The Pre-Neogene Unconformity as Evidence for Major Sediment Delivery Systems Into the Eastern Carpathians

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ABSTRACT

The Moesian Platform spans the margins of Southern Romania and Northern Bulgaria. Several Paleozoic terranes of Avalonian and Baltican origin, which were accreted during the Late Ordovician, comprise the Moesian Platform. Crustal faults separate the Moesian Platform from the surrounding tectonic provinces including the Moldavian Platform, Scythian Platform, and North Dobrogea Orogen. Moreover, it has been affected by Paleozoic, Triassic, and Jurassic extensional deformations followed by compressional episodes associated with the Alpine orogenesis that formed the Balkan and Carpathian Mountains. The Pre-Neogene Unconformity, PNU as it is known in Romanian literature, it is a geological interface separating a largely clastic Neogene aged section from underlying Mesozoic and Paleozoic aged carbonate and clastic strata. The PNU gives rise to high impedance seismic reflection that can be confidently interpreted across the platform using 2D seismic. Modern 3D seismic has enabled detailed interpretation of the PNU surface geometry and paleogeography within East Moesia. The study area is located within the Eastern Moesian Platform, approximately 150 km northeast of Bucharest. The 2014 vintage Padina 3D seismic survey, multiple reprocessed 1990's vintage 2D seismic lines, and well data were used for detailed interpretations of paleo-geography and depositional systems during Paleogene and early Neogene periods. The Paleogene aged Movila Miresii incised valley acted as a sediment delivery system for the Focsani Basin and Eastern Carpathians. It developed along the NW-SE trending suture zone that separates the Eastern Moesian Platform from the North Dobrogea Orogen to the north. The orientation of the incised valley suggests a southern sediment provenance that is likely associated with highlands as a result of the Balkan Orogen. Paleogene sedimentary fill seems to be absent in the deep incised valleys of the Moesian Platform, but thick Paleogene sequences are preserved in the South within the foreland of the Balkans and further North in the East Carpathians Thrust-Sheets. Eocene-Oligocene aged sandstones are the dominant petroleum reservoirs within the Eastern Carpathians and have produced approximately 800 MMBOE. Understanding the depositional framework for this petroleum system is of commercial importance. As no shallow marine or slope deposits are found in outcrop, a missing element for the paleo-geographic reconstruction has been the sediment delivery system.