sims foundation supporting sydney institute of marine science

Newsletter

June 2015

SIMS IMOS team & the big storm in April

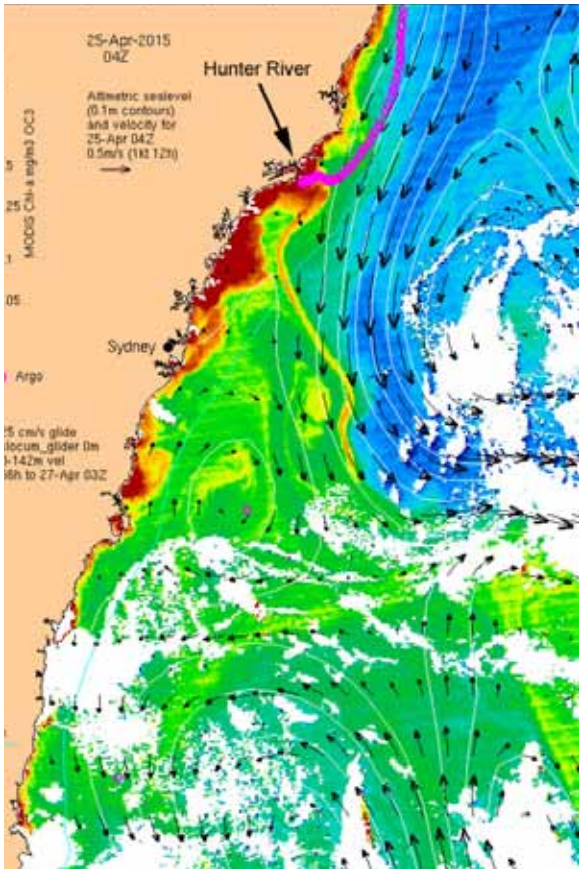
NSW was lashed by heavy wind and rain on 21-25 April 2015, causing much flooding and damage in the Hunter River region. The Hunter River poured out muddy river water into the coastal ocean, and this was evident from satellite as a buoyant plume of water carried out into the Tasman Sea by the East Australian Current. These were perfect conditions for research by the SIMS team working on the Integrated Marine Observing System (IMOS. a $120+ million Australia wide ocean observing system - SIMS operates the NSW node of IMOS).

Earlier, the SIMS IMOS team had deployed an unmanned Slocum Glider off Yamba which made its way down the coast and crossed over the flood waters. The glider detected high levels of Coloured Dissolved Organic Matter (CDOM, including sediments, tanins or tea-coloured water), which provide an input of nutrients to the Tasman Sea ecosystem. This in turn can stimulate blooms of phytoplankton which feed zooplankton and fish.

In the adjacent image, the floodwaters are represented by the thin trail of yellow stretching out about 200 kms into the ocean. The East Australian Current is coloured blue and the coastal waters of the Tasman Sea are coloured green. The pink trail represents the Slocum Glider tracking down the coast and directly into the floodwaters from the Hunter. The dark red/brown colour close to the coast is coastal water with high phytoplankton biomass.

The ability to collect data from this event was important to the scientists. They are keen to learn the extent and importance of land runoff in fuelling phytoplankton growth because phytoplankton feed the rest of the marine food web. If we put more nutrients into our estuaries and coastal waters, we are elevating the natural levels of phytoplankton.

The Slocum Gliders are remote controlled devices that navigate through the water to a series of pre-programmed waypoints. They can operate down to depths of 200m to enable precise sampling of particular oceanographic features. They work regardless of the weather and perform continuous sampling for temperature, salinity, dissolved oxygen, chlorophyll and turbidity.



This satellite image for April 25 says much about the way dispersal works in the ocean. A thin tendril of floodwater, coded yellow/orange in this image, can be seen stretching out into the ocean between the East Australian Currnet and the waters of the Tasman Sea. *Image: IMOS*

Don't delay - register now for a truly great day out

The New Discovery Centre at SIMS

The "Harbour Room" at SIMS Discovery Centre. 3-d model of Sydney Harbour in the foreground and 3-d virtual dive facility behind the curtain of kelp. *Photo: Ian Evans*

The historic sandstone mine labs at the foreshore of Chowder Bay are the perfect backdrop for the new SIMS Discovery Centre, which has been more than a year in the making and is about to open its doors! The two historic rooms (which used to house naval mines) have been fitted out with a series of beautiful displays that showcase what SIMS is all about – research of the marine, coastal and estuarine environment. The impacts of human activities on our coasts and oceans are at the heart of much of SIMS' research and the new centre.

The entry room is a celebration of Port Jackson i.e. Sydney Harbour showcasing the wonderful diversity of marine life, habitats and ecosystems we have at our doorstep. Rocky reefs, above and below the water, are particularly featured. Highlights of this exhibit are a 3-d model of the harbour, which shows the harbour's complex shape and topography of the seafloor, and a virtual dive using 3-d virtual reality goggles. The virtual dive has been designed specifically for SIMS and aims to immerse visitors into the magical world of a local kelp forest, the most prominent ecosystem on our temperate rocky shores. Reactions of visitors have been overwhelmingly positive with comments such as "I don't want to stop!" and "This is amazing!".

"Leaving the harbour" - the second room leads visitors onto the open coast. The main themes explored here are the East Australian Current, the principal boundary current along the east coast of Australia, and the impacts of climate change on the East Australian Current and coastal ecosystems. Exhibits in this room tell the story of individual scientists and their research projects. Superbly designed digital displays invite visitors to explore the stories behind the research and learn about topics such as coastal erosion, coral bleaching, toxic algal blooms and eddies to name just a few. Scientists of the NSW Department of Primary Industries have also contributed to the display with a series of fascinating stories on the management of fisheries in a changing climate.

SIMS is very excited to be able to welcome visitors to its new centre, which offers something for everyone; physical models to touch, colourful images to enjoy, a virtual dive and modern touch screens to delve deeper into the research presented.

We are delighted to advise that the finishing line for this year's Harbour Hike will be adjacent to the Discovery Centre so that participants can enjoy all of these wonderful displays.

The "Coast Room" at the Discovery Centre.
Photo: Ian Evans

A time lapse image of the East Australian Current on the wall shows the amazing ways in which the eddies swirl along our coast.

The interactive digital workstations introduce visitors to our scientists working on ocean currents and marine phytoplankton.

Two large touch screens provide information on exploring the seafloor and coastal erosion. Exploring the seafloor allows visitors to zoom in to detailed images of the seafloor whilst coastal erosion is portrayed in a series of short and fun animations that illustrate what is happening on our beaches.

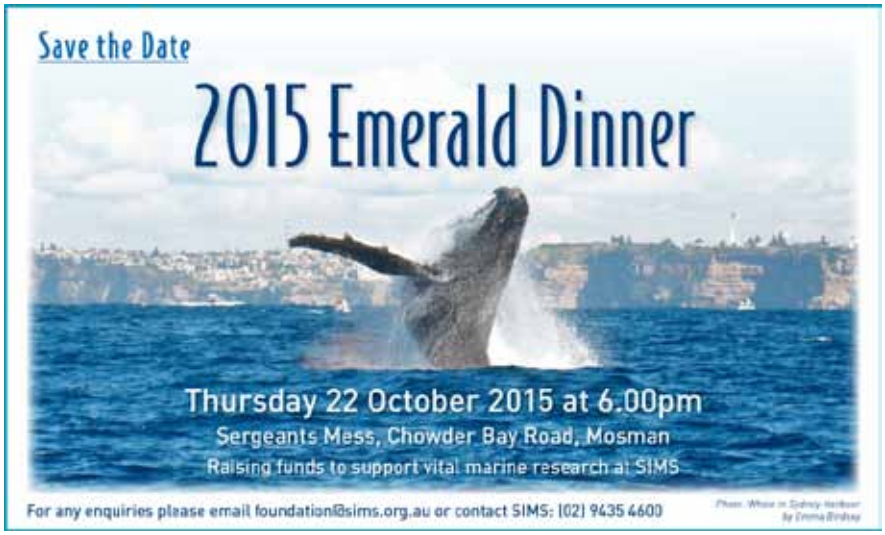
Generous support for the Emerald Dinner
2 nights at beautiful Lizard Island Resort

Delaware North Companies Parks & Resorts have once again donated this magnificent prize to be auctioned at our Emerald Dinner. Lizard Island Resort is an indulgent retreat offering sensational diving, snorkelling right off the beach and superb dining set amongst pristine white sands and clear blue waters. The image above shows the beach in front of the resort.

The prize includes 2 nights in a garden room, gourmet meals, non-alcoholic beverages and selected fine Australian and New Zealand wines, beer, spirits and champagne, picnic hampers, use of non-motorised water sports and motorised dinghies. Return scheduled flights between Cairns and Lizard Island also are included.

Valerie Taylor AM - Guest of Honour at the Emerald Dinner

We are delighted to announce that Valerie Taylor AM, will be Guest of Honour at this year's Emerald Dinner. Valerie and her late husband Ron, specialised in underwater action photography, working with large and potentially dangerous marine creatures. They were the first people to film great white sharks in their natural environment and without a cage. Valerie has received numerous awards for her work in marine conservation. She will be a wonderful and highly entertaining guest speaker.



Fantasea Harbour Hike - better than ever this year

Fantasea Harbour Hike will be back again in 2015, with plans for a revamped finish line and lots of fun activities for the whole family. Scheduled for Sunday 30 August, the Hike will be a perfect way to usher in the Sydney Spring and have a great day out around our precious Sydney Harbour.

As SIMS' flagship community outreach event, Fantasea Harbour Hike is providing even more opportunities for the public to learn about our invaluable research this year as we celebrate the opening of our new Discovery Centre at Chowder Bay and throw open the doors to our laboratories for a behind the scenes sneak peak at our research projects.

Checkpoints along the way pose interesting questions about the Harbour and encourage interaction with SIMS scientists as well as some fun communal cheating! At the finish line, SIMS scientists are there to tell more about their fascinating work.

Photos: Above right - Checkpoint at Sarah's Walk.
Below - Learning how to extract blood from an oyster.

If you haven't done the 12km Hike that starts at Kirribilli, we encourage you to sign up this year and experience a fabulous day out in the sunshine. Wander through the leafy streets of the lower North Shore meeting our scientists along the way, before you hit the National Park tracks past Taronga Zoo, around Bradley's Head and Taylor's Bay and onto Clifton Gardens.

Our SIMS Marine Festival at the finish line will be a showcase for the Chowder Bay precinct that is not only SIMS' home but also Ripples Restaurant, East Coast Lounge, Bacino Cafe and many more. Along with plenty of food and beverage options, and lots of activities for the kids, it really will be a great day out and a wonderful opportunity for people to learn more about SIMS.

Thanks to our major sponsor Fantasea Cruising Sydney, all friends of SIMS will receive a 20% discount on their Whale Watching Cruise:
www.fantasea.com.au Promo code FCSHH15

Deserts and rainforests in the ocean - more research by the SIMS IMOS team

SIMS' scientists have been studying the secrets of small eddies along the NSW coastline. They suspect that the eddies are important offshore nurseries for larval fish. As the East Australian Current sweeps down the coast it often forms large eddies that move in an anti-clockwise direction. The large warm eddies are biological deserts, devoid of much life. But sometimes small cold eddies break off from the main current and rotate in a clockwise direction. They pull up nutrient rich water to the surface and are more like biological rainforests, with a wide variety of species present including larval fish.

The team used high-tech equipment on Australia's new research vessel, the *RV Investigator,* to measure temperature, salinity and type of plankton in the small eddies to determine if they are offshore nursery grounds. If it is found that the small eddies are good for larval fish, it raises the possibility of putting eggs from big fish such as tuna into the eddies to help repopulate the ocean.

On board the *RV Investigator* with the team about to deploy the Lagrangian Drifter which is a piece of equipment that can either float on the surface or at a specific depth to collect data about the current.
Photo: SIMS IMOS team

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CONTACT US

SIMS Foundation:
Building 19
Chowder Bay Road,
Mosman, NSW 2088

Tel: (02) 9435-4600
foundation@sims.org.au

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