RV *Investigator* Scientific Highlights

Voyage #:	**IN2017_C01**		
Voyage title:	GAB deep water geological and benthic ecology program		
Mobilisation:	Hobart, Monday, 10 April 2017		
Depart:	Hobart, 0900 Tuesday, 11 April 2017		
Return:	Hobart, 0800 Friday, 28 April 2017		
Demobilisation:	Hobart, Friday, 28 April 2017		
Voyage Manager:	Tegan Sime	Contact details:	(insert details)
Chief Scientist:	Dr Asrar Talukder		
Affiliation:	CSIRO Energy	Contact details:	Asrar.talukder@csiro.au
Principal Investigators:	Alan Williams, Charlotte Stalvies, Andrew Ross		
Project name:	Great Australian Bight Deepwater Marine Program		
Affiliation:	CSIRO	Contact details:	Andrew.ross@csiro.au

The Chief Scientist

Asrar Talukder is a Senior Research Scientist at CSIRO. He completed his PhD at the University of Granada in Spain in 2003. From 2004 to 2007, he worked as a postdoctoral research fellow at the GEOMAR – Helmholtz Centre for Ocean Research at Kiel, Germany. During his postdoctoral work, Asrar worked on the gas hydrate deposit mechanisms of the Pacific Margin, offshore Central America. In late 2007, he jointed CSIRO Energy based in Perth. Asrar's main research interest is submarine natural seep plumbing systems, seabed processes associated with the seeps including submarine landslides, and migration of hydrocarbons from the seabed to the sea surface.

Title

GAB deep water geological and benthic ecology program

Purpose

The voyage objectives are built around three main scientific objectives:

1. The seabed characterisation and sampling outcropping sedimentary rocks to aid understanding of modern seabed erosional mechanisms, sedimentary processes and paleo-environmental reconstruction.
2. Benthic characterisation and sampling in areas of potential seepage to determine if fluid escape is occurring and the nature of the fluids and their relationship to the benthic fauna in these areas.
3. Sampling of benthic fauna over a large geographic area to establish deep water community structure and function and augment understandings gained from recent IN2015_C01 and IN2015_C02 voyages.

Contribution to the nation

The Great Australian Bight (GAB) represents a unique cold water carbonate margin with a large sedimentary depositional sequence. Whilst recent voyages have begun to reveal the nature and complexity of both the deep water geology and biology in the region, the continental and abyssal slopes remain under described.

The data and samples collected during this voyage will contribute to the fundamental understandings of the origin, evolution and geological framework of the Great Australian Bight. In addition, the systematic collection of some of the deepest faunal assemblages in Australian waters will inform our understanding of the deep sea ecosystems and their relationship to other deep-sea faunal assemblages worldwide. The combination of the geological and biological data collected during the voyage will help inform future management decisions on oil exploration and development, commercial activities and preservation of this deep water marine environment.

As a result of this voyage

Through our collection of biological and geological samples from 41 equipment deployments and mapping of ~ 8,950 km2 of seafloor in water depths ranging between 120 m to 5560 m, our knowledge of the geological evolution of the GAB, including the distribution and occurrence modern day benthic fauna, will greatly enhance our understanding of the region. In particular:

1. The characterisation of previously unmapped submarine canyons and landslides, will help understand the sediment transport mechanisms occurring across the continental and abyssal slopes of the GAB.

2. Through the collection of over 1.28 tons of rock and sediment samples we will have a better understanding of the sequence stratigraphy as well as the processes that have shaped sedimentation in the Great Australian Bight from the Late Cretaceous to Palaeocene

3. The collection of a large and diverse deep water biological taxa comprising 3,238 specimens spanning a total of 206 operational taxonomic units, will inform further understanding of the GAB faunal diversity and distribution, especially in the abyssal water depths.

4. Characterisation of the seafloor and overlying water column has found indications of active natural seepage from seabed into water column.

Subsequent to the voyage we have commenced a program of detailed analysis and interpretation of the geological and biological samples. This will be integrated with the processed voyage data to better inform the processes that have formed the Great Australian Bight and describe the present day environment and fauna.

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