PEEX International Collaboration:
Research Seminar on "Holistic multi- and interdisciplinary approach in supporting the Arctic sustainable development"

Summary
On 19th February 2021, the PEEX international collaboration virtual event "Holistic multi- and interdisciplinary approach in supporting the Arctic sustainable development" (Environmental research and modeling for supporting of social-economic development) was co-hosted by the Institute of Industrial Ecology Problems in the North, Kola Science Center, Russian Academy of Sciences (INEP KSC RAS) and the University of Helsinki, Institute for Atmospheric and Earth System Research (UHEL-INAR). The event goal was to raise awareness about different approaches to study, observe and model environmental processes as well as about currently existing and future problems of social and economic sustainability in the Arctic to find possibilities for using perspective methods of observations and modelling in natural sciences disciplines to solve social and economic tasks.
About 50 researchers from Austria, Czech Republic, Denmark, Finland, Norway, Russia, and Switzerland from 15 different research institutes/ organizations and universities attended this research seminar.
The research seminar included 3 sessions. It has been open with words in the memory of Prof. Sergej Zilitinkevich, the co-founder of the PEEX Programme.

The 1st session **"*Conceptual approaches and examples*"** included presentations on interdisciplinary nature-socio-economic studies for Kola/Arctic domain; novel inter- and transdisciplinary research concept (FutArcSoc) for an analysis of Arctic environment and societies; concept of the Center of Environment, Energy and Health (CEEH); sustainability of the Northern Eurasia forest sector in a changing world: ecological, economic and social challenge; integration of local data, local models and local socio-environmental scenarios; statistical approach to solving socio-economic problems using remote sensing methods; indigenous people use traditional knowledge as a tool for study of nature and climate change processes.
The 2nd session **"*Natural science in support for socio-economical studies (SES)*"** included presentations on climate change based response of Arctic ecosystem; in-situ and ground based observations/ data and remote sensing/ satellite observations/ data in support SES; global-hemispheric scales (climate & atmospheric composition) and regional-urban scales (meteorology & atmospheric composition) modelling in support SES.
The 3rd session **"*Discussions*"** (from Chat and brainstorming) included a series of questions/ interests: Which (and how) results/ outcomes of the delivered conceptual and natural sciences presentations can be utilized with/for socio-economical studies? Which novel suitable indicators/ indices/ etc. can be proposed and jointly elaborated for Arctic specifics? How to interlink natural-socio-economic sciences studies/ outcomes with SDGs specifically connected with Arctic domain? Which models/ research tools and how to interlink/ cross-integrate between natural & socio-economic sciences and corresponding studies? Which limitations on usage of satellite info exist for Arctic regions? Which difference exist in fuel used for domestic heating/ cooking exist between northern Scandinavian and Russian Arctic settlements? Why multi- and interdisciplinary approach in future research/ applications is important for water issues? Why links between ocean/sea – atmosphere vs. socio-economical processes are important to be considered? Which folk signs (indigenous knowledge) of

the Scandinavian countries and Russian Federation native population can be used to study nature and climate change?

Institutions/ Participants of the Research Seminar:

- INEP KSC RAS (Institute of Industrial Ecology Problems in the North, Kola Science Center, Russian Academy of Sciences)
- UHEL-INAR (University of Helsinki, Institute for Atmospheric and Earth System Research)
- IIMM KSC RAS (Institute for Informatics and Mathematical Modeling, Kola Science Center, RAS), Apatity, Russia
- IES KSC RAS (Institute for Economic Studies, Kola Science Center, RAS), Apatity, Russia
- PGI (Polar Geophysical Institute, Kola Science Center, RAS), Apatity, Russia
- MASU (Murmansk Arctic State University), Murmansk, Russia
- UL (University of Lapland), Rovaniemi, Finland
- FMI (Finnish Meteorological Institute), Helsinki, Finland
- SRCES RAS (Scientific Research Center for Ecological Safety, RAS), St. Petersburg, Russia
- IIASA (International Institute for Applied Systems Analysis), Vienna, Austria
- NERSC (Nansen Environment and Remote Sensing Center), Bergen, Norway
- WMO (World Meteorological Organization), Geneva, Switzerland
- UCPH (University of Copenhagen), Copenhagen, Denmark
- MSU (Moscow State University), Moscow, Russia
- GCRI CAS (Global Change Research Institute, Czech Academy of Sciences), Brno, Czech Republic

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