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LIZARD ISLAND  
RESEARCH STATION

Supported by the Lizard Island Reef Research Foundation  
Published March 2008



# AUSTRALIAN MUSEUM LIZARD ISLAND RESEARCH STATION



Photo: Alex Vail

## Australian Museum Lizard Island Research Station Newsletter 2007

Published March 2008

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Lynda Curtis wrote most of the "Research Highlights" section.

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## AUSTRALIAN MUSEUM DIRECTOR'S REPORT

It is gratifying to see that two major collaborative international projects intend to use the Museum's Lizard Island Research Station for key parts of their work this year. The first of those is known as CReefs and is part of the Census of Marine Life project. It will look at the invertebrate populations of Lizard Island, Heron Island, and Ningaloo reef in Western Australia. The second project is part of the International Barcode of Life project, and will look at broader reef populations, particularly fish at Lizard Island later this year. The International Barcode Life project is setting out to establish DNA "barcodes" of all living organisms with a target of five million organisms in five years. The Australian Museum is one of the driving organisations for this in Australia.

These two projects highlight both the important location of Lizard Island within the Great Barrier Reef complex, and perhaps more importantly, the

excellent facilities that the Museum provides at the Lizard Island Research Station.

This in itself is proving an interesting conundrum for us in assessing the range of research activities that could take place at Lizard in future years. The very hard work of our Museum staff at Lizard Island Research Station, led by Anne and Lyle, and the generous support of the Lizard Island Reef Research Foundation, has enabled us to establish a world class research station that has sufficient flexibility to cope with and adapt to a range of changing research needs.

During this calendar year we will also be looking at what those potential needs might be and how that leads us in the strategic development of the Museum's Lizard Island Research Station facility.

**FRANK HOWARTH** Director, Australian Museum



Photo: Stuart Humphreys  
© Australian Museum

## RESEARCH STATION DIRECTORS' REPORT

The station's redevelopment has reached its halfway point and operations are already running more smoothly thanks to new, purpose-built facilities. However, it is challenging to keep the station functioning more-or-less as usual while managing a \$4.75 million project that involves substantial building works of an unusual nature in a remote location. Through these "interesting times", the goodwill of everyone at the station - researchers, student groups, our fabulous staff, the contractor, on-site builders, volunteers - and at the Museum has been enormous, helpful and rewarding. In addition to raising the funds for the upgrade project, extraordinary practical support is provided by people within the Lizard Island Reef Research Foundation and it is a great privilege to work with them. When the project is complete in 2010, the station will be well set up for many more years of research and education on coral reefs.

There is an urgency about research into the effects of climate change on coral reefs. Because they can

thrive in a very limited temperature range, reef-building corals are like canaries in a mine-shaft - and they are singing loudly. Projects related to climate change were proposed by no fewer than 80% of the applicants for the inaugural postdoctoral fellowships and 67% of applicants for the doctoral fellowships. Each of the five new fellowships awarded for 2008 addresses climate change issues either directly or indirectly (pp. 4-6). Buzz-words aside, we do need to know how reef organisms interact with variables such as temperature, pH, light, turbidity, habitat and food availability. There is a very long way to go in this research. The facilities provided at LIRS, and those still to come, will enable researchers to discover these and other things, providing the basis for the best possible management of coral reef resources whatever the future holds.

**ANNE HOGGETT AND LYLE VAIL**  
Directors, Lizard Island Research Station



Photo: Alex Vail



# RESEARCH HIGHLIGHTS



Researchers set light traps at sunset to capture pre-settlement fishes.



Typical vertical swimming position of razorfishes.



Cleaner wrasse removing parasites from inside the mouth of a potato cod.  
*Photo: Alexandra Grutter*



An outer reef crest: wave energy affects coral growth.



Brown patches in the sea slug contain plant cells obtained by eating corals.  
*Photo: Ingo Burghardt*



Large isopod parasitises small fish.  
*Photo: Goran Nilsson*

Researchers undertake a diverse range of investigations at Lizard Island each year and these studies are published in the scientific literature. Recent publications based on work at Lizard Island include studies on the genetic connectivity of coral reef fish populations, diseases of corals, reef fish vision, benthic community structure, and the identification and description of new species. References cited below are listed at the end of this newsletter.

## LARVAL FISH RECRUITMENT

During summer, larval fish settle onto the reef after several weeks in open water as part of the plankton. Settlement is a key event in the life cycle of reef fishes and factors that influence it have enormous implications for the management of reef fisheries. Accordingly, this event attracts a large number of researchers to Lizard Island who study the dynamics of the recruitment of new fish to the reef. This year, they found:

“Even small, young larvae have swimming, orientation and vertical positioning capabilities that can strongly influence dispersal outcomes” (Leis et al., 2007).

Behaviour of larval fishes in tropical seas may have more influence on their dispersal than in temperate areas (Leis, 2007).

Reef fish prefer to settle onto living corals or partially-degraded corals and they shun dead, algal-covered corals (Feary et al., 2007).

In a damselfish species, survivorship of an individual fish is strongly related to its growth rate as a larva and young recruit (Gagliano et al., 2007).

In the same damselfish species, territorial behaviour by adults can alter the survivorship of new recruits because some predators are excluded from the guarded territories (McCormick and Meekan, 2007).

## BEHAVIOUR

Many complex interactions take place between organisms on the reef. These behaviours may be associated with avoiding predation, gaining access to mates, obtaining food, or removal of parasites. An example is the mutualistic relationship between host fish seeking removal of their parasites by cleaner shrimp which eat them. Becker and Grutter (2007) found that variations in client fish parasite load and cleaner shrimp hunger level are two factors that affect the balance in this mutualism.

A similar study found that in some cases cleaner fish “cheat” and eat the hosts mucus instead of parasites, resulting in the host fish “punishing” the cleanerfish by chasing it (Bshary and Grutter, 2007).

## CORAL REEF DEGRADATION

Coral reefs are under threat due to the impact of increased sea surface temperatures, invasive species and pollution. These disturbances have resulted in a global decline in live coral cover on reefs. This in turn has a negative impact on the abundance of fish as habitat health may play an important role in structuring coral-associated fish assemblages (Feary et al., 2007).

Severe tropical storms are another major disturbance to coral reef communities and to the coastlines that they protect. A model developed by Madin and Connolly (2006) can predict the effects of major hydrodynamic disturbances and how coral reefs may respond to an increase in the frequency of severe storms which may be associated with a changing climate.

## PHYSIOLOGY

Scientists working at Lizard Island have discovered a myriad of interesting adaptations in the fish and other animals inhabiting the reef. For example, Nilsson et al. (2007) found that small coral-dwelling fish called gobies can breathe when exposed to air due to adaptations such as a reduction in scales and a network of subcutaneous capillaries. Another interesting adaptation is that of the “solar powered” sea slugs which consume the chloroplasts found in plant material and incorporate them into their tissues and use them as an energy source. Evertsen et al. (2007) have developed a method to determine how long these chloroplasts stay active in the host.

## PARASITES

The range of parasites inhabiting fish on the reef is quite diverse and new species are discovered frequently. A study by Muñoz et al. (2007) investigated the role of ecological and phylogenetic processes in structuring parasite communities in fourteen species of the wrasse family of fishes. This study demonstrated the exceptional complexity of parasite communities that inhabit wrasses on the Great Barrier Reef. It found that differences in parasite composition and their distribution on the host are apparently responses to ecological characteristics (body size, abundance, swimming ability and diet) rather than to the phylogeny of the hosts.

Isobel was delighted to have the fellowship named in her honour.  
Photo: Paul Slade



Lynda Curtis (2006 Doctoral Fellow) and the four 2007 Doctoral Fellows were all at Lizard Island during December 2007 (Standing: Adel Heenan, Tom Holmes, Michael Holcomb; kneeling: Andrew Hoey and Lynda Curtis)



# FELLOWSHIP PROGRAMS

## ISOBEL BENNETT MARINE BIOLOGY FELLOWSHIP

Funding from the Hermon Slade Raiatea Foundation to the Lizard Island Reef Research Foundation has enabled establishment of the Isobel Bennett Marine Biology Fellowship for research at the Lizard Island Research Station. The Fellowship is named in recognition of Dr Isobel Bennett AO, one of Australia's eminent marine biologists who died aged 98 in January 2008.

The Fellowship provides funding for field work at Lizard Island to conduct original, field-intensive research into any area of marine biology that complements the Australian Museum's Science Research Strategy. It is awarded on a competitive basis and is aimed at early-career scientists who obtained a PhD degree less than six years ago. The maximum value of Fellowship is AU\$8,000 to be spent within one year from March 2008.

The inaugural Isobel Bennett Marine Biology Fellow is Dr Line Bay of the ARC Centre of Excellence for Coral Reef Studies at James Cook University and the Australian Institute of Marine Science.

## SIR JOHN AND LAURINE PROUD FELLOWSHIP AT LIZARD ISLAND

Sir John Proud was the founder and inaugural chairman of the Lizard Island Reef Research Foundation. With his wife Laurine, Sir John has supported research at Lizard Island since the 1970s. Sir John died in 1997 and Lady Proud died in 2006. The John and Laurine Proud Estate Trust continues to provide ongoing funding to the Lizard Island Reef Research Foundation. The Foundation has decided that it is appropriate to award an annual fellowship named for the Prouds. In 2008, the benefits and conditions of the Fellowship are identical to those of the Isobel Bennett Marine Biology Fellowship.

The inaugural Sir John and Laurine Proud Fellow is Dr Morgan Pratchett of the ARC Centre of Excellence for Coral Reef Studies at James Cook University.

## 2008 ISOBEL BENNETT MARINE BIOLOGY FELLOWSHIP



Dr Line Bay

**Can a common species of coral adapt to climate change?**

Reef building corals display striking colour variation, caused by algae that live

within the coral animals' bodies and a group of Green Fluorescent Proteins (GFPs). The GFPs function as UV filters that modify the internal light environment of corals. They may also perform anti-oxidative roles, neutralising toxic reactive chemicals that arise under natural and stressful conditions. Adjusting GFP levels may therefore be an important mechanism by which corals can change their susceptibility to coral bleaching and this may vary among corals with different colours.

The common reef coral *Acropora millepora* displays three colour morphs (yellow, red and green) resulting from combinations of four GFPs. The three colour morphs occur at different relative frequencies in populations on the central Great Barrier Reef. Historical data indicate that the relative frequency of the green morph has decreased over the past 30 years concomitant with an increase in sea surface temperatures and bleaching frequency.

In her work at Lizard Island, Line will:

- Document the distribution and abundance of colour morphs among sites, exposure and depth in *A. millepora* at Lizard Island.
- Examine natural variation in the expression of GFP genes and resulting protein levels among colour morphs, sites, exposure, depth and seasons in *A. millepora*.
- Examine variation in bleaching susceptibility and expression of GFP genes among morphs in an experimental bleaching experiment.

## 2008 SIR JOHN AND LAURINE PROUD FELLOWSHIP AT LIZARD ISLAND



Dr Morgan Pratchett

**How will reef fishes respond to climate-induced coral bleaching?**

The most pressing effects of climate change on coral reefs are severe episodes of coral

bleaching, which not only lead to declines in live coral cover, but also affect many other organisms, including coral reef fishes. While the effects of climate change on corals are immediately apparent, its effects on reef fishes are only just beginning to become evident.

Coral-dwelling damselfishes are dependent on live corals for shelter. They are an important component of coral reef ecosystems, as they sustain extensive food webs of piscivorous fishes while making use of planktonic prey. The effects of habitat loss on these fishes will depend on the ability of displaced individuals to move among suitable habitat patches, as well as the success with which individuals can recruit to habitat patches already occupied by other coral-dwelling damselfishes. Coral-dwelling damselfishes are adversely affected by coral bleaching and rarely occupy bleached coral hosts, but it is not known whether these fishes die when the coral dies or simply move to alternate coral habitats. Establishing whether these fishes can withstand loss of their coral hosts by moving to alternate coral hosts is fundamental to understanding their vulnerability or resilience to future climate change and the increasing frequency and or severity of coral bleaching.

Morgan will examine the responses of coral-dwelling damselfishes to coral bleaching and habitat loss, distinguishing between in situ mortality versus movement among corals as proximate causes for the loss of fishes from bleached coral hosts. His field experiments will be complemented with aquaria experiments to test habitat selection for bleached, partially bleached and healthy coral colonies of alternate prey corals.

## THE IAN POTTER DOCTORAL FELLOWSHIP AT LIZARD ISLAND

The Ian Potter Foundation has provided funds for three 3-year doctoral fellowships, the first of which was awarded in 2006.

The Fellowship provides funding for an outstanding PhD candidate to conduct field-intensive research at Lizard Island over a period of up to three years. The research must complement the Australian Museum's Science Research Strategy. The award of \$7,000 per year (\$8,000 for a student from an overseas university) is highly sought after.

The 2008 Ian Potter Doctoral Fellow is Vanessa Messmer of James Cook University.

## 2008 IAN POTTER DOCTORAL FELLOWSHIP AT LIZARD ISLAND



Vanessa Messmer

**Why is the diversity of reef fishes declining and does it matter?**

Biodiversity is at risk worldwide. Hundreds of recent extinctions in the terrestrial environment

have mostly been caused by human-induced habitat loss and this trend is expected to accelerate with rapid climate change. Coral reefs are one of the most diverse and threatened of all marine ecosystems and their state is declining on a global scale. Although marine extinctions appear to be few to date, dramatic declines in the extent and structure of marine habitats have been widely documented. This is sufficient to cause substantial reductions in fish abundance and local extinctions of some species. Despite numerous threats to marine biodiversity, the consequences of species loss to the marine ecosystem remain poorly understood.

Vanessa will use a rigorous experimental approach to test the consequences of biodiversity loss on coral reefs ecosystems including:

- How loss of coral diversity affects the diversity and abundance of fish communities.
- How productivity (growth and biomass) of fish communities is affected by diversity loss.



LIZARD ISLAND DOCTORAL FELLOWSHIP

Funded by the Lizard Island Reef Research Foundation since 1982, the Lizard Island Doctoral Fellowship has a proud history of supporting PhD students who go on to substantial careers where they produce influential research and/ or contribute to management and conservation of marine resources. The conditions and benefits are identical to those of the Ian Potter Doctoral Fellowship at Lizard Island.

In 2008, funds are available to support two new Lizard Island Doctoral Fellows: Roberta Bonaldo and Jacob Johansen, both of James Cook University.

2008 LIZARD ISLAND DOCTORAL FELLOWSHIP



Roberta Bonaldo  
**How do plant-eating fishes affect benthic community structure of coral reefs?**

Knowledge of the functional role of individual species is necessary for effective management of coral reefs. Animals that eat plants (termed herbivores) form an important functional group within coral reef ecosystems because they are one of the key factors that shape the large community of organisms that lives attached to or associated with the sea bottom (collectively termed benthos). It is only when we know the extent of functional redundancy within the system that we can determine the potential for resilience in a community that is facing environmental change.

Little is known of the quantitative impacts of individual herbivore species on coral reefs, especially in the Indo-Pacific. Notably absent are studies on the effect of herbivorous fishes on the algae that encrusts coral rock (known as the epilithic algal matrix, or EAM). The EAM is a ubiquitous component of coral reefs and it is the primary grazing surface for most nominally herbivorous reef fish and invertebrates. Roberta will be the first to examine the direct role of herbivorous fishes on the EAM structure and dynamics.

2008 LIZARD ISLAND DOCTORAL FELLOWSHIP



Jacob Johansen  
**How do habitat parameters influence energy transfer in a plankton-eating fish?**

Understanding the habitat requirements of particular species has great importance for conservation efforts and the management of marine ecosystems. To date most studies examining fish-habitat relationships on coral reefs have focused on short-term numerical parameters and processes such as predation, recruitment, and mortality, which directly affect the numbers of species and individuals. However, the longer-term effects of habitat degradation on fish communities may result from a disruption of energetic processes. Factors that disrupt the transfer of energy into growth and reproduction may have profound consequences for the long-term persistence of reef fish assemblages but the role of energetic processes in coral reef ecology is not well understood.

Ocean temperatures are predicted to increase and this will increase the metabolism of fishes and hence their daily energetic needs. Depending on the plasticity of energy intake, such increased energetic demands may reduce fitness and survival of numerous species. Similarly, eutrophication and sedimentation from terrestrial sources is expected to increase the turbidity of inshore reef waters, resulting in a reduced ability of fishes that eat tiny food organisms in the plankton to visually locate their food items, further reducing their fitness.

Using field-based observations and experimental measures of energy use, Jacob will evaluate the energetics of fish habitat-choice on coral reefs. The results will be used to clarify the energetic resilience of coral reef fishes to environmental disturbance such as increased turbidity, increased ocean temperatures and more frequent storms.

30TH ANNIVERSARY DEVELOPMENT



The new and existing Purves Labs are connected by a short walkway.



New dinghy *Ellie* will be used by researchers and educational groups.



Fish biologists from Australia and overseas conducted collaborative studies.

The Lizard Island Reef Research Foundation started raising funds in 2003 for a major upgrade of the station. Charlie Shuetrim, chairman of the Fundraising Committee, was pleased to announce in 2007 that commitments have been received to meet the target of \$4.5 million. The target has been revised to \$4.75 million to cover some cost increases. Substantial funding was received during 2007 from:

The Queensland Government's Smart State Research Facilities Fund  
The Ian Potter Foundation  
The James N. Kirby Foundation  
The Thyne Reid Foundation  
The Raymond E. Purves Foundation  
The Vincent Fairfax Family Foundation  
The Yulgilbar Foundation  
The Macquarie Group Foundation  
The Balnaves Foundation

The 30th Anniversary Development entered its third year of implementation in 2007. The following projects were completed or started:

- The **THYNE REID WING** of the Ian Potter Centre for Tropical Marine Research was totally refurbished to provide three separate laboratory spaces with a microscope room and a lab store. This wing is used by researchers who need lab space that has not been exposed to fixative chemicals. Funding for this project was provided by the Thyne Reid Foundation.
- The **RAYMOND E. PURVES LABORATORY** of the Ian Potter Centre for Tropical Marine Research was extended to provide a large new lab area with a separate instrument room. Fixatives may be used in the Purves Lab. The Raymond E. Purves Foundation continued its long term support of this building by providing the funds.
- **NEW DINGHIES**, named *Lili* and *Ellie*, were purchased this year. The Thyne Reid Foundation provided funds for *Lili*, while *Ellie* was funded from a range of sources. The boats are identical to *Freya*, purchased last year.
- The **OUTBOARD MOTOR UPGRADE** has reverted to two-stroke technology because four-stroke motors in the size range used at LIRS proved to be too unreliable.
- The **LABORATORY EQUIPMENT** will be progressively upgraded in the coming years. The Raymond E. Purves Foundation and the Thyne Reid Foundation have both contributed substantial sums to fit out the laboratories. In 2007, the following new equipment was purchased: a centrifuge, a stereomicroscope with digital camera, several cold light sources for microscopy, an analytical balance and a water distiller.
- Preparatory works, mostly underground, were undertaken for future upgrades to the **SIR JOHN PROUD AQUARIUM** and the **POWER GENERATION SYSTEM**. The upgrade to the aquarium is being funded by the Vincent Fairfax Family Foundation.
- LIRS contributed labour and materials to a substantial upgrade of the **VEHICLE TRACK** between the station and the airstrip that was carried out by Queensland Parks and Wildlife Service.



LIZARD ISLAND REEF



Tom Healy (left) and John Gough (right) with 2007 Ian Potter Doctoral Fellow Andrew Hoey.

RESEARCH FOUNDATION

FOUNDER

Sir John Proud^

PATRONS

- Dr Des Griffin AM
- Mr Raymond Kirby AO
- Mr Henry Loomis and Mrs Jacqueline Loomis Lady Proud^
- Mr Robert Purves AM
- Prof Frank Talbot
- Dr Charles Warman AM

TRUSTEES

- Mr Kenneth Coles AM (Chairman)
- Mr Andrew Green (Secretary & Treasurer)
- Mr Charlie Shuetrim (Chairman, Appeal Committee)
- Dr Penny Berents
- Mr James Bildner
- The Hon Virginia Chadwick AO\*
- Dr Ronnie Harding
- Mr Trevor Haworth AM
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- Mrs Heather Power
- Mr Robert Purves AM
- Mr Michael Seyffer\*\*
- Mr David Shannon
- Dr Charles Warman AM

^ deceased  
\* new Trustee in December 2007  
\*\* New trustee in (month to be advised) 2007

The Lizard Island Reef Research Foundation was established in 1978 to raise funds for the Lizard Island Research Station and to support research on the Great Barrier Reef. It is going from strength to strength under the chairmanship of Ken Coles and an active board of Trustees.

In 2007, membership of the Foundation hit a record high, its level of funding for research increased substantially through an expanding fellowships program, and it was instrumental in providing well over \$1.1 million for the 30th Anniversary Development. Details of these achievements are provided elsewhere in this newsletter.

Members of the Foundation donate \$1,000 or more per year. Members go into a draw to win one of two great prizes: a four-night holiday for two at the Lizard Island Resort and a four-night cruise for two on Reef Endeavour. Both prizes include airfares within Australia. The land content of the prizes is generously donated by Voyages Resorts and Hotels and Captain Cook Cruises, respectively.



A dinghy has been named after Freya Potts, shown here with Ian Reid of the Thyne Reid Foundation.  
Photo: Jill Potts.

MEMBER'S EVENTS

Two terrific events are organised each year by chairman Ken Coles for members of the Foundation to inform them about the work of the station and of the Foundation and to thank them for their support.

The function in Melbourne is a luncheon. It was held at the Athenaeum Club on 23 May this year with a record number of 24 guests attending. Dr Anne Hoggett, director of the research station, spoke about the high level of threats facing coral reefs worldwide and about recent developments at the station.

The Sydney event is a dinner which was held at the Wharf Restaurant on 6 August this year. John Tanzer, acting Chairman of the Great Barrier Reef Marine Park Authority, addressed the record crowd of more than 100 guests about the challenges facing coral reef managers and how the Authority is tackling this important task.

MEMBER PROFILE

Peter and Linda Greer

Peter and Linda run a company that hires houseboats in southern Queensland. Lovers of nature, and especially of diving and snorkelling on the reef, they have stayed at the Lizard Island Resort on many occasions. They became members of the Foundation in 2003. When they visited the station this year, Linda said "We love visiting the research station when we come to Lizard Island to see the interesting things that are always going on. As members, we feel a connection and that we are making a worthwhile contribution."



VISITORS

Prof Tom Healy, a governor of The Ian Potter Foundation, was unable attend the opening of the Ian Potter Centre for Tropical Marine Research in October 2006. He came instead in July this year to see the result of the Ian Potter Foundation's generous donation along with his wife Bev, John Gough (also a governor of The Ian Potter Foundation), Rosemary Gough and Charlie and Sandy Shuetrim.



Penny Berents, Des Griffin and Anne Hoggett celebrate the newly-refurbished Griffin Laboratory.

LIRRF patron and former director of the Australian Museum, Dr Des Griffin AM, stayed at the station during October with his wife Janette to see the newly refurbished Griffin Laboratory, part of the Thyne Reid Wing. LIRRF trustee Dr Penny Berents and her husband Peter visited at the same time.

Other people associated with the Lizard Island Reef Research Foundation who visited the station during the year are:

- Darvell and Barbara Hutchinson
- Sir Roderick and Lady Carnegie
- Baillieu and Sarah Myer
- Allan and Maria Myers and their guests
- Chris Tallent, Darren Cann and Guy Hayward of Voyages
- Coral and Ian Ackery
- Lou and Mike Hamshire
- Peter and Linda Greer





FOR THE RECORD

KALKHOVEN WING

This was the first full year of operation of the Kalkhoven Wing of The Ian Potter Centre for Tropical Marine Research. It is a well equipped facility that is used by every visitor to the station. Areas of particular importance include the Balnaves Aquarium Rooms, Macquarie Bank Seminar Room, Shuetrim Library and the Kirby Computer Room which is fitted out with computers donated by Australian Projects Pty Ltd.



Dr Mary Poteet (Univ. of Texas) giving a lecture in the Macquarie Bank Seminar Room.

USAGE

Total usage during 2007 was 5,593 person nights, about 9% lower than last year. However, usage by core user groups (researchers, postgraduate students and student groups) was similar to the level in 2006. The planned usage cap for the station after the upgrade program is completed is 7,000 person nights.

BENCH FEES

Per person per night, including GST	2007	2008
Researcher	\$108.00	\$110.00
Researcher's assistant	\$95.00	\$97.00
Postgrad. student (own project)	\$41.00	\$43.00
Postgrad's assistant	\$37.00	\$38.00
School of university group	\$67.00	\$68.50
Commercial	\$202.00	\$206.00

STAFF

There were no changes to the permanent staff during the year. Lyle Vail and Anne Hoggett continued as directors, and the maintenance positions continued to be shared on six-month rotation between Lance and Marianne Pearce (in summer) and Bob and Tania Lamb (in winter).

Additional staff are needed to cope with the increased work load caused by the upgrade program. Full-time temporary staff employed during the year for this purpose were Tessa Richardson (to February 2007) and Mathew Richmond (November and December 2007). Alex Vail and Lynda Curtis were also employed on a casual basis during the year.



Left to right: Anne, Lance, Marianne, Bob, Tania and Lyle.

TOURS

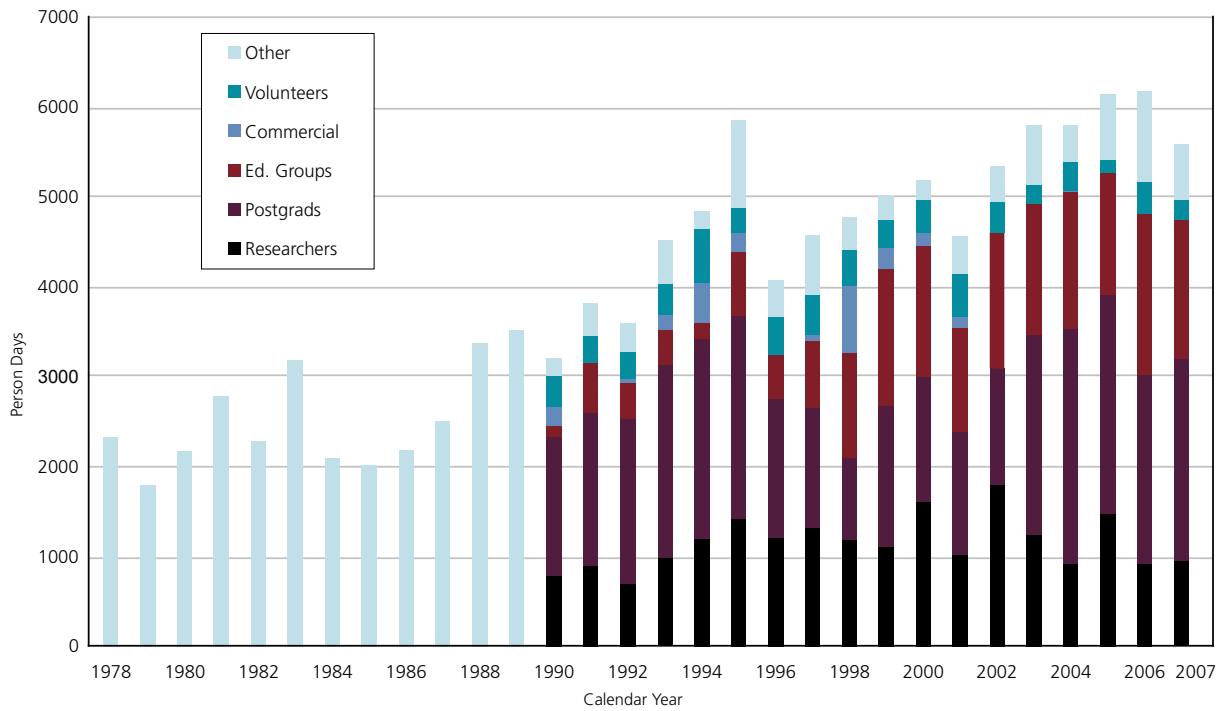
Tours of the station are conducted for resort guests on Monday and Friday mornings. A tour for other island guests, mainly campers and yachties, is conducted between May and October at 11 am on Mondays only. At other times, visitors are welcome to call into the station to view the Sir John Proud Aquarium and courtyard displays but guided tours are not available.



Providing information to island visitors through tours is an important role for the research station.

VOLUNTEERS

The following people provided valuable volunteer assistance with maintenance of the station in 2007: Snow Amos, Linda Baumgart, Chico Birrell, Nicholas Carroll, David Collins, Terry Ford, Brian Hall, Felicity Hayward, Jarrett Hines, Jonas Hines, Renie Hood, Yvonne Kilroy, Fran Jones, Massimo Marengo, Saul Newman, Toby Whitelaw and Lois Wilson. As well, specialist services were provided on a volunteer basis by Allan Ross (microscope service and repair) and Charlie Makray (first aid training). Our sincere thanks go to all these people for their help in making the station run efficiently.



## RESEARCH PROJECTS AND PARTICIPANTS

Projects for 2007 are listed in order of arrival at the Station. Repeat visits for the same project are listed only once, for the first trip of the year. Leaders who are postgraduate students are indicated with an asterisk (\*).

### Selectivity of predation on juvenile tropical reef fish

\*Tom Holmes (James Cook University; October 2006 to January, October to January 2008)

### Identification of haemogregarine blood parasites in coral reef fishes and their effect on host fish physiology

\*Lynda Curtis (University of Queensland; November 2006 to January, January/February, June, November to January 2008)

### Female benefits of multiple matings in simultaneous hermaphroditic sea slugs

\*Dennis Sprenger (University of Tübingen; November 2006 to February, November to January 2008)

### Habitat specialisation in coral reef fishes and its influence on patch composition and local species diversity

\*Valeriya Komyakova (James Cook University, November 2006 to January)

### Home ranges and territories of coral reef fish

\*Melissa Cowlshaw (James Cook University; December 2006/ January, February)

### Latitudinal variation in the diet and physiology of juvenile butterflyfishes (Pisces: Chaetodontidae)

\*Marcus Gregson (University of Technology Sydney; January)

### Coral-associated viruses in the Great Barrier Reef

\*Nicole Patten (Southern Cross University; January)

### Effects of parasites on juvenile reef fish

Bronwyn Cameron for Dr Lexa Grutter (University of Queensland; January, April/May)

### Biophysical thresholds in benthic communities

Dr Christopher Fulton (Australian National University; January/February)

### Ecology of cryptobenthic reef fish assemblages in the Great Barrier Reef

\*Alonso Gonzalez Cabello (James Cook University; January/February)

### Influence of herbivorous fishes on the benthic community structure of the Great Barrier Reef

\*Roberta Bonaldo (James Cook University; January/February)

### Fish/ algal interactions: the role of herbivory in structuring algal communities across an exposure gradient

\*Andrew Hoey (James Cook University; January/February, July, September, October/November, December/January 2008)

### Social behaviour in coral gobies

\*Marian Wong (James Cook University; February)

### Reconstruction of Ediacaran biota

Peter Trusler (in association with Monash University; February)

### Prevalence and impact of coral disease

\*Cathie Page (James Cook University; February/March)

### Social structure of *Centropyge bicolor*

\*Tzo Zen Ang (University of Cambridge; February to April, October to December)

### Genetic finger printing of bêche-de-mer species

Dr Sven Uthicke (Australian Institute of Marine Science; February/March)

### Effects of climate change on coral reefs

Dr Morgan Pratchett and \*Darren Coker (James Cook University; April)

### Effect of climate change on coral reef infaunal invertebrates

\*Jessica Stella (James Cook University; April, October/ November)

### Effects of bleaching on coral reef fish

Dr Uli Siebeck (University of Queensland; April)

### Ultraviolet communication in reef fish

Dr Uli Siebeck (University of Queensland; April)

### Ultraviolet communication in *Pomacentrus amboinensis*

\*Amira Parker (University of Queensland, April)

### Hawk moths and butterflies of Lizard Island

Rob Lachlan (Australian Museum, April)

### Measuring coral albedo

\*Ruth Reef (University of Queensland; April/May)

### Large-scale connectivity of *Acropora millepora* populations on the Great Barrier Reef

\* Pim Bongaerts (University of Queensland; April/May)

### Habitat choice by fish: bleached and unbleached corals

\*Marcus Allen (School for International Training; April)

### Colour vision in reef fishes: behavioural experiments in *Pomacentrus amboinensis* and *Pseudochromis fuscus*

\*Kelley Bostrom (School for International Training; April/May)

### Effects of coral bleaching on xanthid crab habitat selection

\*Brienne Engel (School for International Training; April/May)

### Effects of coral bleaching on the predation of coral reef fish

\*Allison Klein (School for International Training; April/May)

### Spatial and ontogenetic changes in resource use of the damselfish *Neoglyphidodon melas* at Lizard Island, Great Barrier Reef

\*Leslie Mills (School for International Training; April/May)

### Visual sensitivity to patterns and ultraviolet light in a coral reef damselfish

\*Callen Miracle (School for International Training; April/May)

### Protistan parasites of teleosts and elasmobranchs: biology, transmission and identity

Dr Rob Adlard (Queensland Museum; May/June)

### Lepocreadiidae and Acanthocolpidae from Lizard Island fishes

Dr Rod Bray (The Natural History Museum, UK; May/June)

### Patterns of ecto- and endoparasitism in haemulid fishes of the Great Barrier Reef

\*Anthony Byrne (University of Queensland; May/June)



Ruth Reef and Cameron Veal measuring coral albedo on a Porites coral.  
Photo: Pim Bongaerts

### Transversotrematid trematodes of Great Barrier Reef fishes

Dr Thomas Cribb (University of Queensland, May/June)

### Life cycles of bucephalid trematodes

Dr Thomas Cribb (University of Queensland, May/June)

### Patterns of trophic transmission of digenean trematodes in fishes of the Great Barrier Reef

\*Abigail Downie (University of Queensland, May/June)

### Phylogenomics of parasitic platyhelminthes

Dr Peter Olson (The Natural History Museum, UK; May/June)

### The complex of Opecoelidae (Platyhelminthes: Digenea) in GBR goatfishes (Perciformes: Mullidae); an investigation of host specificity, phylogenetic relationships and co-evolution

\*Christoph Rohner (University of Queensland; May/June)

### Latitudinal patterns in the distribution of apocreadiid trematodes of Great Barrier Reef fishes

\*Tane Sinclair-Taylor (University of Queensland; May/June)

### Host-parasite interactions between pomacentrid fishes and kudoid parasites

\*Mieke Burger (University of Queensland; May/June)

### Myxosporean parasites of elasmobranchs

\*Ricky Gleeson (University of Queensland; May/June)

### The bivalvulidan fauna of teleosts from Queensland

\*Nicole Gunter (University of Queensland; May/June)

### Ciguatera dinoflagellates and nutrients

\*Mark Skinner (University of Queensland; June)

### The evolution of social and reproductive behaviours in reef fish

Dr Marian Wong (James Cook University; June)

### Sound production in damselfish

Dr Uli Siebeck (University of Queensland; June)

### Colour change in *Pomacentrus fuscus*

Dr Uli Siebeck (University of Queensland, June)

### Climate change and effects of environmental factors on zooxanthellate symbiosis in marine invertebrates

Dr Ursula Shepherd (University of New Mexico) and Dr Ingo Burghardt (Rüth Universität Bochum; June/July)

### Phylogeny of Xenidiidae

\*Kristina Stemmer (Rüth Universität Bochum; June/July)

### Learning with Australians: coral reefs a case study

Dr Carl Stepath (James Cook University; July)

### Effects of haemogregarine blood parasites on coral reef fishes

Bronwyn Cameron for Dr Lexa Grutter (University of Queensland; July)

### Long-term monitoring of giant clam populations

Dr David Phillips (Independent researcher; July/August)

### Ecological significance of coral disease on the Great Barrier Reef

Assoc Prof Bette Willis (James Cook University; August)

### Abundance and distribution of freeliving zooxanthellae

\*Raechel Littman (James Cook University; August)



RESEARCH PROJECTS AND PARTICIPANTS

Monitoring *Acropora millepora* bacterial communities for disease Occurrence and colour polymorphisms

\*Raechel Littman (James Cook University; August)

Training dive professionals and volunteers to recognise and collect data on coral disease

\*Roger Beeden (James Cook University; August)

Monitoring pesticides in the Great Barrier Reef Marine Park

Dr David Haynes and Dr Joelle Prange (Great Barrier Reef Marine Park Authority; August)

Ambient underwater reef noise

Dr Andrew Jeffs (National Institute of Water & Atmospheric Research, New Zealand; August)

Quantifying neutrality in ecological communities

Dr Andrea Manica (University of Cambridge, August/September)

Stomatopod behaviour

Prof Roy Caldwell (University of California, Berkeley; September)

Stomatopod opsin evolution and phylogeny

Dr Megan Porter (University of Maryland Baltimore County; September)

Polarization in twilight/nocturnal skies

Dr Tom Cronin (University of Maryland Baltimore County; September)

Polarized signaling of stomatopods

\*Tsyrr-Huei Chiou (University of Maryland Baltimore County; September)

Trophic ecology of siganids

\*Tony Sunderland (James Cook University; September)

Growth rates in modern sea lilies and sea stars from the pacific waters of eastern Japan and Queensland

Dr Aaron Hunter (University of Tokyo; October)

Survey marlin fishing competition

Martin Russell and Mandy McKaig (Great Barrier Reef Marine Park Authority; October)

Coral bleaching, selective mortality and damselfishes

\*Jessica Scannell (James Cook University; October to December)

Diurnal cycles in coral growth

\*Michael Holcomb (Woods Hole Oceanographic Institute; October to January 2008)

Intra reef genetic connectivity of Pocilloporidae

\*Pim Bongaerts (University of Queensland; October/ November, December)

Symbiodinium diversity assessment in and around Lizard Island

Dr Eugenia Sampayo (University of Queensland; October/November)

Olfactory behaviour and response to coloured light of larval fishes

\*Adel Heenan (University of Edinburgh; October to January 2008)

Spatial and ontogenetic changes in resource use of the damselfish *Neoglyphidodon melas* at Lizard Island

\*Sai-Wing Chan (School for International Training; November)

Correlation between sperm transfer and copulation time in *Chelidonura sandrana*

\*Kate Kunigelis (School for International Training, November)

Long-term effect of cleaners on ganthiid isopods

Nadia Aurisch for Dr Lexa Grutter (November)

The importance of attitude: behaviour and performance in the ultimate test

Dr Mark McCormick (James Cook University; November, December)

Causes and consequences of fish diversity loss on coral reefs

\*Vanessa Messmer (James Cook University; November)

Energetics of habitat choice in planktivorous coral reef fishes

\*Jacob Johansen (James Cook University; November)

Density effects on mating behaviour in *Chelidonura sandrana*

\*Rolanda Lange (University of Tuebingen; November to January 2008)

Colour & pattern discrimination in reef fish

Dr Uli Siebeck (University of Queensland; November/December)

Vision in larval fish

Dr Nathan Hart (University of Queensland; November/December)

Pattern and face recognition in *Pomacentrus amboinensis*

\*Amira Parker (University of Queensland, November/ December)

Natural pH variability in coral reefs

Dr Monica Gagliano (James Cook University; November/December)

Effect of UV & temperature stress on reproduction of *Pomacentrus amboinensis*

Dr Monica Gagliano (James Cook University; November/December)

Coenzyme Q in coral reef fishes

Dr Monica Gagliano (James Cook University; November/December)

John Doyle and Australian of the Year Professor Tim Flannery, shown here with Lynda Curtis, visited LIRS to learn about reef issues.



Effect of pH stress on performance of *Pomacentrus amboinensis* egg and larvae

Dr Monica Gagliano (James Cook University; November/December)

Sex change in *Eviota* spp

Dr Monica Gagliano (James Cook University; November/ December)

Functional genomics of coral/ *Symbiodinium* symbiosis

Dr Mauricio Rodriguez-Lanetty (University of Queensland; November/December)

The effect of oxidative DNA damage on coral bleaching and symbiosis breakdown

\*Joshua Meisel (University of Queensland; November/December)

Roles of benthic algae in coral settlement and climate change impacts on algae

Dr Guillermo Diaz Pulido (University of Queensland; December)

Critical functional groups on coral reefs: herbivory and reef resilience

Prof David Bellwood (James Cook University; December)

Personality trait variation in reef fish

Dr Peter Biro (University of Technology Sydney; December)

The role of escape performance in survival at settlement in a pomacentrid fish

Prof Lee Fuiman (University of Texas Austin; December)

Temperature effects on oxygen consumption of reef fishes

Prof Göran Nilsson (University of Oslo, December/January 2008)

Anaerobic metabolism in reef fish

Prof Göran Nilsson (University of Oslo, December/January 2008)

STUDENT GROUPS

World Learning, School for International Training, USA

Led by Dr Tony Cummings and Dr Andrew Lewis (March and October)

University of Texas, USA

Led by Dr Mary Poteet and Dr Andrew Lewis (May/June)

Geelong College Preparatory School, Australia

Led by Stuart McCallum, Melissa Barnes and Wayne Barnes (June/ July)

RMIT University, Australia

Led by Dr Brian Leonard and Dr Gale Spring (July)

Haileybury College, Australia

Led by Dr Andrew Lewis, Alissa Beecher, Gillian Silberer, Jessica Luth and Kirsten Owens (August)

Barker College, Australia

Led by Miriam Broadhurst, Tim Binet and Drina Trimm (September/October)

Darwin High School, Australia

Led by Rachel Elphick, Don Elphick and Wayne Bailey (October)

OTHER VISITORS

US public radio show on climate change

Adam Burke (April)

QPWS park management

Alan Clackson and others (April, May, September)

James Cook University

Prof Mike Kingsford and Kari Arbouin (April)

Ascham School

Scott Malcolm, Jayne Taylor, Jessica and Samantha Malcolm (April)

Great Barrier Reef Research Foundation

Paulina Kaniewska and Tracy Ainsworth (May)

Documentary about fish colours and research methods

Hugh Piper (Electric Pictures; June)

Construction works

Max Bryant Constructions: Max Bryant, Aaro Raappana, Keith Kammerhofer, Dylan Fraser, Germaine Toscarini, Mal Stevens, Kevin Smith, Paul Gorman, Aaron Gorman and others (June, August/September)

Lizard Island Reef Research Foundation

Charlie and Sandy Shuetrim (July)

The Ian Potter Foundation

John and Rosemary Gough, Tom and Bev Healy (July)

Australian Conservation Foundation

Don Henry and Natalya Wagner (July/August)

First Aid Training

Charlie Makray and Julie Armour (September)

Australian Museum management

Ken Pope and Glenn Hodges (October)

Lizard Island Reef Research Foundation

Des and Janette Griffin, Penny and Peter Berents (October)

Microscope service

Allan Ross (October)

PAC Architects

Bill Phillips (October)

Filming for ABC TV series “Two Men in the Top End”

Michael Cordell (Cordell Jigsaw Productions), Dr Tim Flannery, John Doyle and others (day visit only; December)

Mauricio Rodriguez-Lanetty with recently fertilized eggs of the coral *Acropora millepora*.



Monica Gagliano investigates the effects of stress in reef fishes.



## PUBLICATIONS

The following publications based on work carried out at the Research Station were received into the Station's collection during the year. The collection now stands at over 1100 publications.

**Almany, G.R., L.F. Peacock, C. Syms, M.I. McCormick and G.P. Jones, 2007.** Predators target rare prey in coral reef fish assemblages. *Oecologia*, 152: 751-761.

**Angert, E.R. and K.D. Clements, 2004.** Initiation of intracellular offspring in *Epulopiscium*. *Molecular Microbiology*, 51: 827-835.

**Anthes, N. and N.K. Michiels, 2007.** Precopulatory stabbing, hypodermic injections and unilateral copulations in a hermaphroditic sea slug. *Biology Letters*, 3: 121 - 124.

**Arvedlund, M. P.L. Munday and A. Takemura, 2007.** The morphology and ultrastructure of the peripheral olfactory organ in newly metamorphosed coral-dwelling gobies, *Paragobiodon xanthosomus* Bleeker (Gobiidae, Teleostei). *Tissue and Cell*, 39: 335-342.

**Atkins, B. 2007.** Larval fish in the fast lane. *Explore*, 4: 22 - 23.

**Baldwin, C.C. and J.M. Leis, 2007.** *Rainfordia opercularis*, a liopropomin serranid (Teleostei: Serranidae: Epinephelinae): corroborative evidence from settlement-stage larvae. *Ichthyological Research*, 54: 193-197.

**Becker, J.H.A. and A.S. Grutter, 2005.** Client fish ectoparasite loads and cleaner shrimp *Urocaridella* sp. c hunger levels affect cleaning behaviour. *Animal Behaviour*, 70: 991-996.

**Bellwood, D.R., P.C. Wainwright, C.J. Fulton and A.S. Hoey, 2006.** Functional versatility supports coral reef biodiversity. *Proceedings of the Royal Society B*, 273: 101-107.

**Boyett, H.V., D.G. Bourne and B.L. Willis. 2007.** Elevated temperature and light enhance progression and spread of black band disease on staghorn corals of the Great Barrier Reef. *Marine Biology*, 151: 1711-1720.

**Bray, R.A. and T.H. Cribb, 2007.** *Holorchis gigas* n. sp. (Digenea: Lepocreadiidae) from the yellow-striped sweet-lips *Plectorhinchus chrysotaenia* (Perciformes: Haemulidae) from Lizard Island, Great Barrier Reef, with observations on *Aephniidiogenes major*. *Zootaxa* 1517: 63-68.

**Bray, R.A. and T.H. Cribb, 2007.** *Monostephanostomum nolani* sp. n. and *M. krusei* Reimer, 1983 (Digenea: Acanthocolpidae) from carangid fishes from coral reef waters off Australia. *Folia Parasitologica*, 54: 19-26.

**Bray, R.A., T.H. Cribb, A. Waeschenbach and D.T.J. Littlewood, 2007.** A new species of *Stephanostomum* Looss, 1899 (Digenea, Acanthocolpidae) with a bizarre oral sucker: *S. adlardi* sp. nov. from the common coral trout *Plectropomus leopardus* (Lacepede, 1802) (Perciformes, Serranidae) from Lizard Island, Great Barrier Reef. *Acta Parasitologica*, 52: 206-212.

**Bshary, R. and A.S. Grutter, 2005.** Punishment and partner switching cause cooperative behaviour in a cleaning mutualism. *Biology Letters*, 1: 396-399.

**Burghardt, I., 2006.** Biologie, Diversitaet und Evolution "solarbetriebener" Nudibranchia (Mollusca: Gastropoda) und ihrer Symbiose mit Zooxanthellen. PhD thesis, Ruhr-Universitaet Bochum, Germany.

**Burghardt, I. and H. Waegele, 2006.** Interspecific differences in the efficiency and photosynthetic characteristics of the symbiosis of "solarpowered" Nudibranchia (Mollusca: Gastropoda). In: Contemporary studies into the systematics and evolution of opisthobranch molluscs, (Eds. G. Brodie, S. Fahey and F.E. Wells), *Records of the Western Australian Museum, Supplement* 69: 1-10.

**Campbell, S.J., L.J. McKenzie, S.P. Kerville and J.S. Bite, 2007.** Patterns in tropical seagrass photosynthesis in relation to light, depth and habitat. *Estuarine, Coastal and Shelf Science*, 73: 551-562.

**Cheney, K.L. and I.M. Cote, 2007.** Aggressive mimics profit from a model-signal receiver mutualism. *Proceedings of the Royal Society B*, 274: 2087-2091.

**Choat, J.H. & D.R. Robertson, 2002.** Age-based studies on coral reef fishes. Chapter 3 in "Coral Reef Fishes" ed. P. Sale, Academic Press.

**Cisternas, P.A. and M. Byrne, 2005.** Evolution of abbreviated development in the ophiuroid *Ophiarachnella gorgonia* involves hererochronies and deletions. *Canadian Journal of Zoology*, 83: 1067-1078.

**Costa, F.O., J.R. deWaard, J. Boutillier, S. Ratnasingham, R.T. Dooh, M. Hajibabaei and P.D. Hebert, 2007.** Biological identifications through DNA barcodes: the case of the Crustacea. *Canadian Journal of Fisheries and Aquatic Sciences*, 64: 272 -295.

**Craig, M.T., J.A. Eble, B.W. Bower and D.R. Robertson, 2007.** High genetic connectivity across the Indian and Pacific Oceans in the reef fish *Myripristis berndti* (Holocentridae). *Marine Ecology Progress Series*, 334: 245-254.

**Cronin, T.W., N. Shashar, R.L. Caldwell, J. Marshall, A.G. Cheroske and T.-H. Chiou, 2003.** Polarization vision and its role in biological signaling. *Integrative and Comparative Biology*, 43: 549-558.

**Depczynski, M and D.R. Bellwood, 2006.** Extremes, plasticity, and invariance in vertebrate life history traits: insights from coral reef fishes. *Ecology*, 87: 3119-3127.

**Depczynski, M., 2006.** Small cryptic fishes on coral reefs: a new perspective on reef fish ecology and life histories. PhD thesis, James Cook University.

**Depczynski, M., C.J. Fulton, M.J. Marnane and D.R. Bellwood, 2007.** Life history patterns shape energy allocation among fishes on coral reefs. *Oecologia*, 153: 111-120.

**Evertsen, J., I. Burghardt, G. Johnsen and H. Waegele, 2007.** Retention of functional chloroplasts in some saccoglossans from the Indo-Pacific and Mediterranean. *Marine Biology*, 151: 2159-2166.

**Feary, D.A., G.R. Almany, G.P. Jones and M.I. McCormick, 2007.** Coral degradation and the structure of tropical reef fish communities. *Marine Ecology Progress Series*, 333: 243-248.

**Feary, D.A., G.R. Almany, M.I. McCormick and G.P. Jones, 2007.** Habitat choice, recruitment and the response of coral reef fishes to coral degradation. *Oecologia*, 153: 727-737.

**Fisher, R., 2004.** Nocturnal vertical distribtuion of late-stage larval coral reef fishes off the leeward side of Lizard Island, Great Barrier Reef, Australia. *Bulletin of Marine Science*, 75: 439-451.

**Fulton, C.J., 2007.** Swimming speed performance in coral reef fishes: field validations reveal distinct functional groups. *Coral Reefs*, 26: 217-228.

**Gagliano, M., 2006.** The role of early life history traits on the survival of a coral reef fish. PhD thesis, James Cook University.

**Gagliano, M. and M.I. McCormick, 2007.** Maternal condition influences phenotypic selection on offspring. *Journal of Animal Ecology*, 76: 174-182.

**Gagliano, M. and M.I. McCormick, 2007.** Compensating in the wild: is flexible growth the key to early juvenile survival? *Oikos* 116: 111-120.

**Gagliano, M., S. Kowalewsky and M.I. McCormick, 2006.** An alternative method for the preservation of tropical fish larvae. *Journal of Fish Biology*, 68: 634-639.

**Gagliano, M., M.I. McCormick and M.G. Meekan, 2007.** Temperature-induced shifts in selective pressure at a critical developmental transition. *Oecologia*, 152: 219-225.

**Gagliano, M., M.I. McCormick and M.G. Meekan, 2007.** Survival against the odds: ontogenetic changes in selective pressure mediate growth-mortality trade-offs in a marine fish. *Proceedings of the Royal Society B*, 274: 1575-1582.

**Gottschalk, S., S. Uthicke and K. Heimann, 2007.** Benthic diatom community composition in three regions of the Great Barrier Reef, Australia. *Coral Reefs*, 26: 345-357.

**Grim, N.J., 2006.** Food vacuole contents in the ciliate, *Balantidium jocularum* (Balantidiidae), a symbiont in the intestine of the surgeonfish, *Naso tonganus* (Acanthuridae). *Journal of Eukaryotic Microbiology*, 53: 269-274.

**Grzybowski, Y., K. Stemmer and H. Waegele, 2007.** On a new *Ercolania* Trinchese, 1872 (Opisthobranchia, Sacoglossa, Limapontiidae) living within *Boergesenia* Feldmann, 1950 (Cladophorales), with notes on anatomy, histology and biology. *Zootaxa*, 1577: 3-16.

**Guenther, J., G. Walker-Smith, A. Waren and R. de Nys, 2007.** Fouling-resistant surfaces of tropical sea stars. *Biofouling*, 23: 413-418.



Researchers using a barrier net to capture reef fishes.



Rob Lachlan has made several trips to Lizard Island to study hawk moths and butterflies.  
Photo: Courtesy Rob Lachlan



## PUBLICATIONS

**Hamdani, E.H. and K.B. Doving, 2007.** The functional organization of the the fish olfactory system. *Progress in Neurobiology*, doi:10.1016/j.pneurobio.2007.02.007.

**Hoey, A.S. and D.R. Bellwood, 2007.** Cross-shelf variation in the role of parrotfishes on the Great Barrier Reef. *Coral Reefs*, DOI 10.1007/s00338-007-0287-x

**Hoey, A.S. and M.I. McCormick, 2006.** Effects of subcutaneous fluorescent tags on the growth and survival of a newly settled coral reef fish, *Pomacentrus amboinensis* (Pomacentridae). *Proceedings of the 10th International Coral Reef Symposium*, 420-424.

**Huelsken, T., M. Clemmensen and M. Hollmann, 2006.** *Neverita delessertiana* (Recluz in Chenu, 1843): a naticid species (Gastropoda: Caenogastropoda) distinct from *Neverita duplicata* (Say, 1822) based on molecular data, morphological characters, and geographical distribution. *Zootaxa*, 1257: 1- 25.

**Huffard, C.L., 2006.** Locomotion by *Abdopus aculeatus* (Cephalopoda: octopodidae): walking the line between primary and secondary defences. *Journal of Experimental Biology*, 209: 3697-3707.

**Huffard, C.L., 2007.** Ethogram of *Abdopus aculeatus* (d'Orbigny, 1834) (Cephalopoda: Octopodidae): can behavioural characters inform octopodid taxonomy and systematics? *Journal of Molluscan Studies*, 73: 185-193.

**Jackson, D.J., L. Macis, J. Reitner, B.M. Degnan and G. Woerheide, 2007.** Sponge paleogenomics reveals an ancient role for carbonic anhydrase in skeletogenesis. *Science*, 316: 1893-1895.

**Johansen, J.L., C.J. Fulton and D.R. Bellwood, 2007.** Avoiding the flow: refuges expand the swimming potential of coral reef fishes. *Coral Reefs*, 26: 577-583.

**Jones, C.M., L. Nagel, G.L. Hughes, T.H. Cribb and A.S. Grutter, 2007.** Host specificity of two species of *Gnathia* (Isopoda) determined by DNA sequencing blood meals. *International Journal for Parasitology*, 37: 927-935.

**Kassahn, K.S., M.J. Caley, A.C. Ward, A.R. Connolly, G. Stone and R.H. Crozier, 2007.** Heterologous microarray experiments used to identify the early gene response to heat stress in a coral reef fish. *Molecular Ecology*, 16: 1749-1763.

**Keable, S.J., 2006.** Taxonomic revision of *Natanolana* (Crustacea: Isopoda: Cirolanidae). *Records of the Australian Museum*, 58: 133-244.

**Kearn, G.C & I.D. Whittington, 2005.** *Neoentobdella* gen. nov. for species of *Entobdella* Blainville in Lamarck, 1818 (Monogenea, Capsalidae, Entobdellinae) from stingray hosts, with descriptions of two new species. *Acta Parasitologia*, 50: 32-48.

**Klanten, O.S., J.H. Choat and L. van Herwerden, 2007.** Extreme genetic diversity and temporal rather than spatial partitioning in a widely distributed coral reef fish. *Marine Biology*, 150: 659-670.

**Lacalli, T.C., 2005.** Diversity of form and behaviour among nemertean pilidium larvae. *Acta Zoologica*, 86: 267-276.

**Lamprell, K. and J.M. Healy, 2002.** A review of the Indo-Pacific *Lioconcha* Moersch (Mollusca: Bivalvia: Verenidae), including a description of four new species from Queensland, New Caledonia and the Philippine Islands. *Molluscan Research*, 22:101-147.

**Leis, J.M, 2007.** Behaviour as input for modelling dispersal of fish larvae: behaviour, biogeography, hydrodynamics, ontogeny, physiology and phylogeny meet hydrography. *Marine Ecology Progress Series*, 347:185-193.

**Leis, J.M., K.J. Wright and R.N. Johnson, 2007.** Behaviour that influences dispersal and connectivity in the small, young larvae of a reef fish. *Marine Biology*, 153: 103-117.

**Lowry, J.K. and P.B. Berents, 2005.** Algal-tube dwelling amphipods in the genus *Cerapus* from Australian and Papua New guinea (Crustacea: Amphipoda: Ischyroceridae). *Records of the Australian Museum*, 57: 153-164.

**Lowry, J.K. and R.T. Springthorpe, 2005.** New and little-known melitid amphipods from Australian waters (Crustacea: Amphipoda: Melitidae). *Records of the Australian Museum*, 57: 237-302.

**Madin, J.S. and S.R. Connolly, 2006.** Ecological consequences of major hydrodynamic disturbances on coral reefs. *Nature*, 444: 477-480.

**McCormick, M.I., 2006.** Distress a normal part of life for a damsel. *Australasian Science*, October 2006: 29-31.

**McCormick, M.I., 2006.** Mothers matter: crowding leads to stressed mothers and smaller offspring in marine fish. *Ecology*, 87: 1104-1109.

**McCormick, M.I. and A.S. Hoey, 2006.** Biological and physical correlates of settlement and survival for a coral reef fish, *Pomacentrus amboinensis* (Pomacentridae). *Proceedings of the 10th International Coral Reef Symposium*, 425-430.

**McCormick, M.I. and M.G. Meekan, 2007.** Social facilitation of selective mortality. *Ecology*, 88: 1562-1570.

**Miller, T.L. and T.H Cribb, 2007.** Phylogenetic relationships of some common Indo-Pacific snappers (Perciformes: Lutjanidae) based on mitochondrial DNA sequences, with comments on the taxonomic position of the Caesioninae. *Molecular Phylogenetics and Evolution*, 44: 450-460.

**Miller, T.L. and T.H. Cribb, 2007.** Two new cryptogonimid genera (Digenea, Cryptogonimidae) from *Lutjanus bohar* (Perciformes, Lutjanidae): analyses of ribosomal DNA reveals wide geographic distribution and presence of cryptic species. *Acta Parasitologica*, 52: 104-113.

**Miller, T.L. and T.H. Cribb, 2007.** Two new cryptogonimid genera *Beluesca* n. gen. and *Chelediadema* n. gen. (Digenea: Cryptogonimidae) from tropical Indo-West Pacific Haemulidae (Perciformes). *Zootaxa*, 1543: 45-60.

**Muñoz, G., A.S. Grutter and T.H. Cribb, 2007.** Structure of the parasite communities of a coral reef fish assemblage (Labridae): testing ecological and phylogenetic host factors. *Journal of Parasitology*, 93: 17-30.

**Murphy, B.F., J.M. Leis and K.D. Kavanagh, 2007.** Larval development of the ambon damselfish *Pomacentrus amboinensis*, with a summary of pomacentrid development. *Journal of Fish Biology*, 71: 569-584.

**Murray, A. and G.W. Rouse, 2007.** Two new species of *Terebrasabella* (Annelida: Sabellidae: Sabellinae) from Australia. *Zootaxa*, 1434: 51-68.

**Myers, M.R., 2003.** Coral reef monitoring for management purposes and the impact of marine protected areas on benthic communities on the Great Barrier Reef. Doctor of Environmental Science and Engineering thesis, University of California Los Angeles.

**Nagel, L. and A.S. Grutter, 2007.** Host preference and specialisation in *Gnathia* sp., a common parasitid isopod of coral reef fishes. *Journal of Fish Biology*, 70: 497-508.

**Newman, L. and L.R.G. Cannon, 2002.** The genus *Cycloporus* (Platyhelminthes: Polycladida) from Australasian waters. *Raffles Bulletin of Zoology*, 50: 287-299.

**Nilsson, G.E., J.-P.A. Hobbs and S. Ostlund- Nilsson, 2007.** Tribute to P. L. Lutz: respiratory ecophysiology of coral-reef teleosts. *Journal of Experimental Biology*, 210: 1673-1686.

**Nilsson, G.E., J.-P.A. Hobbs, S. Ostlund- Nilsson and P.L. Munday, 2007.** Hypoxia tolerance and air-breathing ability correlate with habitat preference in coral-dwelling fishes. *Coral Reefs*, 26: 241 - 248.

**Nilsson, G.E., S. Ostlund- Nilsson, R. Penfold and A.S. Grutter, 2007.** From record performance to hypoxia tolerance: respiratory transition in damselfish larvae settling on a coral reef. *Proceedings of the Royal Society B*, 274: 79-85.

**Pankhurst, N.W., Q.P. Fitzgibbon, P.M. Pankhurst and H.R. King, 2007.** Habitat-related variation in reproductive endocrine condition in the coral reef damselfish *Acanthochromis polyacanthus*. *Gen. Comp. Endocrinol.*, Jul 2007 [Epub ahead of print]

**Pears, R.J., J.H. Choat, B.D. Mapstone and G.A. Begg, 2007.** Reproductive biology of a large, aggregation-spawning serranid, *Epinephelus fuscoguttatus* (Forsskal): management implications. *Journal of Fish Biology*, 71: 795-817.

**Pearse, V.B. and O. Voigt, 2007.** Field biology of placozoans (Trichoplax): distribution, diversity, biotic interactions. *Integrative and Comparative Biology*, 1-16. doi:10.1093/icb/icm015.

**Pleijel, F. and G.W. Rouse, 2005.** Reproductive biology of a new hesionid polychaete from the Great Barrier Reef. *Biological Bulletin*, 208: 69-76.





PUBLICATIONS

**Pratchett, M.S., 2007.** Feeding preferences of *Acanthaster planci* (Echinodermata: Asteroidea) under controlled conditions of food availabliliy. *Pacific Science*, 61: 113-120.

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