April 2023

REEF RESTORATION & ADAPTATION PROGRAM

Larval-based Restoration

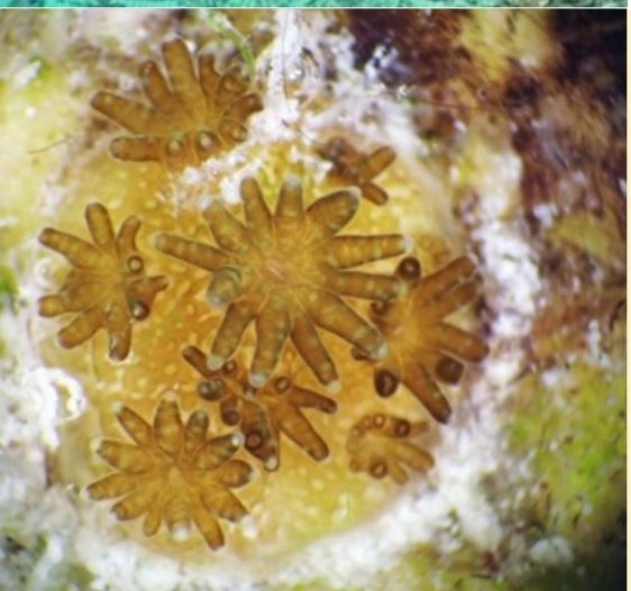
This intervention aims to develop cost-efficient, large-scale production of billions of genetically diverse coral larvae, harvested from spawn slicks and reared at sea, for transfer and seeding onto reefs with low coral cover. This process is intended to catalyse natural reef recovery.

We are focused on developing:

- Efficient and scalable collection techniques to capture wild coral spawn slicks
- Methods to mass culture and treat coral larvae in floating pools on reefs, for enhanced survival and growth
- Short- or long-distance assisted transfer of naturally thermally tolerant larvae
- Targeted transfer of larvae onto damaged reefs through direct releases and via settlement devices

Outcomes to Date

- **Larval pool design and conditions improved to yield 50-60% of competent larvae from original 1-day old larval stock**
- **Development of a rapid and low-cost larvae staining technique, to track movement over a >1.5ha reef area**
- **Development of high-resolution hydrodynamic models and particle tracking, to optimise spawn collection and larval release timing and location**
- **Incorporation of direct and indirect approaches for scaling targeted larval deployments including pipes, clouds, AI-boat transfer and mediated transfer via optimised settlement devices**



Next Steps:

Identifying knowledge gaps:

- Longer term assessments of growth and survival of deployed coral recruits compared to natural coral recovery
- Detecting settlement and recovery signals of large scale releases of larvae cultured from wild coral spawn slicks

Prototype refinement:

- Increased larval culture pool capacity and optimisation of larval health and survival
- Scaling culture pools and vessel-based aquaculture, to allow assisted transfer of larvae between reefs

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