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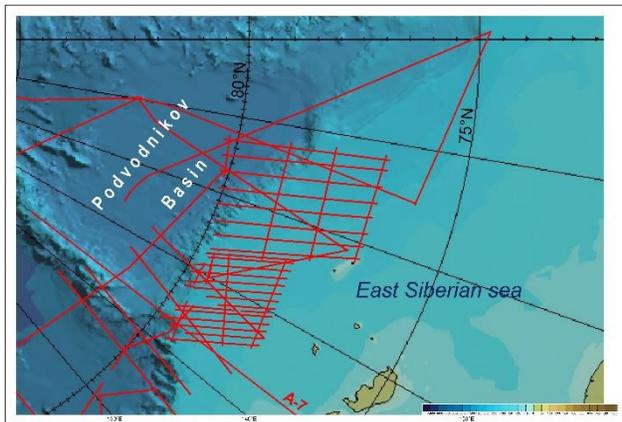
The Tectonic Map of the East Siberian Sea: the Undisturbed Paleozoic Cover (According to the Data Acquired by MAGE)

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Following regional geophysical surveys performed on the East Siberian shelf in the early 1970s, scientists reached a firm conclusion on the young age of the shelf basement. According to this view that was for the first time expressed by V.A. Vinogradov in 1974 [1], the entire water area represents the Early Cretaceous folding overlapped by the Upper Cretaceous-Cenozoic sedimentary cover. Moreover, the seismic data acquired by K. Hinz, D. Franke, S.B. Sekretov, and S.S. Drachev at the turn of the 21st century has completely approved the expressed point of view. In addition to that, based on the detailed analysis of the seismic and gravity data, V.V. Verba concluded that there is no Early Cretaceous folding in the area.



The scientist concluded that there is one more carbonate-terrigenous formation under the undeformed Upper Cretaceous-Cenozoic sedimentary cover. The newly discovered formation is weakly and unevenly affected by the Alpine collision deformations. MAGE had performed marine geophysical CMP surveys at high resolution with the help of a long seismic streamer in the East Siberian Sea (the De Long uplift) and in the central deepwater part of the Arctic basin of the Arctic Ocean over the past 5 years [Fig. 1].

Figure 1: Seismic lines performed by MAGE

The surveys for the first time gave conclusive evidence of the presence of a thick Mesozoic-Paleozoic sequence practically flat underlying in the western part of the East Siberian Sea under the clear erosive unconformity and well represented Cenozoic sedimentary cover. The thickness of the Mesozoic-Paleozoic sequence is not less than 4-6 km [2]. Relatively low velocity level, minimal development of dislocation with a break of continuity, and flat dip visible on profiles indicate the platform nature of the sediment mass. CMP seismic data collected in the eastern part of the East Siberian Sea shelf confirms the conclusion about gentle and platform occurrence of the Middle and Upper Paleozoic and Mesozoic terrigenous sequences within the limits of deep sedimentary troughs located between the islands. The abovementioned data collected by MAGE made it possible to update the tectonic map of the East Siberian Sea generated by M.L. Verba in 2006 [3]. Thickness of the sedimentary cover was revised; Mesozoic-Paleozoic weakly disturbed platform deposits between the basement and sedimentary cover were identified as an intermediate geological unit. New data collected by MAGE does not question the credibility of land geological observations. Moreover, it suggests that N.S. Shatskiy and then S.M. Tilman

were right to notice attenuation of the Early Cretaceous folding on the East Siberian shelf. Sedimentary rocks located beyond mainland and islands were not deformed. As the data acquired on the last seismic profiles showed, the nature of local distribution of orogens is determined by fault deformations of strike-slip type.

References:

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- [2] Kazanin G.S. et al. [2014]. Exploration and protection of subsurface resources. 4, 7-12
- [3] Verba M.L. et al. [2011]. Exploration and protection of subsurface resources. 10, 66–70.

