AIMS@JCU NEWSLETTER

VOLUME 5, ISSUE 4 November 2009

Alex Vail & Darren Coker

June 2009 Conference Summary

In June this year, the combined 8th Indo Pacific Fish Conference and 2009 Australian Society for Fish Biology Workshop and Conference were held in beautiful Fremantle, Western Australia. Among the several hundred icthyologists

Darren Coker with his poster

attending this international meeting were the AIMS@JCU supported students Darren Coker and Alex Vail. Although over 150 students were present, the conference was numerically dominated by postdoctoral researchers, with many distinguished names representing the best minds in their field.

Story continued on page 2

CONTENTS

About the AIMS@JCU Newsletter:

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:

Editor: Lauren Gregory
Phone: (07) 4781 4074
Email: aims@jcu.edu.au

Alex Vail & Darren Coker conference report continued

Scientists heralded from around the globe, but our own country was well represented, especially by JCU and AIMS. This was particularly noticeable at the packed plenary sessions, where invaluable insights were gained from the work of JCU's Professor Howard Choat, David Bellwood and Geoff Jones. Other keynote speakers included Peter Sale, Gerald Allen, and Yvonne Sadovy. Industry was also well represented, adding to the applied aspect of many presentations. The conference's symposia, although fish specific, were highly diverse, ranging from biogeography and phylogeography to sustainability and management.

Darren Coker presented a poster with some findings from his PhD on the effects of coral bleaching on coral-dwelling fishes. His study showed a significant decline in the abundance of coral-dwelling fish following experimental bleaching, with two thirds of the resident fish moving away from their host coral immediately following bleaching. These fish migrated to nearby healthy coral colonies where some were successful at joining the existing fish community while some were met with resistance from dominate resident fish and were forced to swim over 10 meters to an adjacent reef. Fish abundance on healthy coral colonies did not increase significantly from the original abundance even though one third of the fish from the bleached colonies were successful at joining the existing community. This is because roughly just under half of the fish originally associated with the healthy colony migrated to the adjacent reef. This suggests that the healthy colonies were close to carry capacity and that existing individuals were forced out with the event of new individuals entering the colony. It is also possible that the remaining fish on the impacted colonies were not there by choice but rather they were forced to remain associated with it because they were not able to join the healthy colony due to resistance from the dominant resident fish. This study shows that coral-dwelling fishes respond rapidly to host coral bleaching, suggesting that coral-dwelling fishes rely on their coral hosts for more than just physical structure. This is shown by a significant decline in the abundance of fish on coral colonies that were subjected to bleaching.

Alex Vail presented a seminar of his Honours research on the non-lethal effects of predators on settling reef fish. Alex's study examined whether settlement-stage reef fishes had the ability to detect and react to predator stimuli. As most settlement occurs at night and around the new moon, the key sense investigated was olfaction. It was found in laboratory flume trials that settlement-stage pomacentrids avoided odour from a predatory fish over that from a non-predator. This led to the key finding that pomacentrids use this olfactory ability to avoid settling on experimental habitat patches in the field that were manipulated to emit predator odour. This olfactorily mediated predator avoidance appears to be an anti-predator adaptation, and further research is required to determined the extent of its effect on reef community dynamics. Alex was fortunate enough to receive both the Gilbert P. Whitley Memorial Student Award and Michael Hall Award for Innovation for his research and presentation. Travel costs for Darren, Alex, and many other student members of the ASFB were supported by the John Glover Travel Fund.

Story continued on page 3

Alex Vail & Darren Coker conference report continued

Attending the IPFC gave both Darren and Alex the opportunity to further develop their presentation skills and broadcast their results to a large audience, gaining constructive feed back in the process. Both information specific to their projects and that which broadened their understanding of ichthyology was gained by attending the diversity of presentations on offer. Last but certainly not least, the conference provided a key opportunity put faces to names on papers. Fostering relationships between scientists of the world is a key function of this and all conferences, as by the pooling our individual knowledge may we put it to best use.

Contacts: alexander.vail@jcu.edu.au and darren.coker@jcu.edu.au

Chaoshu Zeng

New JCU Program Leader for the Tropical Aquaculture program

Dr. Chaoshu Zeng is a Senior Lecturer at the School of Marine and Tropical Biology, James Cook University, where he leads the Tropical Crustacean Aquaculture Research Group. Chaoshu's research interests encompass broad areas, including development of aquaculture techniques for commercially important species, particularly crustaceans; nutrition and formulated feed development for broodstock, larvae and juveniles; toxicology of nutrients to commercially important crustaceans; physiology and behaviour of marine larvae and juveniles. His current research focuses are on the development of hatchery/nursery techniques and the investigation of nutritional requirements for the mud crab *Scylla serrata*, the blue swimmer crab *Portunus pelagicus*, the Australian indigenous giant freshwater prawn *Macrobrachium rosenbergii* and a variety of tropical ornamental species. He also works on the development of intensive culture techniques for tropical copepods as prey for marine larvae.

Contact: chaoshu.zeng@jcu.edu.au

Greg Torda & Patricia Warner

Australian Marine Sciences Association Conference 2009
July 5-9, Adelaide

The 46th Annual Conference for the Australian Marine Sciences Association (AMSA) was held in Adelaide, South Australia from 5 - 9 July 2009 at the Adelaide Convention Centre. The theme for this year's meeting was "Marine Connectivity", inspired by increasing evidence that the complexity and scale of biogeochemical systems, oceanic hydrology and the connectivity of particles between modules have important implications for understanding resilience and stability in these systems. Increasingly, research in this field is expanding to include multidimensional and multidisciplinary approaches to understanding connectivity processes and "what", "where", "how" and "why" different components of these systems are linked. Conventionally, connectivity has often been understood as the exchange of 'particles', such as sediment, nutrients and pollutants, genes, eggs, larvae, or adult organisms, between locations, populations, and habitats across several geographical scales. Frequently, these patterns and processes are largely driven by oceanic currents and smaller scale oceanographic and ecological processes. However, the organizers of this conference accepted talks from the widest possible sense of 'marine connectivity', considering connectivity between different marine science disciplines, individual scientists (i.e. networking), and also the exchange between different sociopolitical systems from the public and indigenous communities to national and international government relations. The outcome of this broad interpretation of the term 'connectivity' was an extremely diverse and fascinating selection of topics and presentations.

The most interesting plenary talk was Dr. Bob Warner's opening address entitled "Estimating dispersal scales and connectivity among coastal marine populations". Dr. Warner presented the preliminary results of a large interdisciplinary study on population connectivity off the coast of California (USA) using high resolution circulation models validated by indirect dispersal measurements with chemical tags and genetic markers in fish populations. The fine scale model predicted dispersal patterns with promising precision, and spectacularly demonstrated how packages of 'particles' (e.g. larvae) behave in various circulation patterns and oceanographic events, concentrated by some eddies and twirled into fine filaments by others.

We had a strong contingency of AIMS@JCU students and AIMS researchers in attendance and presenting their work from the Stress in Tropical Marine Systems Program, led by Dr. Madeleine van Oppen.

Story continued on page 5

Greg Torda & Patricia Warner conference report continued

Most of the group presented their work in the 'Spatial genetic insights into the connectivity of marine populations' symposia, chaired by Dr. van Oppen. AIMS@JCU PhD student Patricia Warner presented a talk on her research exploring small-scale dispersal processes of coral sperm in the brooding coral, *Seriatopora hystrix*. She has conducted a novel genetic parentage analysis of larvae within a mapped study population in the Palm Islands. Gergely Torda presented an excellent poster revealing the preliminary results of his exciting PhD project investigating ecological connectivity and recruitment of brooding Pocilloporid corals within and between populations of Lizard Island and the Palm Islands. Greg's favorite session was the symposium on marine connectivity and emerging technologies. It was extremely exciting and promising to see the current possibilities of new technology. And, the most intriguing part was a demonstration of new GIS software that incorporates an emphasis on the temporal aspect of spatially explicit features, for example changes in seawater temperatures at various depths and the corresponding vertical migration of zooplankton.

Contact: gergely.torda@jcu.edu.au and patricia.warner@jcu.edu.au

Felipe Gusmão

Peter Holloway Oceanography Oral Award 2009

Also at the AMSA conference, AIMS@JCU student member Felipe Gusmão presented the results of a cruise in Western Australia covering the extensive area from North West Cape to Cape Naturaliste. In long oceanographic cruises like this one, it is impractical to use incubation methods for the estimation of zooplankton growth. It was an excellent opportunity to use biochemical indices of growth. Having estimated the activity of the enzyme AARS (an index of protein production) in different zooplankton size fractions from samples collected in this cruise, they were able to observe latitudinal variations in the zooplankton growth rate that would be unable to be seen if traditional techniques were used. In addition, they could observe the effect of the Leeuwin current in the zooplankton growth, and how the eddies affected zooplankton productivity in the region. This is a rare example showing the connectivity of physical oceanographic processes and zooplankton productivity.

"It is a great honour to receive the Peter Holloway Oceanography Award. The 2009 AMSA conference was replete with high quality student presentations, and it was a huge surprise for me to have been selected for this prize. I would like to thank AMSA for the outstanding conference in Adelaide, and the organisers of the "Zooplankton connectivity: environmental and trophic linkages" symposium for their excellent work. Finally, I would also like to thank AIMS@JCU for the financial assistance to attend the conference, and CNPq (Brazilian Government) for my PhD Scholarship."

Contact: fgusmao@aims.gov.au

AIMS@JCU Update

2009 Student Seminar Day

The 2009 AIMS@JCU seminar day will be held Friday 27th of November in the JCU Endeavour room. Last year's seminar day featured excellent talks and posters with the first prize for presentation awarded to Jean-Baptiste Raina and second to Paulina Cetina Heredia. Prizes will again be awarded to for best presentation ($2,000) and runner-up ($1,000) as well as best poster ($500). Catered lunch will be provided as well as a reception at the end of the day. If you wish to attend please RSVP to the AIMS@JCU office.

2007 - 2008 Biannual Report

The latest AIMS@JCU Report has now been printed and distributed. Please advise the AIMS@JCU office if you wish to receive a copy and thank you to everyone who contributed to this publication.

Contact: aims@jcu.edu.au

Where are they now?

Norway!

After finishing her undergraduate degree at Flinders University in Adelaide, **Jana Guenther** moved to Townsville in 2003 to continue with her postgraduate studies at James Cook University. During her PhD degree under the supervision of Prof. Rocky de Nys, she investigated the mechanical, physical and chemical antifouling defences of tropical sea stars.

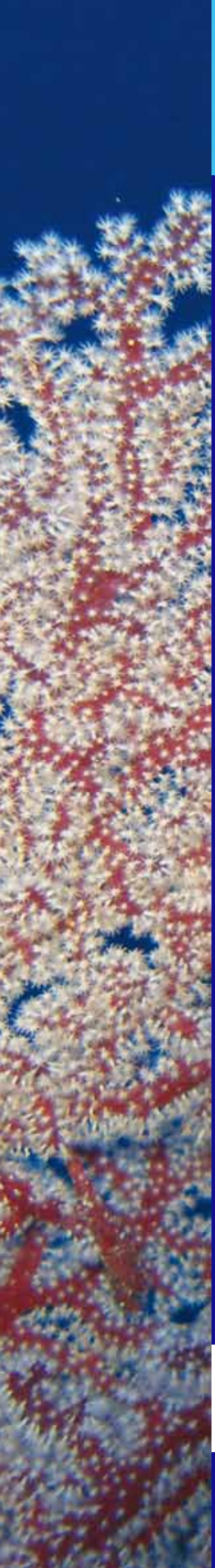
Jana moved to Trondheim, Norway, in January 2008 to take up a postdoctoral position at SINTEF Fisheries and Aquaculture. SINTEF is the largest independent research organisation in Scandinavia. She is now working with biofouling on aquaculture nets of the Norwegian salmon industry. The aims of her project are to understand the biology of the major fouling organisms (mainly the hydroid *Ectopleura larynx*) on aquaculture nets and develop strategies to reduce, control and remove fouling organisms on nets in a more efficient and sustainable way. Further funding from the Research Council of Norway for a 4-year project on the settlement preferences and growth of hydroids, the effects of fouled nets on the oxygen distribution in and around sea cages, and the effects on the drag forces allow her to continue her research in this field.

Contact: Jana.Guenther@sintef.no

Raymond Bannister began his studies at JCU in 2000, undertaking a Bachelor of Science majoring in Aquaculture and Marine Biology, followed by a PhD in Aquaculture, which he completed in 2008. Raymond's PhD research focused on the ecology and feeding biology of a commercially important sponge, *Rhopaloeides odorabile*. This research was successfully completed under the supervision of Professor Rocky de Nys from the School of Marine and Tropical Biology and Dr Chris Battershill from AIMS.

After graduation, Raymond moved to Norway where he now works as a research scientist at the Institute of Marine Science (IMR). IMR is one of the largest marine research institutions in Europe and is important in providing experimental research and management advice for aquaculture and the ecosystems of the Barents Sea, the Norwegian Sea, the North Sea and the Norwegian coastal zone. Although his background is on sponge ecology in tropical Australia, Raymond is now working in temperate/sub-Arctic habitats investigating the environmental impacts of Salmon farming. His research will provide necessary management advice for the Norwegian Ministry of Fisheries and Coastal affairs to improve current aquaculture practices in Norway.

Contact: Raymond.Bannister@imr.no



Research Director's Report

Welcome to the final AIMS@JCU newsletter for 2009. It has been a productive year within the joint venture and I would like to thank all of you for your continued progress and efforts. As most of you have hopefully seen by now the AIMS@JCU Biannual Report has been produced and published. Great thanks need to go out to everyone who contributed. A special thanks is owed to the AIMS image library and especially the Long Term Monitoring Team. Without input of their images the report would certainly lack some of its quality and beauty. Finally, Lauren and Vanessa must be thanked for the many hours they put into producing this document. Lauren dedicated much of this year to ensuring the joint venture was displayed well through this document and she should be congratulated for her amazing effort.

In other news I am pleased to announce that we have a new Program Leader in the Tropical Aquaculture program. Paul Southgate has asked to step down and has been replaced by Chaoshu Zeng as the JCU representative. Chaoshu is a long-term member of AIMS@JCU and supervisor of several students within the Tropical Aquaculture program. We welcome Chaoshu into his new role in AIMS@JCU.

As we approach the end of the year I am looking forward to finishing off on a high note at the seminar day scheduled for Nov 27. I look forward to hearing about the progress of your research.

Thanks to all of our members for your continued efforts and support and best of luck with your research.

Michelle

Contact: michelle.heupel@jcu.edu.au

MERRY CHRISTMAS

FROM THE AIMS@JCU TEAM!

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