

MRQ

Monitoring Research Quarterly



Volume 5 issue 4

Monitoring Research Quarterly (MRQ) is produced by Auckland Council's Research, Investigations and Monitoring Unit, RIMU. Each edition of the newsletter contains reports of RIMU's current work including information about recent publications, research, facts and trends about Auckland. RIMU publications are available on the Auckland Council and Knowledge Auckland websites.

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Seaweed wash ups on Tryphena beaches

RIMU is leading a research programme to examine the source of nutrients fuelling seaweed growth resulting in large seaweed wash ups on beaches at Great Barrier Island's Tryphena Harbour.

The seaweed called *Microdictyon umbilicatum* is a non-toxic, non-invasive species also found at Leigh, other Great Barrier Island locations, the Alderman Islands, Auckland's East Coast Bays and in New South Wales, Australia.

The research will provide seaweed management options for the Great Barrier Local Board. To do the research, RIMU is using nutrient tracking techniques (for example, stable isotope analysis), satellite imagery and water samples to determine the sources of nutrients (land compared with oceanic) and describe the spatial (across the Hauraki Gulf) and temporal (months to years) variations in nutrient concentrations. In addition, RIMU will examine how variations in climate (for example, El Nino or La Nina) influence how plants and animals grow in the Hauraki Gulf and any links to *Microdictyon* growth in Tryphena Harbour.

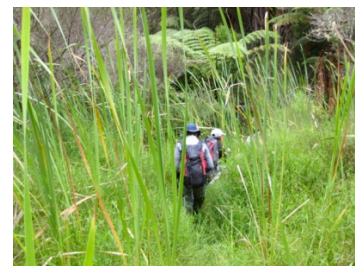
RIMU will also investigate the abundance, distribution and demographics of the seaweed to understand where *Microdictyon* occurs, what eats it and under what conditions it likes to grow (including its nutrient uptake, nutrient cycling and growth rates). This information will guide the appropriate management responses to help alleviate the growth and wash up of seaweed.

Students join RIMU for summer fieldwork

RIMU plays a vital role in collecting data on the state of Auckland's environment. Data is collected throughout the year however, the summer months offer favourable weather and abundant ecological activity - a great opportunity to gather large amounts of meaningful information.

This summer, six students from the University of Auckland, AUT and the University of Waikato have joined the RIMU science teams to help with the busy summer fieldwork data collection period. The summer students will be involved in the annual freshwater, forest and wetland monitoring programmes as well as the busy hydrology programme. Along with helping out in the field, the students will assist with data management and investigations.

As part of the studentship programme, and to ensure the next generation of students benefit from their time with RIMU, all students are supported by a stipend during the research component of their masters degree. The collaboration with Auckland Council means that the students' projects will have a focus on topics important to Auckland, increasing our knowledge of how the Auckland environment works. Students receive valuable work experience, with support from scientific experts and the council receives a capacity boost over the busy summer field season.





Census 2013: Auckland Counts

With less than four months until the next New Zealand Census of Population and Dwellings, RIMU is getting busy with its Auckland Counts project!

There are two central aims for RIMU's Auckland Counts project. The first aim is supporting Statistics New Zealand to encourage and empower everyone in Auckland to fill out a form on census day.

The 2013 census will be held on Tuesday, 5 March 2013. It is the official measure of people and dwellings in New Zealand and under the Statistics Act 1975, a form must be filled out for everyone in New Zealand on that day including all residents, visitors and tourists.

There are known challenges in collecting information from 'hard to reach' groups in Auckland. This can include young people, city centre apartment dwellers, new migrants and those for whom English is a second language. Auckland Council is well placed to assist in overcoming these challenges through our communications channels, knowledge of local communities, community links and events. Auckland Council and Statistics New Zealand have agreed to work together to do what we can in the lead-up to the 2013 census.

The second aim of the project is coordinating the purchase of 2013 census data for Auckland Council in a timely and cost effective manner.

Data from the 2013 census will be released by Statistics New Zealand from December 2013. RIMU will work with all council departments to ensure good value, bulk purchase of customised 2013 census data for Auckland Council.

If you have any queries please contact Alison Reid, senior social researcher, and Auckland Council's 2013 census advocate. alison.reid@aucklandcouncil.govt.nz

Recent research activities

RIMU's scientists, researchers, technical specialists and analysts have assisted with many projects over recent months. Some of our activities are listed below.

- Dr Todd Landers and Dr Jarrod Walker have been appointed honorary lecturers at the University of Auckland
- hosting the RIMU Research Insight seminar series including presentations by Judge Andrew Becroft (youth at risk), Dr Susan Morton (Growing Up in New Zealand study) and Dr Elizabeth Craig (the health of Auckland's children and young people)
- researchers presenting and chairing panels at the Pathways to Metropolis in the 21st Century: Immigration Issues and Futures Conference, held at Massey University Albany
- contributing data and advice for Unitary Plan projects including a review of water valuation methods and retail impact assessments
- publishing the 2012 State of Auckland report cards including a dedicated website <http://stateofauckland.aucklandcouncil.govt.nz>
- attending the air quality offset workshop in Wellington
- completing the Auckland Council draft research strategy. The confirmed strategy document will be available in 2013
- Adding RIMU's computer for environmental data (the Hydrotel server) to the Auckland Council network
- launching the Social Research Network
- providing climate information for reports about the Cricket World Cup 2015
- providing a harbour water quality report for Waterfront Auckland
- environmental specialists interviewed by a Mt Eden Normal Primary School group for the school's kid witness news programme, "not a drop to drink". RIMU staff answered questions about monitoring water quality and demonstrated stream water quality monitoring techniques.

Upgrading Great Barrier's weather station

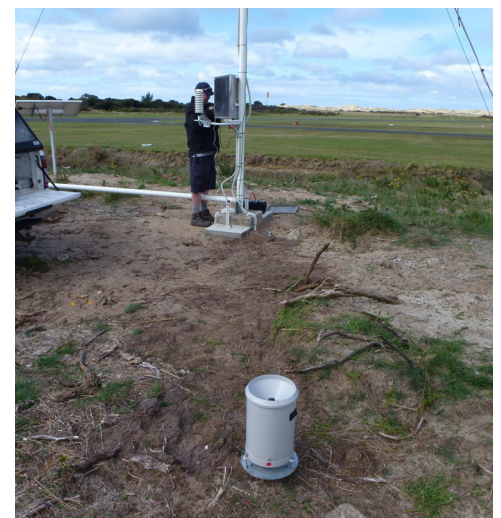
Auckland Council's Environmental Monitoring team members Matt Hope and Ed Clayton spent two days on Great Barrier Island recently, moving and upgrading a Remote Automated Weather Station (RAWS) monitoring site for the National Rural Fire Authority.

The RAWS was moved from the Auckland Council service centre at Claris to the airfield close by and the site was upgraded at the same time to provide real-time communication.

A new Vaisala ultrasonic wind speed and direction sensor was also installed, along with air temperature, humidity and rainfall sensors and a new datalogger. In addition, an ethernet data connection to the logger was installed, so that data can now be sent to RIMU's hydrological monitoring team, public GIS systems, and the National Rural Fire Centre in Wellington every ten minutes, replacing the old dial-up connection that only transmitted data once a day.

"This data fills a gap in our spatial coverage of the Auckland region," says Matt. "By bringing this important service for the National Rural Fire Authority back in-house as part of the Auckland Council's monitoring network we also provide better value for money to our ratepayers, ensure the availability of the data to the National Rural Fire Centre in Wellington and provide the airfield and local users with important real-time weather conditions."

The upgrade and ongoing support highlights Auckland Council's expertise with deploying advanced technology solutions for environmental monitoring. The wind sensor uses ultrasonic technology and compensates for the effects of temperature, humidity and barometric pressure while providing a rugged low maintenance system by removing all moving parts that cause wear in traditional anemometers. The ethernet connections will provide fast reliable communications at sites that are usually subject to poor coverage from mobile data networks.





Antifouling biocides in marinas

Auckland's marine environment plays a significant role in making our city the most liveable in the world. Many recreational and commercial activities rely on the marine environment, and our boats are a key component of these activities. As our population increases, so too does our fleet of vessels and the areas required to store them.

To help understand our environment's ability to cope with these increases RIMU scientist Marcus Cameron has been working with NIWA's Dr Jennifer Gadd to measure levels of copper from antifouling paint products used to inhibit the growth of marine organisms on boat hulls (biofouling). Since tributyltin (organic tin) based products were banned for use on recreational vessels in 1989 (due to their environmental impact) the use of copper-based products has increased and copper is now found in almost all antifouling paints in New Zealand. Most antifouling paints are designed to prevent biofouling by leaching copper into the water column. This process therefore represents a potentially significant source of copper to the marine environment, where it may affect non-target organisms.

Recently, a project was undertaken by NIWA for the New Zealand Environmental Protection Authority (EPA), which modelled copper leaching from antifouling paints on vessel hulls. This study suggested that in many New Zealand marinas, including several in Auckland, copper concentrations could be above guidelines for protection of marine life. Given these high predictions, a study was designed to measure copper in the water column of Auckland's marinas. The aims of the study were to:

- validate NIWA's modelled predictions
- investigate the potential for environmental effects on aquatic life
- measure and estimate the export of copper from Auckland's marinas to the wider coastal environment.

In early 2012 sampling was carried out at eight Auckland marinas, as well as three sites in the Waitemata Harbour. The export of copper from one marina (Westpark) was also examined.

Dissolved copper (the most harmful form to organisms) was detected in samples from all marinas (Figure 1). Highest concentrations were measured at Westpark and Milford marinas, which are both also influenced by urban stormwater and marina hard-stand activities (boat-washing, scraping and repainting). Lowest concentrations were measured at Bayswater Marina, which has floating walls, while other marinas primarily use solid walls. Results from sites in the Waitemata Harbour indicate that copper concentrations are higher in marina waters, but are still present in the wider harbour at levels that could affect marine life.

In most marinas concentrations exceeded Australian and New Zealand Environment and Conservation Council (ANZECC 2000) guidelines based on either the 90 or 95 per cent level of protection for aquatic species (Figure 1). Measured copper concentrations also compared well to modelled concentrations, with a general overlap of results.

Copper concentrations in most samples from the export study at Westpark Marina were also measured at levels that could affect marine life. Based on these results, and the modelling predictions, an estimate of the total export of copper from Auckland marinas was made. This is approximately 3100 kg/year, roughly double that predicted from stormwater for the entire Waitemata Harbour catchment (Figure 2). Based on these results, leaching from antifouling paints on vessel hulls appears to be the major source of copper to marina waters, rather than inputs from stormwater or hard stand activities.

The MAMPEC (marine antifoulant model to predict environmental concentrations) model provides a robust platform for modelling contaminant loads from antifouling paints and can assist with risk assessment for marinas, mooring areas and ports. Further information on management of antifouling paints is available on the following websites:

The EPA is carrying out a [reassessment of antifouling paints](#).

The Ministry for Primary Industries has released [draft antifouling and in-water cleaning guidelines](#).

The full report: Gadd, J and Cameron, M. 2012. *Antifouling biocides in marinas: Measurement of copper concentrations and comparison to model predictions for eight Auckland sites*, Auckland Council TR2012/033 is available on the Auckland Council website or from Marcus Cameron, marcus.cameron@aucklandcouncil.govt.nz

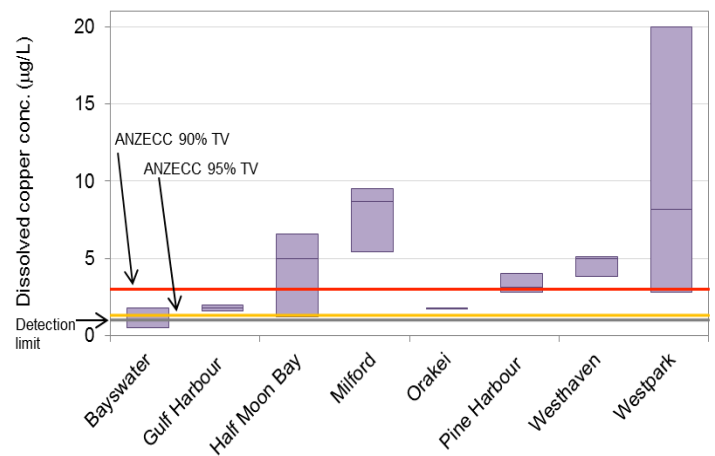


Figure 1. Dissolved copper concentrations. Top of the box is the maximum, middle of the box the median and bottom of the box the minimum. Results below detection shown at half detection limit.

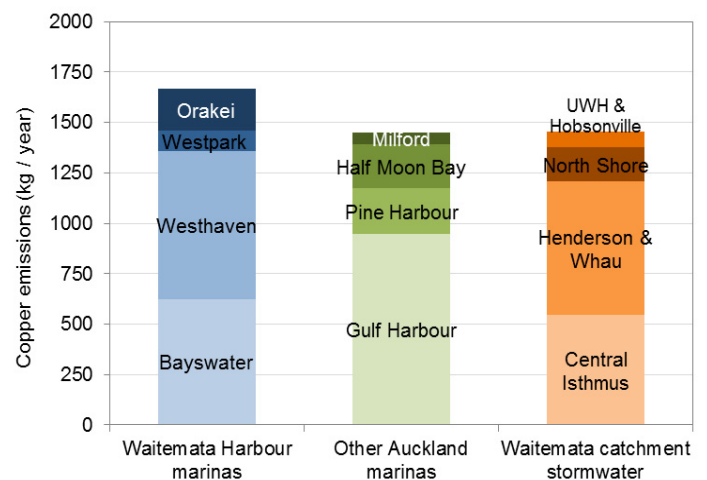


Figure 2. Estimate of copper loads exported from Auckland marinas compared with stormwater discharges from the Waitemata Harbour catchment.

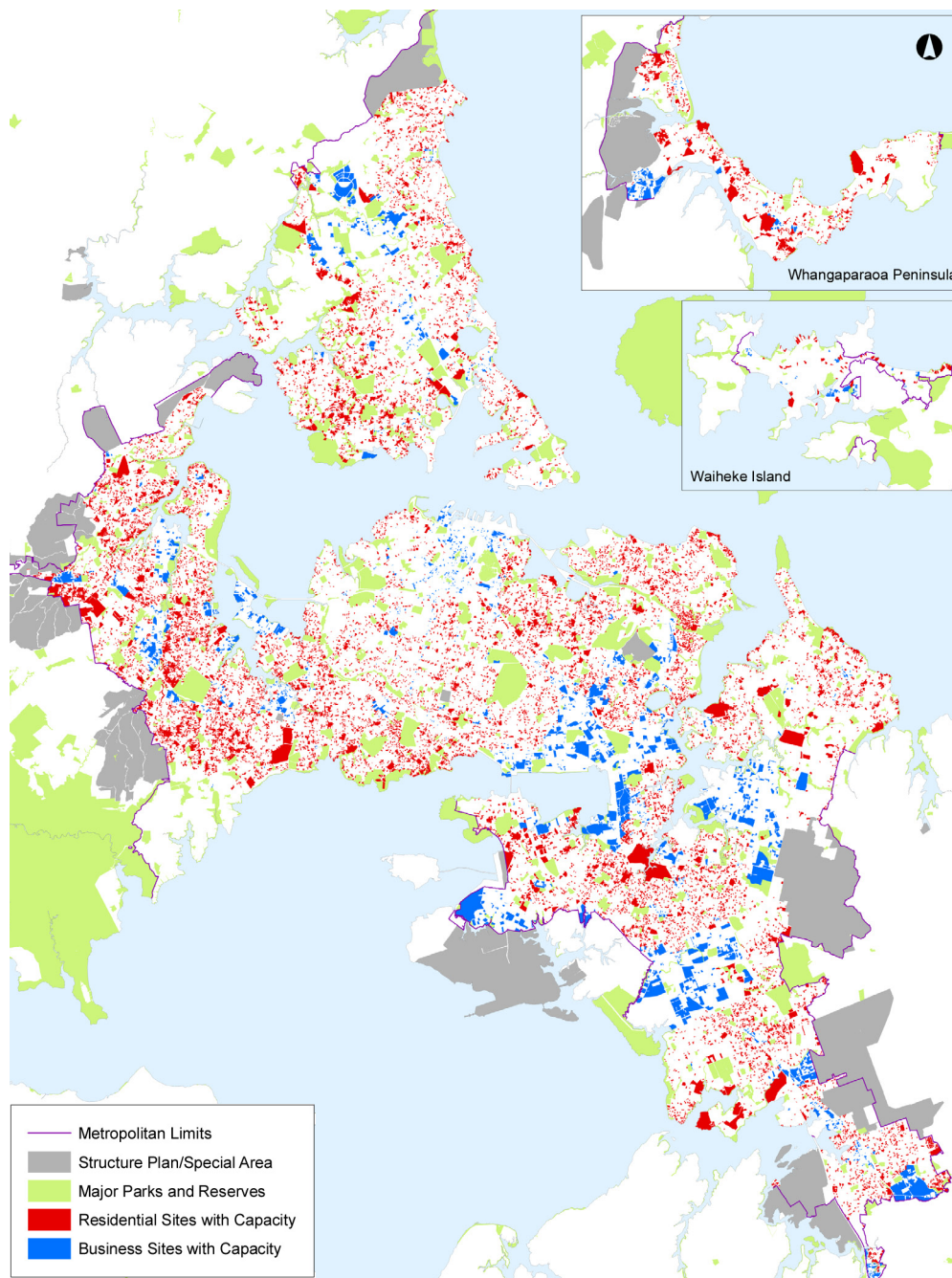
Capacity for growth study 2012

The Auckland Council capacity for growth study monitors residential, business and rural land availability in Auckland.

Residential, business and rural zoned sites have been assessed for their capacity to accommodate additional development under the current operative district planning rules as at May 2012.

The working report explains the preliminary results from the 2012 study, describes the method used to calculate capacity and provides examples of current and future use of the growth study information. A comprehensive technical report on the capacity for growth study will be published in 2013.

Craig Fredrickson and Kyle Balderston, *Capacity for growth study 2012 working report*, Auckland Council WR2012/006



Map 1B: Sites identified as having capacity (Urban area, residential and business). Preliminary results (model 1.1.0)

Capacity for Growth Study 2012

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For more information about Auckland related research, data and monitoring programmes visit the Research Unit's websites, [Knowledge Auckland](#), and [Monitor Auckland](#).

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