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It's that time of year again – baby coral joy at AIMS' SeaSim

Scientists at the Australian Institute of Marine Science (AIMS) are currently preparing for the annual 'mass' spawning of Great Barrier Reef corals – an important time of reproduction and rejuvenation on the Reef.

This once-a-year synchronised phenomenon is where multiple species of reef-building corals release sperm and eggs over several days following the full moon. These float to surface and fertilise, developing into coral larvae, some of which go onto settle on the reef and begin to grow, eventually creating new coral colonies.

Following the recent serious and extensive mass bleaching event on the Reef, this year's spawning events – due in late October, November and potentially in December – are more important than ever.

AIMS teams have collected wild corals from the central Great Barrier Reef and have brought them to the AIMS' National Sea Simulator where they spawn at around the same time as those on the Reef. This provides AIMS scientists and collaborators with the opportunity to better understand how the Reef is able to renew itself, and to investigate how recent bleaching may have impacted this process.

It is also the time scientists can investigate possible ways to accelerate the heat tolerance of young corals, and fast track reef recovery through large scale coral aquaculture.

Experiments being conducted this year include:

- Protecting young corals with [antifoul coatings](#) (with Griffith Uni).
- Different [strategies](#) of delivering food to young corals held in aquaculture facilities to boost survival.
- Using robots and AI to monitor the growth and health of young corals (with QUT).
- The introduction of symbiotic bacteria to corals to test if this helps them form more stable associations, in a [step towards](#) enhancing their heat resilience (with The University of Melbourne).

Research Program Director Dr Line Bay, who leads research in the fields of coral aquaculture, restoration and adaptation at AIMS, said coral spawning was like Christmas for coral scientists.

"It's an incredibly exciting time of year. We and our collaborators work through the spawning nights to conduct experiments that address critical knowledge gaps in how corals respond to and recover from stress," she said.

"We must reduce carbon emissions globally to secure the best future for coral reefs, which are threatened by climate change.

"In the meantime, our teams are working hard now to build a suite of interventions to help reefs adapt and fast track their recovery."

Over the last few years, AIMS teams have greatly increased the number of corals bred in aquaria, with more than 50 Great Barrier Reef coral species spawned in the SeaSim over the last five years.

AIMS scientists have also developed an automated system called the [Autospawner](#), which aids the fertilisation of large numbers of coral eggs with minimal labour, making it more efficient to produce millions of coral larvae, as part of their collaboration in the Reef Restoration and Adaptation Program (RRAP).

Dr Bay added: “Each year we build on these innovative approaches to large scale coral aquaculture. For example, this year, we’re excited to be taking the Autospawner and further developing it for use by international collaborators.”

[ReefSeed](#) is a first-of-its-kind portable containerised coral aquaculture system that can be set up in remote areas to produce millions of coral larvae at a time for reef restoration.

The AIMS team designed and built the system to put it through its paces for the first time during spawning in October. The project is being developed in collaboration with the Maldives Marine Research Institute (MMRI) and the organisation’s technicians are currently being trained at AIMS on operating and maintaining the system.

After the Great Barrier Reef spawning trial at AIMS concludes, the ReefSeed system will be packed, shipped to the Maldives, and reassembled for use when their corals spawn in March 2025.

AIMS coral reproduction and aquaculture scientist Dr Muhammad Azmi Abdul Wahab said the training will include larval rearing and settlement tank processes and approaches.

“We will help our colleagues understand the processes we have been working on at AIMS across the last four years, including how we help coral larvae settle onto tiles which can be transferred to reefs on specially-designed ceramic devices, which help with survival rates in the wild,” said Dr Abdul Wahab.

“It’s exciting to be able to share the knowledge and experience we’ve gained with our international colleagues, and to see how this knowledge may help with large scale restoration on coral reefs outside of Australia.

“In the last decade, coral reefs in the Maldives have been exposed to major coral bleaching events driven by climate change. The Maldives depends on coral reefs and the species they support for sustaining communities and livelihoods. We’re proud to be playing a role in helping to support restoration efforts there and the development of local capacity in this field.”

Shafiya Naeem, Director General of the MMRI said historically, coral reef restoration efforts had been small scale on the islands.

“We now have a vision to deliver cost effective and scalable restoration for Maldivian coral reefs – an ecosystem that profoundly impacts our country’s economy, the livelihoods of our people, and our very existence.

“Collaborating closely with AIMS, we aim to test and refine this innovative approach within the Maldives, with the ultimate goal of sharing this technology with restoration practitioners across our geographically dispersed small island nation.”

Dr Cedric Robillot, Executive Director of RRAP, Great Barrier Reef Foundation, said: “These breakthroughs in coral conservation aquaculture from across the Reef Restoration and Adaptation Partnership, will pave the way for a new phase of the Program, involving larger field trials and coral deployments at scale from 2025. The automated solutions now have the potential to deploy millions of corals onto the Reef, significantly increasing the scale of current reef restoration efforts both here in Australia, and around the world.”

ReefSeed was awarded with US\$1.5M (Aus\$2.3M) over three years by the G20 Coral Research and Development Accelerator Platform (CORDAP), the only international organisation fully dedicated to funding global research and development for tropical and cold-water coral restoration and conservation.

ReefSeed uses science and technology developed under the Australian government’s Reef Restoration and Adaptation Program (RRAP). The project also includes a partnership with CSIRO to investigate natural patterns of coral reproduction in the Maldives.

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Download images and vision [here](#).

More about the Australian Institute of Marine Science:

The Australian Institute of Marine Science (AIMS) is Australia's tropical marine research agency. In existence for half a century, it plays a pivotal role in providing large-scale, long-term and world-class research that helps governments, industry and the wider community to make informed decisions about the management of Australia's marine estate. AIMS science leads to healthier marine ecosystems; economic, social and environmental benefits for all Australians; and protection of coral reefs from climate change. More here: <https://www.aims.gov.au/>

More about the G20 Coral Research and Development Accelerator Platform:

The G20 Coral Research & Development Accelerator Platform – CORDAP – was launched in 2020 by the G20 to fast-track research and development (R&D) solutions to save the world's corals. CORDAP brings together the best minds worldwide, in a transdisciplinary approach, to accelerate international research and development to supply the technologies and innovations required to secure a future for corals and reefs. More here: <https://www.cordap.org>

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