

Alexander Shiklomanov
University of New Hampshire

Northern Eurasian Landscapes: Interactions Between Humans, Hydrology, Land Cover And Land Use

We present a framework for data integration, modeling and analysis across Northern Eurasia to support land cover land use change - related science questions of the Northern Eurasian Earth Science Partnership Initiative (NEESPI) Science Plan.

The central hypothesis governing our work is: Climate and human-induced land cover/land use changes have a pronounced influence on the major components of the hydrological cycle over large parts of Northern Eurasia and these changes can significantly alter the hydrologic regime which can be detrimental for both the human population and their infrastructure.

The research plan is organized around three specific objectives:

Objective 1: Understand interactions between land cover/land use, and hydrology and to project into the future hydrologic responses of changes in climate and land cover/land use from local to large scales and to bring the results into a broader spatial perspective.

Objective 2: Evaluate the effects of the interrelated changes in hydrology and land cover/land use on humans and their environments and identify the vulnerable areas for socio-economic development in Northern Eurasia.

Objective 3: Incorporate NASA and affiliated biogeophysical data products, in situ data, modeled results, and human dimensions information into a hydrological analysis and mapping system for Northern Eurasia.

The proposed research involves the analysis of in-situ observations, remote sensing data, and numerical modeling. Objectives 1 and 2 are process-based and include the direct and indirect impacts of climatic change and land cover/land use modification on hydrologic regimes at local, regional, and continental scales. The integrative objectives of the proposed research will provide a critical link between ongoing process-oriented studies in North Eurasian natural and human-induced regions of change. The third objective focuses on the organization of information and results into a united data analysis and exploratory system for Northern Eurasia. This project builds on a number of past and ongoing studies.