



New Tectonic Map of the Arctic (TeMAr) and the Question of Distinguishing the Paleo-Asian Ocean

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Over the last decade in the framework of the international project "Atlas of Geological Maps of the Circumpolar Arctic at 1:5 M scale" under the auspices of UNESCO/CGMW, a new Tectonic Map of the Arctic (TeMAr) has been compiled; its first version (draft) was displayed at the 34th IGC in Brisbane. To date, the international working groups of the geological surveys of Arctic states involving France and Germany have already compiled the geological map and geophysical maps of magnetic anomaly and gravity fields of the Arctic, set of geophysical maps and sections reflecting the deep structure of the Arctic region up to 60°N. The set includes: zoning map of the Circumpolar Region by nature of potential fields, thickness maps of the sedimentary cover, consolidated crust, and the Earth's crust in general, schematic map of the Earth's crust types in the Circumpolar region showing the distribution of areas with oceanic, continental, and transitional crust, seismic velocity models of tectonic structures of the Arctic.

It has been revealed during TeMAr compilation that the basement in the central Arctic region is one of the largest on the planet accretion polychronous collages clamped by three cratons – Siberian, North American, and East European. It combines orogenic belts of different ages from 1 Ga (Timan, Yenisei, Central Taimyr, Chukchi-Seward orogens) to 205-135 Ma (Pai-Khoi-Novaya Zemlya, Novosibirsk orogens). These fold belts enclose and cement the Early Precambrian cratonic blocks (North-Kara, Alpha-Mendeleev ridges etc.). Arctic accretionary collage (mobile belt) is built up to the south by the Ural-Mongolian (Central Asian) also polychronous mobile belt, that formed on the place of the Paleo-Asian Ocean in the age range from Neoproterozoic to Permian. Thus one can observe the largest Arctic-Paleo-Asian mobile belt, which corresponds to the paleo-ocean comparable in size to the modern Atlantic and Indian oceans. This mobile belt is characterized by a complex combination of accretionary and rifting tectonic-magmatic processes, with their gradual rejuvenation to the north and east until the junction with the Pacific mobile belt structures. At its early stages, accretionary tectonics with a wide development of volcanic belts dominated; at the late ones (in the Late Paleozoic, Mesozoic, and Cenozoic) stretching, rifting and postrift subsidence were widely shown with the formation of oil and gas sedimentary basins with a thick sedimentary cover (East Barents, West Siberian, South Kara, Yenisei-Khatanga, North Chukchi, Beaufort), large igneous provinces (East and West Siberian, Central Arctic) and rift systems (Canada Basin, Laptev Sea, etc.). During the Cenozoic, penetration of the North Atlantic rift system, accompanied by intraplate volcanism of NALIP, into the Central Arctic is observed. As a result, suprarift Eurasian oceanic basin crossing across the strike structures of the Arctic-Paleo-Asian mobile belt was formed. Spatial and age boundaries, the history of origination and development of this belt as a global-level structure should be the subject of further investigations under the international Asian and Arctic projects.