



Great Barrier  
Reef Foundation

## Media Release

# BREAKTHROUGH FOR THE REEF: PROBIOTICS PROVEN TO BOOST CORAL SURVIVAL

In a scientific breakthrough for the Reef, researchers have proven that feeding coral a dose of good bacteria increases their overall health and tolerance to stresses related to climate change such as rising water temperatures.

Great Barrier Reef Foundation Managing Director Anna Marsden said pioneering science such as this provides hope for the future of the Great Barrier Reef that is already seeing the effects of climate change with our precious icon weathering its third mass bleaching in just five years.

“People may be surprised to find out that just like us, corals rely on a host of good bacteria to help keep them healthy and, just like us, the balance between good and bad bacteria is often disrupted in times of stress,” Ms Marsden said.

“Probiotics have been widely and successfully used to improve both human and animal health, however their use in marine ecosystems has been largely unexplored until now.

“It is fitting to announce this breakthrough for coral survival during World Ocean Week, a time when the world is reminded of the importance of oceans and its coral reefs as critical ecosystems that are essential to the future of our planet.

“Not only are coral reefs home to 25% of the ocean’s marine life but they also support the livelihoods of 1 billion people globally.

“However, we are increasingly seeing corals becoming stressed due to threats such as rising water temperatures which is causing them to become prone to infections and less likely to survive.

“Federal University of Rio de Janeiro Professor Raquel Peixoto and her international research collaborators, who include scientists from Brazil, US, UK, and James Cook University in Australia, have been able to prove for the first time, in a laboratory setting, that feeding corals beneficial probiotics increases their overall health and improves their chance of survival during heat stress.

“We fed the corals with beneficial microorganisms, which is like feeding them probiotic yoghurt full of good bacteria,” Prof. Peixoto said.

“Then we ran numerous stress tests on the corals, and time and time again the corals that had received the probiotics were in better health than those that had not.

“This finding is an exciting breakthrough in boosting the ability of coral species to survive in times of stress and help them cope with a changing climate.”

“This technology can be used by Queensland research institutions such as the Australian Institute of Marine Science to help boost the health of the corals reared in their National Sea Simulator before they are transported out to the Reef as part of their reef restoration projects,” Ms Marsden said.

“The survival rate of these corals once they are out on the Reef is currently quite low so giving them a health boost while they are in the Sea Simulator will boost their chance of survival.



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“It will add another tool to Reef researchers’ toolkits as they commence the world’s most ambitious Reef restoration and adaptation effort (Reef Restoration and Adaptation Program).”

Professor Peixoto’s research team are currently running tests on different species of corals in the world’s largest artificial ocean (the Biosphere 2) in Arizona and in laboratories at the University of Hawaii to refine which groups of good bacteria are the best for each species.

They are also investigating new methods to scale up the application for use on coral reefs, such as delivering parcels of slow release probiotics to targeted reefs during times of heat stress.

This research project won the Great Barrier Reef Foundation’s Out of the Blue Box Reef Innovation Challenge People’s Choice Award supported by The Tiffany & Co. Foundation.

The Tiffany & Co. Foundation has supported ocean conservation efforts for two decades and are so pleased to see the Out of the Blue Box Reef Innovation Challenge from 2018 continue to kickstart and accelerate novel solutions from around the world to bolster the Great Barrier Reef’s long-term resilience, especially at a time when the Great Barrier Reef is being hit with the third major bleaching event in five years.

“Saving the Reef is a huge task and this pioneering research project is just one of the ways that we’re making a real difference with our partners,” Ms Marsden said.

“Using science, we’re gaining an understanding of the Reef with [3D mapping](#) and [DNA sequencing](#), partnering with groups like NASA, Google and the Australian Institute of Marine Science (AIMS) and pioneering new Australian technologies, like QUT’s Reef [RangerBots](#) and [sun shield technology](#) with Melbourne and Deakin Universities and AIMS, to monitor and protect corals.

“We are also [restoring Reef islands](#) to protect precious marine life, including the [world’s largest green turtle nesting area](#) and rebuilding reefs using [coral IVF](#), as well as partnering with the Smithsonian to store [cryogenically frozen coral samples](#) so they’re never lost.”

Photos and video of the project are available via Dropbox:

<https://www.dropbox.com/sh/wmsx6dbvpy5luw3/AADQ1EB9X3BMarNDii9d2EBKa?dl=0>

General Reef footage is available for download [here](#) and [here](#).

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## **Examples of research projects pioneered by the GBRF:**

### **[Coral IVF](#)**

Rebuilding damaged coral reefs by rearing millions of healthy coral babies during the Reef’s annual coral spawning and delivering them to damaged reefs in a world first project.

### **[Sun shield for the Reef](#)**

Protecting corals from damaging levels of heat and light from the earth’s atmosphere to combat coral bleaching on a small scale by using a biodegradable surface film as a Reef sun shield. The film is just one molecule thick (that’s 50,000 times thinner than one human hair) and tests have shown that it can reduce light by 30% and reduced the level of bleaching in most species.



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### RangerBot

RangerBot is the world's first vision-based underwater robotic reef protector. It provides an extra set of hands and eyes in the water by identifying and destroying outbreaks of coral eating Crown-of-thorns starfish, monitoring reef health indicators like coral bleaching and water quality, and mapping expansive underwater areas at scales not previously possible. RangerBot also delivers microscopic baby corals which are collected during the annual mass coral spawning event on a damaged reef in order to help repopulate it as part of the Coral IVF project.

### Cryopreserving coral for the future

Preserving the biodiversity of the Reef is critical as it is one of the most diverse habitats on the planet. An international science collaboration has created the world's largest collection of frozen coral cell samples which have the potential to be used to aid conservation efforts for the Great Barrier Reef far into the future. Partnering with the Smithsonian to store cryogenically frozen coral samples so they're never lost.

### eReefs

eReefs is delivering reef water quality information online in near real time, enabling anyone to track the effects of storms, cyclones, floods and other impacts on the reef.

### Restoring Raine Island

Restoring the world's largest green turtle nesting area to save the population from collapsing. The project is focused on saving as many turtles as possible by reshaping nesting grounds so that less baby turtles drown in their eggs and establishing fencing so that turtles don't fall off cliffs while nesting.

### Unlocking corals' genetic code: 9 coral genomes

A world first project which is unlocking the genetic secrets of corals in the Great Barrier Reef. The information revealed from sequencing the genomes of 9 reef-building corals has bridged a vast gap in current knowledge and is fast tracking the answers to critical questions such as: are corals able to adapt to changing environments; how quickly can they adapt; and what can be done to help them adapt?