Geophysical Research Abstracts
Vol. 20, EGU2018-2200, 2018
EGU General Assembly 2018

Seismic stratigraphy and tectonostratigraphy of the Arctic Ocean based on new Russian geophysical data

Anatoly Nikishin (1), Eugene Petrov (2), Carmen Gaina (3), and Sergey Freiman (4)

(1) Moscow State University, Geological Faculty, Moscow, Russian Federation (nikishin@geol.msu.ru), (2) Rosnedra, MNR, Moscow, Russia, (3) The Centre for Earth Evolution and Dynamics – CEED, University of Oslo, Norway, (4) Moscow State University, Geological Faculty, Moscow, Russian Federation

New Russian seismic data collected from 2011 to 2014 (Arctic-2011, Arctic-2012 and Arctic-2014 expeditions) allowed us to revisit the tectonics of the Arctic region. Based on available vintage and new data we propose a new seismic stratigraphy of the Arctic Ocean. We suggest that the rift systems within the Laptev, the East Siberian and the Chukchi Seas were formed not earlier than the Aptian time. Based on all available geological and geophysical data, few conclusions may be drawn: 1. The Canada Basin formed before the Aptian time (probably, during Hauterivian-Barremian time). 2. There are many evidences of intense tectonic and magmatic events, possibly connected to mantle plume activity, during the Aptian-Albian in the area of the De Long Islands, Mendeleev Ridge and other regions. After the cessation of the Verkhoyansk-Chukotka orogen, rifting occurred on the shelves of the Laptev, East Siberian, North Chukchi and South Chukchi basins, and the Chukchi Plateau. In the same time, continental rifting started in the Podvodnikov and Chukchi Abyssal Plain basins. 3. Late Cretaceous rifting may have continued in the Podvodnikov and Chukchi Abyssal Plain basins. 4. At the end of the Late Cretaceous and Paleocene, the Makarov basin was formed by rifting, and possibly seafloor spreading. 5. The youngest oceanic basin -the Eurasian Basin - started to open in the Early Eocene and formed oceanic crust in an intermediate-slow spreading regime until ca. 45 Ma. Since mid-Eocene time, this oceanic basin formed in an asymmetric ultra-slow spreading regime and today hosts the slowest mid ocean ridge on Earth.