

# **Lizard Island Research Station**

## **Report 2024**

Prepared by:  
Lizard Island Reef Research Foundation





**Acknowledgements**

The Australian Museum acknowledges and pays respect to the Gadigal people and the Dingaal and Ngurrumungu people, as the First Peoples and Custodians of the land and waterways on which the Australian Museum and Lizard Island Research Station stand.

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**Kim McKay AO**  
**Director & CEO, Australian Museum**

The Australian Museum’s (AM) Lizard Island Research Station (LIRS) has embarked on a pivotal new chapter this year as we welcomed Dr Emily Howells and Dr David Abrego as our new Co-Directors. This leadership transition comes at a critical moment when our work monitoring and building resilience in the Great Barrier Reef has never been more urgent in the face of accelerating climate change.

Dr Howells and Dr Abrego bring exceptional qualifications to their new roles, with specialised research on coral heat tolerance and climate adaptation mechanisms. Their work investigating how corals respond to warming oceans provides crucial insights into potential adaptation pathways – research that forms the foundation of resilience-building strategies for coral reef ecosystems under threat.

Our monitoring efforts have taken on renewed urgency as climate impacts intensify. Each year, LIRS hosts approximately 400 scientists and support personnel working across some 100 research projects, with scientists collectively building knowledge of reef systems under stress and developing innovative approaches to enhance reef resilience. Their work contributes to comprehensive monitoring programs that track coral health, recovery patterns after bleaching events, and the complex interactions between rising ocean temperatures and reef ecosystems.

As we bid farewell to Dr Anne Hoggett AM and Dr Lyle Vail AM after their 35 years of exceptional leadership, we recognise their significant contribution to establishing LIRS as a world-leading tropical marine field research station. Their legacy lives on as they take up new honorary roles as Fellows of the Australian Museum.

The vital work at LIRS would not be possible without the unwavering support of the Lizard Island Reef Research Foundation (LIRRF), led by Chair Kate Hayward. Since its establishment in 1978, LIRRF has raised more than \$17 million to support science on the Reef.

As climate change continues to challenge coral reef ecosystems worldwide, Dr Abrego has articulated their mission clearly: “to leave the Great Barrier Reef better for the next generation.” This commitment encapsulates our approach-finding pathways to ensure this magnificent ecosystem thrives despite the challenges ahead.



**Kate Hayward**  
**Chair, Lizard Island Reef Research Foundation**

Five months into the ‘new’ year, there’s much to relay about the 2024 year – and this one, flying by.

In mid February this year, after more than 34 years as co-directors, Anne Hoggett and Lyle Vail flew off the island, a parting that must have been tinged with great sadness. Lizard Island was their home and work place for over three decades, and an idyllic spot to raise their young son Alex in those early years. Over this period they touched the lives of many, including up to three generations of our donors and supporters. They built a culture of true collaboration between researchers while guiding many careers, planned and oversaw expansion of facilities, and built the worldwide reputation of the facility. Anne and Lyle pen a heartfelt farewell on page 17, and we wish them well in their much deserved ‘retirement’.

We’re excited to be working with the recently appointed LIRS co-directors, Dr Emily Howells and Dr David Abrego, who took up their new positions in late January. It’s a complex role, managing a remote field station, and they come well credentialled, as you’ll read on the following page. We look forward to David and Emily meeting our LIRRF community over the coming year.

This report shares the array of projects our generous donors funded over 2024 – 83 research projects in total, conducted by scientists from over 35 institutions from 13 countries. In total, \$400,000 of funding supported research, education and the upkeep of facilities over the year. This includes supporting six new Fellows who will commence field work in 2025. We’re also pleased to be able to support three new critical research grants. Two of these grants involve research to better understand the drivers of Crown-of-Thorns Starfish (COTS) outbreaks, and to contain them. With fear that another outbreak of COTS is imminent (it would be the 5th outbreak of COTS since the 1960s) such work is critical to maximise opportunities for coral recovery following the 2024 bleaching event.

Coinciding with the 2023 50th anniversary of the Station’s founding, we launched an ambitious \$2 million capital campaign to fund a new laboratory and new staff house. I’m delighted to say \$1.8 million has now been raised. We acknowledge the generosity of all our donors. Coral reefs play a critical role in supporting marine ecosystems and understanding how they function is becoming more and more crucial as threats increase. We thank you for your part.



# 2024 in review

## Introducing the new Lizard Island Station Co-Directors

We are thrilled to embark on this opportunity of a lifetime as the new Co-Directors of Lizard Island Research Station. We have visited Lizard Island (Jiigurru) as students and researchers several times since 2006 and have witnessed the growth of the Station as a powerhouse of reef knowledge generation, thanks to the efforts and vision of Anne and Lyle. We take on these roles with tremendous appreciation of the reputational standing of the Station and look forward to building on its legacy with the support of the Australian Museum and the LIRRF. We both had brief visits at the end of 2024 to begin handover activities and moved to the Island with our seven year old daughter at the end of January to formally take up our posts.

Although this section of the report usually provides a reflection of the previous year, we have only been at the helm for two months at the time of writing. However, Anne and Lyle provided a review of the 2024 year, including projects and equipment, special projects, reef health, and a personal reflection on pages 12-17. We thank Anne and Lyle for their lifelong commitment to the Station, and their contribution to this report. We will instead use this section to tell you a little about ourselves and share some of our vision and plans for LIRS.

We are both coral ecologists and completed our PhD training at James Cook University, where we met only a couple of years before visiting Lizard Island for the first time. We share similar broad interests but have developed our own research programs. Emily's current research is focused on the responses of corals to warming oceans. She is currently investigating drivers of variation in heat tolerance in several coral populations on the Great Barrier Reef, including at sites around Lizard Island. David's research focuses on the establishment and maintenance of symbioses between corals and microalgae as this relationship underpins the success of corals as builders of healthy reef ecosystems. He is currently investigating uptake of microalgal symbionts in early life stage corals to gain insights for optimizing symbiont provisioning that may be useful in assisted evolution strategies.

We have conducted research in Australia and overseas, including substantive roles in the United Arab Emirates and ongoing collaborations in Japan and Saudi Arabia. Both of us care deeply about corals and the reefs they build and are keen to continue our research through a shared appointment with Southern Cross University, where we supervise several PhD students. Being based at LIRS provides unique opportunities to support long-term research and we are excited with the prospect of maintaining and attracting new research to the Station, both as collaborators with colleagues in Australia and overseas, as well as by independent research groups.

Coral reefs are facing great challenges from threats at global (ocean warming and acidification) and local scales (cyclones, Crown-of-Thorns Starfish outbreaks, and declining water quality). The role of LIRS as a facilitator of critical research, communication, and education on reef science is more important than ever. There are exciting and ambitious developments planned for the near future, including the 50th Anniversary Infrastructure project to build a new laboratory and house on the Station. The Station's Master Plan is being updated to reflect this project and will soon be submitted to the Queensland Government for approval. Running parallel to this process are the submissions to the Cook Shire Council, which already has the building plans for the new laboratory. We anticipate the plans for the new house to be submitted in the next few weeks to move on to tendering and contracting by the end of this year so that construction can begin in 2026. This expansion will allow us to amplify the impact of the work that happens at LIRS by providing additional laboratory space for visiting researchers and to accommodate a planned increase in Station staff so we can better support our visitors.

The Lizard Island Coral Reef Study Tour will be held for its fourth year thanks to the generous support of our donors (Corella Fund, Peters Family Foundation, and Big Blue Ocean Foundation). Two tours are planned for this year, one for students and one for teachers. Both tours will run consecutively at the end of September and start of October. These tours have been very successful in promoting coral reef education and environmental and cultural stewardship. We look forward to welcoming students and teachers to the Station and finding ways to grow this program.

We close this section with two very important acknowledgments. The first one is to the Traditional Owners of Jiigurru (Lizard Island). We look forward to establishing and building key relationships with Dingaal elders and representatives in partnership with the Australian Museum and LIRRF. We seek to listen and form an understanding of Traditional Owner priorities so that we can co-develop plans and potential funding opportunities for the future of the Station. The second acknowledgement is to the many generous donors to the LIRRF. LIRS would not exist without your support and we look forward to meeting as many of you as possible later this year.

**Emily Howells and David Abrego**  
Co-Directors, Lizard Island





# Fellowships and grants

The Lizard Island fellowships and grants program provides funding for field-intensive research at LIRS. It is fully supported by the Lizard Island Reef Foundation (LIRRF) and its donors.

New fellowships are awarded each year to support broad categories of research by PhD students and recent postdocs. Grants are awarded periodically to support more tightly targeted research.

In 2024, we awarded two doctoral and four postdoctoral Fellowships. In addition, three new Critical Research Grants were awarded, which is a record for this category. Donors who support specific awards are listed below. We sincerely thank them for their generous support.

- Lizard Island Reef Research Foundation members and friends
- Big Blue Ocean Foundation
- The Gough Family
- Maple-Brown Family Foundation
- Estate of Sir John and Lady Proud
- Hermon Slade Raiatea Foundation
- Charles Warman Foundation
- Sally White OAM

Details of the conditions and selection criteria for these awards can be found in the Lizard Island Research Station section of the Australian Museum’s web site. Applications close in August or September for funding that becomes available in March of the following year.

## Fellowships

The scope of projects supported by Fellowships is intentionally broad to enable applicants to seek support for research within their areas of interest and existing commitments. They are highly competitive and produce excellent research while making an important contribution to research training. The program is unique for its scope and longevity and for the rare support it offers for field work by early career scientists. Since the program’s inception in 1984, the LIRRF has supported 139 Fellowships to a value of more than \$2 million.

The amounts provided for Fellowships have increased substantially in recent years. This is to ensure that their value is maintained in the face of the increasing cost of conducting research at LIRS, for reasons external to LIRS. There is a growing requirement by universities for diving to be conducted by three-person teams instead of by two people, and the cost of flights between Cairns and Lizard Island has also risen steeply. Doctoral fellowships are now worth up to \$14,000 per year (excluding GST) for up to three years while postdoctoral fellowships are now up to \$19,000 per year (excluding GST) for up to two years.

Six new fellows will commence field work in 2025: two PhD students and four recent post-docs. Outlines of their projects can be found on pages 6 – 9.

## Critical research grants

The LIRRF has supported a research grants program since 2012 with 33 grants awarded to a total value of more than \$1.1 million.

Critical Research Grants support coral reef research that is important on a broad scale and has a time-critical element. Unlike the fellowships program, grants are not limited to a particular research demographic – applicants can be at any level within the research community. They are offered irregularly depending on need and the funding available.

In 2025, field work will commence on three new Critical Research Grants:

Prof Maria Byrne (University of Sydney), A/Prof Jon Allen (College of William and Mary, USA) and Prof Mary Sewell (University of Auckland, NZ) were awarded a 2025 Critical Research Grant thanks to funding from Sally White: Resilience and adaptation of Crown-of-Thorns Starfish larvae to development in oligotrophic tropical waters: maternal provisioning, bacterivory and larval cloning.

The Great Barrier Reef is in a tenuous state in the face of climate stress and Crown-of-Thorns Starfish (COTS) outbreaks, with only the latter amenable to local management action. Faced with investment decisions, it is imperative that management is better informed with respect to the drivers of COTS outbreaks. Central to current COTS management action is the notion that COTS larvae are limited by food availability in nature and that boosts of food generated by nutrient-laden runoff from the mainland promote outbreaks – this is the terrestrial runoff hypothesis. Coastal water quality improvement is promoted as a tool to suppress COTS outbreaks. This project will be a definitive test of the terrestrial runoff hypothesis and will inform management of the efficacy of this approach to controlling COTS. Maria Byrne and her team will conduct their research at LIRS in late 2025 when COTS spawn.

Prof Morgan Pratchett and Dr Peter Doll (James Cook University) were awarded a two-year Critical Research Grant thanks to funding from the Big Blue Ocean Foundation: Novel methods for Crown-of-Thorns Starfish management to contain emerging outbreaks at Lizard Island.

Increasing densities of Crown-of-Thorns Starfish (COTS) have been recorded in the Lizard Island region since 2021, signifying the potential initiation of the fifth population irruption of COTS on the Great Barrier Reef since the 1960s. These increases were detected by Pratchett’s team using Scooter Assisted Large-Area Diver (SALAD) surveys. This project will assess the utility of SALAD-based culling to increase the efficiency and effectiveness of COTS management. Importantly, SALAD-based culling is only likely to be viable in areas with low to moderate COTS densities. Where COTS densities are high, Pratchett and Doll will co-ordinate with established culling operators to ensure timely and extensive culling is undertaken. The goal of this project is to attempt to suppress COTS densities in the Lizard Island region and maximise opportunities for coral recovery in the aftermath of the 2024 mass coral bleaching event. SALAD-based culling will be undertaken during six trips over two years (2025 and 2026). As well as reducing coral loss caused by increasing densities of COTS, this project will rigorously compare detectability of COTS using different surveillance and culling methods to help establish specific contexts where particular methods should be applied.

Dr Vincent Raoult (Griffith University), Dr Karen Joyce (James Cook University), Dr Stephanie Duce (James Cook University), Dr George Roff (CSIRO) and Prof. Jane Williamson (Macquarie University) were awarded a two-year Critical Research Grant thanks to funding from Sally White: drone-based monitoring of Lizard Island bleaching recovery.

This research harnesses a unique opportunity to extend drone survey datasets collected at the peak of the global beaching event in March 2024 and subsequent assessments of coral mortality in June 2024. The research will provide a detailed and large-scale analysis of shallow water coral recovery following a bleaching event. It will also identify causal links to environmental variables that encourage or discourage coral recovery. Drone surveys will be conducted approximately six months apart starting in mid-2025. This valuable data will be made freely available to other researchers.



Eleanor Kelly

2025 Gough Family  
Doctoral Fellowship

University of Otago, New Zealand



### The effect of oil exposure and elevated temperature on the predator-prey dynamics of coral reef fish

Globally, marine environments are subjected to multiple stressors including warming and increasing pollutants. Of particular concern is exposure to heavy crude oil which contains toxic compounds such as polycyclic aromatic hydrocarbons. These types of compounds can negatively impact physiological, morphological, and behavioural traits in marine organisms. In addition, the ever-increasing threat of warming events not only exert stress onto marine taxa but can also interact with other stressors including oil pollution. With an increasing prevalence of marine heatwaves, it is essential we gain an understanding of how these two stressors interact and impact coral reef inhabitants.

Eleanor's research aims to determine the effect of oil and warming on multiple traits and life-histories of coral reef fish, such as embryonic development, predator-prey interactions, and underlying metabolic drivers. Damselfish embryos and juveniles will undergo a simulated heatwave followed by exposure to non-lethal, environmentally relevant concentrations of crude oil. Kinematic analysis of behavioural interactions between treated damselfish (as prey) and predatory fish will determine whether oil exposure and warming impact predation rates or prey evasion capabilities. Oxygen consumption and metabolic enzyme analysis of embryos and juvenile damselfish will be recorded to indicate any cost of fitness.

Presently, there is no published research on the behavioural effect of oil and warming in coral reef fish. By focusing on behavioural and physiological traits associated with predator-prey interactions, this research will help determine how oil pollution and warming may influence coral reef fish at individual, population, and community levels.

Ryan McAndrews

2025 Big Blue Ocean  
Doctoral Fellowship

James Cook University



### The evolution and ecology of pair bonding and cooperation in a coral reef rabbitfish

According to Charles Darwin's model of evolution by natural selection, an individual organism's fitness is the key to the survival and the persistence of species. Descent with modification, as Darwin called it, defined evolutionary fitness to be the ability of an organism to contribute its own variation to the species by producing offspring. Following this, cooperation among relatives to raise offspring is self-explanatory, as cooperators have a shared outcome in terms of Darwinian fitness. However, cooperation requires an investment for each individual that equals some level of fitness cost. For a cooperative strategy to be evolutionarily stable, the fitness benefits need to outweigh the costs.

On coral reefs, 14 species of rabbitfishes form pairs, some of which are known to cooperate when foraging. While one individual is feeding, the other takes a vigilant posture, apparently acting as a lookout. There is evidence that pairing among these rabbitfish may not necessarily be for mating and they do not perform parental care (the two most straightforward explanations for the evolution of cooperation). So why has this behaviour evolved? The key to understanding this lies in the cost-benefit balance of the relationship and determining who partners with one another. Are they related? Are they of the opposite sex?

Ryan's research will investigate the cooperative behaviour of the Two-barred Rabbitfish, *Signanus doliatus*. He will use their unique face and body markings to recognise and track individual fish with the help of computer vision software. While observing pairs' cooperative behaviour, Ryan will investigate the cost-benefit balance of the relationship. This balance will be compared among pairs under different environmental conditions (such as predation risk, competition, and habitat condition) to see how these conditions influence the cost-benefit relationship and cooperation at large. Over the 3.5-year duration of the project, Ryan will frequently visit the same pairs and see how long paired fish stay together. By studying their behaviour, the cost-benefit balance, and from determining partners' relatedness and sex, this research will be able to determine the mechanism underpinning the evolution of this cooperative behaviour.

Dr Sam England

2025 John and Laurine  
Proud Fellowship

Museum fur Naturkunde Berlin



### Surfing the web: elucidating the ecology of enigmatic coral reef spiders

Whether it's the fish that first crawled onto land, or the whales that slid back into the ocean, transitions from life in the water to life on land (and vice versa) represent some of the most important evolutionary events in the history of life on Earth. There are over 50,000 species of spiders on Earth, inhabiting effectively every terrestrial biome on all continents except Antarctica. Despite this ubiquity, it is currently thought that only a single species of spider worldwide has successfully transitioned to a fully aquatic lifestyle: the freshwater diving bell spider (*Argyroneta aquatica*). However, another group of spiders also spend considerable time underwater. These are the intertidal spiders (*Desis* spp.).

Intertidal spiders live in the intertidal zone, typically amongst coral reefs, and spin webs within empty seashells, rock crevices, corals, and abandoned holes of other animals. At high tide, they are thought to take shelter in these nests, with the ability to survive submerged in some cases for over a month. At low tide, they are thought to freely forage for bugs and crustaceans on the exposed reef, but critically, are not believed to leave their nests or forage whilst underwater. Despite this, laboratory experiments show that *Desis* spiders will readily attack and kill fish whilst submerged underwater. This suggests that these

spiders might be adapted for hunting in the ocean. For example, they could possess eyes adapted for aquatic vision. If true, this would transform our understanding of the ecology of these spiders and also the ecology of coral reefs and intertidal zones more generally, as spiders have previously not been regarded as predators in the marine environment.

At Lizard Island, Sam will investigate spiders of the recently described intertidal species *Desis bobmarleyi*. Observations by other researchers indicate that they are relatively common at Lizard Island, especially on the reef flat at Coconut Beach. Initially, he plans to find their natural nest sites at low tide, place infrared-sensitive cameras near them and then film them through the high tide to determine if the spiders leave their nests and/or try to hunt underwater. His team will also perform experiments in the laboratory to establish whether intertidal spiders react to visual cues underwater, by playing videos to them on screens. He plans to determine the resolution of their vision in water and air. If the resolution is better underwater, it will tell us that their eyes are adapted for use in the ocean.

This project promises to significantly further our knowledge of these unique and enigmatic coral reef inhabitants. In the process, it is expected that a deeper understanding of broader processes and themes will be developed, including visual evolution, biological optics and aquatic colonization.



Post doctoral Fellows Alexandre Siqueira (left) and Sterling Tebbett (right) monitoring how coral communities change over time. North Pt, Lizard Island, 10 December 2024



### Dr Christopher Hemingson

2025 Charles Warman  
Foundation Fellowship

The University of Texas at Austin, USA



### Understanding the drivers of diverse colouration on coral reefs and their susceptibility to environmental change

Both the organisms that build reefs (hard-skeleton corals) and residents that call them home (including fishes) possess an almost unimaginable diversity of colours and patterns, many of which are only found in reef ecosystems. Since the times of Darwin and Wallace, scientists and naturalists have worked towards understanding how these unique colourations function; whether that be to attract mates, indicate individual health, or provide camouflage from predators. Why this diverse colour palette evolved in the first place still remains poorly understood.

Some coral species have intricate growth forms that provide refuge to resident fishes from predators. This protection, paired with the colourful appearance of many coral species, are thought to be two important traits that generally support more colourful fish communities. Yet, exactly how each of these features attract and shape fish communities with different appearances has not been explored.

Chris will use custom, 3D-printed mini reefs that vary in colour and shape to understand what habitats attract and promote colourful fish communities. These structures will be deployed on the reef and surveyed daily to learn which shapes and colours fishes prefer to call home and how that relates to their appearance. Additionally, a model fish species will be reared in aquaria on different coloured habitats to study its capability to change appearance to match the local environment. Ultimately, this research will highlight the factors responsible for supporting colourful fish communities and how fishes can cope with changing visual environments.

### Dr Jennifer Mallon

2025 Isobel Bennett  
Marine Biology Fellowship

Nova Southeastern University,  
Florida, USA



### Quantifying calcification by distinct functional groups in reef benthic metabolism measurements

Coral reefs are constructed over millennia from the calcium carbonate skeletons of corals and calcifying algae to create some of the largest living structures on Earth. Through the process of calcification, they protect coastlines from storms and provide structurally complex habitat for biodiverse inhabitants.

This project builds upon existing methods for measuring calcification by corals and calcifying algae. Measuring their rates of growth in the field has been a challenge due to the slow timescales on which these organisms build their skeletons. In this study, a biogeochemical approach will be used to measure real-time in-situ benthic metabolism at sites close to the LIRS. Seawater samples will be collected using benthic chambers known as the Community In Situ Metabolism system to measure metabolism over small areas of single organisms. In addition to measuring calcification, the team will also collect data on photosynthesis and respiration of the calcifying organisms for an enhanced understanding of the carbon cycling driving accretion of coral reef ecosystems.

The project will go a step further by applying a novel technique to tease apart the relative contributions of different types of calcifiers by identifying the distinct calcium carbonate types precipitated by reef organisms. While corals produce aragonite skeletons, calcifying algae form high-magnesium calcite structures, and other reef organisms, such as molluscs, create low-magnesium calcite shells. The different modes of calcification will be detected from changes in seawater metal composition, as the distinct modes of calcification use distinct ratios of key minerals from the water column to build their skeleton types. By measuring alkali metal uptake, it will be possible to define relative contributions by distinct calcifiers to overall community calcification. Understanding the contributions of these distinct functional groups to reef calcification is important for predicting the future resilience of coral reefs under climate change.

### Dr Wyatt Million

2025 Maple-Brown Family  
Foundation Fellowship

University of Technology Sydney



### BREATH: Benchmarks of resilience evaluated across thresholds of hypoxia

Ocean deoxygenation – defined as the loss of biologically available oxygen in seawater – can limit the ability of coral to produce the energy needed to grow, reproduce, or respond to stress and it can also directly cause mortality. Because increasing sea temperature reduces the ability of seawater to hold and replenish its oxygen, the mild deoxygenation prevalent on reefs today will only intensify with the occasional severe deoxygenation events becoming more frequent as the climate continues to change.

Hypoxia is a biological state where oxygen supply is inadequate to sustain normal functioning within an organism relative to that under normal oxygen conditions. Unlike humans, some corals can survive under extremely low oxygen for hours to days, even when there is not enough oxygen to support their main energy production process – aerobic respiration. Therefore, to accurately determine the consequences of ocean deoxygenation, it is important to characterize not only the limits of aerobic energy production but the point at which coral can no longer survive the oxygen loss. This project seeks to assess both aerobic and sublethal/lethal thresholds to identify the consequences of short, mild deoxygenation (aerobic impacts) and also prolonged, severe hypoxia (sublethal and lethal impacts).

Lizard Island is an excellent place to explore concepts in coral deoxygenation due to the diversity of species and habitats occurring in the area. Previous work has uncovered a variety of strategies among coral species to deal with hypoxia so access to such diversity will ensure this project provides a comprehensive assessment across species.

A good understanding of coral tolerance to ocean deoxygenation is required to predict how ocean deoxygenation will change the species composition, coral cover, growth, and success of restoration on future reefs. Wyatt's research will target this gap in knowledge using multiple ocean deoxygenation experiments that characterize the hypoxia tolerance of Lizard Island corals.



# Lizard Island Reef Research Foundation

<b>Founder</b>	Ms Allison Haworth-West
The late Sir John Proud	Mrs Wendy King
	Mr James Kirby
<b>Patrons</b>	Mrs Anna Le Deux
Mr Andrew Green	Prof Lynne Madden
Dr Des Griffin AM	Ms Kim McKay AO
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Mr Charlie Shuetrim AM	Mr Charlie Shuetrim AM
(Chair, Appeal Committee)	Dr Lyle Vail AM
Mrs Greer Banyer	
Prof Larissa Behrendt AO	<sup>1</sup> Died in September 2024
Dr Penny Berents	<sup>2</sup> Died in October 2024
Ms Jennifer Dalitz	<sup>3</sup> New Trustee February 2025
Ms Kylie Doye <sup>3</sup>	<sup>4</sup> Resigned March 2025

We thank Australian Museum staff Dr Shane Ahyong for being part of the Selection Committee in 2024 for LIRRF Fellowships, joining Science Committee members Penny Berents, Kris Helgen, Anne Hoggett and Lyle Vail (Chair of Selection Committee). The incoming Directors of LIRS (Dr Emily Howells and Dr David Abrego) for providing input into the selection process.



The Lizard Island Reef Research Foundation (LIRRF) is an independent trust established in 1978 to conduct and support scientific research at LIRS and elsewhere on the Great Barrier Reef. LIRS would not be the place that it is without the support of the LIRRF.

Visit [lirrf.org](http://lirrf.org) to learn about the Foundation and the research it supports and to donate to its worthy causes. All donations of \$2 or more are tax deductible in Australia.

Supporters are recognised at several levels.

- Friends donate any amount below \$1,000 in a year.
- Members donate \$1,000 or more in a year.
- Major Supporters have a history of recent donations exceeding \$20,000 in total.
- Principal Supporters have donated between \$20,000 and \$100,000 in total, with support continuing in recent years. Individuals and Institutions are listed separately in this category.
- Life Members donate at least \$100,000 which may be spread over several years.

Members and higher-level supporters are listed on page 28 and 29.

## LIRRF Board

There were no board changes in 2024. Trustees meet four times a year and they are responsible for meeting the Foundation’s objectives, including raising funds for LIRS. As chair, Kate Hayward is instrumental in organising fundraising initiatives and keeping supporters informed. Trustee Charlie Shuetrim is chair of the Appeal Committee and manages the Foundation’s finances.

## Vale

Two giants in the history of LIRS and the LIRRF died during the year.

Raymond Kirby AO was a passionate supporter of the LIRRF over many decades, both personally and through the James N. Kirby Foundation. He was a LIRRF Trustee from the mid-1980s through 2014, was Chair from 1986 to 1990, and served as one of LIRRF’s foundation Patrons. Current LIRRF Trustee James Kirby is Raymond’s son.

Professor Frank Talbot AM, then Director of the Australian Museum, was the founder of LIRS in the early 1970s. He retained his interest in and passion for coral reef science and LIRS throughout his long and illustrious career as a scientist and leader of scientific institutions. Frank was a Patron of the LIRRF.

Raymond and Frank have both left bequests to the LIRRF.



LIRRF trip June 2024 left to right – Mark McGovern, Penny Berents, Megan Hender, Julie Viney, Andrew Collett, Peter Berents, Charlie Hayward, Yi-Kai Tea, Connor Jephcott, Katherine Gambini, Kate Hayward.



Projects and equipment in 2024

In the 2024 financial year, the LIRRF contributed a total of \$395,900 to research, education and upkeep of LIRS that underpins its ability to facilitate those activities.

- \$116,355 for research through its fellowships and grants program
- \$54,850 for an educational program, Lizard Island Coral Reef Study Tour
- \$91,130 for painting Kirby and Suntory Houses and the solar frame
- \$62,124 for roofing works
- \$22,316 to replace equipment including saltwater pumps
- \$13,385 for electrical works including load analyses for a future electrical upgrade
- \$8,871 to replace honour boards and signage
- \$7,188 to refurbish dinghy Primrose
- \$6,500 to develop plans for future 5-metre research dinghies
- \$13,181 for regular projects including microscope maintenance

The Australian Museum Research Institute also contributed to some infrastructure improvements this year from its capital budget. The 18-year-old cool room used for food storage was replaced, four 30 hp outboard motors for dinghies were replaced, and the Station’s 10-year-old 4WD vehicle was repainted and thoroughly overhauled.



Above: Cher Chow (2024 Ian Potter Foundation Doctoral Fellow) mapping coral at North Point.

Below: Cher Chow with Matthew-James Bennett. This team works with Dr Maria Dornelas, who received critical grant funding to map coral recovery, funded by the Charles Warman Foundation.

50th Anniversary infrastructure projects

As LIRS celebrated its 50th Anniversary last year, the LIRRF started an ambitious fundraising campaign to commemorate it. Two million dollars was targeted for two major items of infrastructure that will help LIRS remain at the forefront of coral reef research for the coming decades. Thanks to some exceptional support, we’re well on the way with pledges and donations totalling \$1.8 million to date.

A new air-conditioned laboratory is needed to provide adequate laboratory space, especially during the busy summer period. It will accommodate up to eight researchers with their equipment. Funding for this facility is secure thanks to a generous donation by Life Member Rowena Danziger AM in memory of her late husband and former LIRRF Chair, Ken Coles AM. Rowena wishes the new laboratory to be named: Anne Hoggett and Lyle Vail Laboratory given in Memory of Ken Coles by his wife Rowena Danziger.

An additional staff house is needed to accommodate a planned increase in the number of staff at LIRS and to allow for greater flexibility in filling staff positions. Since 1990, LIRS has operated with only four full-time staff. During that period, capacity has increased by nearly 50% (from 25 to 37 visitor places) and usage has increased proportionally. Many donors have contributed to this project to date with notable contributions from the Thyne Reid Foundation, the James N. Kirby Foundation, the Maple-Brown Family Foundation, an anonymous Foundation, the Sapphire Project, Lady Potter AC, Tim Fairfax AC, Sally White OAM, Jay & Greer Banyer, The Raymond E Purves Foundation and Mark McGovern.

Design of the new lab is close to completion and design of the house commenced in early 2025. Construction of both buildings is planned to commence in May 2026.

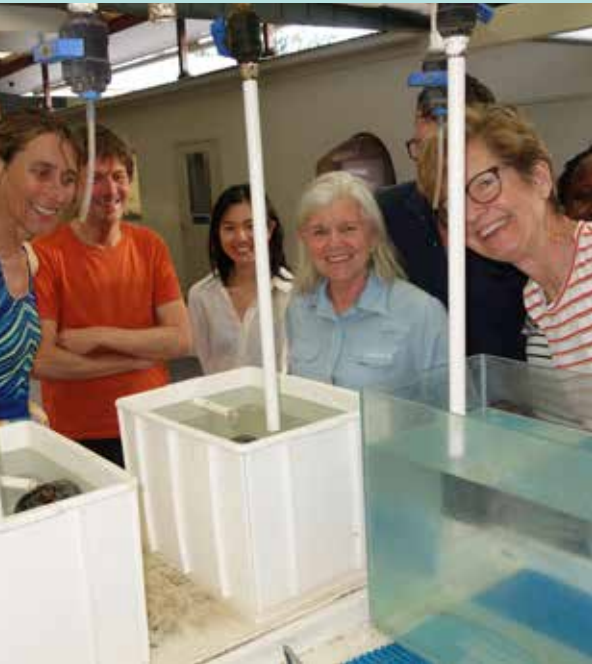


Schematic of The Anne Hoggett and Lyle Vail Laboratory given in Memory of Ken Coles by his wife Rowena Danziger. Credit PAC Architects

Electrification project

LIRS currently produces about 95% of its electrical needs from solar energy with battery storage. We seek to reduce carbon emissions further by replacing gas cooking appliances with electric ones. This prompted a thorough assessment of the current system, including capacity of existing underground cabling as well as solar and battery capacity, with options for future upgrades.

With funding from the LIRRF, Tropical Energy Solutions (Townsville) analysed the system this year and provided a comprehensive report which will inform decision-making about future electrification of LIRS. We thank LIRRF Life Member Jay Banyer for his assistance in summarising the technical details of this complex report.



LIRRF trip September 2024 – Scientist Dr Sven Uthicke and his team sharing their eDNA and COTS research with LIRRF visitors.



## Coral Reef Study Tour

The third annual Lizard Island Coral Reef Study tour took place in September 2024. Nineteen teachers from NSW schools took part, in contrast to the previous tours which were for 16 high school students with two teachers.

This program is a seven-night, live-in educational experience at LIRS that is fully funded by the LIRRF except for small contributions made by some participants. The program was conceived and organised by former LIRS Director Anne Hoggett. Day-to-day operations and the educational content are provided by Reef Ecotours. Dr Andy Lewis and Dr Cristiana Damiano, Reef Ecotours again led the Tour this year.

Participants are selected through a competitive process: 58% were from public schools, 56% taught Years 11 & 12, 27% taught Years 7-10 and 16% taught at primary schools, 63% were female, and the single Indigenous applicant was successful.

"My teaching will be most impacted by the stories pertaining to the rich connection between the Great Barrier Reef and the original custodians of the land, especially given my context working in a school with a demographic of 99% Aboriginal students," according to a teacher.



Another said, "As teachers we need to help create passionate stewards of the Earth by sharing moments of wonder like those we have experienced on this trip. The incredible adaptations of reef animals and symbiotic relationships of many are marvellous examples that we can share both with images and stories to again inspire the students in our care to love and protect our reefs."

Both types of tour have proven to be very successful, and we are delighted to announce that two tours are planned for 2025 – one is for students and two teachers as in 2022 and 2023, and the other is for teachers only. This is possible thanks to generous donors to the LIRRF who share our conviction that these educational experiences for students and teachers are both beneficial and highly leveraged, having widespread benefits for the community into the future. The Corella Fund and the Peters Family Foundation provided funding for the 2024 trip and one of the 2025 trips. The other 2025 trip is supported by the Big Blue Ocean Foundation.

## Events

LIRRF events keep its supporters in touch with activities at LIRS and with coral reef issues. They are organised by a group of LIRRF Trustees, led by Chair Kate Hayward.

### Indigenous archaeological research at Jiigurru (Lizard Island Group)

Professor Sean Ulm (Director of the ARC Centre of Excellence for Indigenous and Environmental Histories and Futures at James Cook University) gave a fascinating talk to LIRRF supporters at the Australian Museum Theatre on 31 July 2024 about his extensive archaeological research concerning Indigenous custodianship and use of the island. The talk was followed by an engaging panel discussion with four Directors of the Walmbaar Aboriginal Corporation led by its Chair, Kenneth McLean, who answered questions from the audience.

### Visits to LIRS

LIRRF Chair Kate Hayward led trips to LIRS in June and September 2024 for small numbers of invited donors, Trustees and other supporters. Participants took part in the daily life of the Station, meeting with researchers, attending presentations about reef topics and experiencing the reef first-hand by snorkelling expeditions. Participants are listed on page 22.

## Lizard Island Resort

The luxurious Lizard Island Resort provides an exceptional base from which to experience the Great Barrier Reef. Delaware North, operator of the Resort, is a long-term supporter of LIRS and of LIRRF.

Each year Delaware North donates to LIRRF a generous three-night stay at the Resort for two people that includes return transfers by light aircraft from Cairns, accommodation, meals, beverages and more. This wonderful package is used to raise funds.

In addition, current LIRRF Members (i.e., those who have donated \$1,000 or more in the last 12 months) qualify for a 20% discount on any stay of 3 or more nights at the Resort, except in the last week of October and in the Christmas-New Year period. See [lirrf.org](http://lirrf.org) for information about making a booking.

When you are on the island, please be sure to visit the Research Station to see how your donation is being put to good use. For more information about the Resort, visit [lizardisland.com](http://lizardisland.com).

## Donations

LIRRF operates with very low overhead costs, and it provides a highly efficient channel for donations to support science on the Reef. LIRS would not exist and could not continue without donor support.

Various options for donating are available online at [lirrf.org/donate](http://lirrf.org/donate). All donations of \$2 or more are tax deductible in Australia.



Scan to  
donate online



# For the record

## Weather and reef health

In late January, Cyclone Kirrily caused disruption to activities at LIRS but no damage to the island. It crossed the coast near Townsville and brought strong north-westerly winds to Lizard which kept researchers out of the water for several days and caused breakage to some corals at exposed sites.

It has been eight years since the devastating mass coral bleaching event of 2016 when Lizard Island was Ground Zero. Water temperature was just as high for just as long in early 2017 and that would have caused mass mortality of corals too if there had been any susceptible ones left to kill. In the following years, corals recovered amazingly in some areas such as North Point, to the extent that they looked beautiful again by January 2024. Unfortunately, that was not the situation everywhere – the lagoon remains a long way from recovery.

Even though bleaching has occurred every year since 2020 at Lizard Island, the heat stress that caused it did not persist for long enough to kill many corals – most recovered and continued to grow and reproduce.



Severe coral bleaching

When corals started to bleach again in early February 2024 in response to elevated sea temperature, we hoped that would be the case again. But it was not to be. By mid-March, many corals were dead or dying. By April, the fifth mass bleaching on the GBR and the fourth global mass bleaching had been declared.

This is the first mass bleaching event on the GBR that includes all three sectors: south, middle, and north. By early May at Lizard Island, at least 80% of shallow water *Acropora* corals were dead in water shallower than 5 metres. Virtually all were less than seven years old, having settled since the 2016/2017 bleaching event. This is the second worst coral bleaching event ever recorded at Lizard Island after 2016. Unlike that earlier event, corals deeper than about 5 metres were only slightly affected and corals at the outer reef were largely spared.

Fortunately, despite the bleaching event earlier in the year, there were still enough corals left in water deeper than 5 metres to contribute to a big coral mass spawning event – the main nights were 29 and 30 November.



Mass coral spawning

## Staff

Dr Lyle Vail AM and Dr Anne Hoggett AM completed 34 years as joint Directors in August 2024. In late 2023, they decided it was time to pass the baton to others and advised the Australian Museum they would retire in late 2024. The Museum conducted an international recruitment process during the year and selected Dr Emily Howells and Dr David Abrego, both from Southern Cross University, to succeed them. David and Emily took up their new positions in early 2025.

Anne and Lyle believe LIRS is in a strong position to continue its successful support of coral reef research under new leadership.

“We leave Lizard with a feeling of enormous personal loss – for the amazing environment and the fabulous research community that have been our lives for so long. But it feels like now is the right time to step out and rejoin mainstream society. Coral reefs are in a period of enormous change. It’s been both a privilege and a challenge to observe those changes first-hand while being so closely involved with the science that tries to understand them and mitigate harm. LIRS plays an outsized part in that global effort. We’re proud of its contribution to knowledge by the researchers who use its facilities and of its role in educating both students and the public about reef issues. The Australian Museum trusted us to realise our vision for the Station and the LIRRF supported it, providing both funding and much-valued guidance to achieve it. We are deeply indebted to both organisations. We have many valued friendships forged at LIRS and a lifetime of cherished memories to take with us into the future. We wish Emily and David all the joy and fulfillment that we have experienced,” said Anne and Lyle.

Arthur Davie and Ruth Carr have completed almost four years as Maintenance Officer and Accommodation Officer, respectively.

Snow Amos, Renie Amos and Kerry Sackett filled in while Ruth and Arthur were on leave. All three have been regular volunteers and occasional fill-in staff at LIRS for many years. Former LIRS staff member Marianne Pearce also filled in when Lyle Vail was on leave. We sincerely thank all of them for their assistance.

## Volunteers

Volunteers are essential to LIRS operations and we value their contributions highly. They assist maintenance staff with a wide range of essential maintenance work including cleaning, grounds work and jobs that utilise any specific skills they may have. Without the generosity of volunteers, LIRS would not be the place that it is.

Our wonderful volunteers in 2024 are listed on page 22. Several among them have volunteered more than once, led by Renie Amos who has been contributing her time almost annually for more than 30 years. Ian Hardie’s contribution as a licenced electrician was invaluable, for the second consecutive year.

## Lizard Island Field Guide

Lizard Island Field Guide (LIFG) is an online guide to the life of Lizard Island, both terrestrial and marine. The LIFG website (<http://lifg.australianmuseum.net.au/Hierarchy.html>) is usually updated continuously but in 2024 no additions or updates were made while backend changes were made to improve cybersecurity. The Guide will continue to be expanded and updated from 2025.

We thank the LIRRF for its ongoing support for this initiative. LIRRF Trustee Geoff Shuetrim created and develops the website. LIRS Director Anne Hoggett curated the content. Former LIRS staff Marianne Pearce entered collection data. We thank Armin Aschoff for his pro bono work in making the site compliant with NSW Government cybersecurity requirements.



Learning reef monitoring techniques, Coral Reef Study Tour for teachers.



Bench fees

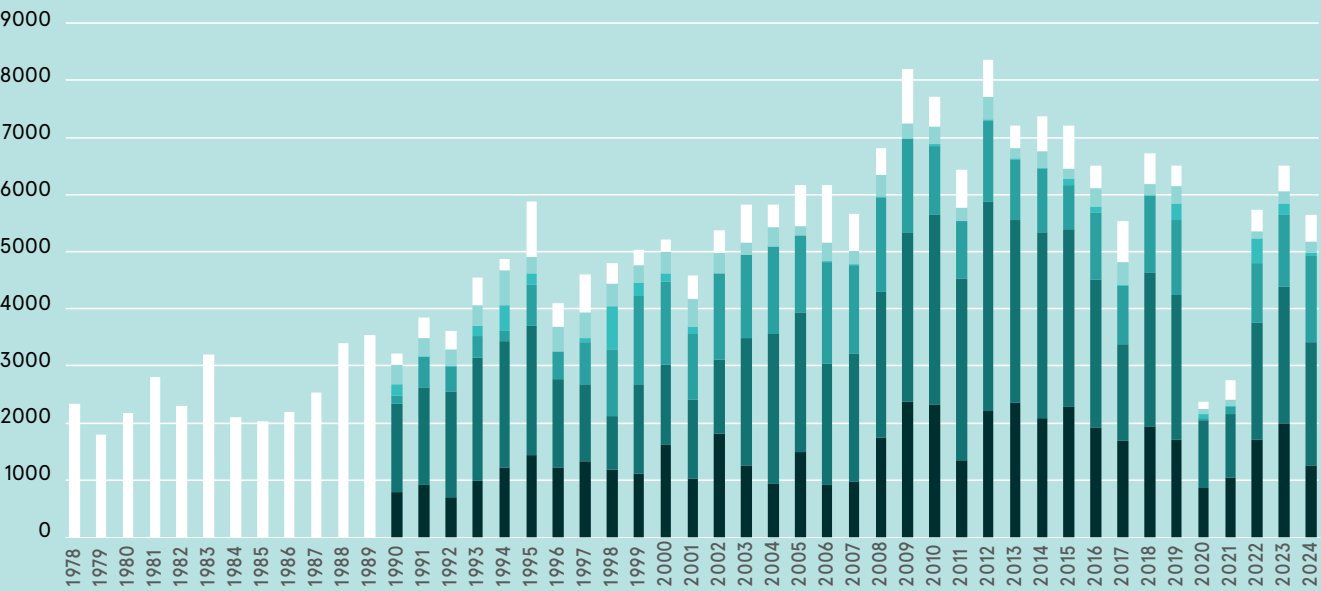
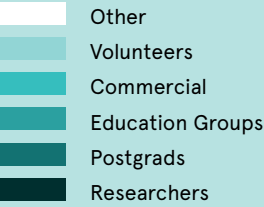
Per person per night, including GST	2024	2025
Researcher	\$158.00	\$174.00
Researcher’s assistant	\$142.00	\$156.00
Postgrad student (own project)	\$61.00	\$67.00
Postgrad’s assistant	\$56.00	\$63.00
School or university group	\$101.00	\$111.00
Media	\$238.00	\$262.00
Commercial	\$298.00	\$328.00



Coral reef community

Usage

Occupancy was 5619 visitor nights in 2024, substantially lower than the optimum 7000. This was mainly due to operational considerations with the changeover to new directors.



Visitors in 2024

Scientists from 35 institutions in 13 countries conducted 83 research projects in 2024. Of these, 26 were led by senior scientists or postdocs, 36 by PhD candidates, 13 by MSc candidates, 1 by an Honours candidate and 7 by undergraduate research students. The researchers are listed here with project titles and institutional affiliations.

Institutions

Australian

1. Australian Institute of Marine Science
2. Australian National University
3. Central Queensland University
4. Curtin University
5. James Cook University
6. Macquarie University
7. Murdoch University
8. Queensland Museum
9. Queensland University of Technology
10. Southern Cross University
11. University of Newcastle
12. University of Queensland
13. University of Sydney
14. University of Tasmania
15. University of Western Australia

International

16. California State University Monterey Bay, USA
17. College of Charleston, USA
18. Duke University, USA
19. Georgia Southern University, USA
20. Florida International University, USA
21. King Abdullah University of Science and Technology, Saudi Arabia
22. Osaka Metropolitan University, Japan
23. School for International Training, USA
24. Università degli Studi di Milano-Bicocca, Italy
25. University of Bern, Switzerland
26. University of Bristol, UK
27. University of California Davis, USA
28. University of Exeter, UK
29. University of Geneva, Switzerland
30. University of Hawaii, USA
31. University of Lisbon, Portugal
32. University of North Carolina Wilmington, USA
33. University of Otago, New Zealand
34. University of Oxford, UK
35. University of Pennsylvania, USA
36. University of Neuchatel, Switzerland
37. University of St Andrews, UK



Senior scientists and postdoctoral researchers

Rohan Brooker, Miles Parsons, Daniel Pygas and others<sup>1</sup>  
Reef Song: an ecosystem-based approach to enhancing reef recovery and resilience

Fabio Cortesi<sup>12</sup>  
Comparative brain morphology of coral reef fishes

Scott Cutmore<sup>12</sup>, Tom Cribb<sup>12</sup>, Terry Miller<sup>8</sup>, Nick Wee<sup>8</sup> and Storm Martin<sup>7</sup>  
Biodiversity of trematode and monogenean parasites infecting fishes of the Great Barrier Reef

Peter Doll<sup>5</sup> and Scott Ling<sup>14</sup>  
Quantifying predation rates on Crown-of-Thorns Starfish relative to fisheries management zones and corresponding differences in abundance of putative predators

Maria Dornelas<sup>37</sup>, Joshua Madin<sup>30</sup> and Viviana Brambilla<sup>31</sup>  
Understanding coral reef recovery from extreme disturbances using 3D maps

Matthew Dunbabin<sup>9</sup>  
CoralBots for benthos classification, impact and restoration assessment

Matthew Dunbabin<sup>9</sup>  
Payloads and behaviour for robotic reef monitoring

Peter Harrison<sup>10</sup>  
Moving Corals RRAP Coral Larval Restoration

Andrew Hoey<sup>5</sup>  
Differential recovery of coral- and macroalgal-dominated areas following repeated disturbances

Emily Howells<sup>10</sup>  
Genetic basis of variation in coral heat tolerance

Scott Ling<sup>14</sup>  
Short-term turf dynamics – persistence stability of turfs

Mike McWilliam<sup>5</sup>  
The importance habitat geometry for coral reef productivity

Michalis Mihalitsis<sup>27</sup>  
Feeding kinematics reveal novel axes of niche partitioning in herbivorous coral reef fishes

Sophie Nedelec<sup>28</sup>  
Snap maps

Alexandra Ordonez Alvarez<sup>10</sup>  
Reef-based research exploring the role of crustose coralline algae species on coral larvae settlement and survival for coral larval restoration purposes

Amanda Pettersen<sup>15</sup>  
Investigating the metabolic ecology of Crown-of-Thorns Starfish larvae

Chiara Pisapia<sup>21</sup>  
Measuring reef accretion and bio erosion rates

Steve Purcell<sup>10</sup> and Brendan Kelleher<sup>10</sup>  
Long-term recapture of tropical sea cucumbers to reveal lifespans and home ranging

Elias Samankassou<sup>22</sup>, Chiara Pisapia<sup>15</sup> and Daniela Basso<sup>18</sup>  
Understanding coral thermal bleaching thresholds during past interglacial extremes: Insight into thermal stresses dynamics on tropical coral reef ecosystems (RESILIENCE)

Alexandre Siqueira Correa<sup>4</sup>  
The evolution of a critical ecosystem function for the future of coral reefs

Sterling Tebbett<sup>13</sup>  
The boom-and-bust future of coral reefs in the Anthropocene

Zegni Triki<sup>25</sup>  
A pilot exploration of sex-changing fish abundance around Lizard Island house reef

Sven Uthicke<sup>1</sup> as field leader for Florita Flores<sup>1</sup>  
Naturally occurring radioactive material on tropical marine organisms

Sven Uthicke<sup>1</sup> and Jason Doyle<sup>1</sup>  
eDNA detection of Crown-of-Thorns Starfish

Jane Williamson<sup>6</sup>  
Assessment of long-term dietary factors of the sea cucumber *Holothuria atra*

Kennedy Wolfe<sup>12</sup> and Sven Uthicke<sup>1</sup>  
Detecting cryptic predators of the Crown-of-Thorns Seastar

Research students

Marine Amann<sup>36</sup> with supervisor Redouan Bshary<sup>36</sup>

Impacts of (a) growth rate and (b) a climatic event on cognition and brain development in the cleaner fish *Labroides dimidiatus* (PhD)

Helen Armstrong<sup>7</sup>  
Taxonomy and biodiversity of the Cryptogonimidae (Trematoda) parasitic in fishes (PhD)

Juan Azofeifa Solano<sup>4</sup>  
Decoding coral reef soundscapes of Lizard Island (PhD)

Carlos Barbanoj Arnaiz<sup>36</sup>  
Behaviour of facultative clients of the common cleaner fish (MSc)

Matthew-James Bennett<sup>29</sup>  
Coral community effects on early post-settlement dynamics (PhD)

Casey Bowden<sup>5</sup>  
Water flow ecology: How reef structure and water flow shape the world of fishes (PhD)

Michelle Brayshaw<sup>3</sup> with supervisor Justin Marshall<sup>12</sup>  
Sex-change, screens and the secret signals of the Scaridae (MSc)

Rowan Carew<sup>12</sup>  
Lizard Island pipefish visual ecology and distribution (PhD)

Leo Chiu-Leung<sup>5</sup>  
Mapping the Great Barrier Reef Soundscapes from shelf to shore (PhD)

Cher Chow<sup>37</sup>  
Biodiversity and productivity relationships in coral reef ecosystems (PhD)

James Cordery<sup>34</sup> with supervisor Cait Newport<sup>34</sup>  
Sensory pollution and fish navigation on coral reefs (PhD)

Emer Cunningham<sup>12</sup>  
Detecting ecological novelty in coral reef communities (PhD)

Alejandra Daniel<sup>19</sup> and Meg Van Horn<sup>32</sup>  
Lizard Island coral cover changes after the 2024 bleaching event (MSc)

Lenin De Silva<sup>7</sup>  
Biogeography of fish trematode fauna in the Indo-West Pacific (PhD)

Eric Fakan<sup>5</sup>  
Exploring the stress response of coral associated fishes to bleaching events (PhD)

James Gahan<sup>5</sup>  
Planktivorous fishes on coral reefs: a trophic exploration (PhD)

Katrina Giambertone<sup>16</sup> and Hannah-Marie Lamle<sup>20</sup>  
Analyzing coral population size structures through marine heatwaves (MSc)

Estelle Girod<sup>36</sup>  
Cleaner wrasse and client interactions: cleaner cheating rate and client responsiveness (MSc)

Ben Glass<sup>35</sup> and Piper Zola<sup>17</sup>  
Coral morphology and genus drive differential patterns of prolonged bleaching (MSc)

Alan Gojanovic<sup>15</sup>  
Breaking the bottleneck: methods for enhancing post-settlement survival in coral reef fishes (PhD)

Hannah Gower<sup>28</sup>  
Behavioural ecology of snapping shrimp trapped on patch and natural reefs (PhD)

Lauren Hasson<sup>10</sup>  
Juvenile coral survival (MSc)

Dominic Hayes<sup>33</sup> with supervisor Bridie Allan<sup>33</sup>  
Assessing thermal response curves of escape performance in coral reef fish (MSc)

Jessica Hodge<sup>26</sup>  
Long-term monitoring of sites around Lizard Island using past data (PhD)

Carina Hosford<sup>23</sup>  
An investigation into the diet and health of Crown-of-Thorns Starfish after a bleaching event at Lizard Island, Great Barrier Reef (Undergraduate)

Emily Jackson<sup>20</sup> and Josette McLean<sup>18</sup>  
Environmental impacts on humbug damselfish density and behavior (MSc)

Elly Jenkins<sup>23</sup>  
Analyzing how substrate composition affects Chaetodontidae abundance and diversity around Lizard Island (Undergraduate)

Brooklyn Johnson<sup>5</sup>  
Shifts in the functional and taxonomic composition of reef fish following repeated coral bleaching (MSc)

Eleanor Kelly<sup>33</sup> with supervisor Bridie Allan<sup>33</sup>  
The effect of oil exposure and elevated temperature on the predator-prey dynamics of coral reef fish (PhD)

Taiga Kobayashi<sup>122</sup>  
Verification of metacognition in cleaner fish focusing on the ability to build complex social relationships (PhD)

Sarah Lok Ting Kwong<sup>1</sup>  
Age determination in Crown-of-Thorns Seastar using DNA tools (PhD)

Keolohilani Lopes<sup>30</sup>  
Development of ChondriaBot (PhD)

Elara Lugt<sup>36</sup>  
Switching and queuing behaviours in cleaner wrasse – client interactions (MSc)

Ryan McAndrews<sup>5</sup> with supervisors Jenni Donelson<sup>5</sup> and Megan Head<sup>2</sup>  
The evolution and ecology of reciprocal cooperation among *Siganus doliatus*, a coral reef rabbitfish (PhD)

Kristen McSpadden<sup>11</sup>  
Diet and size at maturity of sea cucumbers (PhD)

Florian Moix<sup>36</sup>  
Clients’ response to cheating by the common cleaner wrasse, *Labroides dimidiatus* (MSc)

Juliano Morais<sup>5</sup>  
Coral recovery dynamics on post-bleach coral reefs (PhD)

Melissa Naugle<sup>10</sup>  
Identifying genomic markers of heat tolerance in *Acropora hyacinthus* (PhD)

Isabelle Ng<sup>5</sup>  
The evolution of diet, habitat, and morphology in reef fishes (PhD)

Erin Papke<sup>32</sup> and Elizabeth Weatherup<sup>32</sup>  
Crappy cucumbers: How do sea cucumbers alter sediments through their digestion? (MSc)

Basile Pasquini<sup>36</sup>  
Impact of environmental perturbations on cleaner fish cognition (MSc)

Letizia Pessina<sup>36</sup> with supervisor Redouan Bshary<sup>36</sup>  
Life history of cleaner fishes (PhD)

Evelyn Sage<sup>14</sup>  
Key threats to invertebrates of inshore habitats (PhD)

Carl Santiago<sup>12</sup>  
Host sharing and territorial aggression in anemonefishes: investigation the formation of mixed species groups around Lizard Island, Great Barrier Reef (PhD)

Clara Seinsche<sup>12</sup>  
Plasticity and colour vision behaviour in coral reef fish (MSc)

Abigail Shaughnessy<sup>12</sup>  
Seasonal visual function in Pomacentridae (PhD)

Emma Smith<sup>10</sup>  
Efficacy of using drones for quantifying tropical sea cucumber populations (Hons)

Runting (Tori) Wang<sup>12</sup>  
Cryptic diversity of *Xystretrum* species infecting triggerfishes of the Great Barrier Reef (MSc)

Anna Wilson<sup>5</sup>  
Genetic diversity of *Asparagopsis taxiformis* populations within Queensland (PhD)

Devynn Wulstein<sup>30</sup>  
Self-thinning in coral assemblages as they recover from disturbance (PhD)



Education groups

Ascham School

- Led by Reef Ecotours staff Christiana Damiano, Erin O’Brien and Emily Horton and teachers Tamara Heath, Emily Mathey and Sarah Wilson

Barker College

- First group for teachers led by Tim Binet and Sarah Cormio
- Second group for students led by Tim Binet, Sarah Cormio and Alison Pope

Emmanuel Anglican College

- Led by Justine Jacob, Daniela Pyne, James Pearson and Paul Pryor

Lizard Island Coral Reef Study Tour

- Led by Reef Ecotours staff Andy Lewis, Christiana Damiano and Emily Horton

RMIT University

- Led by Jeff Shimeta, Nathan Bott and Kathryn Hassel

School for International Training

- Both groups led by Tony Cummings, Vanessa Messmer, Sailor Benitez and Jason Turl

Sea Women GBR

- Led by Coral Sea Foundation staff Christiana Damiano and Emily Horton

Other visitors

Australian Museum

- Jose Koechlin (Inkaterra Peru), Liza Massias and Gabriel Meseth accompanied by Australian Museum scientist Amanda Hay
- Dr Emily Howells and Dr David Abrego

Lizard Island Reef Research Foundation

- LIRRF Chair Kate Hayward with LIRRF Trustee Penny Berents & Peter Berents, Andrew Collett & Meagan Hender, Katherine Gambini & Mark McGovern, Charlie Hayward, Connor Jephcott, Yi-Kai Tea, and Julie Viney
- LIRRF Chair Kate Hayward with Sam Armstrong & Abesi Mwenda, Will Hayward, Robbie Hayward & Amanda North, LIRRF Trustee James Kirby and Claire Wivell Plater, Dave & Liz Sheen, and Steve & Katrina Weir
- LIRRF Trustee Greer Banyer with family

Media and creative

- BBC Natural History Unit filming team: Katy Moorhead, Alex Vail, Alexia Graba-Landry, Berenice Mathieu and Kent Holmes
- Agence France-Presse journalists Laura Chung, David Gray and Andrew Leeson
- Playwright Michael Linney, Ascham School

University of Sydney

- Managers of One Tree Island Research Station Ruby Holmes and Heinrich Breuer with son Lukas

Services and trades

- Charlie Makray and Julie Armour, first aid training
- Australian Institute of Marine Science, GBROOS maintenance: Scott Gardner, Mark Chinkin and Ivor Bruce
- Queensland Parks and Wildlife Service, island maintenance: three teams led by Katie Bampton, Lewis Wycherley and Ethan Nihot respectively
- Tropical Energy Solutions, Ben Wilson and Nicholas Jonsson, preparation for future increase in electrification of LIRS
- Stratford Painting Contractors, team led by Troy Owen, painting works
- FNQ Hot Water, Henry Sciani and David Sciani, replace solar hot water systems
- J&R Refrigeration, Jonathan Mitchell-Donnelly, Jack Smith and Crispin Offman, replace cool room
- Telstra, team led by Scott Collins, upgrade voice communications from 3G network

Volunteers

- Renie Amos
- Rosamund Allen
- Simon Dunn
- Ann Dunn
- Martine Farley
- Paul Guenther
- Fenella Hardie
- Ian Hardie
- Liri Latimore
- Zoe Latimore
- Ceri Pearce
- Paul Pryor
- Karen Thomas
- Maxime Willems





# Publications

1. Ahnelt, H., O. Macek and V. Robitzsch, 2024. *Schindleria nana*, a new extremely progenetic gobiid fish species (Teleostei: Gobiiformes: Gobiidae) from Lizard Island, Great Barrier Reef, Australia. *Journal of Vertebrate Biology*, 73: 23112.

2. Alvarez-Noriega M, J.S Madin, A.H. Baird, M. Dornelas and S.R. Connolly, 2023. Disturbance-induced changes in population size structure promote coral biodiversity. *American Naturalist*, 202:5 604–615.

3. Aston, E., 2023. Quantifying and assessing coral reef structural complexity and its role in ecological processes and dynamics using photogrammetry. PhD Thesis, James Cook University.

4. Bacchus, M.D., P. Domenici, S.S. Killen, M.I. McCormick and L.E. Nadler, 2024. Kinematic performance declines as group size increases during escape responses in a schooling coral reef fish. *Frontiers in Fish Science*, 1: 1294259.

5. Bellwood D.R, S.J. Brandl, M. McWilliam, R.P. Streit, H.F. Yan and S.B. Tebbett, 2024. Studying functions on coral reefs: past perspectives, current conundrums, and future potential. *Coral Reefs*, 43: 281–297.

6. Bellwood, D.R. and S.B. Tebbett, 2024. Habitat trumps biogeography in structuring coral reef fishes. *Coral Reefs*, doi.org/10.1007/s00338-024-02556-y.

7. Brown K.T., A. Genin, M.A. Mello-Athayde, E. Bergstrom, A. Campili, A. Chai, S.G. Dove, M. Ho, D. Rowell, E.M. Sampayo and V.Z. Radice, 2023. Marine heatwaves modulate the genotypic and physiological responses of reef-building corals to subsequent heat stress. *Ecology & Evolution*, doi 10.1002/ece3.10798.

8. Byrne, M., P. Cisternas, T.D. O’Hara, M.A. Sewell and P. Selvakumaraswamy, 2024. Evolution of maternal provisioning and development in the *Ophiuroidea*: egg size, larval form, and parental care. *Integrative and Comparative Biology*, 64(6), 1536–1555.

9. Chandler, J.F., W.F. Figueira, D. Burn, P.C. Doll, A. Johandes, A. Piccaluga and M.S. Pratchett, 2024. Predicting 3D and 2D surface area of corals from simple field measurements. *Scientific Reports*, 14: 20549.

10. Coghlan, A., 2023. Drivers of reef fish community trophic structure and function. PhD thesis, University of Tasmania.

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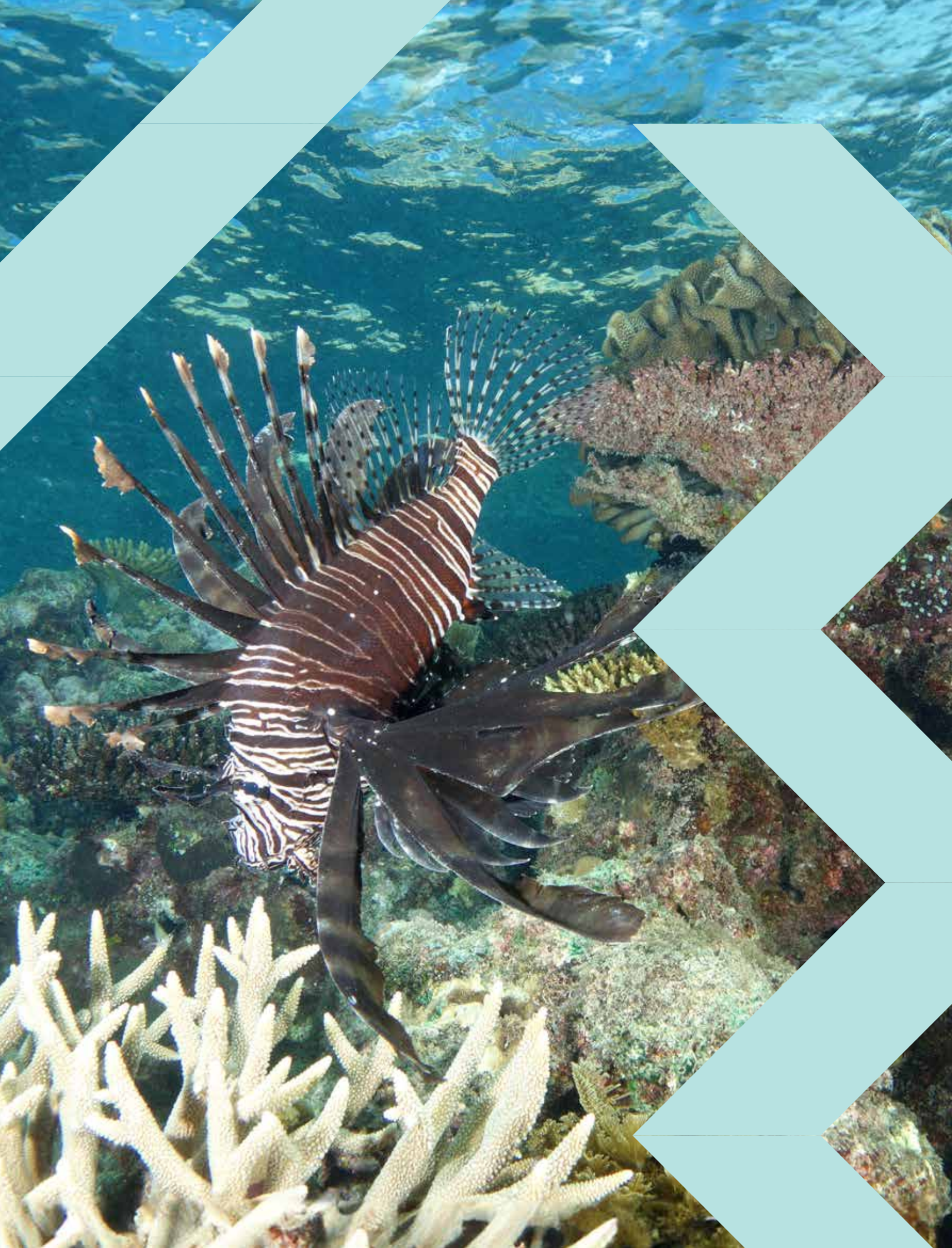
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