RV *Investigator* Voyage Scientific Highlights

Voyage #:	**IN2018_V06**		
Voyage title:	Status and recovery of deep-sea coral communities on seamounts in iconic Australian marine reserves		
Mobilisation:	Hobart, Thursday 22 November 2018		
Depart: Leg 1	08:00 Hobart, Friday 23 November 2018		
Leg 1 ends / Leg 2 begins:	10:00 Southport, 5 December 2018		
Leg 2 ends / Leg 3 begins:	10:00 St Helens Point, 14 December 2018		
Return:	08:00 Hobart, Wednesday, 19 December 2018		
Demobilisation:	Hobart, Wednesday, 19 December 2018		
Voyage Manager:	Max McGuire	Contact details:	max.mcguire@csiro.au
Chief Scientist:	Dr Alan Williams		
Affiliation:	CSIRO	Contact details:	alan.williams@csiro.au
Principal Investigators:	Dr Nic Bax (CSIRO), Dr Malcolm Clark (NIWA), Dr Thomas Schlacher (USC)		
Supplementary Project:	Spatial and temporal variability in the distribution and abundance of seabirds		
Affiliation:	Dr Eric Woehler Birdlife Australia / UTAS	Contact details:	eric.woehler@gmail.com

PART A – SCIENTIFIC HIGHLIGHTS

Scientific Highlights

The Chief Scientist

Dr Alan Williams currently leads several projects, and contributes to others, that focus on understanding the biodiversity, structure and anthropogenic use (principally fishing and oil/gas industries) of continental shelf, slope and rise ecosystems – especially those of seamounts and submarine canyons. His team and collaborators design, develop and use photographic tools and techniques to assess benthic habitats, biodiversity, and ecosystem structure and function. He has a 25+ year track record of success in planning and implementing large sea-going research programs. His research results have had uptake in many Australian marine fisheries and conservation management initiatives and policy settings, e.g. design of Australia's network of offshore Marine Parks, and spatial management in fisheries.

Title

Status and recovery of deep-sea coral communities on seamounts in iconic Australian marine parks

Purpose

Australia protected spectacular deep-sea coral reefs living on undersea mountains ('seamounts') in marine parks off southern Tasmania. This protection is an important step in marine conservation because deep-sea coral reefs support highly diverse communities of seafloor organisms, but are fragile and vulnerable to human disturbance – particularly by bottom trawling.

During this voyage, 147 seabed transects were completed with an underwater camera in 500 to 2,000 m depths; each was 1 to 2 km in length. The high resolution image data collected will allow us to map the extent of globally-significant deep-sea coral reefs, and determine how much of the reef area lies within marine parks. Samples from seamounts that were previously sampled 10 and 20 years ago – some of which had been impacted by bottom trawling, and some of which are now protected in marine parks – will provide information on patterns of recovery of reef communities.

Contribution to the nation

This research addresses two of Australia's largest challenges –conservation and management of its marine parks, and the need for measureable and robust methods for ecological monitoring, including to establish baselines.

The high quality results from this voyage provide quantitative, non-extractive observational data on conservation status and recovery potential of deep-sea coral habitats that will enhance their management and conservation – nationally and internationally.

The results will contribute importantly to a national government and industry blueprint to cost-effectively monitor the marine environment by providing data that are unique in being from the deep-sea, and by extending a 'time-series'.

As a result of this voyage

1. We better understand the distribution of deep-sea coral reefs and their associated biodiversity. We found that coral reefs extend from seamounts onto adjacent rocky areas, and also occur on small 'knoll-like' features at the continental shelf edge. This considerably expands the previously known distribution of deep-sea coral reef.
2. These data will considerably increase the confidence in predictive models of coral distributions – in both national and international settings.
3. We will be able to detect recovery in seamount communities if it is occurring. In areas that were previously impacted by bottom trawling but are now protected, there are some apparent signs of change. These will need to be confirmed by analysis of the data, but appear to be the arrival of mobile animals including urchins and feather-stars, and colonisation by non-mobile animals including anemones and small corals.
4. We have commenced the program of data analysis to substantiate these initial observations.