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PhD 2007 to 2012

School of Marine and Tropical Biology

Supervised by:

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Climate variation and population dynamics in tropical seabirds

Carol is originally from the United States and has a BSc in Environmental Chemistry from Colorado School of Mines. In 2004, she completed a Grad. Dipl. of Research Methods at JCU and completed her PhD on an AIMS@JCU Scholarship in 2012.

Predicted increases in both sea surface temperatures (SST) and the intensity or frequency of El Niño-Southern Oscillation (ENSO) events are likely to have serious detrimental impacts on some aspects of the breeding biology of the pelagic and offshore foraging tropical seabird species.

Carol set out to examine current and potential future impacts of environmental variability on tropical seabirds. To do this, she examined the population and reproductive dynamics of multiple sympatric species using different foraging guilds and breeding sites on the Great Barrier Reef. Seabird population dynamics were compared to a broad range of environmental and anthropogenic variables. The potential for species to respond to predicted future changes in climate through behavioural and developmental flexibility was also assessed.

Carol has demonstrated that most impacts on these species are directly linked to large-scale global climate phenomena rather than more local threatening processes. Carol has also shown that species similar to the Black Noddy will likely have limited capacity to adjust breeding biology over the short term in response to climate change. The most exciting finding has been documenting that pelagic seabirds species in the western Coral Sea are sensitive to ENSO precursors up to a year in advance of ENSO indices registering a formal event. This phenomenon is linked with changes in productivity and/or thermocline depth that occur independent of sea-surface temperature variation.



Publications

Chambers, L.E. et al., 2011. Observed and predicted effects of climate on Australian seabirds. *Emu*, 111(3), p.235. Available at: <http://www.publish.csiro.au/?paper=MU10033>.

Chambers, L.E. et al., 2012. Seabirds. In E. S. Poloczanska, A. J. Hobday, & A. J. Richardson, eds. *Marine Climate Change Impacts and Adaptation Report Card for Australia 2012* (Eds. pp. 401–428. Available at: http://www.oceanclimatechange.org.au/content/index.php/2012/report_card_extended/category/seabirds.

Devney, C. a, Caley, M.J. & Congdon, B.C., 2010. Plasticity of noddy parents and offspring to sea-surface temperature anomalies. *PloS one*, 5(7), p.e11891. Available at: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2912368&tool=pmc-entrez&rendertype=abstract>.