

## **Architecture of Miocene Nearshore Bar and Rip-Channel Deposits (Carpathian Foredeep, Ukraine): Implications for Hydrocarbon Reservoirs**

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Miocene deposits along the northern, craton-ward side of the Carpathian Foredeep in Ukraine reveal fossiliferous, medium to coarse-grained cross-stratified and massive sandstones, which grade transgressively upwards into the Lithothamnium limestone. These sandstones are well exposed in a series of large quarries and are here divisible into two main facies associations corresponding to longshore bars and rip-channel deposits. The longshore bars are dominated by tabular and trough cross-sets (7-100 cm thick), intercalated with intervals of flat (5-50 cm thick) and ripple cross-lamination (1-4 cm). These facies are arranged into composite units, up to 3 m thick, which are separated by major scour surfaces, some possibly representing ravinement surfaces. Paleoflow data point to deposition of the cross-bedded sandstones from persistent unidirectional currents, which were oriented predominantly towards the NW, i.e., sub parallel to the shoreline trend. This facies association is dissected at a number of levels by channel fills, which are up to 5 m thick and 15 m wide. The fills consist mainly of massive sandstones, 5-150 cm thick, that can be stacked vertically across amalgamation surfaces, or separated by thin intervals of faintly plane-laminated sandstone. The dominant W-E axial trend of the channel fills point to erosion and deposition from powerful, sediment-laden flows, which were oriented orthogonally offshore. This suggests that the channel fills represent rip-flow deposits. The entire succession of longshore bars and rip-channel deposits appears as aggradational to possibly retrogradational sandstone stack, up to 50 m thick, which is devoid of finer-grained intercalations. It will make potentially excellent reservoir for hydrocarbon accumulations, with only minor heterogeneities generated by both grain-size differences between differently structured sandstone intervals and erosion surfaces.