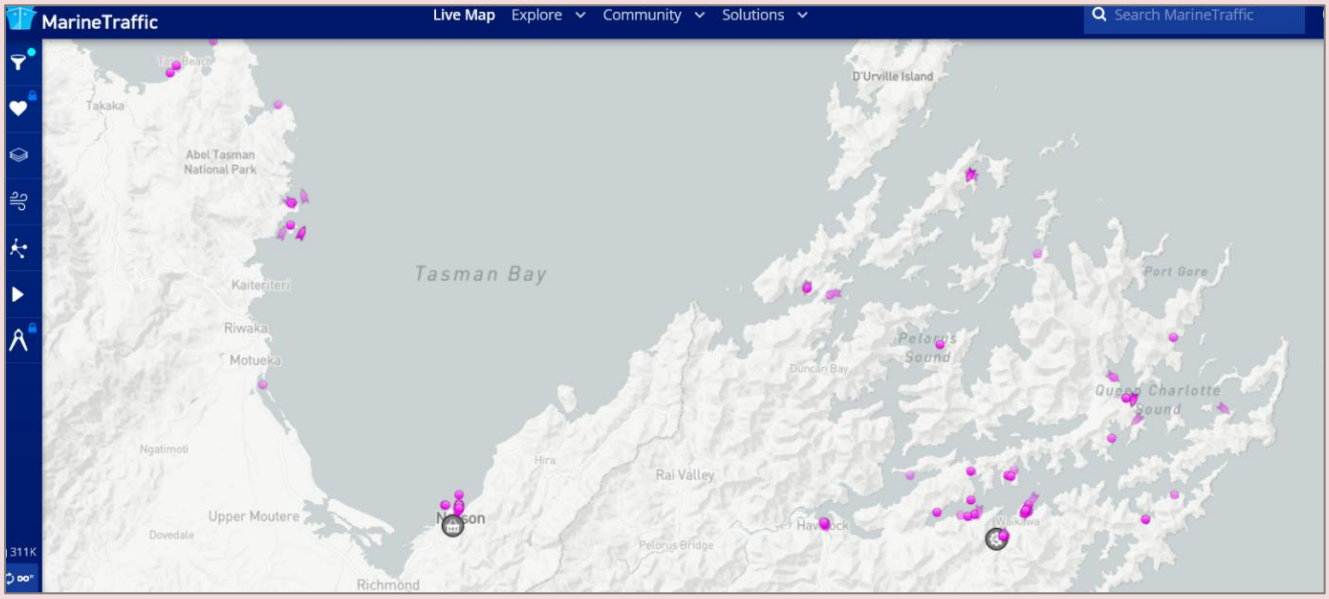
Partners' Newsletter
Keeping you informed
Summer 2023

AIS helps find risk vessels

Enhanced use of the Automatic Identification System (AIS) is helping the TOS track and intercept risk vessels coming from other regions.

"Setting up an automated gateway in the AIS system allows us to get email alerts of recreational vessels with the system entering the region. Although only a small proportion of recreational vessels in New Zealand have this installed, they are often the larger vessels that are travelling longer distances. Various providers give free access online but we have purchased enhanced services that also allow us to look at the past stops the vessel has made. When these include locations of interest with known pests we can support councils and marinas with early notification, or pick them up in our summer survey if the programme allows" said Dr Barrie Forrest who set up the system for the TOS Partnership.



AIS is intended, primarily, to allow ships to view marine traffic in their area and to be seen by that traffic. A secondary, unplanned and emerging use for AIS data is to make it viewable publicly, on the internet, without the need for an AIS receiver. Global AIS transceiver data collected from both satellite and internet-connected shore-based stations are aggregated and made available on the internet through a number of service providers. Data aggregated this way can be viewed on any internet-capable device to provide near global, real-time position data from anywhere in the world. Typical data includes vessel name, details, location, speed and heading on a map, is searchable, has potentially unlimited, global range and the history is archived.[1]

"AIS tracking has increased our efficiency in finding vessels from locations of interest even when they are not using the system themselves. For example, vessels visiting the TOS from Auckland and the north generally come round Cape Reinga and down the west coast during favourable weather windows. We can usually see some of these on the AIS and this lets us know to look for a group of vessels about five days after they round the Cape" said Coordinator Peter Lawless.

Full results of the summer survey will be available online in March.

[1] https://en.wikipedia.org/wiki/Automatic_identification_system

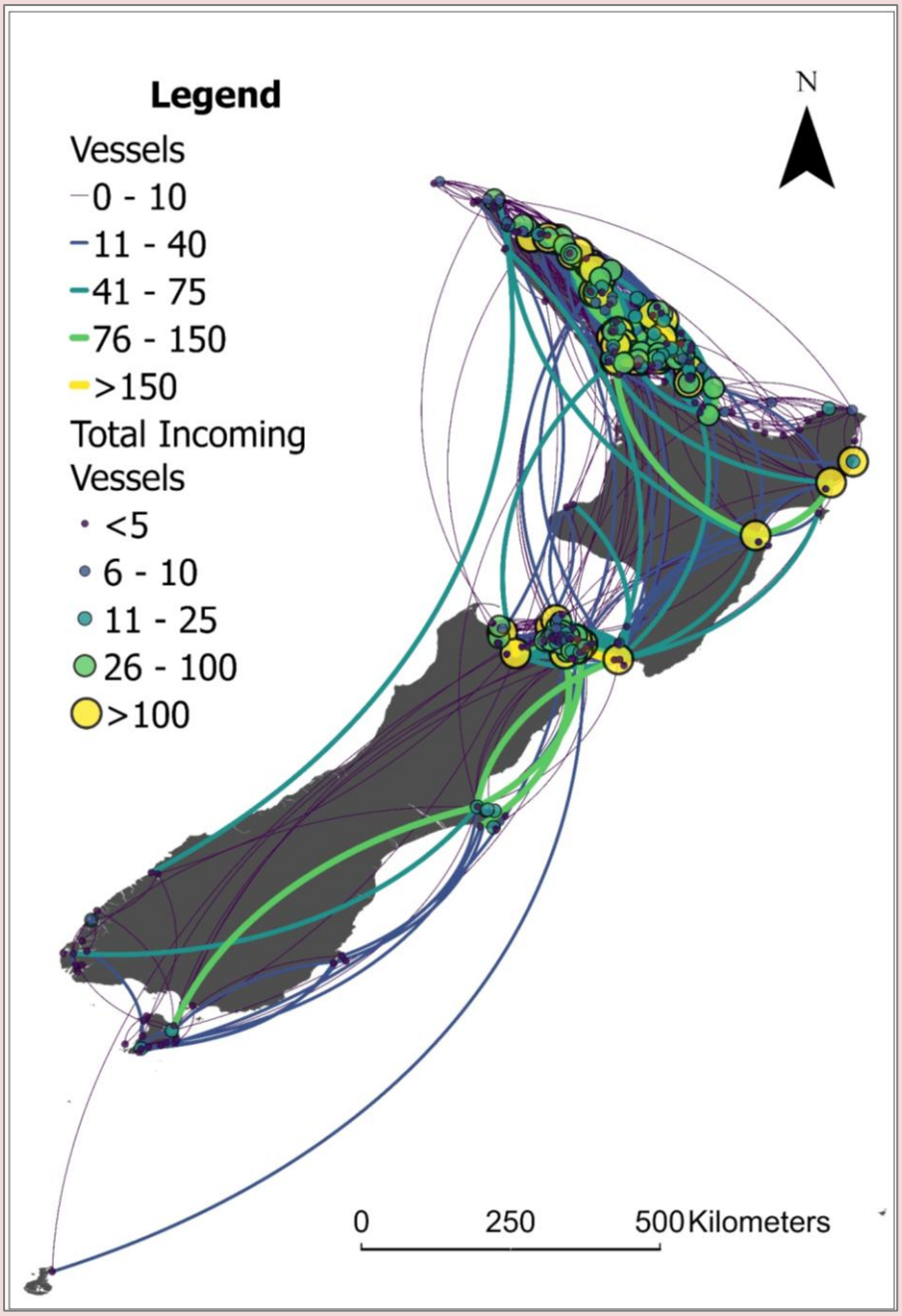
Understanding patterns of recreational vessel movements around New Zealand

MARINE BIOSECURITY TOOLBOX
Kia tirotiro mangōpare, arā ko ngā tai e whā
Look through the eyes of the mangōpare, observing in all directions

MANAGE & RESPOND

Recreational vessels travel all over New Zealand, departing from marinas and mooring areas to thousands of destinations such as beaches, islands and marine protected areas. They can also be a key pathway for spreading marine pests through hull fouling. Recreational vessels are not required to report their location (e.g. via AIS devices). Therefore, there is no readily available information about their movements. This is a significant data gap for regional and national pathway management efforts.

To remedy this, PhD student Kyle Hilliam, in collaboration with Eric Treml, Oli Floerl and Melissa Welsh (Deakin University, Cawthron Institute and Scion Research), gathered information on recreational vessels' movements through an online map-based survey. This survey allowed participants to specify where they travelled to over the past two years and record valuable trip information such as time spent at each destination. Yachting New Zealand, the New Zealand Marina Operators Association and regional harbourmasters throughout the country helped us distribute the survey. More than 1,800 vessel owners responded to the survey and provided information on over 12,000 visits. The resulting dataset is the most comprehensive body of information on recreational vessel 'behaviour' around New Zealand. It was used to create a network model that captures the dynamics of nationwide recreational vessel traffic (see figure).



This network model has 316 'nodes' (homeports and destinations) and over 5,000 'edges' that link these nodes. Using proven analytical techniques, we identified several marinas and moorings areas throughout New Zealand (located in Waitematā Harbour, Gulf Harbour, Great Barrier Island, Tauranga Harbour, the Bay of Islands and Nelson) that act as important 'hubs', or 'stepping-stones within the domestic network. Several of them possess over 150 connections to other nationwide sites.

The next steps in this research will be to parameterize this model with risk factors relating to biofouling or other transport mechanisms. This will enable us to identify destinations that are most at risk of marine pests introductions by recreational vessels, and that should receive extra attention regarding monitoring. Our model will soon be combined with commercial shipping and the aquaculture sector networks and used to simulate incursions of particular marine pests and examine the efficacy of various management actions.

For more information, feel free to contact Kyle Hilliam (Kyle.Hilliam@cawthron.org.nz).

Trials of bubble technology to keep pontoons free of biofouling

The war against marine pests will rapidly get easier if we can prevent them from growing on artificial structures like marina pontoons and wharf piles. Oliver Floerl, co-lead of the New Zealand-led Marine Biosecurity Toolbox research programme, recently described some exciting research initiatives aiming to make this happen.

One of these initiatives, undertaken by Grant Hopkins and collaborators from Cawthron Institute and Durham University, is the use of bubble streams around underwater infrastructure like marina pontoons and wharf piles.

“We shroud infrastructure in small air bubbles that creates a barrier to the larvae of marine organisms so they can’t settle,” explains Grant.

Over the past 7 years, and with support from councils, central government, and industry, Grant’s team have piloted bubble stream generation systems that have proven capable of keeping surfaces clean for several months. A prototype for a retrofitted system for marina pontoons is currently being trialled at Waikawa Marina in Picton. Longer-term, and in partnership with a pontoon manufacturer, they aim to establish a purpose-built, ‘bubbled’ pontoon for longer-term operation in one of the country’s invasion hotspots.

“Our objective is to develop a perpetual and environmentally benign mechanism that will keep structures clean,” explains Grant. The team’s research and testing is currently funded till the end of 2024.

Progress to date

The trial at Waikawa Marina has started and so far it's showing great promise and Stuff recently reported on the pilot.

Waikawa Marina, Picton.

What’s happening in Marlborough

Marlborough continues to have no known established populations of Mediterranean fanworm. If you suspect you have found Mediterranean fanworm please contact the Marlborough District Council Biosecurity team on phone 03 520 7400 or via email biosecurity@marlborough.govt.nz

Marlborough District Council Biosecurity Officer, Hayden Nott, undertakes an inspection.

Summer Survey

The summer survey of recreational vessels for 2022/2023 is almost complete and the data is being analysed.

"This year the focus was on finding active vessels that could be spreading harmful organisms" said Dr Barrie Forrest that heads the survey team. "We put more effort into finding visiting vessels that were out and about, and less on resident boats that are on moorings and don't move much.

As usual the majority of the boats from outside the Top of the South came from Wellington and Mana marina. A recent find of Mediterranean fanworm on a vessel in Seaview Marina made us especially vigilant about those boats. As it turned out they were generally well maintained, the skippers were aware of the risks and requirements, and had taken the necessary steps to keep their vessels clean. As a result, the only pests on those vessels were the seaweed *Undaria* (aka Wakame), and the clubbed tunicate *Styela clava* in low numbers.

We also used AIS (marinetraffic.com) to track vessels arriving from Northland, Auckland and Lyttelton, which are an ongoing risk for introducing Mediterranean fanworm to the Top of the South. We found two vessels with fanworm, one from Lyttelton and one from Auckland. The Lyttelton vessel was a large liveaboard yacht. This had mature fanworm that were reproductive but had not yet spawned. The owners agreed to go directly to Waikawa and were lifted and cleaned the same day. The other vessel was a large, powered vessel in the superyacht range that had come from Auckland. It had been inspected by divers there and cleared as clean. Unfortunately the divers had missed fanworm in the stern thruster. We are following up with the dive companies. The other category of vessel that came back into the survey this year was international vessels that had cleared the border at Opua. None of these was carrying pests, but some had failed antifouling coatings and we are also following up on this issue. "

More on the summer survey results in the next newsletter once the numbers have been crunched.

Some of the team at work.

www.marinebiosecurity.co.nz

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