

# PAN-EURASIAN EXPERIMENT



# PEEX



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PEEX covers the Arctic-Boreal regions of Northern Eurasia.

## RESOLVING SUSTAINABILITY QUESTIONS IN THE NORTHERN EURASIAN REGION

*The Pan-Eurasian Experiment (PEEX) is a multidisciplinary, multi-scale research, research infrastructure and education initiative aimed at resolving the major uncertainties in Earth System Science and global sustainability issues concerning the Arctic and boreal Pan-Eurasian regions and China.*

A bottom-up initiative by European, Russian and Chinese research organizations and institutes

Research communities from 20 different countries

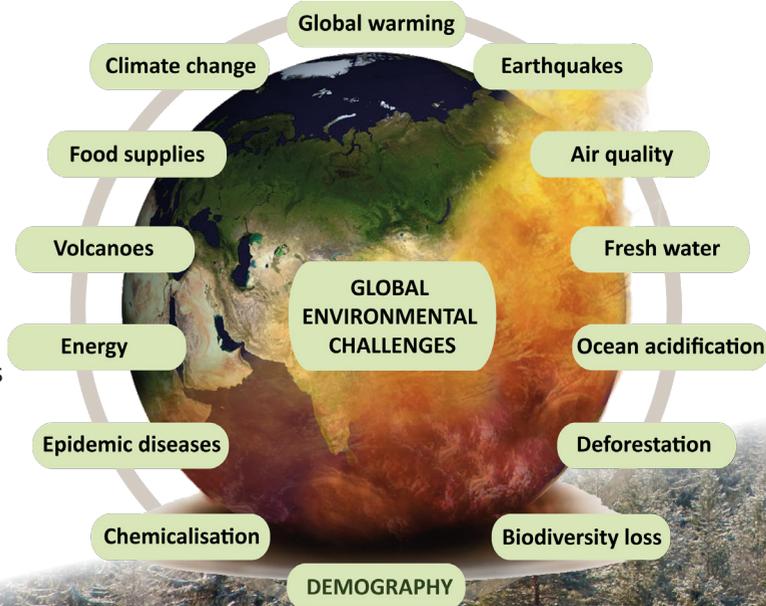
Network of 400 researchers

Set for years 2013-2033

### The four focus areas of the PEEEX initiative:

#### PEEX research agenda

- To understand the Earth system and the influence of environmental and societal changes in pristine and industrialized Pan-Eurasian environments (system understanding).
- To determine the processes relevant to climate change, demographic development and use of natural resources in the Arctic-boreal regions (process understanding).



#### PEEX infrastructures

- To establish and sustain long-term, continuous and comprehensive ground-based, airborne and seaborne research infrastructures together with satellite data (observation component),
- To develop comprehensive data sets and archives in a joint manner (data component),
- To implement the validated and harmonized data products in models of appropriate spatial and temporal scales and topical focus (modeling component).

#### PEEX knowledge transfer

- To educate the next generation of multidisciplinary experts and scientists capable of finding tools for solving grand challenges,
- To increase public awareness of climate change impacts in the Northern Eurasian region,
- To distribute new knowledge and data products to scientific communities and the public sector,
- To deliver tools, scenarios and assessments for climate policy-makers and authorities.

#### PEEX impact on society

- To use new research knowledge together with the research infrastructure services for producing:
  - As reliable scenarios and assessments as possible, to support practical solutions for addressing the grand challenges in the northern context and in China (climate change and natural resources)
  - Early warning systems for the sustainable development of societies (demography development)

-Technological innovations needed for coherent global environmental, technological or social processes in an interconnected world (globalization)

## PEEX Special Issue papers will be part of the PEEX assessment process

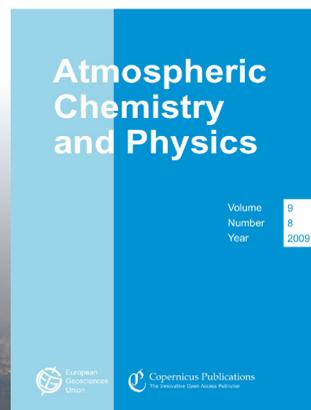
To implement the PEEX research agenda, we have opened the PEEX Special Issue in the *Journal of Atmospheric Chemistry and Physics* ([www.atmos-chem-phys.net/special\\_issue395.html](http://www.atmos-chem-phys.net/special_issue395.html); impact factor 5.5). By publishing your scientific results in the PEEX Special issue your work will be part of the periodic PEEX Scientific Assessment and contribute to the implementation of the PEEX Science Plan. The Assessment(s) will be distributed to various stakeholders and policy makers such as the Arctic Council, IPCC, Future Earth, and the European, Russian and Chinese Ministries.

We also recommend PEEX labeled papers to be published in *International Journal of Digital Earth* or the *Geography, Environment, Sustainability (GES)* journal. If you publish outside the ACP-PEEX Special Issue it is important to acknowledge the PEEX Program in your publication (e.g. "This work contributes to the Pan-Eurasian Experiment (PEEX) Program research agenda") and send a pdf copy of the published paper to the PEEX-HQ-Helsinki ([peex-hq@helsinki.fi](mailto:peex-hq@helsinki.fi)). The same paper can be linked to several special issues, which maximizes the visibility of the scientific results.

### PEEX Special Issue has been opened in the Journal of Atmospheric Chemistry and Physics

**Themes:** climate change, air quality, biodiversity loss, chemicalization, food supply, fresh water and the use of natural resources through mining, industry, energy production and transport.

**Editors:** an international, multidisciplinary team consisting of V.-M. Kerminen, M. Heimann, D. Spracklen, T. Laurila, A. Ding, and I. Salma.



## PEEX filling the observational in situ data gap in the Northern Eurasian regions

One of PEEX's concrete tasks is to establish a coordinated, coherent land based PEEX observation network over the Northern Pan-Eurasian region.

The concept of the hierarchical PEEX in situ station network is based on the know-how obtained from 20 years development of the SMEAR-II flagship station measurement theory and techniques. The backbone of the station network is built on the existing biosphere and atmospheric observation networks in collaboration with European, Russian, Chinese and global partners.

In practice this would mean upgrading and expanding the current measurement capacity of stations step by step with the new blocks of instruments. The station upgrading and/or establishing new stations would need national investments from Russia and China.

The preliminary set of PEEX stations will be selected and expanded in 2015-2016. At the moment we are collecting metadata information of the atmospheric / hydrological / ecosystem field stations across the PEEX geographical domain. You can contribute to this process by sending information on current measurement setup via: [www.atm.helsinki.fi/peex/index.php/peex-in-situ-observation-network](http://www.atm.helsinki.fi/peex/index.php/peex-in-situ-observation-network)

We have published the "PEEX view tool" which enables the comparison between in situ data and modelled data. PEEX-View is an online tool for visualizing and analyzing simulation and observational data, and a demo version has recently been released in the PEEX website. In the future, PEEX-View is envisioned to combine multi-disciplinary datasets of varying temporal and spatial scales. PEEX View tool at: [www.atm.helsinki.fi/aapon\\_demo\\_php/test15\\_demo.html](http://www.atm.helsinki.fi/aapon_demo_php/test15_demo.html)



## PEEX benchmarked courses

Education of the next generation of scientists as well as capacity building of the experts takes place at the workshops and international courses.

PEEX benchmarked courses are especially suitable for networking and collaboration and are typically intensive field or laboratory courses. Course topics range from hands on data-analysis to measurement-focused field courses and modeling biogeochemistry and climatology. The courses bring together experts of the PEEX topics and facilitate horizontal learning among the participants and teachers.

Courses organized by PEEX contributing institutes are opened, when possible, to other communities. Some examples of courses are *Air pollution – from local to global* in Nanjing, China; *Atmospheric optics*, Moscow, Russia, *Paleolimnology of Northern Eurasia*, Petrozavodsk, Russia; *Application of weather and cloud radars* in Hyytiälä, Finland.

More information at: [www.atm.helsinki.fi/peex/index.php/education](http://www.atm.helsinki.fi/peex/index.php/education)



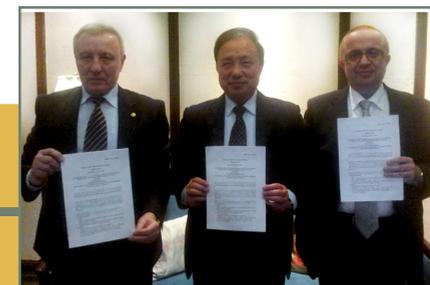
## PEEX Societal impact & Capacity building: opening a dialogue with stakeholders and end-users

PEEX research outcomes, observation activities and innovative methodological concepts are providing new information not only for climate policy making at a global scale but also for the regional scale; including mitigation and adaptation planning.

PEEX contributes to validation of sources and sinks of greenhouse gases and Short-Lived Climate Forcers, e.g. black carbon, ozone and aerosols, which have crucial impact on global climate and are requested in UNFCCC climate negotiations.

The PEEX research approach aims to span over scientific boundaries and start a more intensive interaction between natural sciences and socio-economics.

To respond to global sustainability and climate change challenges, PEEX offers a tool for interactions between social scientists, economists and natural scientists. This way, multidisciplinary and scientifically valid analysis can be done for inventing possible new socio-economic pathways for sustainability.



## How to participate in PEEX?

Contact PEEX-HQ and you will be connected to the PEEX network and research community. You will receive information on the joint funding proposals, training and education courses, as well as become an active PEEX partner in our working groups. For institutes we are also offering an opportunity to sign the Memorandum of Understanding (MoU) with the PEEX Program and be an official part of the PEEX collaboration network.

# Contact information

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