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### **Quantitative Seismic Geomorphology of Belanak and Gabus Fields, West Natuna Basin, Indonesia**

The West Natuna Basin (WNB) is located in the northeast part of Indonesia and the south part of the Gulf of Thailand. It is bounded by the Indo-Australia plate to the south and west, the Eurasian plate to the north, and to the east by the microplates of the eastern Indonesia archipelago. The WNB has undergone an early history of Oligocene and late Oligocene to Miocene inversion, later erosion of inverted structures and graben fill, and finally passive deltaic and fluvial sedimentation.

The WNB is a prolific hydrocarbon basin whose reservoirs are deltaic and fluvial. Reservoir systems are architecturally complex and incredibly well imaged in two 3-D seismic volumes that cover 3,154 km<sup>2</sup>. Fifteen well log suites located within the study boundaries provide deterministic data on lithology.

The geomorphology of the preserved reservoir system can be quantified by measuring element sinuosity, meander wavelength and radius of curvature, channel and valley width:thickness, meanderbelt width and rates and directions of meander migration. These quantitative values are used to examine the size range of reservoir elements, calculate reservoir rock volumes, and ascertain drainage radius.

Elements differentiated in seismic data include high- and low-sinuosity and straight channels, crevasse splays, large incised valleys filled with accretionary bedding architecture, and small dendritic valleys. Channels are 160 to 660 meters deep and 160 to 715 meters wide. Sinuosities are as low as 1 and as high as 1.7. Meander lengths range from 390 to 10,000 meters, and meanderbelt widths range from 230 to 5,100 meters in width.