

## **Depositional environments of the south-eastern Volga–Ural antecline in the Early-Middle Devonian.**

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Nowadays, in the Orenburg region of Russia hydrocarbon potential has been determined down to a depth of 5 km. Therefore, discovery of deep fields is becoming a pressing issue there. Seismic profiles on the south-eastern part of Volga-Ural antecline indicate two uplifts at the depth of 6-7 km composed of Emsian-Givetian deposits which likely represent large carbonate buildups. Then facies analysis of this territory (based on data of about 100 boreholes) was made and it confirmed the presence of bioherm massifs and showed sedimentary environments.

Analysis of the composition and the structure of deposits revealed that in the Emsian stage a shallow-water shelf basin existed, which deepened toward the Ural and North Caspian basins and was characterized by the transgressive evolution. The early stage of transgression was dominated by the terrigenous sedimentation. This region likely had a prodelta with three (proximal, intermediate, and distal) zones. Then the basin was deepened, the amount of terrigenous material decreased and carbonate massifs started to form. At that time following environments occurred: shallow-water coastal zone, intrabasin uplift, shallow-water distal zone, relatively deep-water zone and riftogenic carbonate buildups.

Facies analysis of Eifelian sediments showed that there were two shallow-water zones, where carbonates were deposited with formation of small separate organic structures, surrounded by relatively deep-water zone. Continued submergence caused development of bioherm massifs.

Givetian deposits differed from the Eifelian by abundant input of the terrigenous material. The growth of the bioherm massifs stopped during this time. Due to facies analyses such paleogeographic zones as shallow-water coastal zone, deep-water shelf zone, submarine fan zone were defined.

As a result, two buried reefs were discovered, which could be perspective for finding out oil and gas. These bioherms are covered by the Tournaisian depression sediments that could serve as caprocks.