

## **Seismic Stratigraphy and Geomorphology of Oligocene to Miocene Carbonate Buildups, Offshore Madura, Indonesia**

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A variety of carbonate landscapes have been imaged on 3-D seismic data from the offshore area north of Madura Island, Indonesia. Carbonate buildups ranging from small patch reefs to platforms with outliers, and tide influenced elongate large patch reefs are observed within the Kujung 2, Kujung 1, and Wonocolo Formations. Outcrop expression of these carbonate buildups are incorporated into the interpretation of the seismic data.

The small patch-reef buildups of the Kujung 2 range in size from less than 120 m up to 500 m diameter. Across the platform these buildups are closely spaced with less than 100 m separating isolated buildups. Each buildup is circular in plan view, with vertical relief of approximately 25-40 m. Hundreds of these features are observed within the 3-D seismic volume.

Larger-scale patch reefs of the Kujung 1 coalesced to form a northwest-southeast trending platform. Individual build-ups within the platform range from 600 m to 2 km in diameter and from 200-300 m in thickness. Smaller patch reefs ranging from 60-120 m diameter are observed at the tops of these buildups. Large scale build-ups form off the platform and can be up to 400m thick with diameters from 1-6.5 km. The Kujung 1 reefs are circular to elliptical in planform. 200 m deep, 650 m wide anastomosing channels trend normal to the platform buildup and terminate at the buildup margin.

The Wonocolo carbonate buildups generally are larger than the Kujung buildups and are characterized by internal clinof orm architecture. These buildups are circular to elliptical in planform and range in size from 4-10 km wide, and up to 20 km in length. They are separated from each other by 1.2-2.5 km wide tidal channels.