



Monitoring the Health of Torres Strait Reefs

(NERP Project 2.3)

Investigators: Ray Berkelmans, Hugh Sweatman, Scott Bainbridge and Scarla Weeks

Introduction

Coral reefs of the Torres Strait (TS) are at the northern tip and part of the Great Barrier Reef (GBR) province. Despite its ecological connection to the GBR and its clear importance to TS communities, comparatively little work has been done on these reefs. As elsewhere, climate change, crown of thorns starfish, disease, storms, and pollution from river runoff and shipping are threatening the ecological integrity of TS reefs. This project seeks to establish a monitoring program to enable resource managers to keep abreast of key indicators of coral health and to train local rangers to undertake ongoing monitoring.

Major threats

Little is known about the current condition of TS reefs, or its history of impacts and disturbances. The TS experienced its first coral bleaching event in 2010, however, the scale and nature of impact from this event are unknown. For context, we know from the GBR experience that the following processes have caused the majority of the 51% decline in its coral cover over the last 27 years (De'ath *et al* 2012).



Cyclones and storms accounted for 48% of the loss of coral on the GBR



Repeated outbreaks of crown of thorns starfish accounted for 42% of coral loss on the GBR



Coral bleaching due to warm water killed 10% of GBR corals. Its connection to climate change makes this the biggest looming threat.



Floods, pollution and bad water quality also impact of reefs, especially near the coast and major river systems.

Key deliverables and progress

Coral communities



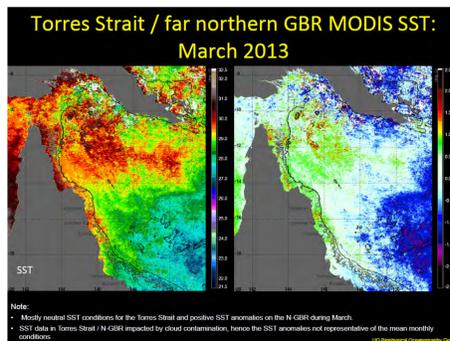
Done A literature survey identified the state of science knowledge and gaps of TS reefs

In progress A biodiversity assessment of coral communities was conducted in Feb 2013. Results are being analysed

In progress A baseline monitoring of coral communities at selected sites was undertaken in Feb 2013. Results are being analysed

To do A second monitoring survey of established sites will be conducted to assess change. This is planned for Feb 2014

Temperature and current conditions



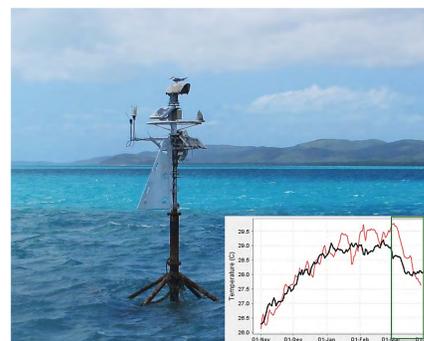
Done A network of temperature loggers was established at sites representative of the TS.

Done Locally relevant thresholds for coral bleaching were derived from GBR and local data

Done Monthly updates on ocean conditions are provided to key stakeholders using satellite and ground-based data

Done The MODIS satellite view over northern Australia was extended to include the Torres Strait and the SST and chlorophyll climatology re-calculated

Early warning of bleaching



Done A real-time weather station was deployed in the western TS and an early warning system established for coral bleaching, based on local bleaching thresholds

Done Real-time data from this station is delivered through displays at high visibility community points as well as through the web and phone 'apps'

In progress A second real-time station will be deployed in the eastern TS with bleaching early warning and data delivered as above

Knowledge transfer



Done Seven TSRA Rangers were trained and certified in snorkelling and First Aid. Snorkelling equipment for these rangers was purchased

Done TSRA Rangers were trained in deploying and exchanging temperature loggers

In progress TSRA Rangers are being trained in benthic monitoring techniques, including Manta tow and 'Eye on the Reef' Reef Health and Impact Surveys

Reference: De'ath G, Fabricius KE, Sweatman H, Puotinen M (2012) The 27-year decline of coral cover on the Great Barrier Reef and its causes. Proceedings of the National Academy of Sciences of the United States of America 109:17995-17999

Conclusion

This project is on track to deliver a program which monitors key indicators of stress and change on Torres Strait reefs. It is a program that is targeted to Torres Strait needs, using in-situ monitoring methods that can be continued by TSRA Rangers at the end of NERP project.