

Biodiversity on the move

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An ocean drifter, used to track the transport of water in the East Australian Current. Credit: Iain Suthers, UNSW

Just like Nemo, Australia's blue water Research Vessel Investigator has spent three days drifting in the East Australian Current (EAC). Researchers on board have been investigating microscopic marine life that forms the base of the marine food web.

Normally hidden from view, these microbes are exceptionally diverse and play a critical role in the ocean, absorbing carbon dioxide, producing oxygen and breaking down organic matter, all of which influence the distribution and abundance of fish and other marine life.

The scientists' mission is to examine how the composition and activity of microbes change as they drift. Chief Scientist on the voyage was Associate Professor Martina Doblin, team leader of the Productive Coasts research program in the University of Technology Sydney's Climate Change Cluster (C3).

Capturing data at unprecedented resolution, researchers will compare the productivity of the EAC with waters all along the NSW coast.

"The EAC has a significant impact on the ecology of eastern Australia, and is well known for transporting organisms southward," says Dr Mark Brown, research fellow at the University of NSW.

However, Dr Brown says we know very little about how EAC microbial communities, adapted to warm tropical conditions, change in structure or function as they are carried into temperate regions.



An example of the diversity of ocean microbes. Credit: J. Ashworth and M. Lassudrie-Duchesne, UTS

Dr Martin Ostrowski, of Macquarie University, says the research team's use of novel sampling methods and molecular techniques will provide new insights into the dynamics of these critical microbial communities and better understand their impact on southern Tasman Sea waters.

Using satellite technology, the ship tracked neutrally buoyant "drifters" 15 metres deep, from the time of their release near Coffs Harbour. After three days the drifters had travelled about 300km south to Port Stephens, moving at more than a metre a second.

Experiments conducted along the way measured important biological

processes such as mortality, photosynthesis, nutrient uptake and changes in microbial composition in response to warming.

"With climate projections indicating the current will warm 2-3 degrees by 2070, our shipboard experiments will provide useful insight into how these communities will change in the longer term," says Associate Professor Doblin.

"Impacts seen at the base of the food web will have cascading effects on other parts of the [marine food web](#), including commercial fisheries."

Investigator, with its team of CSIRO staff and marine researchers from UTS, UNSW and Macquarie University, is now in waters north of Byron Bay continuing research on the hidden diversity of microscopic marine life.

Provided by University of Technology, Sydney

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