Usage of web-GIS platform Climate to prepare specialists in climate changes modeling and analysis

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A web-GIS based platform "Climate" developed in our institute (http://climate.scert.ru/) has a set of tools and data bases to perform climate changes analysis on the selected territory. The platform is functioning and open for registration and all these tools are available. Besides that the platform has a potential to be used in education. It contains several educational courses followed by tests and trainings which are performed within the platform "Climate" using its web-gis tools.

The main purpose of a new "Climatic and environmental modeling" module course is to enable students and graduates meteorological departments to improve their knowledge and skills in modern climatology. Although the emphasis is on climate science, the course is directly related to the part of the ecological science, which refers to the environment. This is due to the fact that the current global climate models have become models of the Earth system and include models of environment as well.

The module includes a main course of lectures devoted to basic aspects of modern climatology , including analysis of the current climate change and its possible consequences , a special course on geophysical hydrodynamics, several on-line computing labs dedicated to specific monitoring and modeling of climate and climate change , as well as information kit , which not only includes the usual list of recommended reading, but also contains the files of many publications , the distribution of which is not limited by copyright law.

Laboratory exercises are designed to consolidate students' knowledge of discipline, to instill in them the skills to work independently with large amounts of geophysical data using modern processing and analysis tools of web-GIS platform "Climate". The results obtained on laboratory work are presented as reports with the statement of the problem, the results of calculations and logically justified conclusion.

Now the following labs are used to train and prepare young specialists:

"Analysis of regional climate changes". It contains description of main statistical methods of processing and analysis of meteorological data which are used to characterize the ongoing changes of regional climate. Theoretical part of this course is followed by a set of trainings to study a long-term behavior of climatic variables in Northern Eurasia.

"Analysis of future climate". This course is supported by the set of tasks based on results of the model "Planet simulator" calculations. "Planet Simulator" is a climate model of intermediate complexity and doesn't require large computing resources. This model allows studying interactions of climate system components and making computations for different future development scenario.

"Analysis of climate extreme indices on the regional scale". It contains description of main statistical methods of processing and analysis of meteorological data which are used to characterize the ongoing changes of regional climate. Theoretical part of this course is followed by a set of trainings to study a long-term behavior of climatic variables in the selected regions. Within the framework of the course trainings students receive the opportunity to use the large set of modern world-known data archives, which are not presented on their university basic courses. This data can be compared with the data of station observations. Students can calculate a basic set of climate characteristics for a chosen region and time period, receive graphically presented results and analyze the dynamics of chosen climatic characteristics.

The educational approach allows making students acquainted with the on-going climatic changes in Northern Eurasia and improving their knowledge and skills.