

EXON, N. F., Bureau of Mineral Resources, Canberra, Australia, and M. S. MARLOW, U.S. Geological Survey, Menlo Park, CA

The Undrilled New Ireland Basin in Papua New Guinea

The arcuate, west-northwest-trending, mostly offshore New Ireland basin is 900 km long and about 160 km wide, and extends northeastward from Manus Island, New Hanover, and New Ireland. The prospective eastern part of the basin is structurally simple and contains up to 7 km of sedimentary strata. Our study used 4,000 km of multichannel seismic data, including 2,000 km of 1984 R/V S. P. Lee data acquired under a tripartite aid program, other geophysical data, outcrop geology, and seabed samples.

The basin formed in a forearc between a southerly Eocene to early Miocene volcanic arc, and a northerly outer-arc high bounding the Manus Trench. Its southern margin drops down to the back-arc Manus basin, which commenced spreading in the Pliocene. North of Manus Island, the New Ireland basin contains areas of deformed strata that have apparently been accreted to the Manus arc by south-dipping thrust faults. In places these strata are overlain by shallowly buried lava flows, which may represent attempted spreading.

The sedimentary sequence in the eastern part of the basin is interpreted to contain thick Oligocene to early Miocene volcanoclastic sediments, overlain by 1,000-2,000 m of Miocene shelf carbonates, overlain by 2,000 m of overburden. The presumed shelf carbonates could contain both source and reservoir rocks. The Lee line 401 revealed a flat, high-amplitude reflector or bright spot in an anticlinal core 1,700 m beneath the seabed in water 2,500 m deep off New Ireland, suggesting that hydrocarbons have been generated in New Ireland basin.