Marine and Coastal

National Environmental Science Program

PROJECT 4.12

Gulf of Carpentaria mangrove dieback – research to support recovery management

The challenge

Shoreline mangrove forests of Australia's northern coast were badly damaged by mass dieback in 2015. Further research and monitoring is being undertaken, to evaluate their current condition and recovery, in an effort to find better ways to preserve and protect these highly-valued marine-coastal habitats.

First Nations people harvest food and timber within these native forests; they protect coasts from erosion during severe weather, store carbon, provide habitat for birds and fish, and are nurseries for many species, such as prawns.

Massive mangrove diebacks in northern Australia's Gulf of Carpentaria (around 39 million trees covering 76 km^2) occurred in 1982 and 2015, alarming communities, the fishing industry and scientists. The diebacks were correlated with the long, but temporary periods of extremely low sea levels, hot weather, and low rainfall associated with the prevailing El Nino weather patterns. These events added further disruptive pressures to shorelines already dealing with steadily rising sea levels.

Since 2015, there has been little follow-up work to examine and support mangrove recovery, or assessment of the long-term consequences for mangrove supported ecosystem services.

The approach

This project will update and map current mangrove condition with revised maps, appraise mangrove management methods that support preservation and protection, and design and cost an innovative Management Response Plan to alleviate substrate dryness in the future during future critical weather conditions.

Components of the work include:

- aerial surveys of the current distribution and condition of shoreline mangroves;
- mitigation works and small-scale trials where possible;
- repeat forestry and physical measures along monitoring transects established in 2018;
- quantification of carbon in damaged, undamaged and recovering shoreline mangrove stands; and,
- environmental monitoring of local shoreline habitat conditions.

Expected outcomes

- Scientific data on mangroves and their vulnerabilities to assist regional planning and management.
- Monitoring of local climatic impacts on intertidal mangroves to meet management needs.
- Evaluation of mangrove protection and restoration solutions, for future mitigation and rehabilitation.
- Assessment of mangrove associated values and pressures, and evaluation of protection options.
- Monitoring of threatened mangrove communities in northern Australia's Gulf of Carpentaria.

Project leader

Dr Norm Duke

norman.duke@jcu.edu.au

James Cook University

Marine and Coastal

National Environmental Science Progr

JAMES COOK UNIVERSITY AUSTRALIA

FRONT: Li-Anthawirriyarra sea rangers monitoring environmental change in dieback-damaged mangroves of Limmen Bight traditional lands. Back: Researching mass mangrove dieback. Photos by Jock Mackenzie, JCU.

This project is supported with funding from the Australian Government under the National Environmental Science Program.