project bulletin
Australian Government
Great Barrier Reef Marine Park Authority
A project initiated under the Climate Change Action Plan

Lightloggers to investigate drivers of change in seagrass meadows

Summary

The Great Barrier Reef Marine Park Authority (GBRMPA) provided light loggers for the seagrass monitoring component of the Reef Rescue Marine Monitoring Program. This program is investigating relationships between seagrass distribution and water quality changes that affect the availability of light in seagrass meadows. Improved understanding of these relationships is critical to better predicting and managing the impacts of climate change on Great Barrier Reef seagrasses and their associated fauna such as dugong, turtle and important fisheries species.

A functioning lightlogger recording conditions in a seagrass meadow

Background

Seagrasses have been identified as highly vulnerable to the projected effects of climate change. It is likely that forecasted increases in intense rainfall events would increasingly expose seagrass meadows to the effects of terrestrial run-off. Such effects include an increase in turbidity in nearshore waters, and greater levels of sedimentation and sediment re-suspension, which reduce light penetration to seagrass meadows.

Through its Reef Rescue Plan, the Federal Government has allocated funding to continued long-term water quality and ecosystem health monitoring of the Great Barrier Reef. The Reef Rescue Marine Monitoring Program assesses the health of key marine ecosystems (inshore coral reefs and seagrasses), water quality in inshore Great Barrier Reef areas, and water quality in terrestrial run-off entering these areas.

The seagrass monitoring component of the program aims to 1) quantify temporal and spatial variation in the distribution of seagrass meadows; and 2) to correlate seagrass distribution with water quality changes and the delivery of contaminants from land-based sources. This component contributes to Objectives 1 (Targeted science) and 2 (Maximising ecosystem resilience) of the *Climate Change Action Plan 2007-2012*.

The availability of light for photosynthesis is essential for the health and productivity of seagrass meadows

Project name: Lightloggers

Project number: 2.3D.415.38.09ThermalStressLTMP

Outcome: A1

Year: 2009—2010

Bulletin type: Final

APPROVED 4/04/12

Measuring light in seagrass meadows

Due to their high light and nutrient requirements, most seagrasses live in coastal waters that are periodically subjected to run-off from the land. As a result, the amount of light penetrating through the water to seagrass habitats can be highly variable depending on the amount of run-off. Shifts in light availability caused by altered water quality can significantly affect the abundance, distribution and condition of seagrass meadows.

Underwater light loggers are used to provide a continuous record of the underwater light environment in seagrass meadows. Through the Marine Monitoring Program, spatial and temporal patterns in light availability are being measured at 11 inter-tidal and four sub-tidal locations. The aim of these measurements is to assess seagrass responses to light availability in the Great Barrier Reef Marine Park.

Project tasks and objectives

The GBRMPA has funded the purchase of 11 light loggers, which are being deployed at the Marine Monitoring Program seagrass monitoring sites. The loggers are regularly maintained, calibrated and downloaded, and the light data is provided to the GBRMPA through the Marine Monitoring Program.

Outcomes

Potential impacts of climate change on seagrasses are addressed in Climate Change and the Great Barrier Reef: A Vulnerability Assessment (GBRMPA: 2007). The Vulnerability Assessment identified projected changes

The seagrass-monitoring project is investigating relationships between underwater light levels and seagrass abundance

to rainfall patterns and terrestrial run-off as an area of concern for nearshore seagrasses. Reduced light penetration to seagrass meadows can cause a shift in species composition towards shorter-lived species. These species are more prone to 'boom and bust' cycles in response to flood events that reduce water quality in seagrass meadows. Such cycles pose a risk to associated fauna such as dugong, turtle and important fisheries species.

The Vulnerability Assessment predicts increases in rainfall events associated with climate change and these will likely expose seagrass meadows increasingly to the effects of terrestrial run-off.

The data collected by the underwater light loggers can provide valuable information to improve our understanding of these processes. This information will help to identify how seagrasses respond to environmental changes, and will facilitate understanding of the impacts of climate change on seagrass health.

For further information contact the:
Climate Change Group
Great Barrier Reef Marine Park Authority
PO Box 1379, Townsville Qld 4810
07 4750 0759
www.gbrmpa.gov.au