, Russia

The development of ecosystem spatial-temporal thermodynamics theory and methods of thermodynamic variables measurement. PI: **Yuriy Puzachenko**, Russia

Regional and Global Climate and Societal Impacts of Land-Use and Land-Cover Change in Northern Eurasia: A Synthesis Study Using Remote Sensing Data and An Integrated Global System Model. PI: **Qianlai Zhuang**, USA

LCLUC Synthesis: Ecosystem-Society Interactions on a Changing Mongolian Plateau. PIs: **Jiquan Chen and Daniel G. Brown**, USA

Combining remote sensing and field studies for assessment of landform dynamics and permafrost state on Yamal. PIs: **Annett Bartsch, Austria and Marina Leibman, Russia**

Creation of Laboratory of Agroecological Monitoring and Ecosystem Projecting, "LAMP". PIs: **Riccardo Valentini, Italy and Ivan Vasenev, Russia**

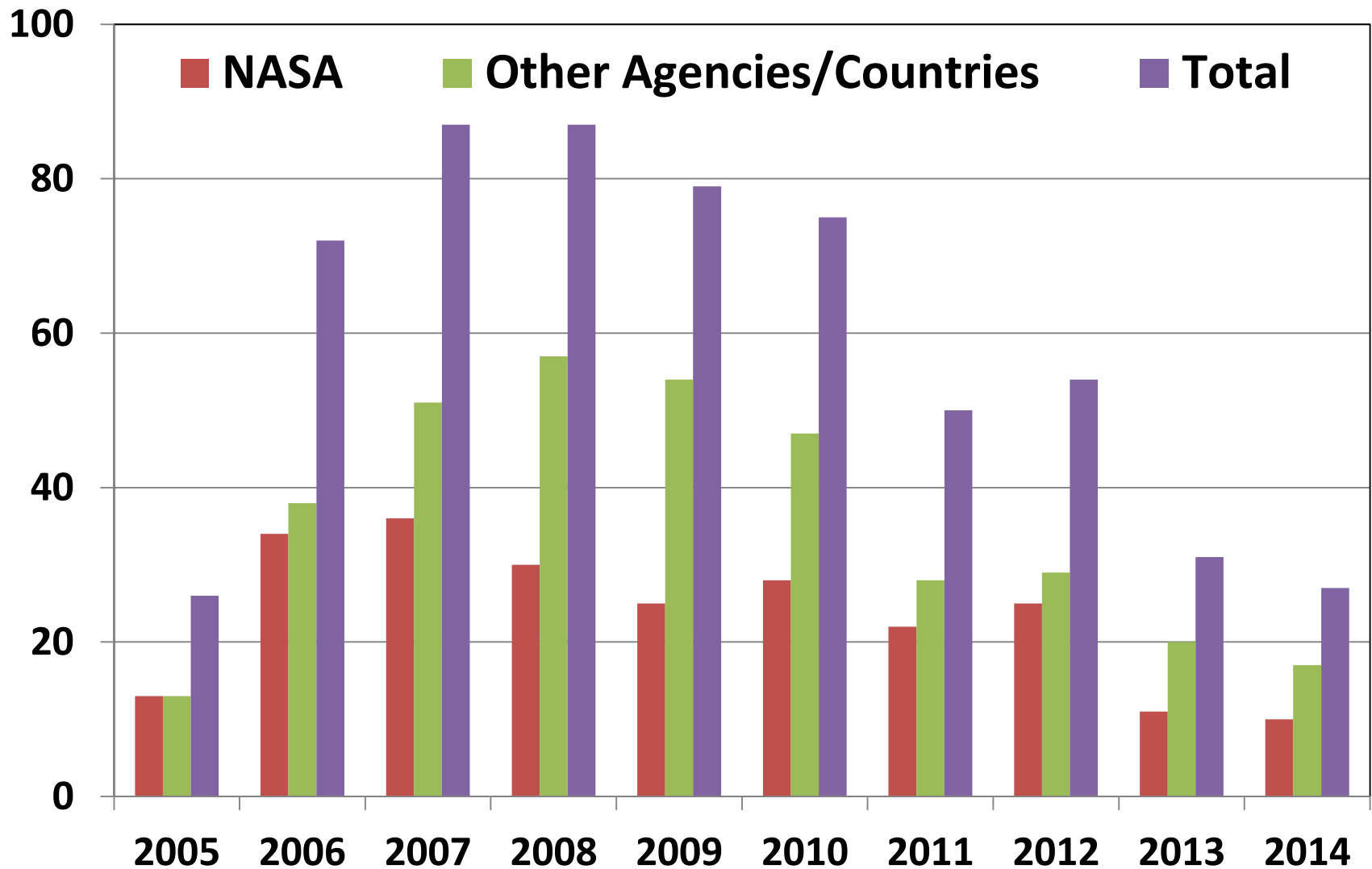
Understanding the linkages between climate, land use, and land degradation in Central Asia. PI: **Irina Sokolik, USA**

How Environmental Change in Central Asian Highlands Impacts High Elevation Communities. PI: **Geoff Henebry, USA**

Arctic climate change and its impact on environment, infrastructures and resource availability. PI: **Peter Koltermann**, Germany/Russia

Title tentative "Carbon cycle in the Russian Arctic". PI: **Igor Semiletov**, Russia/USA

Active NEESPI Projects per year



Transition from Northern Eurasia Earth Science Partnership Initiative (NEESPI) to “Northern Eurasia’s Future” Initiative (NEFI)

Plans:

- 1. Synthesis NEESPI Workshop (*Prague, Czech Republic; April 9-12, 2015*)**
 - 2. Development of the NEFI Program**
- +**
- 3. Preparation of the overview NEESPI Book**

Major NEESPI Science question will remain intact in NEFI:

- **How do Northern Eurasia's terrestrial ecosystems dynamics interact with and alter the biosphere, atmosphere, and hydrosphere of the Earth?**

But it is the time to expand this academic curiosity **question** “**how?**” to another, more practical:

- **What will the changes in this ecosystems dynamics and interactions mean for the societal well-being, activities, health, and strategic planning?**

Ten Research Foci emerged in discussions within the NEESPI community during the past 12 months making the following list:

Group 1

1. Increasing frequency and intensity of **extremes** (intense rains, floods, droughts, and wild fires)
2. Global change and, in particular, **warming of the Arctic**
3. Retreat of the **cryosphere**: snow cover, sea and ground ice
4. Biosphere changes (**ecosystem shifts**; changes in the carbon cycle; land cover, desertification and dust storms)
5. Changes in the terrestrial water cycle; quantity and quality of **water supply** available for societal needs)

Continuation of the Research Foci list

Group 2

6. Pressure on agriculture and pastoral production (growing supply demand, changes in land use; food security)
7. Changes in infrastructure (roads; new routes; construction codes; air, water, and soil pollution; strategic planning)
8. Societal actions to mitigate negative and benefit from positive consequences of environmental changes
9. Assessment / Quantification of the role of Northern Eurasia in the global Earth and Socioeconomic systems

Group 3

10. Incorporation of newly available advanced research tools
 - (a) Observations (e.g., GPM)
 - (b) Models (e.g., new ESMs)

NEFI Challenge

How to provide in Northern Eurasia a sustainable societal development (economy well-being, activities, health, and strategic planning) in changing climate, ecosystems, and... societies?

FOR MORE INFORMATION SEE THE NEESPI WEB SITE:

<http://neespi.org>



Side Note:
“NEESPI” is pronounced
approximately like the
Russian phrase for
“Don’t sleep”
“NEFIg spat” is pronounced
like the Russian *coll.* phrase
for “Don’t dare
to sleep!”

Northern Eurasia Earth Science Partnership Initiative => Northern Eurasia’s Future Initiative