

Photo courtesy of Biosecurity NZ

Modelling heads off marine pest infestations

The challenge

Invasive marine pests, spread by increased international trade and traffic, can cause long-lasting ecological and economic damage. Early detection is critical to containing outbreaks before they take hold.

New Zealand's coastal authorities, local communities and iwi and hapū (Māori tribes and sub-tribes), are concerned that a new marine pest, *Caulerpa* seaweed, is spreading rapidly via boat gear or anchor entanglement.

Surveillance resources are limited, and the country's vast coastline makes it difficult to prioritise where to look for further outbreaks. Once established, invasive marine pests are extremely difficult and costly to eradicate.

The approach

Working in partnership with local stakeholders and other researchers, AIMS scientists mapped vessel movements between ports and coastal habitats across New Zealand.

Then, focusing on the Northland area, they used these vessel networks to model the potential transmission and infection of *Caulerpa* to quantify the biosecurity risk.

They identified:

- How widely *Caulerpa* could spread across New Zealand in a worst-case scenario.
- The most likely routes of *Caulerpa* spread.
- High-risk locations for priority surveillance and early detection.

The impact

The *Caulerpa* spread predictions provided Northland Regional Council with valuable insights at a critical time, enabling a targeted, rapid response to the incursion.

AIMS and partners have created practical tools that are now being used in New Zealand, Australia, and the wider Indo Pacific region. These tools augment local knowledge and help build biosecurity preparedness for future marine pest threats, such as prioritising surveillance locations for early detection and intervention.

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IDENTIFIES
HIGH-RISK LOCATIONS

ENABLES
RAPID RESPONSE

ENRICHES
LOCAL KNOWLEDGE

MAXIMISES
LIMITED RESOURCES