

## **Seismic stratigraphy and regional unconformity analysis of Chukchi Sea Basins**

Mariia Agasheva, Yury Karpov, Antonina Stoupakova, and Anna Suslova  
Lomosov Moscow State University, Moscow, Russia

Russian Chukchi Sea Shelf one of petroleum potential province and still one of the most uninvestigated area. North and South Chukchi Trough that separated by Wrangel-Herald Arch have different origin. The main challenge is stratigraphic sequences determination that filled North and South Chukchi basins. The joint tectonic evolution of the territory as Canada basin opening and Brooks Range-Wrangel Herald orogenic events enable to expect the analogous stratigraphy sequences in Russian Part. Analysis of 2D seismic data of Russian and American Chukchi Sea represent the major seismic reflectance that traced throughout the basins. Referring to this data North Chukchi basin includes four seismic stratigraphic sequences – Franklian (pre-Mississippian), Ellesmirian (Upper Devonian-Jurassic), Beaufortian (Jurassic-Lower Cretaceous) and Brookian (Lower Cretaceous-Cenozoic), as it is in North Slope Alaska [1]. South Chukchi basin has different tectonic nature, representing only Francian basement and Brookian sequences.

Sedimentary cover of North Chukchi basins starts with Ellesmirian sequence it is marked by bright reflector that separates from chaotic folded Franklian sequence. Lower Ellesmirian sequence fills of grabens that formed during upper Devonian rifting. Devonian extension event was initiated as a result of Post-Caledonian orogenic collapse, terminating with the opening of Arctic oceans. Beaufortian sequence is distinguished in Colville basin and Hanna Trough by seismically defined clinofolds. Paleozoic and Mesozoic strata are eroded by regional Lower Cretaceous Unconformity (LCU) linked with Canada basin opening. LCU is defined at seismic by angular unconformity, tracing at most arctic basins. Lower Cretaceous erosion and uplift event are of Hauterivian to Aptian age in Brooks Range and the Loppa High uplift refer to the early Barremian.

The Lower Cretaceous clinofold complex downlaps to LCU horizon and filling North Chukchi basin (as in Colville basin Alaska) progressed from south to north. It indicates the source area was Wrangel Herald arch. Horizon LCU lies on chaotic reflectance sequence of basement in South Chukchi profiles. It matches to the geological structure in Hope basin Alaska.

Cretaceous and Paleogene strata divided by Mid-Brooks unconformity that accompanied with intensive uplift and erosion. Paleogene sequence is characterized by high thickness in North Chukchi basin in comparison with Hanna Trough and North Slope basins. Prograding Paleogene thick clinofold units of various geometries, angular and trajectories are observed in North Chukchi basin. Thick clinofold sequences could be formed as a result of significant subsidence followed by rapid sedimentary influx. This model assumes that North Chukchi basin could be more affected by Cenozoic tectonics of Eurasia Basin rifting.

Complementary studies will be connected with careful clinofold types mapping in combination with sequence stratigraphy analyses to identify the depositional environment, source rocks and reservoirs distribution.

[1] Moore, T.E., Wallace, W.K., Bird, K.J., Karl, S.M., Mull, C.G. & Dillon, J.T. (1994) Geology of northern Alaska. In: The Geology of Alaska (Ed. by G. Plafker & H.C. Berg), Geol. Soc. Am., Geol. North America, G-1, 49-140.