



Geodynamic evolution of the Arctic

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Compiling the new Tectonic Map of the Arctic, the work on which had been carried out since 2003 as part of the international project “Atlas of Geological Maps of the Circumpolar Arctic”, was completed in 2017. The project has been implemented by geological surveys of the Arctic countries: Russia, Norway, Denmark, Canada, and the USA with the participation of specialists from national universities and academies of sciences with active support of the UNESCO Commission for the Geological Map of the World.

New geological and geophysical data on the previously poorly studied Central Arctic Ocean, obtained during mapping, allowed the assessment of the geodynamic history of the Arctic Basin evolution at the new stage of cognition.

Old and recent oceanic structures are combined in the tectonic structure of the Arctic that is responsible for significant variations in the thickness and crustal architecture of the region. In the Paleozoic, the Arctic was located in the influence area of the Yavetus Paleoocean, the Ural branch of the Paleo-Asiatic Ocean, and the Pacific; in the Meso-Cenozoic, the Atlantic and Pacific Oceans. In the Arctic, there exist marginal basins both closed (Novaya Zemlya, Severnaya Zemlya, Taimyr, New Siberian marginal basins), and those preserved as super-deep depressions (South and North Barents and Canada basins). In the history of the Arctic evolution, there has been a consecutive series of divergent-convergent processes: Neoproterozoic, Neoproterozoic - Early Paleozoic, Early Paleozoic, Early Paleozoic - Permian, Late Paleozoic - Early Cretaceous, Cretaceous-Cenozoic.

The present-day tectonic structure of the western Arctic sector is formed under the influence of divergent processes, caused by the opening of the Atlantic with the formation of passive continental margins – Barents-Kara and Amerasian. In the eastern Arctic, divergent processes characteristic of the Atlantic are conjugated with convergent processes of the Pacific belt, which are accompanied by the formation of island arcs and marginal back-arc basins.