CAN-105-Resilient Source Reefs-GBR

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The World Federation for Coral Reef Conservation *281.971.7703* *P.O. Box 311117* *Houston, TX 77231*
Vic Ferguson Executive Director *512.986.1902* *vic.ferguson@wfcrc.org* *info@wfcrc.org*

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Great Barrier Reef recovery hopes buoyed by resilient 'source reefs'

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ABC Science

By environment reporter Nick Kilvert

Most of the robust reefs are in the southern section of the Great Barrier Reef.

(Supplied: Queensland Museum, Gary Cranitch)

Researchers have identified a series of robust reefs that may act as sources to replenish areas of the Great Barrier Reef (GBR) damaged by severe disturbances such as bleaching events and cyclones.

The "robust source reefs" typically lie on the outer shelf fringes of the GBR where ocean currents push deeper, cooler water toward the surface, reducing the severity of heat stress.

It is hoped that these reefs may temper the decline of the GBR as climate change pressures continue to mount, according to Scott Condie from the CSIRO's Oceans and Atmosphere department in Hobart.

"They're the bank for the future of the reef," Dr Condie said.

"Even though they represent a small percentage of the total reefs, they have the ability to actually replenish probably almost half the reefs within a given season, which is very encouraging."

Robust reefs most common in southern GBR In the **paper published today in PLoS Biology**, the researchers identified 112 reefs which met the robust source reef criteria.

Severe coral bleaching hits two-thirds of Great Barrier Reef

(ABC News)
These reefs are identified as being less vulnerable to bleaching. They are also exposed to currents that would convey coral larvae across a significant area of the GBR.

Importantly, they also have a "lower risk of conveying a crown of thorns starfish outbreak".

Spread by larvae carried on ocean currents, similar to coral, crown of thorns starfish has been responsible for 50 per cent of the total GBR decline between 1985 and 2012, according to the Australian Institute for Marine Science.
Although robust source reefs were identified across the length of the reef, from just north of Gladstone to Cape York, they were only sporadically distributed north of Townsville.

"There's a particular cluster offshore in the southern part of the GBR that's probably the largest area that has these characteristics," Dr Condie said.

Source reefs 'reassuring' but intervention still needed

The researchers hope their findings may be used to better streamline conservation strategies in the future, according to lead author Karlo Hock from the University of Queensland (UQ).

"These reefs give some idea of where this local management can be targeted," Dr Hock said.

Ramping up existing regulations in these areas, such as no-anchor zones and active removal of crown of thorns starfish, are some management options available.

The starfish is particularly effective at decimating reefs already under stress and can totally denude a reef of living coral during an outbreak, UQ researcher **Bernie Degnan told the ABC** earlier this year.

"It depends on the density of the outbreak [but] under extreme cases you can have 150,000 animals in a square kilometre of the reef and some of these starfish get to half a metre in diameter," Professor Degnan said.
Although Dr Condie believes targeting starfish is a good option, he thinks it may be time to look at more interventionist strategies.

"The situation has gotten bad enough now that we're really being forced to [look at intervention] and the [Great Barrier Reef Marine Park Authority] is talking about options in this direction," he said.

"They could be engineering solutions like actually pumping colder water from deeper onto these reefs to stop bleaching."

Relying on source reefs to replenish the GBR from increasingly frequent stressors such as bleaching events is not enough to ensure the long-term health of the GBR, Dr Hock agreed.

"It's reassuring that such reefs exist, but whether they continue to exist in the future is going [to depend on] reducing carbon emissions, on limiting global effects and local management," he said.

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