

## RV Investigator Scientific Highlights

<b>Voyage #:</b>	IN2016_T02		
<b>Voyage title:</b>	Transit – Hobart to Sydney		
<b>Mobilisation:</b>	Hobart, 0800 Wednesday, 24 August 2016		
<b>Depart:</b>	Hobart, 1000 Thursday, 25 August 2016		
<b>Return:</b>	Sydney, 1000 Monday, 29 August 2016		
<b>Demobilisation:</b>	Sydney, 1000 Monday, 29 August 2016		
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<b>Chief Scientist:</b>	A/Prof Andrew Bowie		
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<b>Primary project:</b>	Natural iron fertilisation of the oceans around Australia: linking terrestrial dust and bushfires to marine biogeochemistry		
<b>Piggyback project names:</b>	Australasian Seabird Group Australian Hydrographic Office		

## Introduction

The Primary Project of voyage IN2016\_T02 was to study the “Natural iron fertilisation of the oceans around Australia: linking terrestrial dust and bushfires to marine biogeochemistry”.

The voyage consisted of two additional piggyback projects conducted by the Australasian Seabird Group and the Australian Hydrographic Office.

The Primary Project had the following three objectives:

- (1) To sample and conduct experiments on atmospheric particles containing terrestrial dust and bushfire smoke that are transported from Australia to its surrounding oceans.
- (2) To contribute to larger integrated ship- and land-based atmospheric observational program for trace elements and nutrients in oceans around Australia that aims to determination of the geochemical nature, solubility and biological availability of atmospherically delivered trace elements, and how these factors vary with long-range transport and cycling.
- (3) To support the training and research of two postgraduate students from the Institute for Marine and Antarctic Studies at the University of Tasmania.

## Contribution to the nation

Oceans play a vital role in Earth’s climate through the control of atmospheric CO<sub>2</sub>. An important component of this system is the iron cycle, in which iron-rich aerosols are transported from land via atmosphere to ocean. The Primary Project supports research to quantify the importance of trace elements and nutrients in aerosols from Australia for marine biogeochemistry and ocean ecosystem health. This will provide the critical information on atmospheric iron supply for ocean fertility and health, providing the science for predicting a key factor in the future impact of the oceans on climate. Outcomes will also provide a scientific basis for managing the complex role of iron in sustaining marine ecosystem biodiversity and for informing government policy on ocean fertilisation as a carbon mitigation strategy.

## As a result of this voyage

1. We have a better understanding of the delivery of trace elements and nutrients from atmospheric aerosols into the oceans to the southeast of Australia
2. We have found RV Investigator is an excellent platform to undertake these studies and in the future hope to run continuous measurements on voyages of opportunity.
3. We have mapped the dry and wet atmospheric deposition of key chemical constituents to the oceans southeast of Australia on a transit from Hobart to Sydney in late winter.
4. We have commenced a program of research investigating the role of atmospheric transport for providing vital mineral and nutrients for marine ecosystem health and fertility in all the ocean basins surrounding Australia.

Pictures from the voyage can be found in three ABC 'Off Track' radio and online articles linked to voyage IN2016\_T02 prepared by journalist Ann Jones:

<http://www.abc.net.au/news/2016-10-05/worlds-oceans-anaemic-this-scientist-is-trying-to-find-out-why/7902140>