AIMS@JCU NEWSLETTER

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In the field at Heron Island

by AIMS@JCU scholarship student Leanne Currey

Five months after commencing her PhD, Leanne headed back to Heron Island for a month of fishing and diving field work. She is investigating the movement patterns, both among reefs and at a broader scale along the Great Barrier Reef, of the important fishery species redthroat emperor (*Lethrinus miniatus*). Utilising the setup of underwater "listening stations" (acoustic receivers) around Heron, One Tree and Sykes reefs as well as otolith microchemistry techniques, Leanne's project will provide greater insight into whether long-distance movements are common for this species and whether these movements are sex-specific or vary with environmental conditions. The focus of this second field trip was to download the acoustic receivers monitoring the movements of the tagged redthroat emperor, deploy some additional receivers to enhance coverage of detection and collect more biological samples for microchemistry and sex differentiation.

Reef fishing

Surgery to fit fish with acoustic transmitter

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This newsletter is produced quarterly and distributed by e mail to all AIMS and JCU staff.

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

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Report from Heron Island continued

by AIMS@JCU scholarship student Leanne Currey

Acoustic receiver positioned on substrate

In April, twenty animals were fitted internally with acoustic transmitters and released among the array of receivers, with the aim to obtain long-term data on the movement patterns of these fish. The logged data was acquired by retrieval, download and replacement of each receiver, and revealed that tagged individuals were indeed detected by the array! So far, variability in movement patterns has been observed over the 134 days. Some fish remained within the detection range of the single receiver closest to the initial release site, whereas others ventured past four or five receivers, over 6km in distance. Analysis of this information will relate the depth profiles (up to 50m) to tides, time of day and environmental conditions and more data in February will provide further information over time. An exciting find was a recapture of one individual, only 80m from the release location after 132 days at liberty (pictured), supporting the frequent presence of some individuals at one location.

Drawing blood for hormone analysis

During the line fishing days, blood was taken from each retained fish and gonads and otoliths were removed. The blood plasma will be analysed to determine the sex of each individual via hormone levels and compared to the gonads. If this technique can successfully differentiate between sexes, it will be used to determine if movements observed are sex-specific e.g. during the spawning season. Thus, plenty of time will be spent in the laboratory next year!

Leanne is back in the office until next year, writing her proposal and literature review in preparation for her confirmation seminar in November.

Taking measurements

Recapture of tagged fish, keen to return to the water!

Releasing a tagged individual

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2011 AIMS@JCU Honours Student Profile

Vinay Udyawer

Background:

I grew up in New Zealand and started a Bachelor of Science degree at Massey University focusing in Zoology and Ecology. I then moved to Townsville to complete my BSc in Marine Biology in 2010. I am currently enrolled in an Honours research project working with Colin Simpfendorfer (JCU) and Michelle Heupel (AIMS). My project involves using passive acoustic monitoring to look at movement patterns of juvenile blacktip sharks (*Carcharhinus limbatus* & *C. tilstoni*) within Cleveland Bay. Part way through my fieldwork Cyclone Yasi made landfall on the coast of Queensland. I now have the opportunity to look at the changes in movement patterns in coastal sharks to extreme weather conditions. I will be completing my honours project in October and have plans to start a PhD next year.

Research:

My project is looking primarily at the spatial ecology of juvenile blacktip sharks (*C. limbatus* & *C.tilstoni*). Blacktip sharks are the most commonly captured shark in commercial fisheries along Queensland's coast and are also commonly caught by recreational anglers. They are known to give birth during spring along the coast of Queensland, with juveniles spending an unknown amount of time in nursery habitats. The importance of these habitats and the protection they provide is largely unknown.

I am focusing on the change in movement patterns within a shark nursery ground using Home Range analyses. I am also looking at the proportion of time they spend in inshore areas closed to net fishing, therefore determining the efficacy of fishing closures to highly mobile predator like sharks.

I am also looking at the change in movement patterns of elasmobranchs (6 shark species and 2 ray species) within a coastal bay in response to Tropical Cyclones Anthony and Yasi. I am interested in the movement response of elasmobranchs to extreme weather and more importantly their return to the habitat after the conditions have subsided.

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• Research Director's Report

It is now three months since I joined AIMS@JCU as Research Director, and I have thoroughly enjoyed spending part of my time in this role and on-campus. I would like to especially thank Lauren Gregory and Vanessa Adams in the AIMS@JCU office, for patiently easing me into the way things work here. A highlight so far has been the two morning teas (one at AIMS and one at JCU) where I met many AIMS@JCU students and their supervisors. Thanks to everyone for making me feel so welcome. In future, we hope to foster more opportunities for networking and exchange including occasional morning teas, sponsored nibbles at seminars and videoconferenced seminars between AIMS and JCU.

Recent activities in our office have focused on fielding enquiries for the AIMS@JCU PhD scholarship opportunities currently available. Based on initial levels of interest, we are looking forward to a strong field of applicants including some outside historical AIMS@JCU focus. I have also learned about pre-requisites and criteria for supervision of JCU post-graduate research students. With the help of the Graduate Research School, we hope to have more AIMS staff added to the register of supervisors in the near future, which will hopefully ease the pressure on our JCU colleagues, and increase the overall capacity of AIMS@JCU to support post-graduate research training in marine science. Report continued on page 8

• AIMS@JCU goes to ICRS!

As the International Coral Reef Symposium will be held in Cairns next year, we want to take advantage of the enormous opportunity of having such a major international science conference virtually on our doorstep and facilitate participation in it by AIMS@JCU student members. Using joint car travel and share-accomodation in Cairns to be organised by the AIMS@JCU office, we are offering to cover the cost of travel and accommodation for AIMS@JCU students.

Even with the student early bird discounts, the registration costs are significant for this conference; however there are immense benefits to be had in terms of networking and exposure to the world's coral reef science community and of course learning about all the coal-face research. So we hope that by covering travel and accommodation costs, we have made this conference opportunity more affordable for our student members.

We urge all AIMS@JCU student members to consider submitting an abstract, if they haven't already. The deadline is 1st October. An accepted abstract is not a pre-requisite to the offer outlined above - however we would love to have as many students presenting as possible. We will organise our annual seminar day for close to and prior to the conference, so it can be used as a practice run.

For more information, see www.icrs2012.com

• AIMS@JCU Office Information

The standard AIMS@JCU office hours are between 9am and 1pm daily, however the office is often manned outside of these hours so it is best to e mail prior to visiting to ensure we are available. Please feel free to pop by and discuss any issues you may have with any aspects of your study or just to see our new AIMS beach wall art and have a coffee. We also have internet access available for visitors and a spare desk for visiting AIMS staff to take advantage of when at the JCU campus.

These and other images taken by Visual Echo Photography of AIMS beach (and the AIMS@JCU Student Seminar Day hosted at AIMS) can be viewed at www.visualecho.com.au in 'Client Galleries' → 'AIMS@JCU'.

• AMSA Membership

Five more AIMS@JCU students have benefited from one year's free membership of the Australian Marine Sciences Association in the name of Professor Joe Baker – thank you Joe for your continued support of new marine scientists. Stephen Ban, Vinay Udyawer, Joleah Lamb, Jeroen Van De Water and Sam Munroe were the lucky recipients this year and will be able to take advantage of the many opportunities given to them by being AMSA members, e.g. networking, AMSA mailing lists, access to members-only sections of the AMSA website, receiving the Australian Marine Science Bulletin as well as reduced registration for the AMSA annual conference.

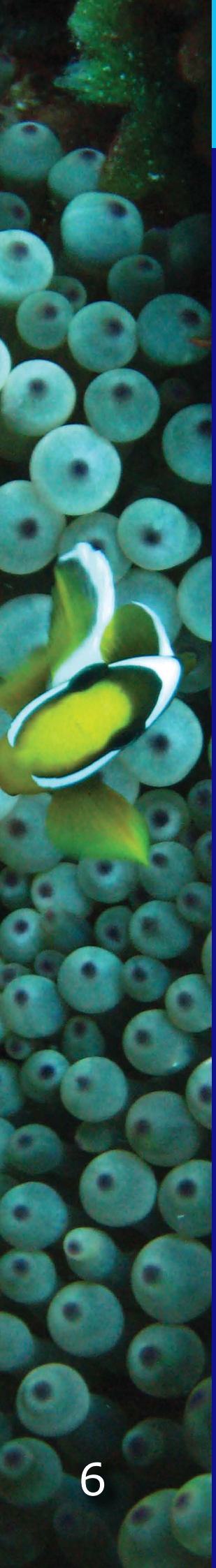
This year's Australian Marine Sciences Association conference was held in Freemantle, WA and the theme was 'Crossing Boundaries'.

For more information, please visit www.amsa.asn.au

• ACRS Awards

Congratulations to AIMS@JCU student member Yui Sato who won a student oral presentation award (Quicksilver Cruises Prize) at this year's Australian Coral Reef Society conference held on the Sunshine Coast. Look out for Yui's personal experience of the conference in our next newsletter.

For more information, see www.australiancoralreefsociety.org/conference



2011 AIMS@JCU Honours Student Profile

Kristen Anderson

I grew up in Canada, finishing my BSc in Biological Science at the University of Calgary. Upon completion, I wasn't sure which avenue I wanted to further my education. Doing some research on various universities, James Cook University seemed to be the best opportunity to achieve my goals. I am currently enrolled in the BSc Honours program supervised by Morgan Pratchett (JCU) and Janice Lough (AIMS).

Climate change possesses an increasing risk to the future status of coral reefs, with increasing ocean temperature and acidification being the greatest threat. On the Great Barrier Reef, massive corals have showed a 14.2% reduction in calcification and a 13.2% reduction in linear extension attributed to acidification as well as ocean warming. At high latitude locations, such as Lord Howe Island, this change may not be as evident as coral growth may currently be limited by temperature. Whereby, climate relates increases in ocean temperature may cause an increase in the growth rate of coral. However, ocean acidification may be reducing the available carbonate saturation for reef growth leading to a decline in growth. Importantly, there is a general lack of knowledge in how climate change is affecting the growth rate of branching corals.

The purpose of my study is to measure the linear extension rate of branching corals at Lord Howe Island and compare the linear extension to data collected in the mid 1990s to assess whether there has been a change in coral growth. Six locally dominant coral taxa (including Acropora, Seriatopora, Pocillopora and Isopora) were analysed over the summer growth period. Coral growth was measured using three methods: linear extension using alizarin red dye, change in 2 dimensional areas from photographic records over time, and change in dimensions of branch length. The results will advance our understanding on the affects of climate change on vital habitat forming corals and be instrumental for future management strategies. I was awarded the AIMS@JCU Honours scholarship and will be completing my thesis in October.

My future goals are to continue my education at JCU with a PhD measuring the linear extension of branching corals at a range of locations along the east and west coasts of Australia, taking advantage of locations where prior measurements of coral growth have been conducted. By combining these findings with increasing experimental studies to test coral responses to changing environmental conditions, predictions can then be made to assess when coral growth will be impeded.

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Where are they now?

Ron Hoeke

Ron Hoeke completed his PhD research under the supervision of Professor Peter Ridd in 2010. This research, jointly supported by AIMS@JCU and the U.S. NOAA Coral Reef Conservation Program, was focussed on the physical oceanography of coral reefs, and led to an offer to become a research officer for the CSIRO Pacific Islands Climate Change Science Program (www.cawcr.gov.au/projects/PCCSP). It was a difficult choice, but Ron decided to leave his job of many years with NOAA in Hawaii and make the move to Melbourne to join the CSIRO Aspendale facility last October. His work since has been centred on assisting Pacific Island nations to understand and predict inundation (flooding from the sea) and other impacts associated with storms, a topic of high concern in the Pacific region, particularly in the face of projected sea-level rise. Future plans include research into how climate change projections, including ocean acidification, will affect patterns of erosion and accretion of Pacific Islands, as well as coral reefs continued viability as natural breakwaters.

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Steven Whalan

I completed my PhD on sponge population ecology in 2007, as one of the first AIMS@JCU students, and was lucky to find work straight away. I commenced a 1 year Post Doc with JCU and CSIRO (Wealth of Oceans) in 2008 working on the effects of novel surfaces to deter marine biofouling invertebrates (e.g. carbon nano tubes , structured micro topographies and photocatalytic surfaces).

I then joined AIMS in 2009 as the Project Leader for a MTSRF funded project researching the ecological and commercial importance of sponges in Torres St. I returned to JCU in 2010 as an ARC Fellow after securing an ARC Linkage project with Reef HQ. This project has focussed on the larval and reproductive ecology of sponges to establish methods of sustainable culture for public aquarium displays.

The ephemeral nature of Post Docs means shifting around a lot and I will be leaving JCU at the end of 2011 to commence a 3 year Post Doc with Southern Cross University and the National Marine Science Centre. I plan to work on larval dispersal, species distributions and adaptations in tropical-temperate transition zones. Photograph taken by Carsten Wolff, AIMS

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Research Director's Report continued

Research Director's Report continued from page 4.

I am looking forward to ICRS next year, and being part of the AIMS@JCU supported excursion there. I hope you are also planning to join us. If you haven't already, make sure you get your abstracts in on time –more information on this is elsewhere in this newsletter.

On a sad note, we say farewell to a key part of AIMS@JCU's nerve-centre. After 3½ years, Vanessa Adams is leaving us and moving to an exciting post-doc position in Darwin. On a personal level, I have relied on Vanessa's expert knowledge and corporate history of AIMS@JCU enormously, and am extremely grateful for her help. However, as my time working alongside her has been relatively short, I have deferred to our past Research Director, Michelle Heupel, who provided the following account of Vanessa's time with us:

"Vanessa has been an integral part of AIMS@JCU since joining the joint venture in 2008. While completing her own PhD Vanessa worked part time for AIMS@JCU helping to revise and eventually re-build the website, help with budgeting and accounting, help organise meetings, functions, newsletters and reports, as well as producing the eResearch newsletter. Through her years at AIMS@JCU Vanessa has been an essential link between postgraduate students and the office and offered critical advice from a student's perspective at key decision points. She has been an extremely valuable member of the AIMS@JCU team and although I am sad to see her time with the group end I am thrilled to know that she has successfully completed her PhD and is moving forward with a postdoctoral appointment that will provide new research challenges and continue to advance her career. I wish her the best of luck in her new appointment and am certain that she will be successful based on all of the skills and expertise she employed for AIMS@JCU and during her PhD."

Good luck Vanessa, and thank you for your contribution to AIMS@JCU.

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Photographs in this publication were submitted by AIMS@JCU students/staff or have been sourced from the AIMS Long Term Monitoring Team unless otherwise stated.

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