AIMS@JCU news

AIMS@JCU IS A COLLABORATIVE JOINT VENTURE BETWEEN THE AUSTRALIAN INSTITUTE OF MARINE SCIENCE AND JAMES COOK UNIVERSITY

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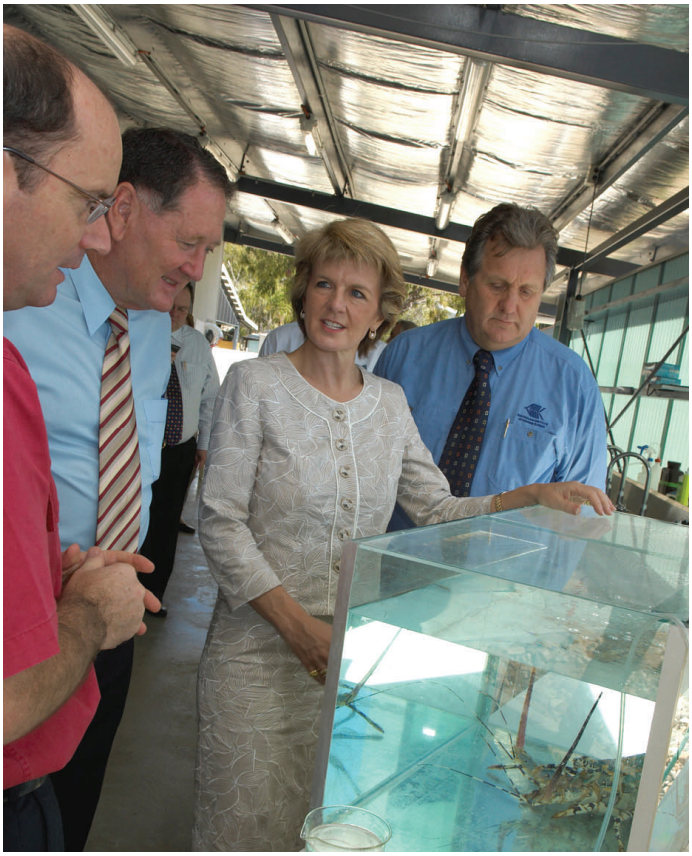
Minister visits AIMS @ JCU facility



L-R - Dr Mike Hall, Mr Peter Lindsay MP, The Hon. Julie Bishop MP, Dr Ian Poiner. Photo: John de Rooy

Photo by John de Rooy, copyright AIMS.

The Minister for Education, Science and Training, the Hon. Julie Bishop , recently visited both AIMS and JCU.

During the visit to AIMS, Minister Bishop announced funding for a new oceanographic satellite receiving station at AIMS and a state of the art fibre optic winch for the Institute's new vessel, the RV Solander.

The Minister also toured the AIMS@JCU Controlled Environment Facility and is pictured at left with AIMS@JCU PhD Scholarship recipient Kiki Tziouveli.

Inside this issue:

About AIMS@JCU News:

This newsletter is produced quarterly, and distributed via email to all AIMS and JCU staff.

If you'd like to be added to our mailing list, or have a query regarding this newsletter, then please contact:

Editor: Trisha Fielding
Phone: (07) 4781 4074
Fax: (07) 4781 6844
Email: aims@jcu.edu.au

Web: http://aims.jcu.edu.au

AIMS@JCU Student awards celebrated

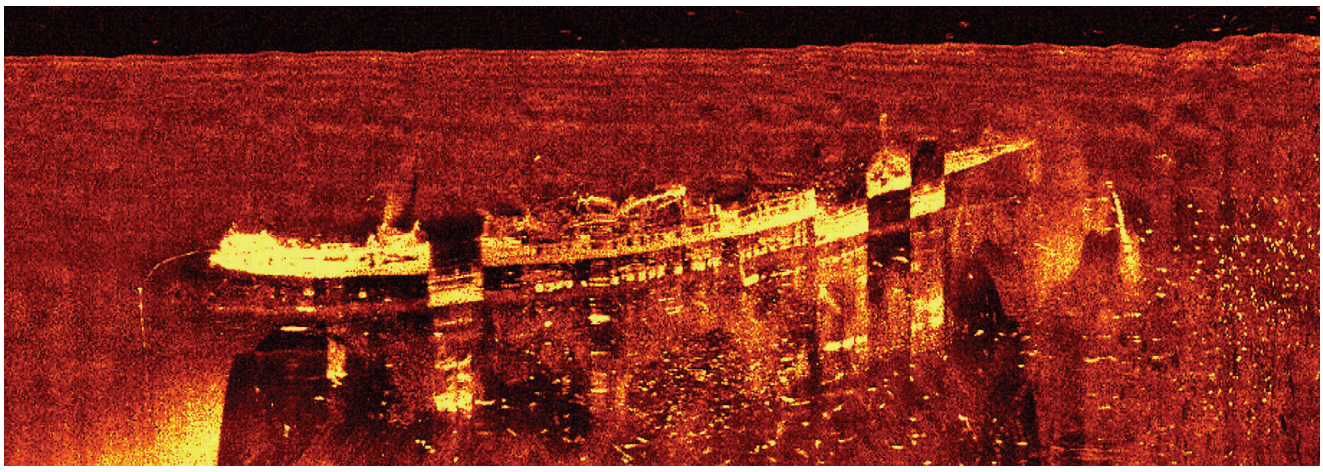
AIMS@JCU Chairperson Rhondda Jones chats to some of the award recipients. Photo: B. Dinsdale.

Recipients of the 2007 round of AIMS@JCU PhD Scholarships, Travel Support and Honours Scholarships were presented with certificates by Chair Rhondda Jones and Executive Officer Brett Dinsdale recently.

The presentation, followed by an informal afternoon tea gave Board Members and students an opportunity to meet and socialise.

Polo shirts with an embroidered AIMS@JCU logo were also distributed to the students. It is hoped that these will be seen far and wide, with the Travel Support Scholarship students presenting at conferences throughout Australia, and one student presenting at a conference in Hanoi, Vietnam.

Project update - 'Yongala's Halo of Holes'



In collaboration with ATLAS Hydrographic, Cairns, the Yongala team has recorded sidescan images of the wreck of the Yongala and the halo of holes around it. This data shows a similar distribution of holes around the wreck to what was found more than two years ago, suggesting that the halo of holes is a semi-stable, long-term phenomenon. With a towed video camera, the team also found substantial benthic growth in some of the holes - further evidence that the holes are a semi-stable habitat.

The weather has not been cooperative in the past months, delaying further work on the feeding behaviour of the rays. Preparations are now underway for an experiment to tag rays and track the animals acoustically in the second half of this year.

Image submitted by Thomas Stieglitz.

Research program update

Coastal Processes & Modelling

Student Activity -

Carol Erwin (PhD) submitted for review one manuscript to Ecology and one manuscript to MEPS. Carol is also 2nd author on a seabirds chapter for the GBRMPA book - *GBR Ecological Vulnerability Assessment*- coming out soon.

Carol began processing and analysing data collected at Heron Island Nov06-Jan07 and has recently been in the lab extracting DNA in order to determine sexes.

Lachlan McKinna (PhD) has completed two field trips with the full instrument set in the GBR lagoon. Initial analysis of the spectra obtained from these cruises has shown that there is a major change in the instrument response when trichodesmium comes into the field of view of the instruments.

Work is progressing to develop a statistical method of converting spectra into a quantitative measure of trichodesmia concentration.

In addition to the work in the GBR, a cruise which involved a circumnavigation of Tasmania was also done with CSIRO and other scientists with different optical equipment. Although the data from this cruise is yet to be analysed, it has been helpful in forming a useful collaboration with other scientists with an interest in marine optics.

Jasmine Jaffrés (PhD) visited the research group of Dr Patrick Marchesiello in Noumea, New Caledonia, from February 27th to March 29th where she collaborated with ROMS-Agrif experts to set up the regional model for the Coral Sea district. She was also working on the revision of a paper based on her honours thesis, which is now in press.

Jaffrés, J., Shields, G.A. and Wallmann, K. The oxygen isotope evolution of seawater: a critical review of a long-standing controversy and an improved geological water cycle model for the past 3.4 billion years. *Earth-Science Reviews* (in press)

Marie Magnusson (PhD) is currently planning the next major part of her project; field-sampling for analysis of herbicide contamination in tropical Queensland. She is also busy writing up two papers based on her results so far on acute toxicity and comparative effects of herbicides on photosynthesis and growth of tropical estuarine microalgae.

Severine Choukroun (PhD) is writing a paper on the circulation in the southern GBR from the data collected during the two years deployment and Satellite Sea Surface Temperature and chlorophyll concentration data will be collected from UQ.

The satellite data will be used in conjunction with in situ data to relate the main features observed in the regional circulation in the region (presence of eddies in the region which may trigger reversals).

Serverine also participated in a workshop at CSIRO in Hobart to develop and calibrate a series of grids. The coarse grid extends from Cairns to South of Fraser Island and will be used to obtain the low frequency circulation. The intermediate grid encompassing the Capricorn Bunker group will help represent the circulation in the region and better understand the influence of the different processes that drive the circulation.

Ron Hoeke (PhD) - School of Maths, Physics and IT

Project Title: Water circulation, residence time and flushing of Hanalei Bay

The data from oceanographic instruments deployed in Hanalei Bay, Kauai, in September, 2006 captured eight large storm wave events (sig. wave height in excess of 4m).

In addition, two pressure sensors were deployed ~4 km either side of Hanalei Bay to collect tidal constituent data and determine phase lags on April 23. These will be recovered in September 2007.

Numerical model development continues; current focus is on accurately modelling deepwater directional wave spectra from offshore to the inshore high-resolution model boundaries and on hydraulic roughness schemes for the inshore model. Preliminary model results were presented at the 2007 Hanalei Watershed Workshop.

Paulina Cetina Heredia (PhD) has been assessing the importance that different circulation mechanisms, such as tidal residual currents, fronts, low frequency currents, etc, have in larvae transport and connectivity between reef systems.

Paulina also took part in a cruise on board the RV Lady Basten to the Capricorn Bunker Reefs and participated in a workshop at CSIRO, in Hobart.

Deane Ludman (Hons) - has been working on a literature review for his Honours project and is in the process of sampling three canyon cores taken during a 1990 Franklin Cruise; with his first run of C14 dates being done at ANSTO this month. Initial results are expected back in the next couple of weeks.

Our congratulations go to Deane who recently won two awards:

Townsville Port Authority Prize in Marine Sciences (Prize C), highest pass grade in level III sedimentology; and the

Michael McLellan Memorial Prize, awarded to the student demonstrating most improvement in achievement on completion of second or third year studies.

Program Leader profile - Mike Hall

Mike Hall is the AIMS Program Leader for the AIMS@JCU Tropical Aquaculture Program.

Mike is a principal research scientist at AIMS in the Sustainable Use of Marine Biodiversity Program and leads Tropical Aquaculture research in economically important crustacea.

His university years were spent in the USA and overseas, obtaining his PhD from the University of Wales (UK).

He has previously held research positions at the Max-Planck Institute (Germany) and University of Bristol (UK), specifically in understanding physiological and endocrinological processes that occur on a circadian and seasonal basis.

Current research include established seafood aquaculture species (penaeid prawns), emerging candidates (tropical rock lobsters) and ornamental marine species.

Specific focus is placed on:

- understanding the relationship between stress and health;
- the role of microbes in larval rearing systems;
- the development of generic hatchery production systems; and
- the development of larval feeds for the production of high quality and healthy larvae.

Contact: m.hall@aims.gov.au

Research program update

Tropical Aquaculture

Student Activity -

Steve Whalan (PhD) recently completed his PhD. The following publication resulting from his research has been accepted for publication.

Whalan S, Battershill C, de Nys R. Sexual Reproduction of the brooding sponge Rhopaloeides odorabile. *Coral Reefs.* DOI 10.1007/s00338-007-0236-8.

Thanongsak (Tony) Thanuthong (PhD) has worked on a volunteer basis with the mariculture section at AIMS and is keen to develop a PhD project within the research themes of the AIMS@JCU Tropical Aquaculture Program.

A recent meeting of AIMS@JCU Tropical Aquaculture Program staff discussed potential research project areas for Tony. His PhD program will be finalised during June 2007 and will focus on the development and use of microparticulate foods for rock lobster phyllosoma.

Kiki Tziouveli (PhD) has completed experiments on mate selection with data presently being analysed. Current experiments on-going include impacts of diets on frequency of spawning and fecundity.

Larval rearing is progressing with one group now 3.5 months old with possible metamorphosis within the next month.

Kiki also met and discussed her project with the Minister for Science, Education and Training, the Hon. Julie Bishop MP, on May 15 (see front page).

Experiments being conducted as part of Kiki Tziouveli's PhD project, utilising the AIMS@JCU Controlled Environment Facility. Photo: T. Fielding

Controlled Environment Facility

Photo: T. Fielding

Tropical Aquaculture Post-doc. Greg Smith talks about the capabilities of the AIMS@JCU Controlled Environment Facility.

The Controlled Environment Facility located at the AIMS Cape Ferguson site is divided into two discrete areas; the Southern and Northern.

Both areas have controlled photoperiod, air temperature and water temperature integrated into them.

The Southern area consists of two rooms that are currently used for holding Ornate tropical rock lobster (*Panulirus ornatus*) broodstock on phase shifted cycles which allows the production of larvae in most months of the year, rather than the three months provided by an ambient cycle.

This phase shifting capacity ensures that spiny lobster larvae are available for student experiments in the Tropical Aquaculture Program and fundamental research over a large portion of the year and provides almost unlimited opportunity for their use.

The Northern area is divided into three larval experimental rooms for spawning and larval experimental research. Two larval experimental rooms are currently used to observe spawning behaviour, larval rearing and dietary experiments on *P. ornatus* and the White Cleaner Shrimp (*Lysmata amboinensis*).

The third room is used for short-term experiments which has included projects in the Stress in Tropical Marine Systems Program.

The basic fit out of the larval experimental rooms took place November and December 2006.

"the design… makes it unique within Australian research sites and amongst only a very few in the rest of the world."

This was complemented by a major investment by AIMS in upgrading the water treatment capability of the Seawater Precinct in January and February of 2007.

Seawater to the facility is sourced from bifurcated pipes approximately 100 metres offshore from the beach at Cape Ferguson through a pump house with a pumping capacity of over one million litres per day.

The seawater is partially settled for up to 24 hours in two 450,000 L enclosed cement towers before being gravity fed to two reservoirs of 1.8 and 1.6 megalitres respectively.

Settled seawater from the second reservoir presently supplies the needs of AIMS, AIMS@JCU CEF and JCU. A tanker truck transports large volumes of seawater from the reservoir to the JCU Douglas campus for marine biology and aquaculture facilities on a regular basis.

Downstream upgrades to the seawater water treatment to supply the strict demands of the AIMS@JCU CEF include additional foam fractionation and filtration to remove particulate matter and the installation of ozone and UV units to improve water clarity and reduce background bacterial loads.

An additional investment in water treatment infrastructure has been recently made by AIMS through the purchase of an ultra-filtration unit (<0.05 mm) capable of processing 150 000 l of raw water per hour.

This will provide greater flexibility in water treatment options and will aid in catering for an expected increase in the use of the facility by students. It is expected that the installation and characterisation of the unit will begin within two months. The entire integration will result in the supply of standardised and pyrogen-free seawater for the most demanding research needs.

During the past few months the characterisation of the current water treatment system has been undertaken in parallel with lobster and shrimp larval experiments examining system design, water treatment and dietary utilisation. Characterisation of the current system will be completed within the next two months to allow the routine use of the facility.

The new facility has undoubtedly provided much needed infrastructure to undertake marine larval studies, in particular into crustacean research.

The fact that the design has focused on the use of flow-through systems with almost unlimited high quality 'oceanic water' makes it unique within Australian research sites and amongst only a very few in the rest of the world.

Research program update

Stress in Tropical Marine Systems

Student Activity -

Vivian Cumbo (PhD) completed her PhD Confirmation Seminar on 26th April.

She is currently on her way to the University of Ryukyus in Japan for two months to attend the 21st Century Centre of Excellence Program: International Summer Course.

Vivian will be concentrating on aspects of coral symbiosis, in particular, mechanism of adaptation to climate change.

Vivian was also awarded an Endeavour Research Fellowship ($25,000) to learn the latest fluorescent *in situ* hybridisation techniques for zoothanthellae, in the Dr Allen Chen laboratory at the Academia Sinica, Taiwan. Congratulations Vivian!

Eneour Puill-Stephan (PhD) was awarded an ACRS Travel Scholarship to attend the annual Australian Coral Reef Society Conference in Fremantle, WA, in October. Congratulations Eneour!

James Moore (Hons.) is in the process of completing the write-up of his BSc Honours thesis. James conducted field work on the impact of coral bleaching on juvenile fishes and found that fewer fish recruited to bleached corals and this was due to an active avoidance of this habitat.

New Members…

Four new AIMS@JCU members were approved at the recent AIMS@JCU Board meeting, on 12th June, 2007. Welcome to:

- Lone Hoj, TA Program, AIMS
- Raechel Littman, STMS Program, JCU MSc.
- Allison Paley, STMS Program, JCU MSc.
- Yui Sato, STMS Program, JCU MSc.

Access Grid now online

The opportunity for researchers from both AIMS and JCU to meet face to face has just become a little easier, with new Access Grid software and AV equipment recently installed at AIMS.

The technology will allow interaction between staff and students of both AIMS and JCU, without the costly and time consuming obstacle of travelling between the two venues.

The system relies on 'multi-casting' rather than traditional 'uni-casting' enabling an unlimited number of people to contribute to the meeting, from unlimited sites.

AIMS Contact: James Smith
Email: j.smith@aims.gov.au
JCU Contact: Russell Sim
Email: russell.sim@jcu.edu.au

Photos in this publication were submitted by the students/staff themselves, unless otherwise captioned.

From the Chair…

Having the first cohort of AIMS@JCU PhD students start to submit their PhD theses triggered some reflection on my part about the AIMS@JCU student and scholarship program. This was originally set up to provide opportunities for graduate students to be co-supervised by AIMS staff, to spend time at AIMS, and to utilise AIMS facilities, as part of their research training.

I think there is no doubt that this element of AIMS@JCU activities has been exceptionally successful. We have been fortunate in recruiting excellent students: they have undertaken significant and innovative projects, and a number of them have begun publishing their results in high-quality journals during their PhD.

I know too, that for most of them, the projects they have undertaken could not have been supported without the contributions by AIMS to their supervision and facilities access being added to the support that JCU could provide. The student conference which we ran in 2006 provided a means to showcase student achievements, and we are planning to repeat it later in 2007.

The access grid facilities now established to provide better visual communications links between AIMS and JCU should also help to enhance links between AIMS-based students and their JCU supervisors, as well as between staff of the two institutions.

The AIMS@JCU Board hopes that this facility will enhance, facilitate, and perhaps even trigger an increase in the collaborative activity that the joint venture was set up to develop.

Rhondda Jones, Chair, AIMS@JCU