School of the Environment – 2024 Winter Research Projects

For more information about these projects, please contact the relevant supervisor linked below.

Name of Supervisor: Dr Tanya Kenyon and Roima Paewai-Huggins

Project Title: Coral recruitment & rubble binding across an environment gradient in the southern GBR

Rubble generation on coral reefs is increasing due to more frequent and severe disturbances including mass coral bleaching, cyclones and ship groundings. Recovery of rubble beds is constrained by physical and biological processes, including rubble mobilisation and binding. Rubble that has been stabilised by binding organisms (e.g., sponges, coralline algae) can provide a suitable, stable substrate for coral recruitment. Yet, the mobilisation of loose, unstable rubble can inhibit or break binding, and restrain coral recruitment, limiting the recovery of rubble beds. We have been investigating rates and strengths of rubble binding across a gradient of water quality, depth and exposure. In both locations, binding rates were generally faster in shallow, exposed sites and, on the GBR, in offshore locations. Rubble binding strength depended more on the binding organism type than on the quantity of binds, with the strongest binders being vermetid snails, serpulid worms, bivalves, tunicates and coralline algae. The results from our research will help to aid managers in predicting the natural stabilisation and recovery potential of degraded, rubble-dominated reefs. Rubble beds with poor recovery outlooks can be prioritised for management strategies that include assisted rubble stabilisation, where appropriate. We have frozen rubble pieces as well as photos of rubble pieces, to determine abundance of coral recruits (through microscopy) and percentage cover of a variety of binders (ImageJ).

Number of Positions Available: 1

Campus: St Lucia

School of the Environment – 2024 Winter Research Projects

For more information about these projects, please contact the relevant supervisor linked below.

Name of Supervisor: Dr Tanya Kenyon and Roima Paewai-Huggins

Project Title: Coral growth and survival across different rubble habitats at Heron Reef, GBR.

Disturbances that generate rubble beds, such as cyclones and coral bleaching events, are becoming more intense and frequent, and the intensity of disturbance drives the type of rubble bed that is created. There is uncertainty about how long rubble beds take to recover and what coral species drive that recovery. This project aims to compare coral species diversity across two different types of rubble beds. The first type is composed of larger, branched rubble pieces that form a relatively stable substrate (i.e., interlocked bed). The second type is composed of smaller, unbranched rubble pieces that form a tightly compacted flat and potentially less stable substrate (i.e., loose rubble bed). Photos of corals taken within both rubble bed types at Heron Island are available for identification (genus) to determine 1) how coral species diversity differs between rubble bed types, 2) whether there is a predominant species that can better grow and survive in rubble, and 3) how does the type of rubble bed influence overall coral cover?

Number of Positions Available: 1

Campus: St Lucia

School of the Environment – 2024 Winter Research Projects

For more information about these projects, please contact the relevant supervisor linked below.

Name of Supervisor: Prof Peter Mumby and Hannah Allan

Project Title: Identifying depth-specific trends in parrotfish feeding and bioerosion

Carbonate budgets describe the balance between the production and erosion of reef calcium carbonate, and underpin crucial ecological functions and ecosystem services. On the Great Barrier Reef, carbonate bioerosion is primarily driven by parrotfish grazing, but our understanding of this process is mostly limited to shallow reef environments. This project aims to better understand how bioerosion and carbonate budgets change with depth by quantifying differences in parrotfish feeding rates along a reef slope at Heron Island (Southern GBR). Stationary video surveys were conducted randomly across different depths to record bite rates in a standardised 1m2 quadrat. These video surveys will be used to extract the bite rates of different parrotfish species while also noting fish size and life phase. This data will then be used to estimate how parrotfish bioerosion changes with depth on Heron Reef.

Number of Positions Available: 2

Campus: St Lucia

School of the Environment – 2024 Winter Research Projects

For more information about these projects, please contact the relevant supervisor linked below.

Name of Supervisor: Dr Maggy Lord

Project Title: Use of Near-infrared spectroscopy technique to characterise mosquito species

The Lord Laboratory is developing next generation tools that can be applied to predict mosquito parameters that are crucial for disease transmission including age, infection status and species identity. This winter project will determine the capacity of near-infrared spectroscopy technique to predict the blood feeding history of Aedes aegypti mosquitoes. The technique involves shining a beam of near-infrared light on mosquitoes, collecting a spectrum and analysing the spectrum to predict the status of interest.

Number of Positions Available: 1

Campus: St Lucia

School of the Environment – 2024 Winter Research Projects

For more information about these projects, please contact the relevant supervisor linked below.

Name of Supervisor: Dr Maggy Lord

Project Title: The role of Probiotics on mosquito health

The Lord Laboratory is investigating the role of probiotics on the overall health of mosquitoes that transmit viruses and parasites. This winter project will determine whether a specified probiotic has an effect on the survival, fecundity (the number of eggs laid by a mosquito) and the size of Aedes aegypti mosquitoes that transmit several viruses such as Dengue, Zika and Chikungunya. This project is part of a larger project whose ultimate goal is to determine whether probiotics can be used to block pathogens transmitted by mosquitoes.

Number of Positions Available: 1

Campus: St Lucia