Sedimentary Basins of East Siberian and Chukchi Sea Shelf: the Structure and Hydrocarbon Potential

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East Siberian and Chukchi Seas occupy vast area of Russian Eastern Arctic shelf, where very limited amount of seismic data is available and no offshore wells drilled yet. The area belongs mostly to the New Siberian-Chukotka fold belt, which resulted from “South-Anyui” collision process in pre-Aptian (Sokolov et al., 2002; Katkov et al., 2007). It was believed, that East Siberian shelf consists of (from S to N): Blagoveshchensk basin, Anzhu ridge and New Siberian basin (e.g. Kos’ko et al., 1993). The seismic data squired by LARGE (Drachev et al., 2001) and BGR (Franke et al, 2004) reveal no mentioned above structures. Quite big East Siberian basin was recognized in the Central Eastern part of the Sea. The basin is filled by relatively thick (more, than 6 km) Late Cretaceous-Cenozoic sediments. Prospect mapping drilling on the adjoining New Siberian Islands revealed gas shows in Jurassic and Cenozoic sediments (Yashin, Kim, 2007). Based on the field work on Chukotka and data compilation, Miller and Verzhbitsky (2007, 2009) pointed, that poscollisional ~E-W extension, accompanied by intrusion of granitic plutons and dikes may be related to Makarov Basin opening in Aptian-Albian. Our study of Chukchi Sea is based on field work on Wrangel Island and TGS/Intergrator 2D seismic data, covered Upper Cretaceous (?)-Cenozoic South Chukchi basin, Kimmerian Wrangel Arch and Upper(?) Paleozoic-Cenozoic North Chukchi basin. The data were processed in TGS Moscow center and brought the unique information about the structure of Chukchi shelf. Field observations confirmed rather uniform general N-vergent low-angle thrust fault and fold structural pattern of the Island. Seismic section across Wrangel Arch also revealed series of thrust faults, but both N- and S-vergent. Three main unconformities were recognized on the seismic records, presumably of pre-Aptian (LCU), Late Cretaceous-Early Tertiary (MBU) and Late Oligocene age. The U.S. Arctic Alaska/Chukchi Sea region is famous for large oil and gas discoveries. The proposed similarities in tectonic history and depositional settings of both sectors, wide-spread anticline structures in Paleozoic, Mesozoic and Cenozoic sequences, wedge-outs, unconformities, “bright spot” seismic anomalies, gas chimneys, buried deltaic/progradational units and anomalous concentrations of hydrocarbon gases in the bottom sediments may point to significant prospectivity of Chukchi Sea shelf, which looks more promising, compare to East Siberian.