CURRENT CLIMATE CHANGES IN THE ARCTIC

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Abstract. The properties of climate fluctuations are described, obtained as a result of a special statistical analysis of observational data from the world meteorological network of stations, taking into account the peculiarities of the northern regions. Using the example of air temperature, free and forced fluctuations of the characteristics of the climate system in their interaction are considered.

New ideas about the structure of fluctuations and possible causes of climate changes have been formulated. A statistical model of periodic nonstationarity of climate is proposed for forecasting climate fluctuations for two decades, and a model for seasonal and monthly meteorological forecasts with an annual lead time is proposed. The practical significance of predictive developments is especially great in the harsh climatic conditions of the north, where the climate is one of the limiting factors of the industrial development of the northern regions.

Keywords: climate change, time scale.

The Arctic Council, an international organization of eight Arctic states, designed to promote cooperation in the field of environmental protection and sustainable development of the circumpolar regions, pays great attention to climate change in the Arctic. In 2000, the Arctic Council launched the preparation of the Arctic Climate Impact Assessment (ACIA) report. It was a joint project of two working groups of the Arctic Council: the Arctic Monitoring and Assessment Program (AMAP) and the Conservation of Arctic Floraand Fauna (CAFF).

The result of the implementation of the project was a thousand-page scientific report, prepared by the end of 2004 and published by the University of Cambridge [1]. 18 chapters of the report contained detailed information on the recorded changes in the atmosphere, cryosphere and hydrosphere, in ozone and ultraviolet radiation, in ecosystems of land and water.

The state of forestry and agriculture, fishing, reindeer husbandry, hunting in a changing climate was assessed.

The health of the population, the prospects of indigenous peoples and the preservation of their ways of life under the influence of the ongoing changes were discussed. UDC 551.582 (98) +551.585

Current climate change in the Arctic: results of a new assessment report of the Arctic Council Yu. S. Tsaturov, Ph.D., Federal Service of Russia for Hydrometeorology and Environmental Monitoring A. V. Klepikov, Ph.D. Antarctic Research Institute "

The article presents the results of the new report of the Arctic Council "Snow, water, ice and permafrost in the Arctic", dedicated to the assessment of the current situation in the Arctic cryosphere.

Climate change has become a major problem in the Arctic over the past decades.

The consequences of climate change, including damage to buildings, roads and pipelines, reduced opportunities for hunting, fishing, reindeer husbandry, negative impact on the health of the population of the northern territories, require the development of an adaptation strategy.

Key words: Arctic cryosphere, climate change in the Arctic, global climate research, ground-based hydrometric networks.

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The results of ASIA showed that there is a tendency for the temperature to rise, reaching almost 3 ° C over a 30-year period (1971-2000) in some regions (Alaska, Northern Canada, Siberia).

Although the magnitude of the observed trends varied within a particular region and some regions experienced cooling, the overall trend for the Arctic over the past few decades has shown warming, almost twice the average global temperature rise on the planet.

For 1971-2000. precipitation increased in most of the Arctic regions by 10% to 30%, sea ice area decreased by 10–15%, and land snow cover decreased by about 10%.

Most glaciers in the Arctic were losing mass.

In most of the Arctic, the temperature of the upper permafrost layer has increased by 1-2 ° C over 30-40 years.

The duration of the freezing period of Arctic lakes and rivers has decreased, and the runoff of Arctic rivers has increased in recent years. Given the importance of the results of the ASIA assessment and due to the fact that the projects of the International Polar Year (IPY-2007/08) provided a lot of new data, the Arctic Council decided to carry out a similar assessment in order to track changes in the Arctic and Subarctic already in the first decade of the 19th century. ... It was decided to focus on 77. Contemporary Arctic Climate Change: Results of a New Arctic Council Assessment Report on Cryospheric Changes.

The term "cryosphere" refers to a part of the earth's surface that periodically freezes or is constantly frozen. This includes snow, frozen ground, river and lake ice, glaciers, ice caps, ice sheets, and sea ice.

The cryosphere is like a skeleton of the physical environment of the Arctic. It is an integral part of the climate system and affects the climate at both the regional and global levels.

At the same time, parts of the cryosphere are extremely important for people living in the Arctic. Snow and glaciers provide the population with fresh water, river and lake ice provide mobility, sea ice enables sea animals to hunt and fish.

The observed changes in the sea ice cover of the Arctic Ocean, in the Greenland ice sheet, in ice caps and glaciers, in the snow cover and permafrost of the Arctic over the past 10-15 years are dramatic and obviously diverge from the results of observations, which were carried out in the XIX-XX centuries.

That is why the assessment of changes in the cryosphere has become the main task of the new climate project of the Arctic Council.

AMAP, as well as the International Arctic Science Committee (IASC), World climate research program through the Climate and Cryosphere Project (CliC) and the International Arctic Social Science Association (IASSA).

Note that since the start of the ASIA project in 2000, AMAP has been actively involved in the generalization and assessment of information on natural climate variability, on anthropogenic climatic changes, on the impact of global, regional and local climate changes and ultraviolet

radiation on the Arctic environment. AMAP has now become one of the leading organizations on these issues.

According to the SWIPA project, a new comprehensive assessment of the state of the cryosphere in the Arctic and Subarctic for the period from 2008 to 2011 is to be made. against a backdrop of climate change including the Greenland ice sheet, mountain glaciers and ice caps, sea ice and freshwater ice, permafrost and snow cover.

It was planned to summarize modern scientific knowledge to recreate the picture of the ongoing changes and to develop mechanisms for adaptation to the challenges associated with climate change in the Arctic and Subarctic.

An important part of the SWIPA project is the assessment of the socio-economic consequences of the impact of climate change and the proposal of measures for adaptation to them.

A key moment for the preparation of a new assessment of the state of the cryosphere in the northern regions was the inclusion of data obtained in IPY-2007/08. The SWIPA project consisted of three sub-projects:

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