

Structural Controls and Resulting Variations in Oligo-Miocene Carbonates of the East Java Basin, Indonesia: Examples from the Cepu and North Madura Areas

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Carbonates of the Oligo-Miocene in the East Java Basin exist in a variety of structural settings which influence buildup architecture and internal characteristics. Examples of these variations can be demonstrated at regional and local scales in the Cepu and North Madura areas. Regional and local influences were investigated through study of well and seismic data. At Cepu, many high-relief reefal carbonate buildups are imaged by 3-D seismic on a structural high block. Absolute timing of deposition of the buildups and overlying sediments was established through integration of Strontium stable isotope and biostratigraphic data. These data indicate that carbonate deposition terminated from west to east due to more rapid subsidence in the western part of the Cepu area. North Madura, also imaged by 3-D seismic, is a broad Oligo-Miocene carbonate platform that is bisected by a large interbuildup low that formed due to increased local subsidence. The interbuildup low hosts numerous buildups which are elongate and smaller than the adjacent platforms. Although they are of similar age and within the same basin, there is a marked difference between the styles of carbonate deposition in the two localities due to structural control. Cepu underwent higher subsidence rates that resulted in less areally extensive carbonate buildups that backstepped through time to keep-up with sea level. North Madura exhibited slower subsidence rates that enabled the carbonate system to build out and cover extensive areas. The differences have implications for variations in stacking patterns, facies distribution, and diagenesis which impact exploration assessments and reservoir performance.