

## Pan-Eurasian Experiment (PEEX) research agenda

### System understanding of the Arctic-boreal regions for scenarios and assessments of the the Northern Pan-Eurasian environments

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The Pan-Eurasian Experiment (PEEX) Program (<https://www.atm.helsinki.fi/peex/>) is a new multidisciplinary, multi-scale research initiative. PEEX research agenda focused on understanding biosphere-ocean-cryosphere-climate-society interactions and feedbacks of the Arctic - boreal regions in the North Eurasia geographical domain (Arneth et al., 2010, Carslaw et al. 2010, Kulmala et al. 2014). China is seen as a crucial area both in source and impact point of view. The agenda covers different spatial and temporal scales, and encompasses diverse geographical regions including both natural and urban environments. The four major large-scale systems studied by PEEX are the land, atmosphere and aquatic systems, and anthropogenic activities. Each of the main systems addresses three key topics and related large-scale research questions. In addition to the four major systems, the PEEX research agenda addresses the feedbacks and interactions between the systems and the major biogeochemical cycles (water, carbon, nitrogen, phosphorus, sulfur) (Lappalainen et al. 2014, 2015).

The PEEX research results are used for producing different types of scenarios and assessments on the impacts of climate change and air quality changes on human population, society, energy resources and capital flows. PEEX will also provide information for mitigation and adaptation strategies for the changing Arctic environments and societies, and will also carry out risk analysis of both human activities and natural hazards (floods, forest fires, droughts, air pollution).

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