

RV Investigator Voyage Scientific Highlights

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| Voyage #: | IN2018_T02 | | |
| Voyage title: | Harmful Algal Blooms and their long term sediment record in East Coast Tasmanian waters | | |
| Mobilisation: | Brisbane, Sunday, 13 May 2018 | | |
| Depart: | Brisbane, 0800 Monday, 14 May 2018 | | |
| Return: | Hobart, 0900 Monday, 21 May 2018 | | |
| Demobilisation: | Hobart, 09.30 Monday, 21 May 2018 | | |
| Voyage Manager: | Stephen Thomas | Contact details: | canbeyan@gmail.com |
| Chief Scientist: | Prof Gustaaf Hallegraeff | | |
| Affiliation: | Institute for Marine and Antarctic Studies | Contact details: | Hallegraeff@utas.edu.au |
| Principal Investigator: | Dr Eric Woehler | | |
| Project name: | Spatial and temporal variability in the distribution and abundance of seabirds. | | |
| Affiliation: | Birdlife Australia | Contact details: | eric.woehler@gmail.com |
| Principal Investigators: | Dr Emlyn Jones | | |
| Project name: | Remote-ROAM: mobile modelling sea trials | | |
| Affiliation: | CSIRO | Contact details: | Emlyn.Jones@csiro.au |

Voyage IN2018_T02 received outstanding media coverage, due to the on-board presence of an ABC media (Rhiannon Shine) as well as a Wild Pacific Media team (IMAX movie on EAC).

[Scientists are breaking new ground in their quest for answers about harmful algal blooms by extracting a 1,000-year-old sediment core off Tasmania](#)

The 3m core was pulled from the seabed in waters just off Maria Island on the state's east coast by scientists on board the CSIRO's research ship RV Investigator. "We are collecting these deep sediment cores to see if harmful algal blooms happened before, and if they did, what were the environmental factors that made it disappear. That will help us to predict the future." According to Chief Scientist Prof Hallegraeff. The sediments will be dated at ANSTO Lucas Heights, studied for microscopic fossils by IMAS, and characterised using cutting-edge ancient DNA technologies by the University of Adelaide [Image by CSIRO].



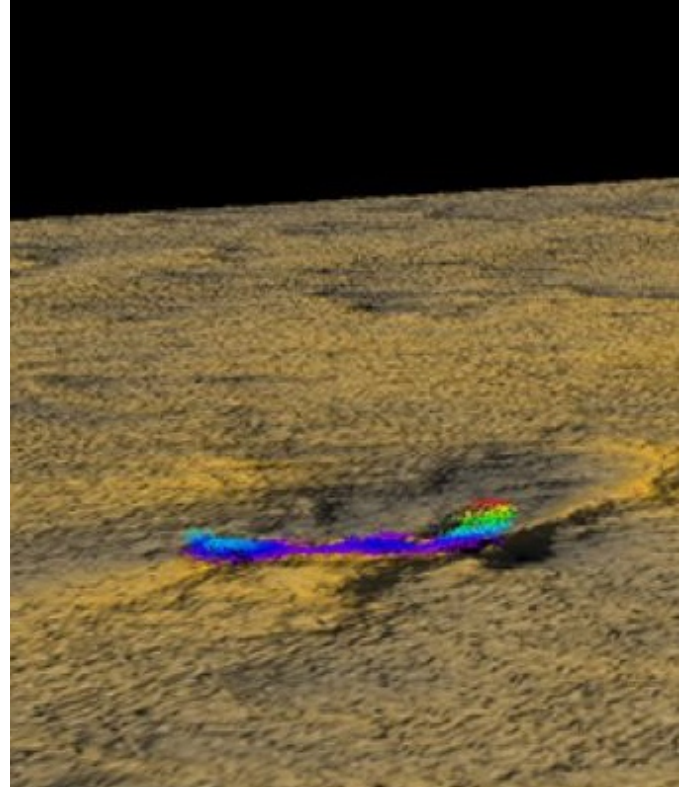
[Teachers live-steaming science from the high seas into their classrooms](#)

Adelaide Seaview Downs Primary School teacher Christie Evans and Hobart Rosny College maritime operations teacher Callum Hollingsworth were among five educators on board, who observed and participated in plankton sampling, ocean forecasting, sea bird tracking and ship wreck surveying. They conducted regular live webcasts to their classrooms and others around Australia during the voyage, and will incorporate their experiences at sea into lesson plans [Image by CSIRO].



Scientists scanning the bottom of Bass Strait in a "lawn-mowing" operation have stumbled on an 1890 shipwreck and uncovered more than they expected

The CSIRO has released footage of the wreck, which was first detected last year as a "blip" in waters between Tasmania and Victoria. The footage comes from scientists onboard Investigator as it makes its way down Australia's east coast. After last year's discovery, volunteers from the Maritime Archaeological Association of Victoria visited the site and identified it as the barque *Carlisle*- a 26-year-old collier which was bound for Newcastle from Melbourne in 1890 when it sank. Matt Boyd (CSIRO) mapped two more shipwrecks. One was HMAS *Pioneer* and the other was unidentified. The Australian National Maritime Museum's Emily Jateff, who was on board to help with the shipwreck mapping, said the unidentified wreck was an exciting find. "The wreck is at this point pretty unidentified. We have vague dimensions — about 67 metres in length and about 11 metres across. "It could be another naval vessel [Digital image by Matt Boyd]



The Chief Scientist



Gustaaf Hallegraeff is a Professor at the Institute of Marine and Antarctic Studies of the University of Tasmania in Australia. He has supervised 40 PhD students and worked on a wide range of Harmful Algal Bloom issues from shellfish toxins, climate change, ship's ballast water to fish-killing algae. He is a Fellow of the Australian Academy of Technological Sciences and Engineering, winner of the 2004 Eureka Prize for Environmental Research and 2014 Lifetime Achievement Award by the International Society for the Study of Harmful Algae.

Title

Harmful Algal Blooms and their long term sediment record in East Coast Tasmanian waters.

Purpose

Unprecedented toxic dinoflagellate blooms occurred off east coast Tasmania in 2012 and 2015, 2016 and 2017. These events led to a global shellfish product recall (AUD23M loss), lengthy (4 months) closures of mussel, oyster, scallop, and rock lobster fisheries, and 4 human hospitalisations (Paralytic Shellfish Poisoning). While the causative *Alexandrium* dinoflagellate had been previously detected, genetic evidence suggests that blooms represent a cryptic genotype newly stimulated by climate-driven increased water column stratification. We did seek to characterize the long-time ancient plankton DNA sediment record off the Maria Island National Reference Station (NRS).

Contribution to the nation

It is likely that toxic algal blooms have occurred off Tasmania in the distant past, but then disappeared. We seek to understand from changes in a broad range of plankton microfossils under what conditions these blooms formed and disappeared, in order to better predict the future.

As a result of this voyage

1. We now have access to high-quality 3 m long sediment cores from the Maria Island inshore and offshore stations covering an expected 1000-2000 years of time.
2. We will analyse them for diatom and dinoflagellate microfossils, as well as ancient DNA molecular sequences. In pilot sediment studies we retrieved sequences of 3500+ operational taxonomic units (OTUs).
3. Knowledge of Australian plankton currently does not go back beyond the 1940s. The results will put the current episode of climate-driven changes to the East Australian Current in a broader context.