



## **The boundary of the Eurasian and North America lithospheric plates**

Oleg Petrov, Sergey Kashubin, Sergey Shokalsky, Nikolay Sobolev, Vladimir Shpikerman, Evgeny Petrov, and Tatiana Tolmacheva

A.P. Karpinsky Russian Geological Research Institute (VSEGEI), Saint-Petersburg, Russian Federation (vsmdir@vsegei.ru)

One of scientific results while compiling a new international Tectonic map of the Arctic (Tectonic map ..., 2019) with participation of geological surveys and universities of the Arctic states (Russia, Norway, Sweden, Denmark, Canada, Germany, and the United States) and active assistance of the Commission for the Geological Map of the World supported by UNESCO is the development of the up-to-date plate tectonic model of the Arctic. Based on this model, it is proved that the tectonic structure of the Arctic region is controlled by the active interaction of the North America, Eurasian and Pacific lithospheric plates. Modern seismicity recorded in the Gakkel Ridge spreading zone as a narrow chain of seismic activity with a shallow earthquake foci at a depth of no more than 35-45 km is an indicator of divergent processes on the boundary between the North America and Eurasian lithospheric plates, which began in the Late Cretaceous and Cenozoic.

In the continental shelf of the Laptev Sea, the modern boundary between the North America and Eurasian lithospheric plates is traced along a series of rift depressions (Ust-Lena, South Laptev Sea, Omoloy and others) initiated in the Late Cretaceous and Paleogene. In the continental part of the Northeast of Russia, the modern boundary of these lithospheric plates is formed in a complicated neotectonic zone, which includes rifts of the Mom Ridge and the Chersky Ridge, and features a diffuse shallow-focus (up to 45 km) seismicity of transpression compression. There, the plate boundary occurs as a series of neotectonic Paleogene-Neogene and Quaternary depressions linearly extended in the northwestern direction with shows of Cenozoic alkaline-gabbroid magmatism. These graben-like structures are conjugate to older Cretaceous volcano-plutonic belts extended northeastward and caused by oceanic plate subduction beneath the continental crust in the zone of the active Pacific margin.

Thus, in accordance with the modern plate tectonic model of the Central Arctic uplifts, the Podvodnikov Basin and the Canada Basin are margins of the continental plate, within which all modern tectonic processes relate to the intraplate ones. Current analysis of geological and geophysical data, studies of the bottom rock material from the Central Arctic uplifts, including shallow drilling and sampling from the underwater escarpments of the Alpha and Mendeleev ridges, as well as studies of the geological structure of the Arctic Islands testify to the continental nature of the Mendeleev Ridge and the Podvodnikov Basin and their genetic relationship with the shelf structures of the East Siberian margin of Eurasia.