

NERP Tropical Ecosystems Hub Project Factsheet

The chronic effects of pesticides and their persistence in tropical waters

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Project summary

Pesticides, and particularly herbicides from agricultural sources, have been detected in nearshore sites of the Great Barrier Reef (GBR) all year round. The actual impacts from these concentrations of herbicides is under debate and information on cumulative impacts is required. To address this, a series of experiments will examine how plants and corals are affected by herbicides in the water in conjunction with other stressors such as temperature, low salinity and low light. An important source of herbicides in coastal waters is flood plumes from river runoff. By creating experimental conditions similar to GBR flood plumes we will determine how long herbicides persist and how they are transformed as they travel into coastal waters.

Why this research is needed

We lack fundamental knowledge about the fate and persistence of herbicides on the GBR. There are few data to explain the extent to which sensitive tropical organisms such as corals, and especially seagrass, are affected by chronic exposure to herbicides combined with increased sea temperature and/or declines in salinity and light.

Research-user focus

Research knowledge from this project will contribute to Queensland and Australian Government policy development to protect the GBR from the effects of pollution and climate change. Data will inform Reef Rescue projects and Reef Plan and facilitate management of the GBR by the Great Barrier Reef Marine Park Authority (GBRMPA). Other research users include the Department of Sustainability, Environment, Water, Population and Communities, Queensland Department of Environment and Heritage Protection, Terrain NRM, Burdekin Dry Tropics NRM, Fitzroy Basin Association, Canegrowers and WWF.

Project Partners:



Find this project at www.nerptropical.edu.au

Theme 2: Understanding Ecosystem Function and Cumulative Pressures

Program 4: Water quality of the GBR and Torres Strait

Project: 4.2



NERP PhD student Phil Mercurio and Florita Flores prepare herbicides for persistence experiments.



Florita Flores and NERP PhD student Jonathan Craft collect seagrass from Gladstone.

Outcomes

- Threshold concentrations for chronic effects of herbicides on seagrass.
- An assessment of whether managing chronic herbicide exposures can protect seagrasses and corals from climate change pressures (e.g. thermal stress).
- Identification of half-lives of herbicides at multiple temperatures.
- Quantification of herbicide breakdown products and their potential toxicity.

Photos (from top): Phil Mercurio; Cecilia Villacorta Rath