

Description of Session R5-03 at the MAIRS Open Science Conference

7-10 April 2014; Beijing Friendship Hotel, China

Session Title: "FUTURE EARTH IN NORTHERN ASIA"

Major Conference Theme "Future Earth in Asia"

Session description

Background. Eight years ago, the Northern Eurasia Earth Science Partnership Initiative (NEESPI) was launched as an interdisciplinary program of internationally-supported Earth science research addressing large-scale and long-term manifestations of climate, environmental, and socioeconomic changes (focusing on Northern Eurasia) that affect the rate of global change through atmosphere-biosphere-cryosphere interactions and through strong biogeophysical and biogeochemical couplings (<http://neespi.org>). The major NEESPI science question is: How do Northern Eurasia's terrestrial ecosystems dynamics interact with and alter the biosphere, atmosphere, and hydrosphere of the Earth? NEESPI research team (~700 enlisted scientists from around the world) is positioning itself as an open community that welcomes a broad spectrum of participants and does not restrict its gatherings to the Science team members.

Historically, the studies in the Asian part of the NEESPI domain played a major role in the Partnership Initiative for two reasons:

- (a) The Asian part of Northern Eurasia was less studied than Europe and
- (b) Climatic and environmental changes in northern Asia have been the largest over the entire continent. These changes and their ability to impact the Global Earth System well beyond northern Asia (large scale energy and carbon cycle changes, dust storms, and dramatic sea ice retreat from the Asian Arctic shores) defined high interest to northern Asia by two large-scale regional programs, NEESPI and Monsoon Asia Integrated Regional Study (MAIRS) with their research domains partially overlapped over the dry land latitudinal belt of Asia.

We anticipate that the Future Earth Land changes will be predominantly defined and shaped over the Eurasian continent and its most dynamically changed northeastern quadrant, i.e., Northern Asia.

After the first two groups of NEESPI projects have been completed and the third generation of projects is in full swing, it is the time to inspect advances in all areas of NEESPI science. **NEESPI has extremely broad research agenda and for this particular Session, we shall invite a diverse suite of presentations** that will convey the latest findings on the biogeochemical cycles, surface energy budget, and water cycle changes in Northern Asia, climate and terrestrial ecosystems interactions in Northern Asia (land cover and land use, soil, and, in particular, permafrost and weather extreme changes that affect and are being affected by climate and ecosystems changes), "human dimension" that includes, in addition to regional impact studies of environmental changes, the feedback studies of societal and land use changes on regional and global environment and climate, and tools to address the Northern Asia studies (paleoclimatic reconstructions, present and past field campaigns, remote sensing, and modeling). The particular foci of the Session discussion topics will be (a) advance in models' ability to represent processes specific to the high-latitudes, including organic soils, permafrost, wetlands, ice sheet dynamics and/or biogeography and (b) the studies of changes of regional water and carbon cycles and the manifestations of these changes in extreme events in Northern Asia.

In the **discussion part of the Session**, we will present and further discuss strategic plans for the post NEESPI period (i.e., future Northern Eurasia Studies after 2015) with an emphasis to coordination with future MAIRS development.

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