

Geological evolution of the northern Mid Kuril trough based on seismic facies analysis

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Abstract. The model of geological evolution of an interarc basin, which is the north-east ending of Mid Kuril trough located on the continental slope of Kuril-Kamchatka trench, was constructed. Seismic facies analysis was first applied to define sedimentation conditions in a deep water trench. The analysis was based on the 2D CDP reflection seismic data obtained by Dalmorneftegeophysica JSC in 2014. According to the modeling results, the basin began to form in the Late Cretaceous and passed several stages. Initial subsidence of a local crust area of the incipient basin changed over to its further separation from the adjacent waters of the Sea of Okhotsk and Pacific Ocean by various volcanic formations framing its contour. The basin waters and the Pacific Ocean waters merged as a result of subsidence and submersion of volcanic structures on the east basin framing at the final stage during the Oligocene-Middle Miocene. This subsidence is directly related to the global processes associated with Kuril-Kamchatka ocean trench appearance such as inherent crust subsidence along valley bottom line accompanied by increase in inclination angle of its flanks. It was concluded that the trench origination time approximately corresponds to the Oligocene-Middle Miocene boundary.

Keywords:

Kuril-Kamchatka ocean trench, Mid Kuril trough, geological evolution, seismic survey, seismic facies analysis

For citation: Zhigulev V.V., Zhigulev A.V. Geological evolution of the northern Mid Kuril trough based on seismic facies analysis. *Geosistemy peredodnykh zon = Geosystems of Transition Zones*, 2021, vol. 5, no. 3, pp. 275–286. (In Russ., abstr. in Engl.).

<https://doi.org/10.30730/gtr.2021.5.3.275-286>

Для цитирования: Жигулев В.В., Жигулев А.В. Геологическое развитие северной части Срединно-Курильского прогиба по данным сейсмофациального анализа. *Геосистемы переходных зон*, 2021, т. 5, № 3, с. 275–286. <https://doi.org/10.30730/gtr.2021.5.3.275-286>

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