Marine Science News

UNIVERSITY OF SYDNEY INSTITUTE OF MARINE SCIENCE (USIMS) NEWSLETTER

Issue2/2009

"Sabbatical Visitor" - Prof David Booth from UTS

Prof David Booth is currently on sabbatical leave from UTS and visiting Dr Adele Pile's labs. Prof Booth collaborates with Dr Pile's research group in the Sea-Serpent deep sea biology program, and is engaged in developing industry partnerships, graduate student supervision and sample processing for the program.

David snorkelling in the tropics.

Fish life on NW Shelf wellhead.

Prof Booth is a fish ecologist interested in biological connectivity among the oil rig infrastructure across NW Australia, the life history of deep sea fishes and the role of artificial structures in supporting marine biodiversity. He hopes research outputs will inform debates regarding the removal (decommissioning) of old rig infrastructure. The deep sea work is an exciting extension to his ongoing interest in coral and temperate reef fish ecology and defects of pollution on estuarine fishes.

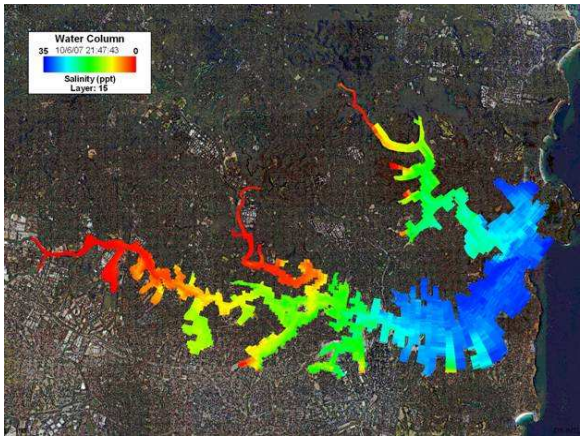
Research focus of USIMS Scientists

PhD student Serena Williams
Supervisor Prof Gavin Birch
School of Geosciences

Understanding Contaminant Behaviour in Sydney Harbour

During rain storms pollutants are washed into Sydney Harbor through the creeks and storm water channels. The freshwater plume makes its way to the sea, mixing along the way with coastal marine waters. Once the pollutants enter the harbour they are taken up by organisms and so enter the food chain. Fish, for example, which are caught by recreational fishers can be unfit for human consumption.

PhD student Serena Lee and her supervisor Gavin Birch of the School of Geoscience are measuring the heavy metals that sink to the harbour floor and modeling this process using tide and rainfall information.



The Sydney Harbour estuary showing the mixing of fresh and high salinity sea water.

Major inflows occur at 29 locations with the model predicting the deposition of contaminants. Next the model will be extended to estimate the movement of copper, lead and zinc under a variety of rainfall conditions.

Activities at SIMS

Environmental science students on a field trip at Chowder Bay

On September 4th the ENVI 2112 Atmospheric Processes and Climate class went on a field trip to Chowder Bay. Firstly the students were given an overview of the oceanography and ecology of Sydney Harbour by Edwina Tanner in the quaint lecture theatre.

The group then went down to the wharf to collect water samples for suspended solid analysis and plankton samples for identification.

Tom Savage gave the group an overview of the sonde instrument which has been collecting temperature and salinity data for a number of weeks. He also brought down the equipment required for filtering water samples from Chowder Bay and some additional samples provided by Dave Mitchell from Iron Cove. The students could clearly see the difference in water quality from the two sites.

Students working together on identification of zooplankton..

Inke Falkner and Kate Thornborough introduced the students to plankton collection and analysis. The students learned how to identify different plankton organisms and managed to scoop a whole bunch of the dinoflagellate *Noctiluca sp.* which occasionally forms red tides in Sydney waters.

Students identifying zooplankton at Chowder Bay.

With the sun shining the Sydney Institute of Marine Science facility provided the perfect backdrop for an introduction to the local climate dynamics of Sydney Harbour.

USIMS at Sydney Uni LIVE

A near capacity crowd attended the Marine Science talk at the SULive information day run by the University for prospective students held on Saturday 29th of August. The talk, given by Peter Cowell in the Eastern Avenue Lecture Theatre (which seats 200), covered the three degree majors offered in Marine Science at the University: a major in Marine Biology, Marine Geoscience, and Marine Science which incorporates elements of both the other two majors.

There were also non-stop inquiries from students at the USIMS information booth in the Great Hall. The marine booth was strategically located between the two booths for the Schools of Biological Sciences and Geosciences. Kate Thornborough deserves special thanks for her assistance on the USIMS booth.

Following up on the increased interest of students in studying Marine Science at Sydney University USIMS is preparing a new information brochure and flyer. The promotion material will be designed by the Faculty of Science design team and will be in accordance with the university's new branding scheme.

Please contact the USIMS coordinators for further information or for contributions.

USIMS scientist in the news

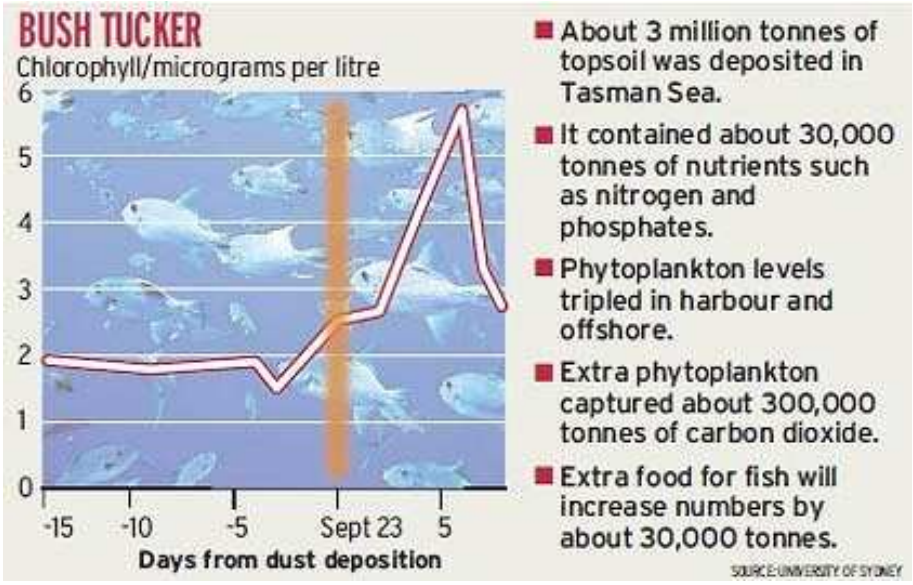
Dust was blooming marvellous for harbour

DEBORAH SMITH SCIENCE EDITOR

October 6, 2009

THE thick blanket of red dust that settled on Sydney two weeks ago caused the harbour to bloom. Nutrient-rich topsoil from the city's worst dust storm in about 70 years led to a tripling in the number of microscopic plants, or phytoplankton, in the upper layers of water, Sydney scientists have found. They also calculate this invisible explosion in photosynthetic life in the harbour and Tasman Sea would have soaked up an amount of carbon dioxide equivalent to a month's emissions from the Munmorah Power Station on the Central Coast.

Ian Jones, head of the University of Sydney's ocean technology group, said Sydney coastal waters were low in nutrients such as nitrogen and phosphate that phytoplankton required to grow. "We're sitting in an ocean desert in Australia," he said. The results of the natural dust experiment were "vindication" for his team's controversial plans to nourish the ocean artificially with nitrogen-containing urea. He said this approach could not only help tackle climate change but also help feed the hungry or poor in countries such Morocco. Phytoplankton growth increases fish production. "If we continuously nourished a patch of water about 20 kilometres in diameter we could support poor artisan fisherfolk and we could raise their daily income from $1 to $2, while storing 10 million tonnes per year of carbon dioxide in the deep ocean," he said.



Like all plants, phytoplankton absorb this greenhouse gas from the environment, taking the carbon with them when they die and sink to the bottom. Other scientists, however, have raised concerns about ocean fertilisation with nutrients such as iron. A recent report by the Royal Society in Britain concluded that, as a large-scale solution to climate change, it has "a high potential for unintended and undesirable ecological side effects".

The Sydney team has regularly tested for chlorophyll at Chowder Bay, home of the Sydney Institute of Marine Science, and at a site 10 kilometres offshore, to determine phytoplankton levels and the impact of events such as heavy rain. The massive dust storm was a fortuitous case of the "world collaborating with scientists", Professor Jones said. The results would boost their case for an initial experiment to spread 2.5 tonnes of nitrogen, in the form of urea, in the Tasman Sea, which would need government approval to go ahead, he said. "Our tests would be perfectly safe in an environmental sense."

Announcements

Professor Maria Byrne received a grant from the Australian Antarctic Division for the proposed project

"Vulnerability of Antarctic marine benthos to increased temperature and ocean acidification associated with climate change."

The grant comprises $29,000 and births for two PhD students who will spend 3-4 months on the ice to start their PhD research. The two students, who will join the next cruise, are Melanie Ho from the University of Sydney and Simon Reeves from the University of Tasmania.

Associate investigators are:
Dr Patti Virtue, University of Tasmania
Dr Catherine King, Australian Antarctic Division
Dr Haruko Kurihara, Nagasaki University
Dr Jane Williamson, Macquarie University

Student prize sponsored by the Marine Aquarium Society of Sydney

The Marine Aquarium Society of Sydney (MASS) is a non-profit organisation for marine aquarium enthusiasts in Sydney and NSW. The society aims to promote and advance sustainable marine aquarium processes and also has a great interest in marine research.

MASS has generously given a donation to support marine research at the University of Sydney. The donation will be announced as a one-off prize for the best Honours thesis in Marine Science. Details will be announced shortly.

Seminars

In August Professor H. Huang of the Chinese Academy of sciences presented an overview of their work on underwater acoustics to the Ocean Technology Group.

Professor Huang discussing his presentation with Dr Martin W. Lawrence, a former associate of USIMS.

Thursday 8 October, 2009

Dr Moninya Roughan from the School of Mathematics and Statistics at UNSW gave a talk about the Integrated Marine Observing System (IMOS) at the School of Geosciences' TGIF seminar series. IMOS is the most comprehensive ocean observation system in Australian waters receiving substantial Federal Government Funding (~ $200 Million to date). Its main purpose is to acquire and provide free data to support research in climate change, boundary currents and biodiversity. Deployed infrastructure to obtain the data include floats, deep- and shallow-water gliders, moorings, AUVs and expendable bathythermograph (*XBT*) probes on commercial vessels. Data can be viewed and accessed at http://imosmest.emii.org.au. There is also an IMOS workshop to be held in Sydney on 9 November. To register for the event please visit http://www.imos.org.au.

Friday 23 October, 2009 from 1-2pm

Dr Will Figueira from the Centre for Research on Ecological Impacts of Coastal Cities will give a talk on "Tropical-temperate connectivity of marine fishes: warming oceans -- shifting ranges?" as part of the Biological Sciences Seminars. Where: DT Anderson Lecture Theatre at the School of Biological Sciences.

Tuesday 27 October, 2009 at 2 pm

Daniel Harrison from the University of Southern California, LA will give a presentation entitled "Dynamic Habitat Mapping of Pelagic Tuna and Shark Species for Improved Fisheries Management". Where: Conference Room No. 449 at the School of Geosciences, Madsen Building.

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Marine Science News has been prepared by the University of Sydney Institute of Marine Science (USIMS). The information it contains has been derived from the USIMS staff and student/s and selected publications of the Centre.

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