



Geological Structure and History of the Arctic Ocean

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New data on geological structure of the deep-water part of the Arctic Basin have been integrated in the joint project of Arctic states – the Atlas of maps of the Circumpolar Arctic. Geological (CGS, 2009) and potential field (NGS, 2009) maps were published as part of the Atlas; tectonic (Russia) and mineral resources (Norway) maps are being completed. The Arctic basement map is one of supplements to the tectonic map. It shows the Eurasian basin with oceanic crust and submerged margins of adjacent continents: the Barents-Kara, Amerasian (“Amerasian basin”) and the Canada-Greenland. These margins are characterized by strained and thinned crust with the upper crust layer, almost extinct in places (South Barents and Makarov basins). In the Central Arctic elevations, seismic studies and investigation of seabed rock samples resulted in the identification of a craton with the Early Precambrian crust (near-polar part of the Lomonosov Ridge – Alpha-Mendeleev Rise). Its basement presumably consists of gneiss granite (2.6-2.2 Ga), and the cover is composed of Proterozoic quartzite sandstone and dolomite overlain with unconformity and break in sedimentation by Devonian-Triassic limestone with fauna and terrigenous rocks. The old crust is surrounded by accretion belts of Timanides and Grenvillides. Folded belts with the Late Precambrian crust are reworked by Caledonian-Ellesmerian and the Late Mesozoic movements. Structures of the South Anuy - Angayucham ophiolite suture reworked in the Early Cretaceous are separated from Mesozooids proper of the Pacific - Verkhoyansk-Kolyma and Koryak-Kamchatka belts. The complicated modern ensemble of structures of the basement and the continental frame of the Arctic Ocean was formed as a result of the conjugate evolution and interaction of the three major oceans of the Earth: Paleoasian, Paleotlantic and Paleopacific.