



## **Ancient subduction processes and formation of back- arc basins in the Sea of Okhotsk**

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In the Sea of Okhotsk in Eastern Sakhalin an ancient (Upper Cretaceous-Paleogene) subduction zone is distinguished. On the surface it is manifested by an ophiolite complex, which separates North Sakhalin oil and gas basin from Deryugin basin of the Sea of Okhotsk. These sedimentary basins formed after the subduction ceased. They have the anomalous deep structure. Their features are rift structures in the basement; active magmatism at the initial stage of formation; active hydrothermal processes; the heat flow high density caused by the rise of the asthenosphere to the crust; and the location of asthenospheric diapirs beneath sedimentary basins. Geodynamic constructions showed that Deryugin basin in the Sea of Okhotsk was formed at the place of an ancient deep trench after the subduction of the Okhotsk Sea plate under Sakhalin ceased in the Early Paleogene. Deryugin basin is located above a hot plume that is asthenosphere diapir revealed at a depth of approximately 25 km. In the Cenozoic, thick sandy-clayey sediments accumulated in Deryugin basin. The North Sakhalin basin is located above the ancient subduction zone. The basin may have formed in the following way. Approximately 100 million years ago, the oceanic lithosphere of the Sea of Okhotsk subducted under Sakhalin, the eastern part of which was an island arc. Behind it, in western Sakhalin, there was a back-arc basin where sandy – clayey deposits accumulated in the Late Cretaceous- Paleogene, which subsequently formed the basement of Neogene North Sakhalin basin. The Neogene sediments consist of marine terrigenous and volcanic rocks.