Research Project Fact Sheet

Project Title: COTSpotter

Subtitle / Tagline: Digital eyes helping us look after Sea Country.

What is the Project?

This is a short-term (12 month) desktop project that will develop computer models and software to help monitor for outbreaks of coral-eating crown-of-thorns starfish (COTS) on the Great Barrier Reef. The project team will analyse underwater photos of the reef collected by Queensland Parks and Wildlife Services (QPWS) as part of their regular coral reef health surveys. CSIRO has developed a computer program to recognise COTS in photos of the reef, using a process called Machine Learning, where the program is given many COTS images hand-picked by human experts to learn from. The program can now scan thousands of photos quickly and detect COTS within minutes, greatly improving the efficiency of COTS surveys. However, the computer program does not always get it right – sometimes it thinks there is a COTS when there is not. This project is developing web-based tools that allow users to review the photos, and spot and correct these mistakes. This teaches the computer to become more accurate and provides better data on reef health for reef managers and Traditional Custodians.

Why is it Important?

COTS can damage coral reefs when their populations grow too large. Monitoring COTS helps reef managers respond to outbreaks and protect coral health. The Great Barrier Reef is large, and many thousands of underwater photos are needed to understand its condition and health. Computer programs can help us become more efficient at monitoring reef health and the data they generate can be used by the COTS Control Program to control COTS outbreaks.

What Will Happen?

Reef Surveys: QPWS will use underwater cameras to conduct reef surveys across the Great Barrier Reef from October 2025 to February 2026 and will share the photos with the project team for analysis by the computer program.

Web Tool Development: A web-based tool will be built to display underwater survey photos and the COTS detected in the photos by the computer program. Users, such as park managers, will use this tool to review the detections and correct mistakes. This helps to improve the reliability of the data.

Survey Reporting: Information from the surveys will be used to create reports about reef conditions. We will make these reports and info sheets available for Traditional Custodians to read and use in looking after Sea Country.

COTS Control Innovation Program

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This project contributes to the COTS Control Innovation Program's Bridging Phase, funded by the Australian Government's Reef Trust, the Australian Institute of Marine Science, and the Great Barrier Reef Foundation.

Where Will it Happen?

The desktop work under this project will take place at the CSIRO offices located on the traditional land of Turrbal and Jagera peoples. The photo surveys conducted by QPWS will cover large regions (e.g. reefs offshore from Cooktown down to Gladstone) and the exact reef locations where photos will be taken are not known in advance. Possible Sea Country areas where photo data may be collected include Yuku Baja-Muliku, Yirrganydji, Gunggandji, and Darumbal.

How can you get involved?

- Contact the project team to discuss this research and future collaboration opportunities.
- Stay informed through the information sheets and survey reports about COTS detections on Sea Country.

Meet the team

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