



## **Tectonics and Evolution of the Ukrainian Black Sea from new regional seismic data**

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A new set of seismic reflection profiles with total length of 10000 km was acquired by Naftogaz of Ukraine in 2005. The seismic record length is 15 s in the deep water area and 9 s in the Odessa Shelf. The high-quality seismic data allow studying the structure of the whole sedimentary cover with the thickness of up to 9 km in Karkinit Through of Odessa shelf and up to 20 km in the Western Black Sea Basin.

Typical (half)grabens were formed by Early Cretaceous rifting over the wide area of the Black Sea. The distribution of main rift faults has been reconstructed in areas of Karkinit Through, Gubkin Swell, Zmeiniy Uplift, most southern part of the East European Platform. The reconstruction confirms our previous conclusion that before the compression event at the end of Middle Eocene the Early Cretaceous Karkinit Rift and subsequent Late Cretaceous – Middle Eocene post-rift basin occupied the area of present-day Gubkin Swell and Zmeiniy Uplift. The rift basin extended likely further to the west in Dobrogea onshore region. It is not excluded the Early Cretaceous extension was an oblique to the direction of main tectonic units that had existed in the area of Odessa Shelf before the Early Cretaceous rifting.

The rifting probably began in Early Cretaceous within the whole Black Sea region. The post-rift thermal subsidence lasted from the Campanian of Late Cretaceous to the end of Middle Eocene. The oblique (?) compression stresses affected the whole Ukrainian Black Sea at the end of Middle Eocene just as the stresses caused inversion tectonics in Balkans, Great Caucasus, Pontides. The strongest inversion caused by the stresses occurred in the western part of Karkinit Through (Gubkin Swell and Zmeiniy Uplift), Andrusov and Shatsky Ridges. The last two ridges represent strongly inverted major (half)grabens. Such insight on the origin of the structures has never been discussed earlier.

Since the Middle Eocene there were at least four pulses of compression that caused formation of local anticlines due to moderate reverse movements of sediments along normal faults as well as due to sliding of sedimentary layers along detachments in sedimentary cover. The seismic data reveal that the water depth of the Black Sea was shallow at least during pulses of compression events. The rapid subsidence of the Black Sea that formed the deep sea occurred not earlier than in Pliocene.