

Patrick Buerger

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Aboriginals and Torres Strait Islanders in Marine Science (ATSIMS) update

Building connections – between coral reef researchers and Indigenous communities, between promising Indigenous students and exciting careers, between science and culture – is the driving goal of the Aboriginals and Torres Strait Islanders in Marine Science (ATSIMS) program. Over the past three years, we have brought together hundreds of Indigenous high school students, marine researchers and Indigenous trailblazers in order to provide students with the skills, confidence and contacts to pursue rewarding science careers.



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Photographs in this publication were submitted by AIMS@JCU members unless otherwise stated

About the AIMS@JCU Newsletter:

This newsletter is produced quarterly and distributed by email to AIMS@JCU members, 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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ATSIMS

Update (continued)

Since ATSIMS' inception, we have observed increased confidence, improved grades and heightened aspirations among our alumni, and the program continues to build upon these successes. At the request of students and teachers, the length of our expedition to Orpheus Island Research Station has increased from two days to five, the quantity and quality of hands-on science programming at the Australian Institute of Marine Science has swelled and we have initiated a new mentorship program to help our alumni successfully transition from high school to university. We have also forged exciting new collaborations with the World Wildlife Fund (WWF) and the Gudjuda and Giringun Aboriginal Corporations to inject even more traditional knowledge, experience and mentorship into the program.



As ATSIMS continues to develop and flourish, so do our alumni. The first cohort of ATSIMS scholars will graduate from high school this year and we are eagerly following their successes and providing them with the support to follow

their personal career goals. Our alumni plan to pursue diverse paths, ranging from environmental law and journalism to politics and marine science. We look forward to welcoming several of our 2013 ATSIMS alumni to JCU's campus next year not as visitors, but as undergraduate students, and we hope that the AIMS@JCU community will help them feel at home.

Finally, we would like to thank AIMS@JCU for their unwavering logistical, moral and financial support. Libby Evans-Illidge has been instrumental to the design and implementation of the ATSIMS program from the very start and we simply would not be able to operate without the continued support of a dedicated team of AIMS@JCU staff and student volunteers.

F. Joseph Pollock, ATSIMS Founding Director and AIMS@JCU Alumnus

For more information go to:

<https://goo.gl/2LqNih> and <https://goo.gl/rnYjAV>

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Cecilia Pascelli

2016 PhD Scholarship recipients

Bettina Glasl

The sea and its creatures have always fascinated Bettina and the fact that she grew up in Austria, a landlocked country, did not stop her from studying marine biology. She successfully completed her Bachelor of Science in 2012 and her Master of Science in 2015, both at the University of Vienna (Austria). During her MSc studies, she spent a semester at the University of Amsterdam (Netherlands) as an exchange student. For her MSc thesis she worked on the dynamics of the prokaryotic microbiome associated with coral mucus and its influence on coral health. As part of her MSc thesis, she spent several months on the Caribbean island Curaçao, where she conducted her fieldwork.



Bettina has started her PhD under the supervision of Nicole Webster (AIMS), David Bourne (AIMS) and Marcus Sheaves (JCU). Her project 'Microbial indicators for water quality and environmental stress assessment', will assess the composition and function of microbial communities associated with coral reef sediments seawater and dominant habitat forming taxa (corals, sponges, seaweeds, seagrasses) in a high temporal resolution sampling program that includes collection of extensive environmental metadata. Once putative microbial indicators of reef

health and/or water quality have been identified from baseline surveys, these microbial species or functions will be extensively validated as robust bioindicators using experimental manipulations in the AIMS SeaSimulator. Validated microbial indicators can subsequently be incorporated into monitoring programs, reef report cards and health indices. Microbial indicators will make a significant contribution to an Integrated Reef Monitoring Program and improve our capacity to rapidly predict ecosystem declines due to cumulative pressures, thereby guiding early management interventions aimed at conserving the unique biodiversity of the Great Barrier Reef.

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Brian Strehlow

2016 PhD Scholarship recipients

Hannah Epstein



Hannah completed her Bachelor of Marine Science with Honours in 2013 at James Cook University. Her honours research focused on the effect of urbanisation on the uptake and retention of trace metals in the benthic

jellyfish *Cassiopea meremeta* and its potential use as a biomonitoring species. During 2014 and 2015, Hannah explored the field of phylogenetics at the California Academy of Science in San Francisco, where she contributed to the sequencing and description of new nudibranch species. Hannah has begun her PhD under the supervision of Madeleine van Oppen (AIMS), Phil Munday (JCU), Neal Cantin (AIMS) and Gergely Torda (ARC and AIMS). Her project, 'Investigating the role of microbes in the acclimatisation of corals to environmental change', will investigate the role of the coral microbiome in the acclimatisation of corals to environmental change, and is part of a larger collaborative study focusing on the non-genetic inheritance of stress tolerance in corals. This research will be highly applicable to the creation of more accurate predictive models for the future of coral reefs stressed by environmental changes.

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Thesis wrap-up

Leanne Currey

Movement of an exploited reef fish across spatial and temporal scales using multiple methods.

Supervisors: Michelle Heupel, AIMS/JCU; Colin Simpfendorfer, JCU; Ashley Williams, SPC/JCU & Stephen Sutton, JCU

Movement of fishes occurs at multiple spatial and temporal scales, including long-distance migration over multiple years, and daily activity in a home range. A better understanding of spatial ecology can be gained by using multiple methods to study movements of fishes at different scales. Leanne's PhD research utilised an innovative combination of techniques to identify the scales at which

Gergely Torda

Thesis wrap-up

Leanne Currey, continued



movements of exploited reef fish (adult redthroat emperor, *Lethrinus miniatus*) occurred, and identified the factors that influenced movement patterns. Despite the importance to fisheries, little was previously known about the spatial ecology of

redthroat emperor. Movement of adult individuals were investigated in three ways: at a broad spatial scale (regions separated by 100s of km) with ontogeny (4 years); among reef platforms (160 km²) over periods of up to 12 months; and among habitats from the reef crest to sandy bottom (1 km²) over 3 months.

Broad-scale migration was inferred using isotope ratios in otolith (fish ear bone) carbonate, which reflects the environment individuals inhabited at different periods during life as fish grow. Isotope results indicated that individuals moved between different isotopic environments from juvenile to adult stages which was related to latitude. This method provided insight into potential migration of individuals with ontogeny: the majority of southern adults and half of the northern adults appeared to originate from warmer environments (suggesting southward migration); almost half of the northern adults originated from cooler environments (suggesting potential northward migration); and a proportion of individuals occupied areas of similar chemistry (signifying self-recruitment to the area).

Acoustic telemetry was used to monitor movements among reefs and finer-scale reef habitats. Adult redthroat emperor were fitted with transmitters and were detected when each individual swam within range of the receivers (listening stations) deployed around Heron Island Reef. Individual variability in space use was observed, with evidence for long-distance migration for a proportion of the tagged fish (e.g. one fish travelled 180 km), and characteristics of both mobile and sedentary lifestyles around reef platforms (e.g. variation in depth use, high site fidelity). Reef-scale movement was related to environmental parameters monitored at Heron Island, and individuals were more likely to be present on the reef slope during days of cooler temperature. This indicates a thermal tolerance threshold may exist and is an avenue for further research. Fine-scale space use reflected the nocturnal nature of the species, with larger areas used at night-time particularly during full moon periods, potentially related to foraging behaviour.



Kathryn Berry

Thesis Wrap-up

Leanne Currey, continued

Leanne's research highlights the need for investigation across multiple spatial and temporal scales, and emphasises that no single management strategy can ensure sustainability of a species. A complete picture of movement patterns at multiple scales is essential for the knowledge of species-specific spatial ecology, and these methods can be applied to other fishes of importance.

Leanne was supported by an AIMS@JCU PhD scholarship and travel awards.

Where are they now?

Leanne Currey

Postdoctoral Fellow at the Australian Institute of Marine Science, Townsville



Since completing her PhD earlier this year, collaborating on projects with Andy Tobin at JCU and working casually for Fisheries Queensland, Leanne is thrilled to have commenced a postdoctoral position at AIMS. Leanne's role forms part of the Global FinPrint Project, a new initiative which aims to produce the world's first standardised survey of shark and ray abundance and diversity in coral reef environments, using baited remote underwater video systems (BRUVS) (<https://globalfinprint.org/>). Funded by the Paul G. Allen Foundation and Vulcan Inc., the project will collate existing data and collect new data for analysis, to provide insight essential for management and conservation efforts. The core research is led by some of the world's top shark biologists and ecologists, comprising separate teams from different organisations sampling the Caribbean, Pacific Ocean, Coral Triangle and Indian Ocean. Three of the six teams are located in Australia, and include the Australian Institute of Marine Science (AIMS) Townsville (led by



Adriana
Humanes

Where are they now?

Continued

Michelle Heupel), AIMS Perth (led by Mark Meekan), and James Cook University Townsville (led by Colin Simpfendorfer).

Leanne's new role on the FinPrint Project involves extensive coordination of field work, sampling locations in northern Australia, and from Palau to the Line Islands in the Pacific. The first field trip for the project was recently conducted at reefs in the far northern Great Barrier Reef using newly designed lightweight BRUVS. These BRUVS consist of GoPro cameras in underwater housings secured in a frame, with a bait bag suspended in the field of view. Elasmobranchs and teleosts in the vicinity are attracted to the bait and are recorded on camera, enabling data collection in a non-extractive way. The trip was successful with >150 hours of BRUVS video collected, and sharks and rays were filmed at the majority of sites! The video footage that Leanne collects and analyses will contribute to the global project and she aims to answer questions about the spatial and environmental drivers for elasmobranch abundance and diversity. 2016 will be full of field work with collaborators in spectacular locations, so stay tuned for the footage!



Leanne thanks AIMS@JCU for her PhD scholarship, support, and the opportunities to promote her research.

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Blanche
D'Anastasi

Research Director report

It's that time of year again when we reflect on the achievements of the past year. We have had another extremely successful student seminar day: this year, we enjoyed 29 individual presentations across the genres: 12 minute seminar talks, 3 minute speed talks (3MT rules), and posters. We also again included a photography competition, and an inspirational invited keynote talk from an alumni (this year Dr Greg Torda) about their HDR journey and life beyond it. We also expanded the involvement of alumni as session chairs, and Drs Sam Munroe, Leanne Currey and Heidi Luter performed this role. A total of \$7,200 prize money was awarded to be spent on future science communication activities.

We have also competitively awarded 15 travel awards and 10 pilot research awards, as well as adding 3 new AIMS@JCU scholarship students, Samuel Matthews, Bettina Glasl and Hannah Epstein, to our Quantitative Marine Science PhD program. 10 of our AIMS@JCU members were awarded PhD's this year and more of our members have submitted their theses and will graduate next year. We have hosted another well received R-Course with Murray Logan, sponsored a morning tea at the JCU College of Marine and Environmental Science Postgraduate conference, and organised a visit to AIMS by the JCU Future Students department.

Well done to all of our fantastic members for an extremely productive year.

Our end-of-year function will be held on 11th December at the Casa Bar in Flinders St East. I hope you can join us, to help mark another successful year.

Libby Evans-Illidge, AIMS@JCU Research Director

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Cecilia Pascelli