

Bright marine science students catch the Next Wave

By Dan Gaffney

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The student team on board 'Southern Surveyor' Research ship 'Southern Surveyor' "Going to sea is inspirational," says 21 year-old Adrienne Gatt, who has just made her first voyage aboard the Southern Surveyor, Australia's only marine research vessel. "It's the best way to see if you're cut out for a career in marine science and oceanography.

Adrienne was among nine university science students who got their first taste of science at sea recently while voyaging south down the Australia's eastern coastline, from Gladstone, Queensland to Sydney, New South Wales.

"There were so many incredible moments," says Adrienne, a UNSW science honours student who is studying the feeding and breeding ecology of lobsters. "Like sitting up on the (ship's) bridge watching the massive swell while hearing other about people's experiences of the journey."

Jennifer Clarke, a second year marine biology major at the University of Technology, Sydney says her highlight was "getting my hands dirty, using the ship's array of nets and other equipment for collecting plankton and taking water samples. I enjoyed getting a real feel for the ocean and oceanography. The low-point was being seasick every day. We were all a bit green; I don't think any of us got our sea legs!"

Sydney University science/arts student Madeleine D'Arcy hopes to do honours in marine biology. "It was great to see the scope and scale of marine research. Going out into the field brings to life everything we learn in labs and textbooks, and made me realise that there's so much going on above and below the sea. We saw whales, seals, gulls and lots of plankton, which looks like brown mush in the water."

Taking young students to sea is part of the national effort to retain and encourage promising students to pursue research at sea. Dubbed, the 'Next Wave' program, it is supported by the CSIRO, the Australian Research Council Research Network for Earth System Science, the NSW Department of Primary Industry and the Sydney Institute of Marine Science.

"We expose students to the challenges of a research voyage," says UNSW marine scientist, Professor Iain Suthers. "The students use the vessel's basic equipment and get learning on the run from the scientific crew and officers. They learn to appreciate the importance of communication, mutual respect, lines of authority and safety involved in each task."

For the scientific crew, led by Dr Ross Hill, University of Technology and Sydney and Dr Jason Everett, UNSW, the voyage was an opportunity to search for cold-core eddies and coastal upwelling events in the separation zone of the East Australian Current (EAC) popularised by the animated film, *Finding Nemo*.

Cold-core eddies and upwelled waters contain nutrient-rich cold water that are important markers for the biodiversity of life in the ocean, according to Dr Everett, a UNSW scientist who completed the journey aboard the Southern Surveyor.

"These nutrient-rich waters often contain large quantities of phytoplankton, microscopic plants that are the foundation of the marine food chain, which drift about in oceans, seas, and bodies of fresh water. Tiny animals called zooplankton feed on phytoplankton and they, in turn, are eaten by fish and other larger sea creatures," says Dr Everett.

In 2005, UNSW scientists aboard the Southern Surveyor were surprised to find larval pilchards in the East Australian Current, 300 kilometres from the New South Wales coastline. The discovery was significant because pilchards, which are a benchmark for several fish species that are commercially fished around the world, were believed to be a coastal species that spent their life just a few kilometres from shore.

Monitoring marine ecology has important environmental and commercial imperatives and could

help solve the puzzle of why Australia ranks 50th in terms of its landed commercial fish weight but has the world's third-largest fishing zone, courtesy of the 370 km exclusive economic zone (EEZ) surrounding its coastline. Australia's EEZ is 70 per cent greater than its landmass and directly affects the nation's climate, food production, wealth and lifestyle.

The Southern Surveyor is vital to understanding and harnessing the wealth of this vast area of ocean. A former North Sea trawler working the Atlantic Ocean, the 66-metre ship has also worked as an oil field support vessel and a dive support vessel, deploying teams of deep-sea divers in oil field construction. Due for decommissioning in 2010, it is Australia's only marine research vessel.

During its four-day journey from Gladstone, the vessel and crew were kept busy capturing novel data from above and below the sea's surface that will eventually reveal rich new details. The ship tracked south at a constant depth of 400 metres, constructing a 3-D map of the seabed on the fly, using a multi-beam sonar device attached to the hull. Overhead, passing NASA satellites captured images of the vessel's journey, while on board, students, scientific and technical crew worked around the clock measuring sea surface and undersea temperatures, testing water quality, collecting tiny marine life, and logging the presence of bird and large marine creatures.

While the journey's scientific success remains to be seen, Halley Durrant is convinced it was a stunning success. "I loved getting out there and getting hands on," said the 3rd year UNSW marine science major. "There are all these tiny ecosystems out there in the sea - a whole world, waiting to be discovered. It's the best thing I've done so far and it's relevant to what I'll be doing in my career. I can't wait to go back."

[The Sydney Institute of Marine Science](#) is a joint venture, research facility based on Sydney Harbour's North Shore at Chowder Bay. It unites teams of leading scientists to work on issues that are critical for the management of our coastal and oceanic environments.

The Australian Research Council Research Network for Earth System Science links individuals and groups within Australia to explore the interaction between the oceans, atmosphere, biosphere and cryosphere.