2026 AIMS@JCU Seminar Day

5th June

Abstract Booklet

Townsville Yacht Club

AIMS@JCU

Seminar Day 2026
Friday, 5th June

Townsville Yacht Club

Time	Title	Presenter/Chair
9.30am	**Welcome to Country**	
9.45am	**Welcome & housekeeping, AIMS@JCU Research Director**	**Dr. Cherie Motti**
10.00am		
	Session 1:	
10.00am	Disentangling Symbiodiniaceae Sequence Variation: An Investigation of Sources of Biological Diversity and Technical Misclassification	Josie Danckaert
10.15am	Reef location and season strongly influence gene expression of reef-associated seawater microbial communities	Grace Yarger
10.30am	Multi-Symbiont Inoculum Boosts Coral Thermotolerance	Elizabeth Ivory
10.45am	Development of a point-of-need molecular assay for pathogen detection in coral aquaculture	Sean Asgari
11.00am	Transferring ReefSeed Coral-Seeding Technology to Remote Communities for Reef Restoration	Crystle Wee
11.15am	**Morning tea**	
	Session 2:	
11.45am	Experimental Turbidity Exposure Produces Variable Physiological Responses in *Seriatopora hystrix*	Aidan Ritchie
12midday	The potential role of marine sponges in the regulation and removal of excess nutrients, microplastics and emerging contaminants	John Kerigan
12.15pm	Synthesis and Characterisation of Sustainable Plasticisers	Sarah Ghobish
12.30pm	Establishing a Baseline of Microplastic Occurrence in Dugong and Marine Turtle Faecal Samples from Cleveland Bay, Queensland	Jay Harris
12.45pm	Soundscape variation among habitats at Lizard Island	Leo Chiu-Leung
1.00pm	**Lunch**	
1.45pm	**AIMS@JCU Alumni Key Note Speaker**	**Dr. Christopher Brunner**
2.15pm	**AIMS@JCU Triad Networking**	**Dr. Andrew Johnson & Dr. Cherie Motti**
3.15pm	**Posters, afternoon tea**	
	Session 3: Speed Talks: 5MT format	
3.45pm	Accessing the hidden genomes of vertically transmitted coral symbionts	Sophie Renton
3.52pm	Regional variation in coral bleaching resilience during the 2024 Great Barrier Reef mass bleaching event linked to chlorophyll-a concentrations	Kelsey Kingsbury
3.59pm	Aligning Narrative and Evidence: A Systematic Review of Marine Protected Area Policy Claims	Myles Philips
4.06pm	Investigating Diverse Knowledges for Sharks and Rays in North Queensland Sea Country	Courtney Burns
4.13pm	**Short Break**	
	Session 4: Speed Talks: 3MT format	
4.20pm	Is 2 better than 1: coral chimerism and fitness trade-off	Seth Keep
4.25pm	Change In Water Nutrients Through River Influxes	Ashoi Dantra
4.30pm	Building long-term monitoring capacity for Tonga's coral reefs and inshore fisheries	Viliami Fatongiatau
4.35pm	Contested Knowledge: Linking Epistemic Recognition to Justice in Marine Conservation and Resource Management - A Systematic Review	Rayhan Dudayev
4.40pm	From Coral Immunity to Combating Antimicrobial Resistance: A Novel Antimicrobial Peptide from *Heliofungia actiniformis*	Rana Elmesseri
4.45pm	Environmental DNA (eDNA) as a proxy for reef fish monitoring on the Great Barrier Reef	Lara Bau
4.50pm	Developing Physiological and spawning synchrony thresholds of *Pocillopora acuta* under long-term inshore light spectra of the Great Barrier Reef	Aidan Ritchie
4.55pm	Home away from home: Improving husbandry of captive Giant Triton Snails (*Charonia tritonis*) at the National Sea Simulator.	Chloe Ferrara
5.00pm	**Judges deliberation; drinks and canapes for networking event**	
5.30pm	**Presentation of awards and prizes, closing remarks**	**Dr. Cherie Motti**

Crystle Wee

JAMES COOK UNIVERSITY AUSTRALIA

Australian Government

Australian Institute of Marine Science

AIMS@JCU Seminar talks

Judging guidelines are as follows:

12 minute presentation; 3 minutes question time. Student talks should be kept to 12 minutes with 3 minutes for questions. Student seminar talks will be judged based on the following components: The Quality of the abstract, Statement of hypotheses (introduction and statement of hypothesis), Clear Objectives, Methodology, Importance of Subject, Innovation and originality, General quality of presentation (grammar, flow, visual appeal of slides, clarity of speech), and the presenter's handling of questions.

Quality of the abstract
Student abstracts should be kept to 250 words and should be formatted as a scientific abstract for a journal article or scientific conference. Abstracts should be well written, indicate the scientific merit of the research presented (quality of science presented and leading edge of field). Usually, abstracts begin with a clear statement of an issue and end with a substantive conclusion.

Statement of hypotheses
This component is based on the introductory portion of the talk. This section of the talk sets up the context of the work and gives a statement of the hypothesis. This component will be scored based on whether the rationale is well explained and the question or hypothesis is clearly stated.

Clear Objectives
The presentation will be judged on whether the objectives of the work are clearly stated.

Clear Methodology
This judging component is to asses both the methodology of the work as well as the results presented. This component will be assessed on whether the methods and analyses used were appropriate (with regards to results presented).

Importance of Subject
This is to judge whether the speaker clearly expresses the importance of the work both in terms of the particular field and broader scientific context.

Innovation and originality
This is to assess the originality of the research and/or methodology.

Traditional Owner acknowledgement
Appropriate, respectful and genuine acknowledgement of Traditional Owners relevant to the project location.

General Quality of Presentation
This portion is to assess the general quality of the presentation visually (grammar, spelling, overall visual appeal of slides) and speaking quality of the presenter (pronunciation, ability to communicate ideas, ability to answer questions clearly). This section will be judged based on: quality of speaker, quality of slides (grammar, spelling, visual appeal, organization of talk), and speaker skills in answering questions.

Seminar Talk - 10.00am

Disentangling Symbiodiniaceae Sequence Variation: An Investigation of Sources of Biological Diversity and Technical Misclassification

Danckaert JE[a,b,c], Ivory EA[a,c,d], Cooke IR[b] & Nitschke MR[a,b,c]

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Coral reefs are currently facing the existential threat of mass bleaching due to climate change, and therefore, increased research attention has been placed on the role of Symbiodiniaceae in promoting resilience through maintaining symbiosis. However, to assess variable thermal tolerance benefits of Symbiodiniaceae strains, tools to clearly identify closely related species are needed . Commonly used tools are prone to technical error, leading to ambiguity in the genetic delineation of phenotypically distinct lineages. This research aims to interrogate lines of evidence from several case studies to find patterns of technical error and true biological diversity, and provide strategies for improving accuracy of Symbiodiniaceae diversity analyses. To detect technical error, case studies will be analysed using common quality control pipelines: Minimum Entropy Decomposition and the Divisive Amplicon Denoising Algorithm 2. This could reveal errors that have bypassed filters , causing overestimations of biological diversity and wasted effort describing identical strains. Additionally, I will conduct an rRNA secondary structure analysis to assess the legitimacy of nucleotide variation from an evolutionary perspective . To assess case studies for biological diversity, I will sequence an additional genetic marker (psbA^{ncr}) on voucher samples, to compare with existing data from those samples (using the ITS2 marker) and test for congruence between markers. This will help determine whether multiple related lineages coexist in a sample , and test for speciation. Overall, this research will result in tools that researchers can use to detect fine-scale biological differences while avoiding the issue of overestimating biological diversity in Symbiodiniaceae genotypes due to technical error.

I would like to acknowledge that all physical samples analysed come from Manbarra Country, and were collected with the Free, Prior, and Informed Consent of the Manbarra people. My research also integrates datasets from around the world, so I would like to acknowledge the diversity of Indigenous cultures worldwide in the areas where this data was collected.

Seminar Talk - 10.15am

Reef location and season strongly influence gene expression of reef-associated seawater microbial communities

Yarger, GC[a,b,c], Laffy, PW[b,c], Shopina, O[d], Bell, SC[b], Bourne, DG[a,b,c] & Yeoh, Yun Kit[b,c]

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Seawater microbial communities play important roles in the health of coral reef ecosystems. Taxonomic composition, and more recently, functional gene profiles of reef-associated seawater microbial communities on the Great Barrier Reef (GBR) have been shown to correlate with environmental and reef health metrics. As such, we hypothesise that gene expression patterns of seawater microbial communities are influenced by the reef environment and potentially associated with ecosystem health. Here, we collected seawater in triplicate from two inshore and two mid-shelf reefs on the GBR seasonally for one year (April, August, November 2021, March 2022) for metagenomic and metatranscriptomic sequencing. Seawater microbial community composition significantly differed across reef and season ($P<0.001$, PERMANOVA), where species richness and diversity at all four reefs were consistently highest in the November samples. *Parasynechococcus* was the most relatively abundant taxa overall (22.31%), whereas *Pelagibacter* became dominant in November samples (23.57%). For RNA mapping, 2864 metagenome-assembled genomes (MAGs) passing quality checks were generated through metagenome assembly and genome binning, representing 607 unique species at 95% average nucleotide identity. RNA mapping to the MAGs revealed gene expression activity primarily differed between inshore vs. mid-shelf reefs, with 217 MAGs significantly more transcriptionally active in inshore reefs and 249 MAGs in mid-shelf reefs (adjusted $p <0.05$, DESeq2). Members of the family *Puniceispirillaceae* were transcriptionally active on inshore reefs while members of the family *Poseidoniaceae* and genus *Pelagibacter* were more active in mid-shelf reefs. These results indicate microbial community composition and gene expression are closely associated with spatial and temporal variables.

We acknowledge the Manbarra, Wulgurukaba, and Bindal Peoples as the Traditional Owners of the land and sea Country where these research activities were conducted, and pay respects to Elders past, present, and emerging.

Seminar Talk - 10.30am

Multi-Symbiont Inoculum Boosts Coral Thermotolerance

Ivory EA[a,b,c], Mieog JC[a], Nitschke MR[b], van Oppen MJH[b,d] & Abrego D[a,e]

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[e]*Lizard Island Research Station, Australian Museum, Sydney, New South Wales, Australia*

The frequency and severity of bleaching level thermal stress events faced by coral reefs in recent years has made it clear that their natural adaptation capacity is struggling to keep pace with rapid climate warming. Interventions, such as the use of heat-evolved coral symbionts, may accelerate the rate at which corals can adapt. Recent research has confirmed that providing corals with these novel symbionts does increase their resilience to bleaching, but their potential when used in concert with other symbionts remains unexplored. Here we show that the intervention of using heat-evolved symbionts can be synergistic, with inoculum containing two heat evolved symbionts (one Cladocopium and one Durusdinium strain) increasing bleaching resilience by 6 DHWs beyond what could be achieved using individual heat evolved strains. Additionally, we show that hosting a second symbiont strain (heat evolved or wild type Cladocopium or Durusdinium), even at low abundance (< 7%), can provide a significant increase in bleaching resilience when compared to corals hosting only one strain. Our results suggest that providing corals with multiple heat-evolved symbionts could enhance resilience to climate warming further than previously expected, and that background symbionts may play a major role in dictating coral bleaching resilience.

Traditional Owners to be acknowledged: Wulgurukaba, Bindal, and Manbarra.

Seminar Talk - 10.45am

Development of a point-of-need molecular assay for pathogen detection in coral aquaculture

Asgari S[a], Sato Y[b], Doyle J[b] & Bourne D[c]

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Production of corals for the aquarium trade and reef-restoration initiatives is increasing, yet disease outbreaks remain an issue capable of causing high mortality in captive environments. Early detection is important for potential interventions; however, conventional diagnostics require multi-hour protocols poorly suited to time-sensitive aquaculture settings. Here, I developed a rapid, point-of-need pathogen detection assay for coral aquaculture utilizing recombinase polymerase amplification (RPA) and CRISPR-based fluorescent detection. The assay was optimized for sensitivity and specificity using DNA from 7 strains of the model coral pathogen *V. coralliilyticus* and 6 non-target *Vibrio* species, with performance validated by limit of detection (LOD) analysis. Real-world performance was assessed using water samples from tanks holding diseased and healthy *Acropora tersa* corals, with results cross-validated by Droplet Digital PCR (ddPCR). With the optimized assay, a highly sensitive and specific detection is achieved in as little as 20-30 minutes. *V. coralliilyticus* was detected in both diseased and baseline tank samples, consistent with its known role as an opportunistic pathogen present at low background levels in marine systems. With further optimization, semi-quantitation of target DNA may be achievable. Establishing signal thresholds would address the practical challenge of a hypersensitive assay as ddPCR distinguished baseline levels from pathogenic loads of concern. Assays of this design could improve coral aquaculture management by enabling frequent, rapid screening and triggering prompt interventions.

Traditional Owners to be acknowledged: Bindal and Wulgurukaba peoples.

Seminar Talk - 11.00am

Transferring ReefSeed Coral-Seeding Technology to Remote Communities for Reef Restoration

Wee SYC[a], Randall CJ[b], Giuliano C[b], Severati A[b], Page C[b], Abdul Wahab M[b], Ali K[c], Mueen FS[c], Ibrahim FR[c], Ahmed N[c] & Doropoulos C[d]

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Most coral restoration projects occur at small scales, often through asexual fragmentation and requiring hours of manual labour. Larval aquaculture is an alternative method that can scale up restoration while producing genetically diverse recruits. Furthermore, it offers advantages such as selective breeding and assisted evolution, increasing the resilience of transplanted corals against thermal stress and disease. However, such aquaculture systems typically require complex infrastructure and high technical capacity, making them difficult to implement in remote locations. ReefSeed presents a solution to these constraints. ReefSeed is an inter-agency and international collaboration to produce a portable, containerised aquaculture system for the purpose of scalable larval-based restoration. Since its construction in October 2024, the system has undergone four trials in Australia and the Maldives. This presentation showcases the preliminary findings of our trials in both countries, the process of technology transfer, and the key challenges faced in understanding Maldivian coral reproduction patterns.

Traditional Owners to be acknowledged: Maldives: Maldives Marine Research Institute Australia: Bindal and Wulgurukaba.

Seminar Talk - 11.45am

Experimental Turbidity Exposure Produces Variable Physiological Responses in *Seriatopora hystrix*

Ritchie, AJ[a], Cartwright, P[a], Brunner, C[b], Duce, S[a], Jerry, D[a] & Sweetman, AK[c]

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Sediment-driven turbidity is an increasing stressor on nearshore reefs, driven by coastal development, dredging and, terrestrial runoff. Turbidity can cause mechanical abrasion, increase energetic costs associated with sediment removal, and attenuate light through the water column. However, the relative contributions of physical sediment stress and light-mediated physiological stress remain difficult to isolate. This study tested whether elevated turbidity altered dissolved oxygen (DO) flux in *Seriatopora hystrix*, using oxygen exchange as a proxy for physiological performance. *S. hystrix* fragments were exposed to a clear-water control, 15 NTU and 150 NTU single-pulse treatments in shallow aquaria, with net DO flux measured using optodes immersed in sealed incubation chambers as an indicator of net photosynthetic activity. Incubation lasted for 2-hour periods over four days, with six pseudo replicates per treatment. We predicted that high turbidity would reduce DO flux, while moderate turbidity could reduce light stress through partial shading. Measured responses were variable, with no consistent decline in DO flux across treatments. However, the 15 NTU treatment exhibited slightly elevated DO flux and reduced bleaching incidence, suggesting moderate turbidity may mitigate light stress through partial shading effects. These findings highlight the difficulty of predicting coral physiological responses from turbidity concentration alone, particularly where altered underwater light environments may produce nonlinear effects.

I acknowledge the Wulgurukaba and Bindal people as the Traditional Owners of the land I work on.

Seminar Talk - 12midday

The potential role of marine sponges in the regulation and removal of excess nutrients, microplastics and emerging contaminants

Kerigan, J[a], Cyrus, M[a], Luter, H[b] Motti, C[b] & Vamounis, G[a]

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Marine environments face persistent water-quality challenges from nutrient enrichment, organic waste, and emerging pollutants like microplastics and plasticizers. Marine sponges are highly efficient filter feeders capable of removing bacteria, particulate organic matter (POM), dissolved organic matter (DOM), and microparticles from seawater. Recent studies suggest that some sponge species may also bioaccumulate microplastics, transform harmful plasticizers, and serve as useful indicators of environmental contamination.

This project investigates the potential of Great Barrier Reef sponges in two contexts. The first is to assess whether selected sponge species can improve water quality under aquaculture conditions by removing nutrients, POM, and DOM, and to evaluate whether co-culture with *Ulva* enhances these effects in integrated aquaculture systems. The second is to determine whether selected sponge species can accumulate microplastics and plasticizers (including BPA, DEHP, and PFAS), whether they metabolically transform these compounds, and whether sponge tissues can serve as reliable bioindicators of pollutant exposure in broader marine environments.

These two research goals will study how native Great Barrier Reef sponges may be applied to different environmental challenges. The aquaculture component will evaluate their potential to support integrated systems through improved water-quality management. The bioremediation and biosential component will assess their utility for tracking and interpreting plastic pollution in marine environments. This project will identify species with practical value for sustainable aquaculture and coastal environmental monitoring.

Traditional Owners to be acknowledged: The Manbarra and Bindal people

Seminar Talk - 12.15pm

Synthesis and Characterisation of Sustainable Plasticisers

Ghobish, S[a,b], Vamvounis, G[a,b,e]; Motti, C[b,c], Bissember, A[d] & Cyrus, M[a,b,e]

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In aquatic environments, plastic waste breaks down into microplastics, which significantly accelerate the leaching of toxic chemical additives - particularly plasticizers - into the ecosystem. These compounds pose both physical and chemical threats to marine organisms. As a result, there is an increasing demand for sustainable, eco-friendly alternatives to conventional plastic additives. This study focuses on the design and synthesis of bio-based plasticizers with an emphasis on sustainability and environmental safety. Computer-aided molecular design was employed to assess compatibility with common polymers. The plasticizers were synthesized via a single-step, cost-effective, and scalable reaction, supporting practical industrial application alongside environmental compatibility. Performance evaluation in polymer formulations was conducted using thermogravimetric analysis (TGA) to evaluate thermal stability and differential scanning calorimetry (DSC) to assess plasticization efficiency. Results showed high thermal stability and effective reductions in glass transition temperature (*Tg*) with the newly designed plasticizers relative to di(2-ethylhexyl) terephthalate (DEHT), a widely used conventional plasticizer. In addition to being derived from renewable bio-based sources, the newly developed plasticizers exhibited low aquatic toxicity. Toxicity assays using marine species such as *Artemia franciscana* showed mortality rates below 10% at concentrations of 100 mg L^{-1}. To further support these findings, *in-silico* toxicity assessments were performed using quantitative structure–activity relationship (QSAR) models to predict drug likeness and ADMET/TOPKAT profiles. Moreover, molecular modelling and docking studies were conducted with key endocrine receptors including androgen (AR), thyroid hormone (TR), and estrogen receptors (ER) to assess potential endocrine disruption. These computational evaluations support the environmental safety and marine compatibility of the newly developed bio-based plasticizers.

We acknowledge the Australian Aboriginal and Torres Strait Islander peoples as the traditional owners of the lands and waters where we live and work.

Seminar Talk - 12.30pm

Establishing a Baseline of Microplastic Occurrence in Dugong and Marine Turtle Faecal Samples from Cleveland Bay, Queensland

Harris J[a,b,c], Santana, M[a], Cleguer C[b], Tol S[c], Motti C[a,d] & Vickers K[a]

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Microplastic pollution represents an emerging and poorly quantified threat to marine megafauna, particularly within coastal environments where anthropogenic pressures are high. Despite increasing concern, baseline information on microplastic contamination in threatened marine species remains limited. Dugongs (Dugong dugon) and marine turtles are listed as threatened species under the IUCN Red List and are ecologically important herbivores within tropical seagrass ecosystems, making them relevant indicator species for assessing microplastic exposure in nearshore habitats.

This student-led preliminary study aims to establish a baseline assessment of microplastic presence, abundance, and diversity in faecal samples of dugongs and marine turtles within Cleveland Bay, Townsville, Queensland. Faecal samples were collected opportunistically from the sea surface during vessel-based surveys using a net, with concurrent seawater samples collected at the same locations to enable environmental comparison. In addition to microplastic analysis, faecal samples were examined for the presence and identification of seagrass seeds to provide insight into dietary composition and potential ingestion pathways.

Microplastics were isolated using density separation techniques and visually classified under microscopy, with polymer identification conducted using Fourier Transform Infrared (FTIR) spectroscopy. Strict contamination control measures, including procedural blanks and material tracking, were implemented throughout all stages of sampling and laboratory processing to minimise secondary contamination. At the time of submission, analyses are ongoing and no results are yet available. This study will provide foundational baseline data on microplastic occurrence in threatened dugongs and marine turtles within Cleveland Bay and contribute to the development of non-invasive, contamination-aware methodologies for future monitoring and conservation-focused research.

Traditional Owners to be acknowledged: The Bindal and Wulgurukaba peoples.

Seminar Talk - 12.45pm

Soundscape variation among habitats at Lizard Island

Chiu-Leung, LC[a,b], Hoey A[b], Azofeifa Solano JC[d,c], Kemp J[e,c], Brooker R[c] & Parsons M[c,d]

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Underwater soundscapes provide useful information on habitat type and condition through the sounds produced by the associated soniferous community. We examined these relationships at 12 sites across four shallow marine habitat types (Coral, Rock, Rubble, and Sand) around Lizard Island, northern Great Barrier Reef, Australia. In each of three sampling periods, we collected simultaneous passive acoustic recordings (up to 8 days, with up to 12 sites surveyed in each period) and compared these to diver-based visual surveys of fish and benthic communities during one of the sampling periods. A selection of ecoacoustic metrics based on the Soundscape Code were extracted from acoustic recordings and a summary output developed to represent the soundscape pattern for each day, at each site. PERMANOVA results indicated that variation in the soundscapes was influenced by sampling period, time, habitat, location, as well as environmental factors such as coral cover and the Shannon-Weiner index. While this model was able to capture a large portion of the community variation, between group variability was also not equal, reflecting environmental variability. Spatial distribution in an NMDS space were also plotted, with strong within site clustering. Daily soundscape metrics were more associated with coral cover and fish diversity than categorical allocation of habitat type or site location, reflecting the gradient of changing soniferous community associated with benthic attributes at each site. These findings highlight the ability of soundscapes to differentiate among locations in close spatial proximity, and to provide insights into how these acoustic differences are driven by community factors.

Traditional Owners to be acknowledged: The Thaanill-warra, Ngurruumungu and Dhingaal People.

AIMS@JCU Speed talks

5-minute presentations:
4 minute presentation; 1 minute of questions. The required format and judging guidelines for the 5 minute speed-talks will follow those of the ICRS with which most students would already be familiar, with the addition of a 300 word abstract. There are no limits on slides for this format.

The decision of the adjudicating panel is final.

3-minute presentations:
3 minute presentation; 1 question. The required format and judging guidelines for the 3 minute speed-talks will follow those of the national 3MT competition with which most students would already be familiar, with the addition of a 100 word abstract. The 100 word abstract should be an extended title of the presentation, which indicates the importance and context of the research and its outcomes.

The presentation should follow the following format:

- A single static PowerPoint slide is permitted. No slide transitions, animations or 'movement' of any description are allowed. The slide is to be presented from the beginning of the oration.
- No additional electronic media (e.g. sound and video files) are permitted.
- No additional props (e.g. costumes, musical instruments, laboratory equipment) are permitted.
- Presentations are limited to 3 minutes maximum and competitors exceeding 3 minutes are disqualified.
- Presentations are to be spoken word (e.g. no poems, raps or songs).
- Presentations are to commence from the stage.
- Presentations are considered to have commenced when a presenter starts their presentation through either movement or speech.
- The decision of the adjudicating panel is final.

Judging guidelines are as follows:

Comprehension & Content

- Was the abstract well written, and did it capture the importance and context of the research that was presented?
- Did the presentation provide an understanding of the background to the research question being addressed and its significance?
- Did the presentation clearly describe the key results of the research including conclusions and outcomes?
- Did the presentation follow a clear and logical sequence?
- Was the thesis topic, key results and research significance and outcomes communicated in language appropriate to a non-specialist audience?
- Did the speaker avoid scientific jargon, explain terminology and provide adequate background information to illustrate points?
- Did the presenter spend adequate time on each element of their presentation - or did they elaborate for too long on one aspect or was the presentation rushed?

Engagement & Communication

- Did the oration make the audience want to know more?
- Was the presenter careful not to trivialise or generalise their research?
- Did the presenter convey enthusiasm for their research?
- Did the presenter capture and maintain their audience's attention?
- Did the speaker have sufficient stage presence, eye contact and vocal range; maintain a steady pace, and have a confident stance?
- Did the PowerPoint slide/s enhance the presentation - was it/were they clear, legible, and concise?

5-minute Speed Talk - 3.45pm

Accessing the hidden genomes of vertically transmitted coral symbionts

Renton, SC.[a,b,d], Cooke, IR[a] Nitschke, MN[b] & Chan, CX[c]

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[b]*Australian Institute of Marine Science, Townsville, Australia*
[c]*University of Queensland, Brisbane, Australia*
[d]*AIMS@JCU, Townsville, Australia*

Photosynthetic microalgae of the family Symbiodiniaceae are essential symbiotic partners to many reef organisms, importantly reef-building corals. Corals rely on endosymbiotic algal symbionts for resource acquisition and acquire them either **indirectly** from the environment via **horizontal transmission** or **directly** from parents via **vertical transmission**. Vertically transmitted symbionts, despite being indispensable to keystone reef species, such as *Porites* and *Montipora*, remain understudied due to the inability to maintain them *ex hospite*, limiting their availability for experimental and genomic investigation. This study presents the first high-level genomic insight into the vertically transmitted symbiont *Cladocopium* C15, through the generation of a highly contiguous genome assembly (total length = 1.41 Gb, N50 = 634.22 kb) enabled by a novel, culture free isolation method and PacBio HiFi sequencing technology.

Traditional Owners to be acknowledged: Manburra, Bwgcolman, Bindal and Wulgurukaba.

5-minute Speed Talk - 3.52pm

Is 2 better than 1: coral chimerism and fitness trade-off

Keep, SD[a,b], Bourne, DG[a,b,c], Page, CA[a,c] & Smith, HA[a,b,d]

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Corals have hidden strategies to cope with environmental stress including rising ocean temperatures driven by rapid climate change. One strategy is chimerism, a process where individuals fuse with others to form a single organism. My study investigated chimerism in newly settled Acropora kenti spat to understand when fusion occurs, with whom, and whether it improves survival under heat stress. By testing how relatedness influences fusion and tracking survival outcomes, we reveal how "teaming up" may help young corals cope with climate change—and what trade-offs this strategy might entail.

Experimental work for this research project was conducted at AIMS SeaSim facilities, located on the traditional land of the Bindal people. Additionally, free prior informed consent was obtained from Manbarra and Bwgcolman Traditional Owners on behalf of AIMS for coral broodstock collection.

5-minute Speed Talk - 3.59pm

Regional variation in coral bleaching resilience during the 2024 Great Barrier Reef mass bleaching event linked to chlorophyll-a concentrations

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Anthropogenic climate change is driving more frequent, severe, and prolonged marine heatwaves, leading to mass coral bleaching and mortality across the globe, including on the Great Barrier Reef. Coral bleaching resilience varies widely across reef regions, yet the drivers underpinning this variability remain poorly resolved. Increasing evidence suggests that heterotrophic plasticity—fuelled in part by ambient food availability—may influence a coral's capacity to survive thermal stress. Chlorophyll-*a* is frequently used as a proxy for phytoplankton biomass and particulate food supply, but its functional links to post-bleaching survivorship have not been evaluated for such a variety of genera and at such broad and varied spatial scales. Here, we integrate regional chlorophyll-*a* climatologies with bleaching and mortality observations from the 2024 mass bleaching event across the Great Barrier Reef to test whether background productivity, and therefore increased heterotrophy, mediates coral thermoresilience. Using satellite-derived chlorophyll-*a* data paired with in-water health assessments and changes in coral cover, we show that reefs within more highly-productive regions exhibited significantly lower bleaching-related mortality prevalence. These findings indicate that regional differences in heterotrophic feeding capacities may buffer coral energetic deficits during heating events, potentially enhancing post-bleaching resilience. This study links patterns in trophic flexibility to spatial heterogeneity in bleaching-related mortality and highlights the importance of trophic context in predicting future climate-driven reef outcomes, particularly in an era of accelerating ocean warming.

Traditional Owners to be acknowledged: Cape Grenville = Wuthathi, Princess Charlotte Bay = Lama Lama, Lizard Island = Dingaal, Cairns = Yirrganydji, Capricorn Bunkers = Bailai, Gooreng Gooreng, Gurang and Taribelang Bunda.

5-minute Speed Talk - 4.06pm

Aligning Narrative and Evidence: A Systematic Review of Marine Protected Area Policy Claims

Phillips, M[a], Adams, V[b], Smallhorn-West, P[a] & Hoey, A[a]

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[b]*University of Tasmania, Tasmania, Australia*

Narratives shape how complex conservation issues are communicated, simplifying processes into claims that guide policy and management. In international agreements such as United Nations' Convention on the Law of the Sea and the Convention on Biological Diversity, marine protected areas (MPAs) are framed as solutions to conservation challenges. However, these narratives evolve and face critique as they are applied across regions and stakeholders. This study uses the Narrative Policy Framework in a systematic review to evaluate whether dominant MPA policy narratives are supported by empirical evidence, and under what conditions these claims hold true.

My desktop study took place at the JCU Bebegu Yuma Campus, and I acknowledge the Bindal and Wulgurukaba Peoples as the Traditional Owners and Custodians of this Land. I pay my respects to Elders past and present, and extend that respect to all Aboriginal and Torres Strait Islander peoples here today.

5-minute Speed Talk - 4.13pm

Investigating Diverse Knowledges for Sharks and Rays in North Queensland Sea Country

Burns, C[a,b,c,d,e], Mills, K[a,d], Bierwagen, S[b,c], Grech, A[d,e] & Maclean, K[f]

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[f]*Commonwealth Scientific and Industrial Research Organisation, QLD, Australia*

Sharks and rays (elasmobranchs) are vital to the ecological health of the Great Barrier Reef (GBR) and hold deep cultural, spiritual, and relational significance for Indigenous peoples through story, kinship, Dreaming, and obligations to sea Country. Despite these rich and place-based relationships, Indigenous knowledges of elasmobranchs remain largely absent from marine science, where Western ecological models continue to dominate how these species are studied and managed. This dominance narrows the discursive and methodological conditions through which sharks and rays become knowable, reflecting long-standing tensions at what Nakata (2007, 2010) describes as the Cultural Interface. This project responds to these gaps through a three-component mixed methods research design that brings marine science and Indigenous knowledge into dialogue on Bindal sea Country, part of the central GBR.

Component 1 examines how elasmobranchs are made knowable within Western science, through a marine ecological assessment; Component 2 adopts a participatory approach to work with Bindal Traditional Owners, using focus groups and interviews, to explore how sharks and rays are understood, experienced, and related to within Bindal knowledge systems; and Component 3 braids these findings through Cultural Interface Theory, analysing the discursive, ontological, and epistemic conditions that shape what counts as knowledge about sharks and rays on Bindal sea Country in North Queensland. Across the three components, the project aims to illuminate how different knowledge systems produce different versions of elasmobranchs, and how these versions converge, diverge, or speak past one another. The project will generate a nuanced, place-based understanding of sharks and rays on Bindal sea Country and provide a case study for how knowledge systems can be braided without collapsing their differences.

Traditional Owners to be acknowledged: Bindal Traditional Owners of the Birri Gubba Nation.

3-minute Speed Talk - 4.25pm

Spatial And Temporal Resolution Of Microbial Communities In Response To Change In Water Nutrients Through River Influxes

Dantra AB[a,b,c], Bourne DG[a,b,c], Laffy PW[b,c], Yeoh, YK[b,c] & Gruber RK[b,c]

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[b]*Australian Institute of Marine Science, Cape Cleveland, Australia*
[c]*AIMS@JCU, Townsville, Australia*

The Great Barrier Reef faces escalating pressure from climate change and degraded water quality. Microbial communities, central to nutrient cycling and ecosystem functioning, are impacted by environmental perturbations. However, they are rarely monitored, and where monitoring does exist, their dynamics are not well understood. In inshore locations on the GBR lagoon environmental drivers differ significantly and their impact on microbial communities and function remain poorly understood. This research will develop a framework identifying microbial taxa that reliably reflect coastal stressors and water quality shifts in the GBR.

We would like to acknowledge the Traditional Owners of the Cairns transect Region, where sampling is conducted, Eastern Kuku Yalanji, Yirrganydji and Gunggandji people. We pay our respects to the people, the cultures and the Elders past and present.

3-minute Speed Talk - 4.30pm

Building long-term monitoring capacity for Tonga's coral reefs and inshore fisheries

Fatongiatau, V[a,b,c,d], Smallhorn-West, P[b] & Gainsford, A[d]

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[c]*Australia Institute of Marine Science, Townsville, Australia*
[d]*Ministry of Fisheries, Nukualofa, Tonga*

Tonga's Special Management Area (SMA) program provides a nationally scaled framework for coastal fisheries co-management, yet long-term monitoring of coral reefs and inshore fisheries remains ad hoc. This work explores the development of an integrated monitoring framework combining ecological, fisheries, social, and economic indicators to support adaptive management and policy decision-making. Key considerations include balancing scientific rigor with feasibility in resource-limited contexts, incorporating gender-disaggregated and small-scale fisheries data, and improving recognition of ecosystem service values. Tonga's experience highlights the importance of locally relevant, cost-effective monitoring systems that strengthen co-management, fisheries governance, and resilience to ecological and social change in Pacific Island contexts.

I acknowledge the Wulgurukaba and Bindal People as the traditional Owner of the Land, and I am greatful to the communities of Tonga for their permission to conduct research in their SMAS.

3-minute Speed Talk - 4.35pm

Contested Knowledge: Linking Epistemic Recognition to Justice in Marine Conservation and Resource Management - A Systematic Review

Dudayev, R[a,b,c], Gurney, G[b,d], Foale, S[b] , Lawless, S[a,c,d], Dyer, M[c] & Adhuri DS[e]

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Equity as a governance goal in marine conservation is increasingly recognised. In environmental governance, equity is commonly grounded in environmental justice frameworks, encompassing recognitional, procedural, and distributive dimensions. However, recognitional justice, particularly its epistemic aspect, remains comparatively underexplored, despite its role in shaping broader justice outcome. This study undertakes a systematic review to examine how diverse knowledge systems are conceptualised and how their inclusion relates to equity outcomes in conservation. The findings of the literature review suggest that engaging equity in marine conservation requires not only institutional reform, but also confronting how knowledge, power, and justice are produced and contested.

I acknowledge the Wulgurukaba and Bindal peoples as the Traditional Custodians of the lands and waters where I live and work.

3-minute Speed Talk - 4.40pm

From Coral Immunity to Combating Antimicrobial Resistance: A Novel Antimicrobial Peptide from *Heliofungia actiniformis*

Elmesseri, RA[a,b], Sorenson, AE[a], Miller, DJ[a], Bourne, DG[a,b] & Hoj, L[b]

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[b] *Australian Institute of Marine Science, Cape Cleveland 4810, QLD*

Coral reefs are declining rapidly, yet coral immune defenses, particularly antimicrobial peptides (AMPs), remain poorly understood. While AMPs have been extensively studied in *Hydra*, coral-derived AMPs are largely unexplored. Here, we investigate a novel hydramacin-like AMP identified in *Heliofungia actiniformis*, examining its antimicrobial activity and influence on coral-associated microbial aggregates (CAMAs). We also explore its relationship with the bacterial symbiont *Endozoicomonas*, providing insights into host–microbiome interactions and coral immunity. This work advances understanding of coral immune strategies and highlights the ecological and biomedical potential of this AMP against coral and human pathogens.

I acknowledge the Wulgurukaba and Bindal people as the Traditional Owners of the land I work on.

3-minute Speed Talk - 4.45pm

Environmental DNA (eDNA) as a proxy for reef fish monitoring on the Great Barrier Reef

Bau L[a,b,c], Laffy, PW[b,c], Bourne, DG[a,b,c], Yeoh, YK[b,c], Terzin, M[d], Ceccarelli DM[b] Lim, JY[b] & Cantin, N[b]

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Resource-intensive approaches such as underwater visual census (UVC) monitor reef fish diversity and assess changes in relation to coral ecosystem health. Environmental DNA (eDNA) targets genetic material shed by species into the environment, offering a cost-effective, scalable and sensitive way to detect fish species. My study investigates whether eDNA can assess reef fish populations from water samples collected from the 2024 Great Barrier Reef (GBR) bleaching event, comparing eDNA community profiles with AIMS Long term monitoring UVC fish surveys. If validated, eDNA metabarcoding has the potential to complement UVC surveys, providing a more comprehensive and sensitive monitoring framework for reef fish communities on the GBR.

Traditional Owners to be acknowledged: Aboriginal and Torres Strait Islander Traditional Owners

3-minute Speed Talk - 4.50pm

Developing Physiological and spawning synchrony thresholds of *Pocillopora acuta* under long-term inshore light spectra of the Great Barrier Reef

Ritchie, AJ[a], Cartwright, P[a], Brunner, C[b], Duce, S[a] & Jerry, D[a]

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Turbidity alters the spectral composition of benthic light environments. Current monitoring practices rely heavily on bulk irradiance metrics that fail to capture spectral variation, such as blue light depletion. This project examines whether such changes influence coral photosynthetic performance and broader physiological stress responses, including potential effects on spawning synchrony. We will experimentally manipulate spectral regimes in Pocillopora acuta under simulated light conditions informed by field-derived spectral data. This work aims to inform light thresholds by accounting for spectral composition rather than relying solely on total irradiance.

I acknowledge the Wulgurukaba and Bindal people as the Traditional Owners of the land I work on.

3-minute Speed Talk - 4.55pm

Home away from home: Improving husbandry of captive Giant Triton Snails (*Charonia tritonis*) at the National Sea Simulator

Ferrara, CB[a,b], Bastin, L[c], Cyrus, M[a,d] & Motti, C[b,c]

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Giant Triton snails (*Charonia tritonis*) have been held in the National Sea Simulator since 2017. During this time, they have provided crucial information into their predation methods and potential as a biocontrol for Crown-of-Thorns Starfish (COTS; *Acanthaster planci*). In anticipation of revived efforts to close their lifecycle in captivity, this project aims to improve broodstock welfare by expanding husbandry protocols and incorporating species specific systems design. This will help address biosecurity knowledge gaps concerning their diet of live, wild-caught COTS, and investigate algae control in the broodstock tank through alternate lighting sources and the implementation of a recirculating tank system.

Traditional Owners to be acknowledged: Bindal and Wulgurukaba.

AIMS@JCU Poster Presentations

Judging guidelines are as follows:

- A clear and concise abstract (max 250 words) as per abstract guidelines
- Well planned, laid out & organised – does it pass the test of capturing attention from across the room?
- Clear and easy to read, with good use of aesthetics and colours and without excessive text
- Quality charts & images
- Made good use of literature
- Thoroughly explained visual materials, charts/graphs, etc
- An effective introduction to the research and key outcomes which makes the reader want to find out more

AIMS@JCU Photography Competition

Judging guidelines are as follows:

- Is the image in focus?
- Is the image well composed?
- Is the image interesting/eye catching?
- Does the caption capture the essence of the image?

Poster

Coral juvenile densities across water quality gradients: implications for reef resilience along the Great Barrier Reef

Drake MD[a,b,c], Noonan SHC[a] & Fabricius KE[a]

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The metric of coral juvenile densities (<5 cm diameter) integrates across dynamic recruitment processes and reflects both acute and long-term environmental conditions. As new population entrants, juvenile densities can serve as a measure of reef health. Here we use one-off surveys of coral juvenile densities and their taxonomic identity to identify their primary environmental drivers across a diversity of reef habitats found on the Great Barrier Reef (GBR). The 86 sites investigated included reefs from 10 to 22°S (Torres Strait to the Capricorn Bunker reefs), covered a gradient of water quality conditions, and included 4 within-reef-habitat types and 2 depths. Across all plots (4, 4-5 m transects per site) surveyed mean juvenile density was 16.5 ± 0.5 m-2 (SE), and regional means ranged from 8.1 ± 0.8 m-2 in the turbid-water Southern GBR to 24.4 ± 1.0 m-2 in the clear-water Central GBR. Taxonomic composition was most distinct in the turbid-water Southern GBR region, where assemblages were dominated by Acropora and Fungia and density and richness were lowest. Juvenile densities across the three turbid-water regions were 2-fold lower than the four clear-water regions (8.7 ± 0.4 and 18.9 ± 0.5 m-2, respectively). Preliminary machine learning models support algal turf height and water-quality related factors, such as sediment deposition, as key predictors of densities. Increasing algal turf height and fine sediment weight were consistently associated with lower densities. Based on the metric of juvenile densities, the data suggest that turbid-water reefs are likely at a disadvantage in their capacity to combat more frequent or intense disturbance conditions.

We pay our respects to the custodians of the land and sea on which this work was conducted, we acknowledge the Torres Strait Islander, Dingaal, Gunggandji, Manbarra, Wulgurukaba, Bindal, Woppaburra, Gooreng Gooreng, Gurang, Bailai, and Taribelang Bunda Traditional Owners.

Poster

Fa'angota: A Description of Tonga's Gleaning Fishery

George, RE[a,e], Smallhorn-West, P[a], Gordon, S[b], Lawless, S[ab], Kioa, S[c], Fatongiatau, V[c], Ika, S[c], Finau, MW[c], Malimali, S[c], Stone, K[d], Fakahau, E[c] & Uiketapu, AH[c]

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[c]*Ministry of Fisheries, Kingdom of Tonga*
[d]*VEPA – Vava'u Environmental Protection Association*
[e]*AIMS@JCU*

Coral reef and intertidal ecosystems underpin food security and local economies across the Pacific, yet many nearshore fisheries remain poorly quantified and undervalued. This presentation examines Tonga's gleaning fishery – an artisanal, shore-based activity that targets reef-associated invertebrates from coral flats, seagrass beds, and mangrove areas. Despite its economic and ecological significance, gleaning remains largely absent in national data and coral reef management frameworks.

Drawing on mixed methods research conducted across eight Tongan communities, this work documents taxa composition, effort, catch, and the social functions of gleaning. Findings reveal that gleaning provides substantial household food and income security, particularly for women in low-income coastal communities, and is tied to the health and accessibility of coral reef ecosystems. Across sites, the estimated annual value of gleaned products reveals modest but consistent income, with the activity requiring minimal financial input and maintaining strong links to traditional ecological knowledge and community reciprocity. These results highlight gleaning as both a safety net and an economic driver – providing reliable access to nutritious seafood and cash income, especially in times of crisis, like the COVID-19 pandemic, or adverse weather that limits offshore fishing.

Recognizing gleaning as an integral part of coral reef fisheries addresses a critical data and governance gap. Integrating it into monitoring and management frameworks will not only strengthen the resilience of Tonga's coastal food systems but also improve valuation of reef ecosystem services, equitable policy design, and sustainable management of nearshore coral reef and intertidal ecosystems in Tonga and the wider Pacific.

I acknowledge the Traditional Owners of the land, the Wulgurukaba and the Bindal people, and pay my respects to Elders past, present, and emerging.

Poster

Establishing a Baseline of Microplastic Occurrence in Dugong and Marine Turtle Faecal Samples from Cleveland Bay, Queensland

Harris J[a,b,c], Santana, M[a], Cleguer C[b], Tol S[c], Motti C[a,d] & Vickers K[a]

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[b]*TROPwater Townsville Megafauna Team*
[c]*TROPwater Cairns Seagrass Team*
[d]*AIMS@JCU*

Microplastic pollution represents an emerging and poorly quantified threat to marine megafauna, particularly within coastal environments where anthropogenic pressures are high. Despite increasing concern, baseline information on microplastic contamination in threatened marine species remains limited. Dugongs (Dugong dugon) and marine turtles are listed as threatened species under the IUCN Red List and are ecologically important herbivores within tropical seagrass ecosystems, making them relevant indicator species for assessing microplastic exposure in nearshore habitats.

This student-led preliminary study aims to establish a baseline assessment of microplastic presence, abundance, and diversity in faecal samples of dugongs and marine turtles within Cleveland Bay, Townsville, Queensland. Faecal samples were collected opportunistically from the sea surface during vessel-based surveys using a net, with concurrent seawater samples collected at the same locations to enable environmental comparison. In addition to microplastic analysis, faecal samples were examined for the presence and identification of seagrass seeds to provide insight into dietary composition and potential ingestion pathways.

Microplastics were isolated using density separation techniques and visually classified under microscopy, with polymer identification conducted using Fourier Transform Infrared (FTIR) spectroscopy. Strict contamination control measures, including procedural blanks and material tracking, were implemented throughout all stages of sampling and laboratory processing to minimise secondary contamination.

At the time of submission, analyses are ongoing and no results are yet available. This study will provide foundational baseline data on microplastic occurrence in threatened dugongs and marine turtles within Cleveland Bay and contribute to the development of non-invasive, contamination-aware methodologies for future monitoring and conservation-focused research.

Traditional Owners to be acknowledged: The Bindal and Wulgurukaba peoples.

Poster

Examining cryptic benthic communities in coral restoration (sea-weeding) sites

Hermanto, B[a,c,e], Smith, H[a,d], Page, C[b,c] & Bourne, D[a,b,c]

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Coral reefs are estimated to support more than 25% of global marine biodiversity, with much of this diversity residing in cryptic habitats formed within the interstitial spaces of coral limestone, which comprise approximately 30–75% of reef structure. Cryptic benthic fauna, encompassing annelids, molluscs, arthropods, and echinoderms, perform critical ecological functions as suspension feeders, predators, herbivores, and detritivores; however, their responses to reef restoration activities such as macroalgae removal (sea-weeding) remain poorly understood. This study examined the effects of sea-weeding on cryptic benthic communities at Arthur Bay and Florence Bay, Magnetic Island, Australia. A total of 72 standardised 3D-printed Rubble Biodiversity Samplers (RUBS) were deployed across removal and control plots (12 plots per bay, 3 RUBS per plot) in November 2025 and retrieved after three months, with fauna identified to the family level. A total of 1,008 individuals representing 41 families across six phyla were recorded. Communities were dominated by Nereididae, Maeridae, and Amphiuridae, comprising 42.3% of total abundance. Removal plots exhibited higher abundance (n = 563) and Shannon diversity (H' = 1.75 ± 0.41) than control plots (n = 445, H' = 1.58 ± 0.38), although these differences were not statistically significant. Furthermore, Florence Bay yielded substantially greater abundance (n = 680, H' = 1.81 ± 0.37) than Arthur Bay (n = 328, H' = 1.51 ± 0.38), with significant differences in Shannon diversity between bays. These findings suggest that sea-weeding may positively influence community structure; however, site-specific environmental factors also exert a strong influence on community composition.

I acknowledge the Bindal and Wulgurukaba peoples as the Traditional Custodians of the land on which we gather today and pay my respects to their Elders, past, present, and future

Poster

Microwave Plasma Upcycling of HDPE Plastics to Graphene for Energy Storage and Anti-Fouling Application

Ifeanyieze C[a], Jacob M[a] & Motti C[b,c]

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[b]*AIMS@JCU, Townsville, Australia*
[c]*AIMS, Townsville, Australia*

This research addresses three critical global challenges: escalating microplastic pollution crisis, development of advanced materials for energy storage, and prevention of marine biofouling. The aim is to identify the critical research gaps in the direct application of graphene derived from plastics for energy storage systems and anti-fouling coatings. The study will specifically synthesise graphene using a microwave plasma system, characterise its structural, chemical and morphological properties using Raman, XPS, SEM, and so on, dope the synthesised graphene to enhance its physical and chemical properties, and determine the effect of the graphene on energy storage systems and anti-fouling coatings for marine applications. The study adopts an innovative approach that transforms plastics (especially high-density polyethylene (HDPE)) into high-quality graphene using plasma technology. The graphene produced will be enhanced through doping to improve its physical and chemical properties, thereby supporting dual applications: advanced energy storage systems, including supercapacitors, and marine anti-fouling coatings. The study is expected to synthesise high-quality graphene from the sustainable upcycling of plastic waste; identify the level of defects in the synthesised graphene based on Raman spectrometer results; enhance the physical and chemical properties of the synthesised graphene; enhance the performance of graphene-based supercapacitors; and provide effective graphene-based coatings for marine anti-fouling. Recommendations will be made based on the findings of the study. This integrated approach will provide an environmentally sustainable solution for plastic waste upcycling, creating high-value materials that address critical needs in both renewable energy systems and marine protection technologies.

Traditional Owners to be acknowledged: The Townsville campus is situated on the lands of the Bindal and Wulgurukaba peoples, the Traditional Owners of Gurambilbarra

Poster

Macroalgae–coral interactions in early life stages: implications for seeding-based restoration techniques

Zampa G[a,b,c], Hoey A[c], Abdul Wahab MA[b], Diaz-Pulido G[d] & Randall CJ[b]

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[d]*School of Environment and Science, Coastal and Marine Research Centre, Griffith University, Brisbane, QLD, Australia*

Coral recruits experience high mortality during their earliest life stages, especially on inshore reefs where macroalgae are abundant. Seeding devices with laboratory-reared and settled coral spat offer a promising method to accelerate reef recovery; however, their success is strongly dependent on local benthic conditions. Identifying which macroalgal traits most strongly influence coral spat performance is critical for deployment decisions and optimizing restoration outcomes.

This study investigates how macroalgal traits (e.g., canopy height, cover, biomass, and taxonomic richness), turf traits, and fine-scale benthic processes (e.g., device fouling and species-specific interactions) affect the survival and growth of coral spat on seeding devices deployed across inshore reefs in the central Great Barrier Reef. Here, we present results from devices deployed following the November 2025 spawning, identifying which macroalgal metrics most strongly influence coral recruit survival and growth, and distinguishing the relative importance of canopy-level versus micro-scale benthic interactions. We expect certain canopy traits to emerge as key predictors of spat performance, while localized interactions will reveal conditions under which seeding devices are most or least effective.

By linking functional ecology with applied restoration, this work will define the ecological limits of coral–macroalgae coexistence during early life stages, provide actionable guidance for site selection, and directly inform strategies to scale coral-seeding technologies to improve reef recovery in increasingly macroalgae-dominated ecosystems.

We acknowledge the Traditional Owners and Custodians of the Manbarra Sea Country, where corals will be collected, and the Bindal people, on whose Country the AIMS facility is located and where the corals will be transported and carefully maintained until spawning. Field experiments will be carried out in the Palm Islands, again within the Sea Country of the Manbarra people, whose enduring connection to these reefs and waters we recognise and deeply respect throughout this work.

Poster

Spatial and temporal patterns of surface *Trichodesmium* occurrence in the Great Barrier Reef from Sentinel-3 OLCI observations: insights and implications

Zheng Y[a,b,c] Robson B[b,c], Blondeau-Patissier D[d] & Rahimi Azghadi M[a,e]

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[d]*CSIRO Environment, Brisbane, Australia*
[e]*Centre for AI and Data Science Innovation, James Cook University, Townsville, Australia*

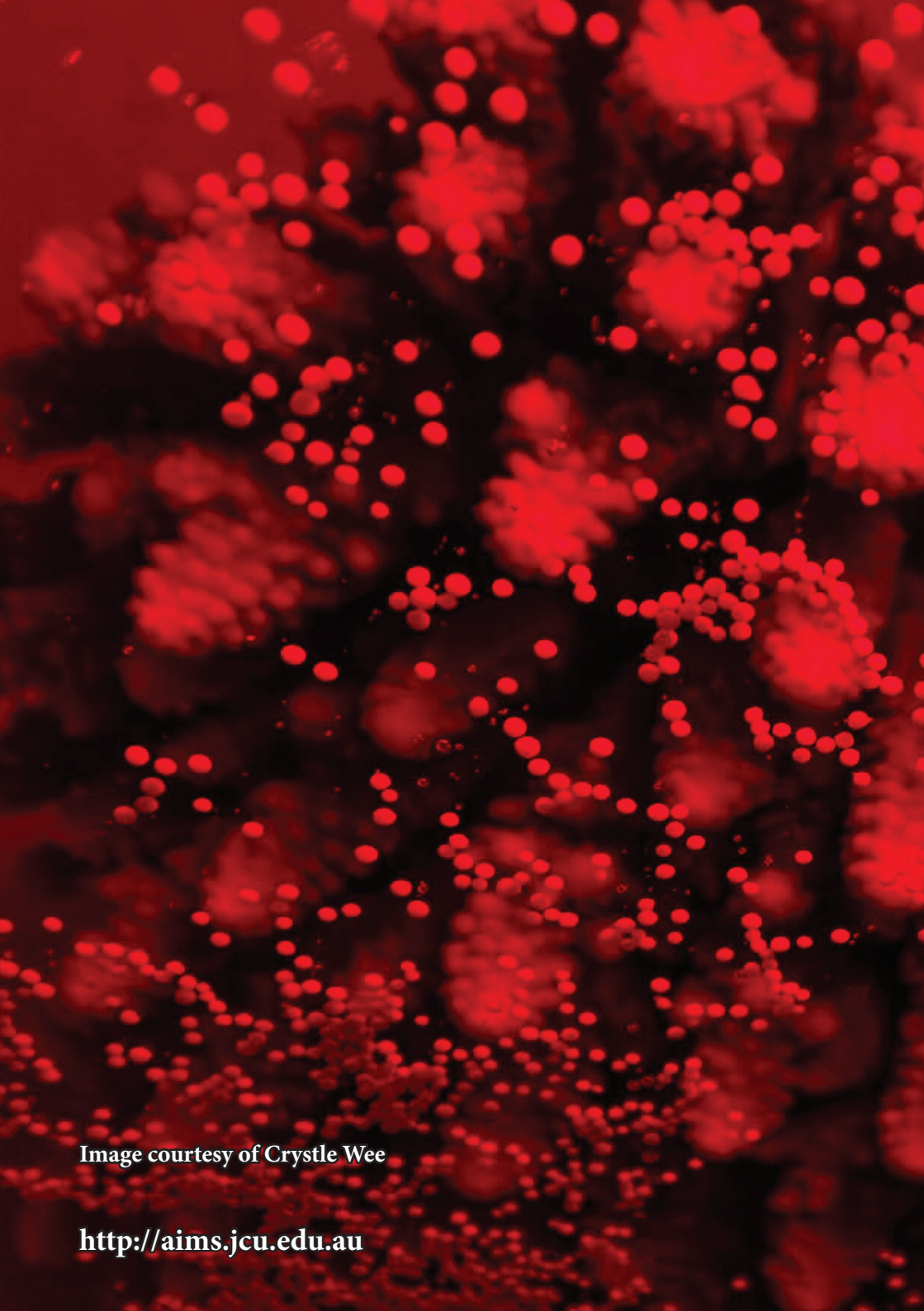
Trichodesmium is a filamentous, nitrogen-fixing cyanobacterium that frequently forms surface blooms in tropical and subtropical oceans. In the Great Barrier Reef (GBR), these blooms are well known, but their spatial variability and environmental drivers remain insufficiently quantified.

This study uses Sentinel-3 OLCI observations to detect surface expressions of *Trichodesmium* across the GBR from 2016 to 2026. Several detection approaches were tested, including the Floating Algae Index (FAI), which was found to be sensitive to cloud contamination and often resulted in false positives. A combined approach based on the Maximum Chlorophyll Index (MCI) and the Normalised Difference Turbidity Index (NDTI) is therefore applied to improve detection reliability by reducing false positives associated with both clouds and coastal turbidity.

Daily MCI composites are then generated to characterise bloom occurrence, frequency, and spatial distribution across the GBR over the past decade. Preliminary results indicate that blooms predominantly occur in the southern GBR, with a seasonal pattern extending from approximately April to October.

Further analysis will compare these patterns with previous satellite-based observations, and assess potential changes in bloom frequency over recent years. Environmental variables, including sea surface temperature, wind conditions, and nutrient-related proxies, will also be examined to identify the key drivers of bloom formation.

We acknowledge the Traditional Owners of the lands and sea Country across the Great Barrier Reef region, and pay our respects to Elders past and present. We recognise their continuing connection to land, sea, and culture.



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