

Nannofossil evidence for the age and depositional environment during the onset of rifting in the South China Sea and the West Philippine Sea

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Early Oligocene nannofossil samples were examined from four sites [Well BY7-1-1, ODP Site 1148, and IODP Site U1435 in the South China Sea (SCS) and ODP Site 1201 in the West Philippine Sea (WPS)] in order to determine the age and depositional environment during the onset of rifting in the region. Four early Oligocene bioevents were identified for Site U1435, which assigned lithostratigraphic Subunit IB to Oligocene nannofossil Zones NP 21–23, with an ~3.81 My depositional duration (<33.43Ma and >29.62Ma). The presence of the LAD of *Coccolithus formosus* in the basal sediments of Site 1148 assigned an age of <33.4Ma.

The thickness of lower Oligocene Zones NP21–NP24 sequences was found to have varied significantly between basins and within the SCS. The sequence at Site 1148 is ten

times thicker than that at Site U1435. A sharp sedimentation hiatus was recognized between 30.00 and 32.02Ma at Site U1435, which may be due to erosion by bottom currents. An age of ~33Ma within early Oligocene nannofossil Zone NP21 was estimated for the onset of rifting of the northern SCS, which is an important time of interaction or transformation between the two marginal seas in the western Pacific, when the WPS ceased rifting and the SCS started rifting.

Nannofossil data indicated that during the initial development of the northern SCS, the depositional environment was shallow seawater from near the shoreline to neritic depths. The differences in the evolution of the basement structure/topography and sedimentary processes between the sites since the onset of rifting is summarized and discussed.