

New data on climate change

A new multinational environment and climate research effort in Eurasia...

The boreal forests and permafrost regions of the Pan-Eurasian area are identified as a hot spot for climate change research on a global scale. The boreal forests are the major source of biogenic volatile organic compounds and natural aerosols, and play an important role in the global carbon cycle. These compounds and particles are critical atmospheric components relating to climate change processes. A major fraction of the boreal forests of the world is situated in the Siberian region. In addition to the significant role of boreal forests to the climate system, key topics of interest in the Pan-Eurasian region are the melting of permafrost and the decreasing ice cover of the Arctic Ocean. A sudden

thawing of the North-Eastern Siberian permafrost areas would lead to potentially high CO₂ or CH₄ emissions, which would accelerate global change.

The University of Helsinki together with Finnish Meteorological institute are organising the Pan-Eurasian Experiment (PEEX) with key Russian and Chinese players in the field of climate and Earth system sciences. The planning of future research activities in the Pan-Eurasian region began with a series of workshops in 2012 and 2013. The PEEX workshops are linked to several national and international research actions and projects such as EU FP7 JPI Climate Fast Track Activity 1.3, 'Changing cryosphere in the climate

system - from observations to climate modelling', NordForsk's Top Research Initiative, Cryosphere-Atmosphere Interaction in the Changing Arctic Climate (CRAICC) and the Finnish Cultural Foundation's Earth System Modelling Working Group activity (2012-2013).

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The first step of the PEEX approach is writing the PEEX Science Plan. The



PEEX Science Plan agenda will consist of five thematic areas:

- PEEX research: investigations on the changes of atmospheric, hydrological, carbon cycles and on the effect of pollution from pristine and industrialised pan-Eurasian environments, are especially scoped to gain understanding on the impacts and feedback on climate/Earth system and to determine the climate change relevant processes in the pan-Eurasian region;
- PEEX infrastructures: these will establish and promote, long-term pan-Eurasian research infrastructures spanning activities from measurement via validated and harmonised data products to the implementation of the data to models of appropriate spatial and temporal scales with specific topical foci;
- PEEX education and knowledge transfer;
- PEEX in climate policy: PEEX contributes to the global climate policies and decision-makers and increases public awareness of the climate change impacts in the pan-Eurasian region;
- Societal issues: PEEX will deliver a societal impact assessment including strategies for sustainable land-use and analysis of health and welfare.

The PEEX vision is to establish and maintain a long-term, coherent and coordinated research activity and research and educational infrastructure in the PEEX domain. Furthermore, PEEX aims to contribute to the Earth system science agenda and climate policy for topics inherent to the Pan-Eurasian environment. This will be done by setting up a process for planning and establishing a large-scale, long-term, coordinated observations and modelling approach in the Pan-Eurasian region, especially to cover ground-based, airborne and satellite observations.



Pan Eurasian Experiment (PEEX) – Towards a new multinational environment and climate research effort in Arctic and Boreal Pan Eurasia region


The PEEX measurements provide input that facilitates the constructing and validation of global and regional models to discover the different forcing and feedback mechanisms in the changing climate. It is planned that PEEX will be active from 2013 in a continuous manner, establishing a long-term research infrastructure in the region that will cover the key areas in the PEEX domain. The envisioned domain covers a major part of the relevant areas of the boreal forest zone and permafrost regions of the Northern hemisphere.

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The scientific aims of PEEX and future actions to develop the Pan-Eurasian research infrastructure can be linked to several EC and ESA-funded activities that aim to develop next generation research infrastructures and data products: EU FP7 Aerosols, Clouds and Trace gases Research Infrastructure Network project (ACTRIS-I3-project 2011-2015); ICOS, a research infrastructure to decipher the greenhouse gas balance of Europe and adjacent regions; and the EU FP7

Common Operations of Environmental Research Infrastructures (ENVRI) project. The new research infrastructure and data products should be developed in line with the ACTRIS, ICOS and ENVRI approaches. Furthermore, PEEX will be supported by Integrated Land Ecosystem – Atmosphere Processes Study (iLEAPS), bringing PEEX under the umbrella of the International Geosphere-Biosphere Programme (IGBP).


PEEX can be listed as one of the most potential experiment initiatives providing new data on the climate change problematic of the cryosphere and Arctic areas.



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