

# Bradley Eyre

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## ***Role of shallow water carbonate sediment dissolution in the future accretion of coral reefs in an acidifying ocean***



**Bio:** Professor Bradley Eyre is a biogeochemist and the foundation Director of the Centre for Coastal Biogeochemistry at Southern Cross University, Australia. His publications range from ecosystem processes (carbon, nitrogen and phosphorus budgets and biogeochemical processes in benthic and pelagic environments), to global issues (carbon and GHG flux estimates and threats to ocean environments). Professor Eyre has published widely in academic journals and won large grants for his research. He has also supervised many PhD students and mentored many early to mid-career researchers.

**Abstract:** Ocean acidification (OA) is predicted to have a significant impact on the future of coral reefs, mainly through the reduced formation of calcium carbonate ( $\text{CaCO}_3$ ). However, the dissolution of stored  $\text{CaCO}_3$  has largely been overlooked in the OA community.  $\text{CaCO}_3$  sediments represent the largest reservoir of carbonate minerals in coral reefs and result from the accumulation and storage of  $\text{CaCO}_3$  material over thousands of years. Benthic chamber incubations in permeable  $\text{CaCO}_3$  sediments show that aragonite saturation in the overlying water is a strong predictor of  $\text{CaCO}_3$  sediment dissolution and most reefs show a similar response to increasing average  $p\text{CO}_2$  (OA). However, every reef shows a different net sediment dissolution starting condition and the effect of end of century OA conditions on net sediment dissolution is different for every reef. Empirical relationships between average aragonite saturation and net ecosystem calcification, coral calcification and sediment dissolution from reefs around the globe are used to quantify future changes in the  $\text{CaCO}_3$  accretion of coral reefs. Quantifying the global dissolution kinetics of permeable  $\text{CaCO}_3$  sediments is clearly just as important as estimating calcification rates when predicting how OA will impact coral reef ecosystems.

◆ Thurs Dec 7, 2017 ◆ 12:30-1:30pm ◆ AERL 120

IRES Seminar Series – *Special Lecture*