

Reef Rubble Stabilisation

This intervention aims to both predict and reduce the impacts of reef rubble to improve the success of reef restoration practices.

In many areas where coral reefs are damaged, natural recovery can be restricted, delayed or interrupted because of unstable dead coral fragments i.e. rubble on the seabed. Lack of stability combined with frequent motion of rubble can strongly inhibit the ability of young corals to settle and grow, limiting reef recovery.

We are focused on addressing critical knowledge gaps in the drivers of rubble formation and locations of rubble bed persistence on the Great Barrier Reef, and investigating low-cost and effective rubble stabilisation tools.

Outcomes to Date

- **Vulnerability and Rubble Persistence mapping of the GBR to constrain where future risk is highest for coral rubble generation and persistence, and where restoration efforts would likely need to be focused**
- **In-situ surveys and experiments conducted over a 12-month period, across an environmental gradient, to predict binding and recovery rates of rubble beds on the GBR**
- **Rubble stabilisation structures of 3 differing designs deployed to assess effect on rubble motion, rubble binding rates, coral recruitment**
- **Structural models of corals combined with lab and in-situ tensile strength tests used to develop predictive models for coral breakage and rubble generation**
- **Fluid dynamics modelling developed and in-situ testing conducted on the GBR to calculate rubble motion probabilities**
- **Development of a Bayesian network model to build an integrated rubble prediction and recovery tool**

Next Steps:

- Continuation of experimental work and data analysis to further define natural rubble formation and predict binding and recovery over an 18-month period.
- Testing of novel bioadhesives as an eco-friendly solution to rubble binding and stabilisation
- Scaling up results from in-situ experiments into models that predict rubble motion and persistence across the GBR
- Develop guidelines for the management of coral rubble areas; when is intervention required and which strategies should be implemented for effective reef restoration

