

Aquatic Biodiversity & Biosecurity

Unique guide to coralline algae

NIWA scientists and colleagues at La Trobe University in Melbourne have produced a unique identification guide to 'crustose' coralline algae, a diverse group of calcified red algae. The guide represents a critical step in understanding these little-studied seaweeds, which play an important role in coastal ecosystems.

Coralline algae can produce chemicals that promote settlement of invertebrate larvae, including paua, and some form intricate reefs that may serve as nursery grounds for fish. However, basic information – including how many species we have, where they grow, and their interactions with other organisms – is sparse or completely lacking.

The guide, which comes in CD and book form, profiles 20 common 'crustose' species from central New Zealand, including the Chatham Islands. It provides a useful reference for biologists, fisheries and coastal managers, and those with responsibility for marine protection and conservation.

The project was funded by the Ministry of Fisheries' Biodiversity Programme.



Exploring groundwater ecosystems

Groundwater ecosystems, which include gravel aquifers and caves, support unique assemblages of animals and serve as important sources of water for humans. NIWA is conducting a four-year research programme funded by the Foundation for Research, Science & Technology to improve understanding of these systems.

Waitomo's famous glowworms feed on invertebrates living in Waitomo Stream. Our preliminary survey of this stream uncovered healthy populations of mayflies and caddisflies. 'The research will help us keep track of glowworm food supply so vital to the health of the cave ecosystem,' says Dr Chris de Freitas, Chair of the Waitomo Caves Environmental Advisory Group.

An important objective of the research programme is to identify tourism impacts in cave systems. We discovered that coins thrown into a pool in Aranui Cave (Waitomo) had contaminated the pool with extremely high levels of copper and nickel. We've since assisted in the clean-up job and will conduct further monitoring.

Combating didymo – *know your enemy*

The invasive freshwater alga *Didymosphenia geminata* (didymo) threatens New Zealand's hydroelectricity generation, angling, tourism, and clean green image. The economic impact of the incursion is estimated at between \$58 and \$285 million over the first eight years. First identified by NIWA scientist Cathy Kilroy in the lower Waiau River in October 2004, didymo has since been found in several South Island rivers.

NIWA has been providing research and advice to Biosecurity New Zealand on the biology, impacts, and control of this tenacious pest. We discovered that didymo will grow in a very broad range of river conditions and can withstand large floods. We estimate that more than 50% of our rivers provide suitable conditions for didymo, mostly in the South Island.

Trials at a specially-designed facility at the Monowai Power Station in Southland have identified several promising chemicals for the control of didymo. These are now undergoing rigorous testing to determine their effects on didymo and other organisms.



NIWA researchers Cathy Kilroy and Elliot Tuck check for didymo at the Ahuriri River, Otago, watched by Royal Society Teaching Fellow Dave Ward.

Identifying marine pests

The ability to identify marine species is fundamental to protecting New Zealand's waters and marine industries against pests. NIWA is now handling all identifications of marine species for Biosecurity New Zealand under a four-year contract.

The Marine Invasives Taxonomic Service performs urgent identifications of suspected invasive species from diverse sources, and non-urgent identifications from routine survey work.

This involves receiving, identifying, cataloguing, and dispatching specimens to experts in New Zealand and overseas, and storing large volumes of both data and specimens for Biosecurity New Zealand projects. These include baseline surveys of species in New Zealand ports and biological fouling on vessel hulls, plus surveillance for particular pest species.

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NIWA biologists Andrew Hosie and Shane Ahyong examine specimens collected during marine biosecurity surveys.