Assessing mangrove dieback in the Gulf of Carpentaria

Project update, June 2019

Norm Duke, James Cook University

Northern Australia Environmental Resources Hub

National Environmental Science Programme

World class research to support sustainable development in northern Australia

This research is improving understanding of extent, patterns, condition, trend and the recovery of dieback-affected mangroves to inform monitoring and management responses.

What's new?

- We've been working with Indigenous rangers and other researchers on aerial and field collections of extensive new imagery, data and observations. The aerial surveys covered 2,633 km of the Gulf shoreline from Weipa to Gove, taking a total of 57,925 continuous, overlapping, oblique, high-resolution images to record the condition of shorelines and the extent of impacts generally.
- We've used field surveys in four remote locations to provide essential validation of mapping and aerial observations as well as quantifying forest stand dynamics, carbon loads, species involved, stand demography, faunal presence and topographic conditions.
- We've identified key management issues for 37 estuaries and will produce report cards on: shoreline erosion, storm damage, bank erosion, depositional gain, saltpan scouring, terrestrial retreat, feral pig impacts, fire damage and the presence of weeds and waste.
- We've developed a working conceptual model about altered sediment transport processes in the Gulf, which could lead to further loss of mangroves fringes and a retreating shoreline.
- We've produced this video and delivered this update to government stakeholders.
- Read more about the combined ecological niche of mangroves and saltmash–saltpans here, and the impact of woody debris here.
- Related publication from the Gulf: Duke, N., Field, C., Mackenzie, J., Meynecke, J. & Wood, A. (2019). Rainfall and its possible hysteresis effect on the proportional cover of tropical tidal-wetland mangroves and saltmarsh–saltpans. *Marine and Freshwater Research*. https://doi.org/10.1071/MF18321

What's next?

- We're preparing our report that assesses the extent, conditions and the patterns of the dieback. The report will also include recommendations for further monitoring and improving reporting processes.
- We're developing training manuals with Indigenous ranger groups that outline training and monitoring processes to support future monitoring efforts.
- We'll be conducting a follow-up aerial survery later in 2019.
- We're organising community meetings to present our research findings to groups around the Gulf in August 2019.
- We'll also present the assessment findings at a synthesis workshop.

Project summary

During the summer of 2015–16, one of the worst mangrove dieback events ever recorded devastated around 7,400 hectares of mangrove forests along more than 1000 km of Gulf of Carpentaria coastline. Field visits suggest that a

"Recovery looks like it's being overwhelmed by erosion combined with physical scouring by masses of drift logs and branches from dead mangroves," Norm Duke.

Four years after the dieback event, mangrove recovery in the Gulf seems limited, photo Norm Duke.

relatively low percentage of trees have recovered and most are dying or dead, but there is no current formal assessment of the condition of affected forests and what proportion are recovering. Our understanding of the patterns of impact across the extent of dieback is also limited – in some areas, all mangrove species in all tidal elevations have been affected but in other areas, only some species in specific locations have been affected. The dieback was not discovered for nearly five months, and individual reports did not recognise the scale of the event, demonstrating shortcomings in coastal monitoring capability.

This project focuses on the Gulf of Carpentaria, particularly the major dieback areas from Pormpuraaw to Numbulwar.

Working with Indigenous ranger groups in the Gulf has led to manuals for future monitoring, photo Norm Duke.

Further information

Contact project leader Dr Norm Duke
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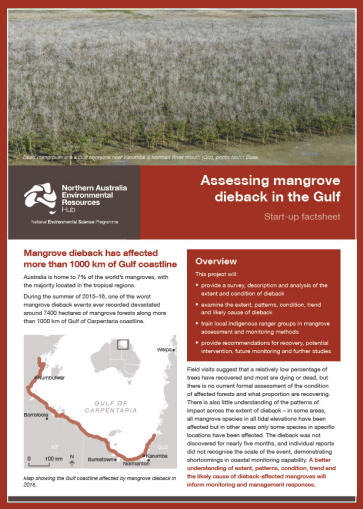
The project page can be found on the Hub website, along with the project start-up factsheet.

This project is due for completion in December 2019.


Northern Australia Environmental Resources Hub
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Assessing mangrove dieback in the Gulf
Start-up factsheet

Mangrove dieback has affected more than 1000 km of Gulf coastline

Overview

This project will:
- provide a survey, description and analysis of the extent and condition of dieback
- examine the extent, patterns, condition, trend and likely cause of dieback
- train local Indigenous ranger groups in mangrove assessment and monitoring methods
- provide recommendations for recovery, potential intervention, future monitoring and further studies

Map showing the Gulf coastline affected by mangrove dieback in 2016.

James Cook University Australia

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