

Science Matters

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Building heralds exciting new phase

Cawthron Institute's new Envirotech wing is now open for business.

The \$5 million facility at Cawthron's main site in Nelson was completed in October this year, marking an exciting new phase for the institute.

Cawthron's staff numbers had grown about 25 percent in the last seven years and the two-storey building provides much-needed breathing space for the scientists.

Housing molecular, biosecurity and ecotoxicology experts, it includes specialist laboratories, offices, meeting rooms and staff facilities. The building is also the new home of Cawthron's internationally-significant living collection of microalgae cultures.

Cawthron marine scientist Chris Cornelisen describes the new facility as "something of an R&D think-tank," and says it will transform the way he and his fellow scientists work.

"It's going to help staff do the best science they can do, while fostering integration among the teams, and bringing people together."

With new equipment replacing outdated technologies, it will also help the institute better meet the needs of its research partners and clients.

"The companies we work with are asking us to increase our capacity and capabilities to help them deliver export growth,"

Cawthron Institute Chief Executive Charles Eason says.

"This new building and laboratory marks a significant step forward for us and will further strengthen our support of the aquaculture and food industries."

The new Envirotech building includes laboratories, meeting rooms and offices.



Breakthrough in didymo research

Scientists Jeannie Kuhajek (left) and Susie Wood are hoping their recent breakthrough will help improve understanding on didymo biology and invasiveness.

In a world-first, Cawthron scientists have discovered how to grow the invasive algae didymo in the laboratory – a breakthrough that could one day lead to its control.

Didymo, also known as 'rock snot', has spread to over 150 South Island waterways in the past nine years. In some areas it forms thick, slimy-looking mats that can smother entire river beds. It is not a significant human health risk, but can affect stream habitats and sources of food for fish, and make recreational activities unpleasant.

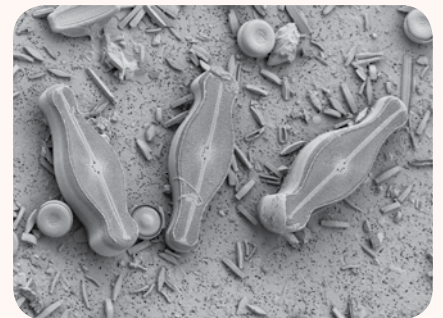
For the past four years, Cawthron scientists have been trying to better understand the basic biology, distribution and abundance of didymo in New Zealand. As well as discovering how to grow it in a controlled laboratory environment, Drs Susie Wood and Jeannie Kuhajek have also identified bacterial species that might enhance or suppress its growth.

Funded by the Ministry of Primary Industries and the Department of Conservation, their research has attracted world-wide attention. Dr Kuhajek presented these latest advancements at this year's International Didymo Conference in the United States, where they were well received.

"Our research could ultimately help us understand why this algae is so invasive and why it has established in some rivers but not others," Dr Wood says.

While eradication is unlikely, Dr Wood believes chemical or biological methods could eventually be used to control didymo in areas where it is problematic.

Didymo cells under the microscope. (Photo: Gustaaf Hallegraef)



New look website

Did you know Cawthron has a 'new look' website? Check out cawthron.org.nz for latest research, publications, science reports and information about our services. You can also find out more about the people behind

Cawthron, learn about our history, and get updates on our community events and education programmes.

Remember to share anything of interest with your friends and colleagues!



Protecting our borders

Cawthron's Biosecurity Team is working with the oil and gas industry and the Ministry for Primary Industries (MPI) to protect New Zealand's marine environment from introduced pests and diseases.

This year, the team developed a biosecurity plan for the international oil rig *Kan Tan IV* and its support vessels to ensure that they were all pest free when entering New Zealand waters. It was the first Craft Risk Management Plan to be approved under the Biosecurity Act.

"The companies involved, Frigstad Offshore and OMV New Zealand, were keen to voluntarily meet the standards and we were committed to helping them achieve that," says Cawthron Biosecurity Team Leader Dr Grant Hopkins.

Using a team of commercial divers, Cawthron scientists inspected the *Kan Tan IV's* exterior for potential biosecurity threats at a shipyard in Singapore before the rig travelled to New Zealand. Arriving here in August, it received the 'all clear' from MPI biosecurity inspectors.

"Ensuring vessels meet MPI expectations before leaving overseas ports means we can provide early assurances to MPI that they are low biosecurity risk – ultimately speeding up clearance checks at the border and reducing the likelihood of costly delays for industry."

Photo credit:
OMV New Zealand



Analytical expertise supports industry growth

Over the past decade, Nelson has become a hub for businesses specialising in the manufacture of health supplements and nutraceuticals.

The companies are part of an emerging global industry worth billions of dollars a year. In Nelson alone, the region's Economic Development Agency estimates that the local health supplements sector brings about \$50 million to the region annually, with huge potential for growth.

Playing a key role in this sector's success is Cawthron Analytical Services, a division of Cawthron Institute providing independent testing services to meet safety and export requirements, as well as research and method development expertise.

It offers one of the few laboratories in New Zealand (and the only one in the South

Island) internationally accredited for testing supplements and nutraceuticals.

Nelson-based Alaron Products is a contract manufacturer of dietary supplements and one of Cawthron's key clients. Its business development director Cary Wernick is in no doubt about the value of Cawthron's service.

"The most important aspect to our work is product safety and integrity. An independent, accredited lab gives our customers reassurance that the products we manufacture on their behalf are safe and fit for purpose."

Ocean acidification on the radar

Ocean acidification is the name given to the ongoing decrease in the pH of the earth's oceans, driven by increasing levels of carbon dioxide (CO₂) in the atmosphere.

This increasing acidity could have negative consequences for marine-based calcifying organisms (those that create shells or hard outer skeletons) across the food chain, from the microscopic foraminifera through to corals, crustaceans and molluscs.

It also has implications for industries that farm or harvest these species, such as the aquaculture sector, as increased acidity can affect shell formation, energy usage and ultimately growth and survival of stock, in particular the young shellfish.

A workshop to help marine farmers, industry groups and government agencies understand and plan for potential effects of ocean acidification on commercial shellfish operations is being held in Nelson in December 2013.

The upcoming workshop has been organised by the Ministry for Primary Industries, NIWA, Cawthron, Sustainable Fisheries Partnership, and the US State Department, among others. United States marine farmers and researchers will attend to share their experiences after CO₂-rich upwelling off the Pacific Northwest coast initially caused an 80 percent decline in production of Pacific oyster larvae.

"There are key lessons to be learned from our colleagues in the United States that will assist us in focusing research, planning and management practices to enable the industry to grow despite pH decline," Cawthron shellfish physiologist Dr Norman Ragg says.

Email ashleigh.cooke@cawthron.org.nz to find out more or register for this free event.

Charlie's corner



If you ever get the chance to visit us here in Nelson, you'll notice something unusual around our new building – it has been 'wrapped' from top to bottom in words.

Not just any words. They are the vision for Cawthron Institute as set down by our founding director, the renowned chemist Professor Thomas Hill Easterfield in 1917:

"I foretell a brilliant future for this Institute. The problems solved in it will lead to results of the greatest value to this city, to the Dominion, and to the human race.

Workers who have carried out these researches are destined to become scientific leaders with a world-wide reputation, and the Institute itself is to be a centre of light, learning, and culture, honoured throughout the civilised world, and a lasting tribute to the memory of Thomas Cawthron." – Excerpt from 'The Aims and Ideals of the Cawthron Institute' by Professor Thomas Hill Easterfield.

Professor Easterfield's words are an inspiration to our dedicated scientists, and a reminder of how far we have come as a leading science organisation – but more importantly, what we must continue to strive for.

Cawthron remains solution-focused – adding value to local and national industries, carrying out internationally-recognised collaborative research, and ensuring the latest science and technology tools and capabilities are applied for the benefit of our clients and research partners. We have come a long way, but there is always more we can achieve.

Professor Charles Eason
CHIEF EXECUTIVE CAWTHRON INSTITUTE

Mapping system puts science in communities' hands

Cawthron scientists have launched a new mapping system that enables communities to measure the health of local stream habitats themselves, without the need for scientific experts.

The GIS-based mapping system, known as the Riparian and Instream Habitat Survey Protocol, is designed to help farmers, communities and fishers more easily assess stream health for high-value species such as trout and eels. It was developed with investment from DairyNZ and the Ministry of Business, Innovation and Employment.

Data such as the quality of the stream bank habitat, streambed and fish cover; and stream depths and widths, is translated into a habitat score for each section of the stream or river.

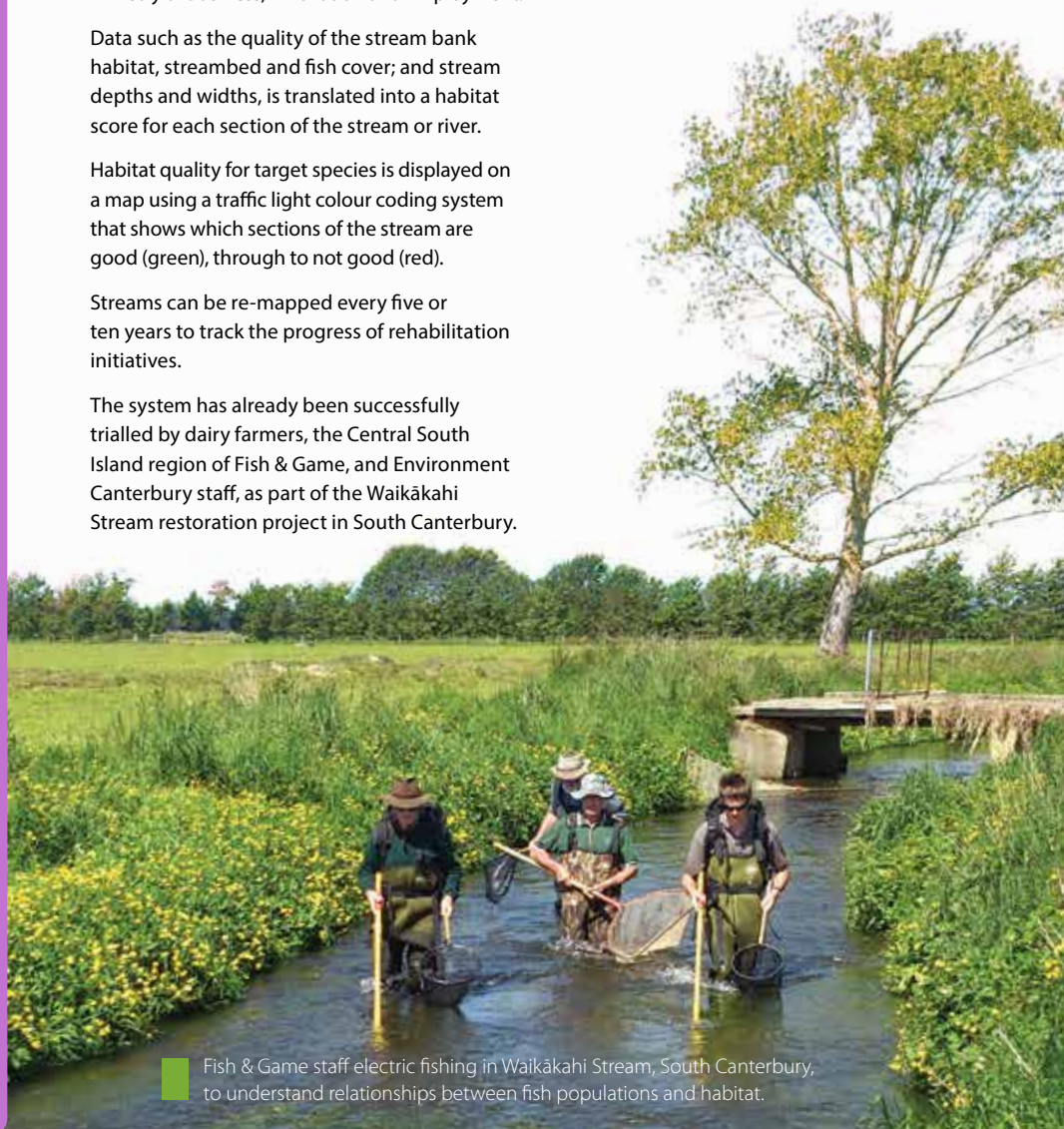
Habitat quality for target species is displayed on a map using a traffic light colour coding system that shows which sections of the stream are good (green), through to not good (red).

Streams can be re-mapped every five or ten years to track the progress of rehabilitation initiatives.

The system has already been successfully trialled by dairy farmers, the Central South Island region of Fish & Game, and Environment Canterbury staff, as part of the Waikākahi Stream restoration project in South Canterbury.

The next step is for the system to be developed for tablets and mobile phones so that anyone, anywhere can map their river or stream.

Contact robin.holmes@cawthron.org.nz to find out more.



Fish & Game staff electric fishing in Waikākahi Stream, South Canterbury, to understand relationships between fish populations and habitat.

Science Matters is a quarterly magazine by Cawthron Institute, New Zealand's largest independent science organisation. To subscribe by email, contact info@cawthron.org.nz

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