

Briefing note: How FNQ's communities and industries are caring for the Great Barrier Reef

The Great Barrier Reef (GBR) supports a \$6 billion pa tourism industry including over 70,000 jobs. Around half of this total value accrues through visitation to the Cairns and Port Douglas region. The health of local reefs is therefore of immense economic as well as ecological importance to the communities that live and work in the region.

Industry-led surveys of coral bleaching severity

During the mass coral bleaching event of late summer 2016, AMPTO & RRRRC surveyed bleaching severity at 32 reefs selected for their high value to the marine tourism industry in the Cairns and Port Douglas region (Fig 1). The surveys were conducted by experienced industry divers, using methods endorsed by GBRMPA, and the results were in accordance with the more extensive bleaching severity surveys conducted GBR-wide by JCU, AIMS and other scientific organisations. The results (including data) are publicly available in report form via the RRRRC website.¹ In brief, the northern-most reefs within the surveyed region (the Ribbon Reefs) were the worst affected, while the southern-most reefs off Cairns were less affected.

These results are important because they show that despite serious bleaching impacts, many reefs in this region currently remain viable assets for the marine tourism industry. While the ultimate cause of coral bleaching events (increasing global temperatures due to climate change) is beyond the scope of regional leaders to manage, the knowledge that all is not lost is catalysing industry, managers, researchers and the community to work together to actively defend and sustain reef health in the region.

More efficient control of Crown-of-Thorns Starfish (COTS) outbreaks

Of the major threats facing the GBR, outbreaks of coral-eating COTS (estimated to have been responsible for nearly half of all coral cover loss from 1985-2012²) are arguably the most directly and immediately amenable to management intervention. Since 2015 the COTS Targeted Control Program has removed ~423,000 COTS from reefs in the region. Left to their own devices these starfish could have collectively consumed an area of live coral greater than the Sydney Cricket Ground each summer's day of their ~3-year lifespan. RRRRC is working with the COTS Targeted Control Program to increase the effectiveness and efficiency with which ecologically and/or economically important reefs can be identified and defended. Results of the local bleaching surveys are being used to help prioritise defence of the region's most ecologically and economically important reef sites. Uptake of the early recommendations from a scientific research project³ applying Integrated Pest Management principles to COTS has already increased the efficiency of control efforts by at least 35%. In the coming year RRRRC will be working to ensure that the research project's findings continue to optimise and evolve the control program's methods. The success of this collaborative research & industry program has recently been recognised with the provision of more Australian Government funding for expansion and inclusion of Indigenous trainees.

¹ RRRRC & AMPTO (2016) [Coral Bleaching Assessment on Key Tourism Sites in the Cairns and Port Douglas Region](#). Reef and Rainforest Research Centre Ltd, Cairns.

² [De'Ath et al. 2012: The 27-year decline of coral cover on the Great Barrier Reef and its causes. PNAS 109\(44\): 17995-17999](#)

³ [This CSIRO-led project](#) is funded through the Australian Government's NESP [Tropical Water Quality Hub](#), which is administered by RRRRC.

Innovative research projects that actually help improve GBR water quality

Agricultural runoff reduces water quality in the GBR lagoon, impairs corals' capacity to recover from stress and disturbances (such as cyclones or bleaching) and is likely to contribute to COTS outbreaks. RRRC's administration of the Australian Government's NESP [Tropical Water Quality Hub](#) helps ensure that the 43 applied research projects conducted through the Hub focus on real-world solutions that will help improve water quality. Examples include:

- Rebuilding trust in water quality science by engaging cane growers in a citizen-science water quality monitoring program conjoined with a robust scientific monitoring program. The use of real-time sensor and telemetry technologies enables growers to directly monitor fertiliser concentrations in runoff from their properties. In the coming year these growers will investigate how practice changes affect runoff water quality, in the knowledge that because of their participation in the project, the government is underwriting their risk of any resultant production losses.
- Engineering solutions for gully repair in the Burdekin River: ~47% of the total suspended sediment load arriving in the GBR lagoon is estimated to be delivered by the Burdekin River, and much of this sediment is eroded from alluvial gullies on grazing properties in the catchment. The development of effective methods to rehabilitate these gullies is thus arguably the GBR's single highest-priority sediment management task. In an innovative approach, researchers are working with some of the largest mining companies in Queensland to adapt and apply mine rehabilitation techniques to gully repair on grazing properties.

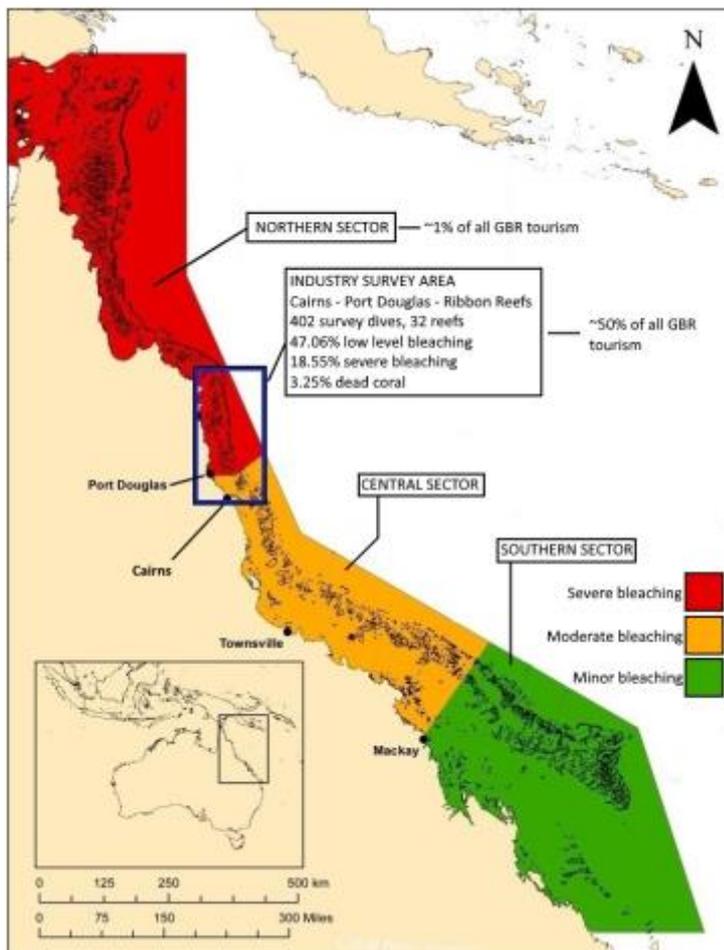


Figure 1. The RRRC & AMPTO survey of coral bleaching severity in 2016 focused on the region most important to the GBR's \$6 billion marine tourism industry (boxed).