

PAN-EURASIAN EXPERIMENT (PEEX)
A NEW RESEARCH INITIATIVE FOCUSED ON THE NORTHERN PAN-EURASIAN REGION

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The increasing human activities are changing the environment and the humanity is we are pushing the safe boundaries of the globe (Rökström et al. 2009). Actions are needed to ensure that the society remains within the sustainable utilization of the resources (Leach et al. 2012). It is of utmost importance to gauge with a comprehensive research program on the current status of the environment, particularly in the most vulnerable locations. Pan-Eurasian Experiment (PEEX) is a new multidisciplinary research approach aiming at resolving the major uncertainties in the Earth system science and global sustainability questions in the Arctic and boreal Pan-Eurasian regions. The PEEX geographical domain covers natural and urban environments of Northern Pan-Eurasian region; Siberia and the Arctic Ocean being the core geographical region of the PEEX domain. The majority of the PEEX geographical domain is situation in the territory of Russia and China.

The vision of PEEX is to solve interlinked global challenges influencing the human wellbeing and societies in Northern Eurasia: climate change, air quality, biodiversity loss, ecosystems transformation, chemicalisation, impacts on major biogeochemical cycles, food supply, energy production and fresh water in an integrative way, recognizing the significant role of boreal regions and the Arctic in the context of global change. The main goal of PEEX Research agenda is to contribute to solving the scientific questions that are specifically important for the Pan-Eurasian region in the coming years, in particular the global climate change and its consequences to nature and human society. PEEX aims to deliver different types of scenarios on the effects of climate change and air quality on human population, society, energy resources and capital flow. Based on the assessment on vulnerability of Northern Pan-Eurasian natural systems and societies to climate change and risk-analysis on the natural hazards (floods, forest fires, droughts), PEEX will provide mitigation and adaptation plans for sustainable land use, health and energy production and improved knowledge and scenarios on future climates.

In order to accomplish the scientific goals and societal impact PEEX will establish a long-term, coherent and coordinated research & educational infrastructures (RIs) in the PEEX domain (Kulmala et al. 2011). These RIs will include ground-based, aircraft and satellite observations, multi-scale and integrating modeling tools able using the standard of encoding geographical information (GIS) and standardized data storage systems. PEEX will find synergies with the major European land-atmosphere observation infrastructures such as ICOS a research infrastructure to decipher the greenhouse gas balance of Europe and adjacent regions, ACTRIS (Aerosols, Clouds, and Trace gases Research InfraStructure Network-project 2011-2015), and ANAEE (The experimentation in terrestrial

ecosystem research) networks and with the flag ship stations like the SMEARs (Station for Measuring Ecosystem-Atmosphere Relations) when design, re-organizing and networking existing stations networks in the Pan-Eurasian region. PEEEX will promote standard methods and best practices in creating long-term, comprehensive, multidisciplinary observation data sets and coordinate model and data comparisons and development being active link to European ESFRI (the European Strategy Forum on Research Infrastructures) process.

PEEX initiative is built on a bottom-up initiative by several European, Russian and Chinese research organizations and institutes. The PEEEX Kick off meeting was held in Helsinki in October 2012. PEEEX is based on the collaboration of Russian, Chinese and European parties and currently involves ca 40 research institutes. The promoter institutes here have been University of Helsinki, Finnish Meteorological Institute in Finland and Institute of Geography, Moscow State University, Aerocosmos and Institute of Atmospheric Optics Siberian Branch, RAS, in Russia. PEEEX research community is currently in the process of writing PEEEX Science Plan and the PEEEX Implementation Plan. PEEEX aims to be operational starting from 2014.

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