

BIRDS, SPIDERS AND BUBBLES

Drawing inspiration from the natural world to develop new solutions to aquatic environmental challenges

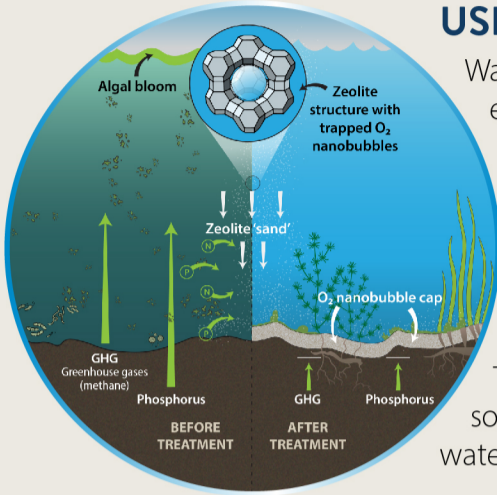
Bubbles are an amazing natural phenomenon. They're beautiful, fun to play with, and a bit mysterious, but they're also proving to be quite useful! New research and development by scientists at [Cawthron Institute](#) is revealing they could also be a powerful tool to address challenges in aquatic environments.

USING BUBBLES TO CLEAN UP DEGRADED LAKES

Water quality is poor in many of Aotearoa New Zealand's lakes with negative effects on the environment and people.

Cawthron freshwater researchers have worked with [Ngā Pae o te Māramatanga](#) and the [Biological Heritage National Science Challenge](#) to explore the use of tiny nanobubbles of oxygen to lock in nutrients stored in the lakebed, preventing the release of greenhouse gases and the algal blooms caused by low dissolved oxygen and high nitrogen and phosphorus levels in the water.

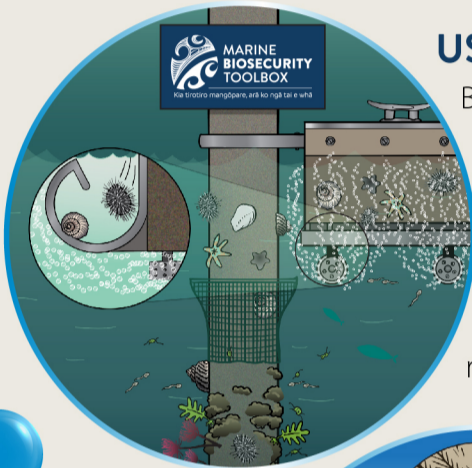
The trial concept involves adding a mineral called zeolite to water. It works sort of like a magnet to do two things – 'carry' tiny nanobubbles around in the water and attract organic matter causing it to clump together.



USING BUBBLES TO PREVENT BIOFOULING

Biofouling occurs when microorganisms, plants, algae and other small animals build up on structures underwater. It causes damage to boats and coastal infrastructure and is a biosecurity risk with international ships transporting invasive species.

Cawthron scientists and researcher partners have been working on solutions to this problem through their involvement in the Cawthron-led, government funded [Marine Biosecurity Toolbox](#) research programme.

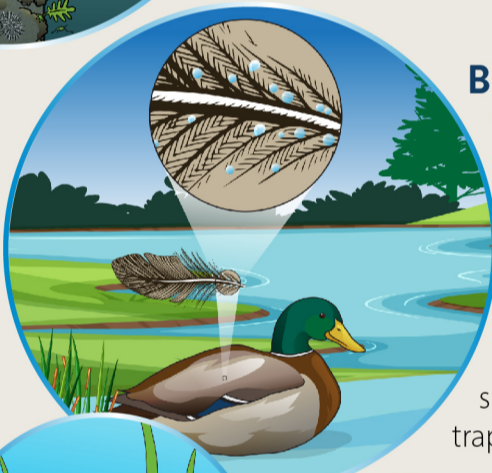


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You've probably heard the term 'like water off a duck's back' – it's because waterfowl and seabirds alike are renowned for their buoyancy and watertight coat of feathers.

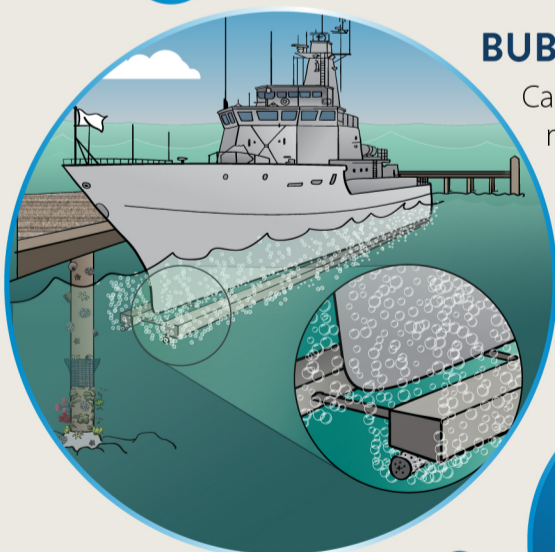
Researchers at Durham University have found a non-woven polypropylene fabric that has similar waterproof qualities to these feathers, and a substance that mimics the effect of preen oil, to trap a layer of gas against a surface underwater.

The researchers have also drawn inspiration from the Diving Bell Spider and its incredible underwater breathing technique when figuring out how to maintain the trapped gas layer, by using a bubble machine to direct short bursts of air bubbles at the surface every few hours.



BUBBLE MACHINES

Cawthron researchers are also using giant bubble making machines underneath marinas to disturb the water and prevent biofouling species from settling on the bottom of boats and on structures like marina pontoons.



FIND OUT MORE

Our researcher's aim to do more research and development to take these technologies from the lab to the field, finding the most affordable and efficient techniques scaling up their use. Read more about this innovative R&D here.



Thanks to our research funders and partners



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