

## **Late Quaternary Sedimentary and Fluvial Evolution of the Northeast Australian Margin.**

By

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The NE Australian margin is a spectacular modern example of a mixed siliciclastic/carbonate depositional system. Presently c. 2.6 Mt/yr of terrigenous siliciclastic sediment is discharged into a major carbonate province that includes the Great Barrier Reef. Preliminary investigations indicate the siliciclastic component of this margin behaves differently than conceived by generic models of mixed margin evolution. Most notably maximum off-shelf siliciclastic fluxes may occur during transgression rather than lowstand.

This project will examine sediment cores from off-shelf settings on the NE Australian margin located proximal to major fluvial systems. These areas best record the siliciclastic depositional history of the margin while also being most likely to behave according to conventional models. Physical property examination including bulk carbonate concentration (a proxy for siliciclastic abundance), determines key intervals in the stratigraphy to be dated via radiocarbon analysis. Establishing the composition and age of depositional packages will reveal the margin's response to large sea-level fluctuations of the last 40 ky. Interpreting seismic images of the continental shelf will determine the nature of the paleo-river systems of the margin, and the influence of fluvial evolution on sediment deposition over space and time.

The NE Australian margin, the largest extant mixed siliciclastic/carbonate margin globally, is an outstanding modern analog for many ancient geological sequences. Yet its behavior may be significantly different to generic models of mixed margin evolution. Consequently this research will not only improve our understanding of the NE Australian margin, but will also significantly improve our understanding of mixed systems throughout the geological record.