PROCEEDINGS OF THE YEREVAN STATE UNIVERSITY
УЧЕНЫЕ ЗАПИСКИ ЕРЕВАНСКОГО ГОСУДАРСТВЕННОГО УНИВЕРСИТЕТА
Geology and Geography **1**, 2026 ***Геология и география***

Special Issue

УДК 551.581.1

OPPORTUNITIES FOR ANALYZING HAZARDOUS ATMOSPHERIC PHENOMENA IN THE TERRITORY OF BELARUS USING INFORMATION TECHNOLOGIES

Natalia V. Dorozhko *

Belarusian State University, Minsk, Belarus

Today, many scientists are exploring the application of computer technologies and their adaptation for atmospheric analysis across territories of varying scales. The state of the atmosphere over a specific territory and at a specific time is determined by various geophysical, geographical, and atmospheric factors, which collectively determine the weather in the studied area. Computer models are used for atmospheric forecasting and analysis, allowing for the rapid and effective resolution of these problems at the appropriate scientific and methodological level. Modern numerical atmospheric models adequately describe the qualitative structure of global circulation, which is reflected in changes in climate system parameters. The ability of models to forecast climate over a given period of time builds confidence in the physical reliability of the calculated data. The use of numerical analysis, computer processing, machine learning, and neural network analysis allows for the processing of large volumes of information and the automation of data processing and analysis systems, improving the quality and lead time of forecasts. Recent advances in atmospheric science and technology create favorable conditions for improving the accuracy of weather forecasts and forecasts of hazardous atmospheric phenomena that negatively impact people and economic sectors. Particularly noteworthy is the use of supercomputer systems, whose capabilities allow the creation and application of highly complex mathematical models of atmospheric circulation for weather forecasting. This study analyzes several cases of hazardous atmospheric phenomena that occurred in Belarus and the potential of using computer technologies in their analysis. It also discusses the potential of modern technologies for recognizing hazardous atmospheric phenomena in a specific region.

https://doi.org/10.46991/PYSUC.2026.SI1.016

Keywords: atmospheric phenomena, technologies, hurricane, active cyclones.

* **Corresponding Author:** Natalia V. Dorozhko, Senior Lecturer, Belarusian State University, Leningradskaya str., 16, Minsk, Belarus. E-mail: natashka_d10.05@mail.ru