Integrated Modelling in CRUCIAL Science Education

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The NordForsk CRUCIAL project (2016-2017) "Critical steps in understanding land surface – atmosphere interactions: from improved knowledge to socioeconomic solutions" as a part of the Pan-Eurasian EXperiment (PEEX; https://www.atm.helsinki.fi/peex) programme activities, is looking for a deeper collaboration between Nordic-Russian science communities.

In particular, following collaboration between Danish and Russian partners, several topics were selected for joint research and are focused on evaluation of: (1) urbanization processes impact on changes in urban weather and climate on urban-subregional-regional scales and at contribution to assessment studies for population and environment; (2) effects of various feedback mechanisms on aerosol and cloud formation and radiative forcing on urban-regional scales for better predicting extreme weather events and at contribution to early warning systems, (3) environmental contamination from continues emissions and industrial accidents for better assessment and decision making for sustainable social and economic development, and (4) climatology of atmospheric boundary layer in northern latitudes to improve understanding of processes, revising parameterizations, and better weather forecasting.

These research topics are realized employing the online integrated Enviro-HIRLAM (Environment – High Resolution Limited Area Model) model within students' research projects: (1) "Online integrated high-resolution modelling of Saint-Petersburg metropolitan area influence on weather and air pollution forecasting"; (2) "Modeling of aerosol impact on regional-urban scales: case study of Saint-Petersburg metropolitan area"; (3) "Regional modeling and GIS evaluation of environmental pollution from Kola Peninsula sources"; and (4) "Climatology of the High-Latitude Planetary Boundary Layer". The students' projects achieved results and planned young scientists research training on online integrated modelling (Jun 2017) will be presented and discussed.