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Carbonate budgets and inshore sediment dynamics

Nicola Browne is currently a lecturer at Curtin university. After she completed her PhD, she took a Post doc position researching the effects of ship-wake induced sediment resuspension on corals and sea grass with the National University Singapore and DHI Singapore,

The overall aim of Nicola's PhD research was to provide a comprehensive assessment of carbonate and terrigenous sediment regimes for inshore turbid reefs on the central GBR by quantifying carbonate production and destruction together with sediment deposition, resuspension and transport across the reef. Carbonate and sedimentary regime data were used to develop a reef growth model with depth and time which quantitatively linked sedimentary processes to ecological processes. This model is a schematic illustration of how reefs subjected to high terrigenous sediment loads have initiated, grown and developed within marginal environmental conditions and furthers our understanding of how sediments influence ecological through to geological processes.

Nicola's research provided the first comprehensive census based, high-resolution carbonate budget for reefs on the GBR, which includes a detailed assessment of sediment dynamics.

Publications

- Browne, N.K., Precht, E., Last, K.S. & Todd, P.A. Photo-physiological costs associated with acute sediment stress events in three near-shore turbid water corals. *Marine Ecology Progressive Series* 502:129-143 - doi:10.3354/meps10714 available <http://www.int-res.com/abstracts/meps/v502/p129-143/>
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- Browne, N.K, Smithers, S.G & Perry, C.T (2013) Spatial and temporal variations in turbidity on two inshore turbid reefs on the Great Barrier Reef, Australia. *Coral Reefs* 32(1): 195-210.
- Browne, N.K. (2012) Spatial and temporal variations in coral growth on an inshore turbid reef subjected to multiple disturbances. *Marine Environmental Research* 77:71-83.
- Browne, N.K, Smithers, S.G & Perry, C.T (2012) Coral reefs of the turbid inner-shelf of the Great Barrier Reef, Australia: An environmental and geomorphic perspective on their occurrence, composition and growth. *Earth Science Review* 115: 1-20
- Browne, N.K, Smithers, S.G & Ridd, P (2012) A field-based technique for measuring sediment flux on coral reefs: Application to turbid reefs on the Great Barrier Reef. *Journal of Coastal Research* 28 (5): 1247-1262.
- Perry, C.T., Smithers, S.G., Gulliver, P. & Browne, N.K. (2012) Evidence of very rapid accretion and reef growth under high turbidity and terrigenous sedimentation. *Geology* 40:719-722.
- Browne, N.K, Smithers, S.G & Perry, C.T (2010) Geomorphology and community structure of Middle Reef, central Great Barrier Reef, Australia: an inner-shelf turbid zone reef subjected to episodic mortality events. *Coral Reefs* 29:683-689