Geophysical Research Abstracts
Vol. 20, EGU2018-12051, 2018
EGU General Assembly 2018

Elaboration of the Situation centre for monitoring and prediction of atmospheric air quality in Saint Petersburg

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In Saint Petersburg, as in any other megapolis, the ecological state of the environment cannot be called good. Congestion of population, motor vehicle emissions and harmful emissions of industrial zones seriously deteriorate the quality of life.
At the Russian State Hydrometeorological University (RSHU), in this context, a specific R&D is planned, on creation of an automatized system of monitoring and prediction of atmospheric air quality (a Situation centre), for obtainment, processing, storage and communication of information on atmospheric air quality, as a unified integrated system of obtainment and processing of measured data, modeling and prediction of parameters of atmospheric air quality, with the purpose of information support and implementation of state control and management in the field of environment protection and provision of ecological in megapolises and major industrial cities.
The Situation centre for monitoring and prediction of atmospheric air quality, created as a result of the R&D, must provide the following:
a) input, preliminary processing and accumulation of the data of meteorological measurements of physical and chemical parameters of atmospheric air that are received from the existing stationary and mobile stations and remote methods of atmosphere sounding;
b) formation and demand output of spatial-temporal information on atmospheric air parameters, and development and visualization of medium- and long-range predictions of changeability of physical and chemical parameters of atmospheric air of various spatial scales;
c) communication, if necessary, of warning sand notifications of sudden atmospheric processes that are dangerous for humans and the ecosystem to the proper bodies of state management.
In the prototype unit and the software under elaboration, several RSHU pilot projects are used, including:
1. Predictor module on the basis of the WRF mesoscale model.
2. Doppler meteorological radar locators.
3. Network of precipitation stations on the basis of the Pluvio2 (Vodokanal).
4. Automatizes system of monitoring of atmospheric air of Saint Petersburg (Mineral).
The elaborated technology of the Situation centre for monitoring, prediction and control of atmospheric air quality must provide significant decrease of expenditures for obtainment, processing and analysis of data of ground-based and remote observations of atmospheric parameters, development of routine, medium- and long-range predictions of their changeability, as well as working-out of warning sand notifications of sudden atmospheric processes that are dangerous for humans and the ecosystem, formation of a new philosophy of ecological safety of people's life on the Earth.