

ABSTRACT

THESIS PROJECT: Tectonic Implications of Deep Sea Limestone and Planktonic Foraminifera of the New Caledonia Basin from DSDP site 206

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The tectonic history of the New Caledonia region is complex and scientists do not agree on its true nature. It is debated as to what plate was the subducted plate, where the subduction zone was and finally how were the continental margin and the Eocene arc oriented. The complexity of the region predates the breakup of Gondwanaland; its timing and location of subduction zones and rift zones not fully fitting into geologic models. To better constrain the deformation, the study of foraminifera is a needed component. Foraminifera have distinct time frames based on the specific paleoceanographic conditions they lived, foraminifera are sensitive to ocean temperatures, depth and salinity, and taxa present vary depending on the conditions. By studying the planktonic foraminifera within the Paleocene and Eocene epochs found at DSDP site 206 and fitting the results into a paleoceanographic model, a better idea of the regions tectonic history and eustatic sea level relationship can be deduced. Specific insight will be gained in connecting the New Caledonia basin to the island of New Caledonia and the basin's relationship to the Lord Howe Rise.

Thin sections were analyzed from DSDP site 206 under a petrographic microscope for any Paleocene-Eocene planktonic foraminifera. The identified taxa were then compared to paleoceanographic models of the South Pacific in order to better constrain the tectonic deformation of the region.

An important correlation and better understanding of the paleoceanography will be attained for this time period and serve specifically to connect the New Caledonia trough with on land exposures. The initial hypothesis is the *Globigerina* studied in this core will correlate with the *Globigerina* seen on land in New Caledonia at locations such as Rocher et Voiles, Ilot Brun Section, Noumea, Sommet Khian and Koumac indicating a forced tectonic uplift on the island of New Caledonia. This hypothesis is valid; significant counts of *Acarinina bullbrooki*, *Globigerinitheka mexicana*, *Globigerina kulgeri*, *Guembelitroides nuttali*, *Morozovelloides crassatus*, *Turborotalia cerroazulensis* and *Astrotalia palmerae* all a part of the *Globigerina* Limestone assemblage noted on land. Additionally, *Orbulinoides beckmanni* was observed in this study, which has its own narrow time index (E12) as well as *Morozovella allisonesis* which has a narrow time index (E1) and serve as an excellent time indices. Similar assemblages were also discovered in Adelhozen, Germany and in the Jaddala Formation of Iraq. The tectonic environment of these two areas are similar, all were deposited in a subduction zone setting during the Eocene. Additionally, large concentrations of alveolinids and nummulites were observed, providing a second line of data suggesting tectonic subsidence on a carbonate platform, possibly the Lord Howe Rise. Specifically, providing evidence for tectonic subsidence of the shelf and providing the needed accommodation space for the taxa to reach the basin through carbonate platform flooding and shedding.

This study has dated core 20R differently than the original expedition (Burns et al. 1973), a thrust fault is now believed to reside between cores 19R and 20R. Biostratigraphically, the two sections age as middle Eocene with different paleoceanographic environments based on taxa present, which is confirmed in the cluster analysis suggesting a thrust fault is present to cause a repetition in age.