



ENVIRONMENTAL REPORTING & AIR QUALITY MONITORING

1 ACTIVITY OVERVIEW

The Science and Innovation Team serves a range of environmental reporting functions including research into the effects of climate change and drinking water security, and ongoing development of data management tools to support environmental reporting. The team works closely with Horizons' Communications Team to share data and information via the Horizons and **Land, Air, Water Aotearoa (LAWA)** websites, as well as provide annual **State of Environment (SOE)** reporting. The team also monitors air quality in Taihape and Taumarunui and works alongside the Communications Team to run public information campaigns about good wood-burning practices.

The activity update below summarises environmental reporting and air quality activities during the 2020-21 financial year.

2 ANNUAL PLAN TARGETS

2.1.1 The Annual Plan targets for Environmental Reporting and Air Quality Monitoring are aggregated in Table 1 below.

Table 1 Progress reporting for Environmental Reporting and Air Quality Monitoring Annual Plan targets for 2020-21.

Performance Measures for Levels of Service	Target 2019-20	Target Achieved	Progress Update
Complete drinking water supply research with a focus on Horizons-operated drinking water supplies and complete an annual report on this to Council.	1	Yes	Drinking water source protection zones were delineated for the remaining 34 Horizons-operated and large non-council operated supplies. This year work began on implementing recommendations made during the initial delineation of source protection zones. One of these recommendations was to investigate bore security in relation to drinking water, in priority source protection zones across the region. There are 214 bores identified as being priority 1, 106 bores as priority 2 and 39 bores as priority 3. Work is underway with

Performance Measures for Levels of Service	Target 2019-20	Target Achieved	Progress Update
			<p>consultancy Pattle Delamore Partners (PDP) to train field staff and begin assessing priority 1 and 2 bores across the region. This will carry over into the next financial year.</p> <p>Further work is underway to update the annual status report on compliance with drinking water regulations for all council-operated and large supplies across the region. The report is due on 30 June 2021.</p> <p>Finally, delineating source protection zones for remaining small sources is being scoped.</p>
Investigate one aspect of climate change impact in the region and report on this to Council.	1	Yes	This year the climate change research budget contributed to the production of the Regional Climate Change Risk Assessment. This project was contracted to Tonkin + Taylor. The interim report will be delivered early June 2021. The final report covering both Stage 1 and Stage 2 will be delivered by June 30 2021 and will be presented to the Strategy and Policy Committee next financial year.
Air quality is monitored in Taihape and Taumarunui and reporting is made available to the public via LAWA and Horizons' annual State of Environment report.	Completed	Yes	<p>PM₁₀ monitoring continued in Taihape and Taumarunui until February 2021, when the old beta attenuation monitoring (BAM) units were removed for upgrading with new 5014i BAM units that can monitor both PM₁₀ and PM_{2.5} particle sizes.</p> <p>The 'new' 5015i BAM has been installed in Taumarunui and a new location for particulate monitoring in Taihape is being investigated.</p>
Undertake an annual public education air quality campaign.	1	Yes	A social media post was released in March 2021 and guidance information on 'good' burning practices and an additional reminder post will be released in June 2021.

3 ACTIVITY UPDATE

STATE OF ENVIRONMENT REPORTING

- 3.1.1 The previous **State of Environment (SOE)** report was published in May 2019 and a framework for annual reporting, in the form of catchment summary report cards, was developed. In September 2019, we published a suite of SoE summary report cards for each of the seven major catchments or **Freshwater Management Units (FMUs)** in the region.
- 3.1.2 The LAWA website is a regional sector-driven initiative, working with a range of partners to present information about the state and trends of New Zealand's natural resources, including for Horizons. It now hosts surface and groundwater quality, quantity, lakes, swim spot monitoring, and air monitoring information, including Horizons region.

- 3.1.3 Data to the end of 2019 for surface and groundwater quality, water quantity, lakes and macroinvertebrates was released on World Rivers Day (27 September 2020). For the Horizons Region we now have 109 river sites with chemical and microbiological parameters and 82 river **Macroinvertebrate Community Index (MCI)** sites for **National Objectives Framework (NOF)** grades available on LAWA. We also have 29 impact sites, monitored downstream of a known point-source discharge, with chemical and microbiological parameters available for NOF grades and eight impact sites with MCI NOF grades.
- 3.1.4 State of river sites analysed for these measurements are based on data from January 2015 to December 2019. Preparation for the 2021 LAWA update has begun to make data to the end of 2020 available. Data delivery to the project is due in July 2021.
- 3.1.5 Staff are updating the catchment summary (State of Environment) report cards, which are in the final stages of design. These report cards provide a snapshot of the current state of the environment for each FMU and will be available by the end of financial year.

AIR QUALITY

- 3.1.6 Air quality monitoring at Horizons' designated airsheds, Taihape and Taumarunui, continues. Existing BAM units have had their pre-winter independent annual calibration checks and are operating adequately. There have been no verified exceedances of the **Air Quality National Environmental Standards (NES)** recorded at either location this year.
- 3.1.7 We have purchased two new 5014i BAM units that are capable of monitoring both coarse and fine particles (PM₁₀ and PM_{2.5}) to comply with the amendments proposed by the **Ministry for the Environment (MfE)** to the **National Environmental Standards for Air Quality (NES-AQ)** in late 2019. The changes propose limits on both daily and annual concentrations of fine particle (PM_{2.5}) in ambient air. An average daily limit of 25µg/m³ with no more than three exceedances per year and an annual limit of 10µg/m³ are proposed.
- 3.1.8 The new 5015i BAM has been installed at Horizons' Service Centre in Taumarunui and has been operating well. We are still looking for a suitable monitoring location in Taihape as the 'old' site (Taihape Fire Station) is no longer available and locating a suitable site has been challenging. The team is negotiating access to a land parcel attached to Taihape High School and expected that the station would be fully operational by the end of May 2021.
- 3.1.9 The new BAM units will enable us to maintain a long-term record for PM₁₀ at the sites and will also allow us to comply with the proposed change to PM_{2.5} monitoring under the proposed amended NES-AQ.
- 3.1.10 As with previous years, the 'Bernie and Chip' characters were used in a social media post in early March 2021 to promote good wood burning practices ahead of winter and an additional reminder post will be used in June.



Figure 1: The *Good Wood* campaign features Bernie and Chip on social media.

CLIMATE CHANGE RESEARCH

- 3.1.11 Climate change research was introduced as a dedicated budget in year one of the LTP seeking to investigate one aspect of climate change in the region and report on this to council annually. This item provides the annual report on climate change research noting that climate change has been reported to council via a range of items over the year.
- 3.1.12 This financial year Horizons has led the development of the region's first **Regional Climate Change Risk Assessment (RCCRA)**. The RCCRA aims to identify community risks, prioritise those risks for action, and share, with communities, information about vulnerabilities and the approach we are taking. A high-level risk assessment will allow decision-makers to identify hotspots, raise awareness and prioritise action. It is a preliminary step to a more in-depth consideration of what actions could be taken in a particular place, utilising existing datasets, reports, information and expert knowledge.

- 3.1.13 This project is a collaboration, led by Horizons with a steering group representing the region's councils, facilitation by an external consultant and a project team across the councils.
- 3.1.14 The project is divided into two stages, Stage 1: Exposure and Stage 2: Vulnerability and Consequence. The first stage considers hazards and consequences in terms of community values.
- 3.1.15 The first phase of this project began with a social media campaign called #ClimateChangeInOurRegion using the Social Pinpoint interactive map with the aim of identifying community values that may be affected by climate change in the region.
- 3.1.16 The next stage of the project involved three hui with subject matter experts and rangatahi iwi held over March and April 2021. These hui presented an opportunity to test an initial set of community values that were developed through the community engagement carried out in October 2020. Attendees also developed initial risk scores for community values that are exposed to climate hazards.
- 3.1.17 The interim report will be delivered early June 2021. The final report covering both Stage 1 and Stage 2 will be delivered by June 30 2021 and will be presented to the Strategy and Policy Committee next financial year.

Reports produced

Tonkin + Taylor (2021) *Manawatu-Whanganui Climate Change Risk Assessment*. Client report produced for Horizons Regional Council and the Region's District and City Councils (via the project's steering group).

DRINKING WATER

- 3.1.18 Drinking water research was introduced as a dedicated budget in year one of the Long-term Plan to annually complete drinking water supply research with a focus on council operated drinking water supplies and complete an annual report on this to council. This item provides the annual report on drinking water research.
- 3.1.19 Over the past two years this funding has contributed to co-funded work with all of the Territorial Authorities in the region to delineate source protection zones for the Council-controlled drinking water supplies for larger populations (500 people or more), and selected other large supplies, to help with risk identification and management. During the financial year, the delineation of source protection zones was finalised for Council-operated supplies that serve more than 25 people and fewer than 500 people, and some large non-Council operated supplies. The report outlines recommendations to improve security of the supplies assessed, and has been shared with stakeholders.
- 3.1.20 A programme of inspections of groundwater bores across the region was scoped, building on recommendations from previous work. We have completed a prioritisation report looking at bores within source protection zones 1 and 2 for all drinking water sources that have had the source protection zones delineated. These are areas in the immediate vicinity of an intake structure and those where contaminants can reach the supply within eight hours or in harmful concentrations. The report recommended

three levels of priority. Total bores identified numbered 359 with 214 as priority 1, 106 as priority 2 and 39 as priority 3.

- 3.1.21 Work is underway to train field staff in bore inspections using a custom reporting form. This training was expected to be completed in May and inspections of priority 1 and 2 bores were expected to begin in May-June. Due to the high number of bores identified, this piece of work will continue in the next financial year. Field surveys and data analysis will assess the security of current groundwater bores in relation to drinking water supply. Approximately 60 bore inspections are expected to be completed this year.
- 3.1.22 Further work to update the prioritisation report of all Council-controlled and large takes is underway. This report uses the most up-to-date drinking water compliance data from the Ministry of Health and is expected to be finalised before the end of the financial year.
- 3.1.23 Source protection zones have been delineated for all Council-controlled supplies and other large suppliers. However, there are a number of small network supplies that serve a population of under 25 that have not had source protection zones delineated and that work is being scoped.

Reports produced

Pattle Delamore Partners (2020) *Summary of source protection zone management zone recommendation*. Client report for Horizons Regional Council.

Pattle Delamore Partners (2021). *Source protection zone 2 bore inspection prioritisation*. Client report for Horizons Regional Council.

Pattle Delamore Partners (2021). *Community drinking water supply assessment in Horizons Region 2019-20 compliance period*. Client report for Horizons Regional Council.

COMMUNITY AND NATIONAL ENGAGEMENT

- 3.1.24 An important part of our role is to ensure up-to-date and relevant scientific information is effectively communicated to Horizons' staff, Councillors, consent holders, iwi, the public, and any other parties interested in aspects of natural resource management.
- 3.1.25 Staff have developed a community engagement plan for Horizons' 'Oranga Wai Our Freshwater Future' programme. Initial conversations are focusing on confirming/identifying the values we associate with freshwater. This will help frame our long-term vision and inform future discussions about setting objectives, limits and action plans to maintain/improve water quality. These conversations involve iwi/hapū, stakeholders and community groups through print, digital and social media channels, community and public events, and local hui and meetings.
- 3.1.26 The first round of community engagement began with iwi on 25 February 2021 with a hui held in Marton attended by several of the region's iwi representatives and Horizons staff. Further hui will be held every six weeks, alternating between Marton and

Ohakune. Staff have found these early discussions with iwi/hapū valuable, guiding our approach to implementation, helping improve communication and enabling participation and engagement.

- 3.1.27 Staff were also available at community events including the Rural Games and Central District Field Days (both held in mid-March) and the public River Scheme meetings during March and April 2021 to invite discussion on the Oranga Wai Freshwater Future process.



Photo 1: Staff attended community events including Rural Games and Central Districts Field Days.

- 3.1.28 The Nguturoa Catchment Group open day on 8 April 2021 was attended by Maree Patterson and Anna Regtein. The Nguturoa **Seeing, Understanding, Believing (SUB)** Project was established by a group of landowners and farmers in the Nguturoa Catchment of the Manawatū. The purpose of the project, funded by Our Land and Water, is to measure trends in the ecological health, nutrient levels and sediment status of the Nguturoa Stream, directly linked to waterways draining from critical source areas on agricultural properties. Three participating landowners have developed farm plans showing how they are contributing towards improving the waterway in the catchment as part of their farming businesses.
- 3.1.29 This field day was funded by the Manawatū River Leaders' Accord community funding programme. Staff presented at the field day on water quality in the wider Manawatū

Catchment, how community monitoring can be used to inform decision-making and the Oranga Wai programme.

3.1.30 Staff have been increasingly engaging with regional sector special interest groups (SIGs) and 2020-21 saw the establishment of a freshwater implementation group and an implementation SIG focused on the delivery for the Jobs for Nature projects. Recent SIG attendance includes:

- SWIM (Surface Water Integrated Management) SIG annual meeting held in April, attended by Michael Patterson and Mark Mitchell.
- Groundwater Forum, attended by Stephen Collins in May 2021.
- Land Monitoring Forum, attended by Malcolm Todd in March 2021.

3.1.31 Other national conferences and meetings attended by staff include the National Air Quality working group meeting in March 2021, attended by Harold Barnett.

3.1.32 Horizons was Gold sponsor and host of the Coastal Restoration Trust Conference held in Whanganui on 10-11 March. The theme was *Ko Te Kawa o Tangaroa, he kawa ora - Living on a dynamic coast*. Scotty Moore and Neil Mickleson, with support from the Horizons Communications Team, contributed to the overall success of the conference as members of the organising committee. Whanganui District Mayor Hamish McDouall and Horizons Councillor Sam Ferguson spoke as part of opening proceedings and staff from across the organisation contributed to and/or attended the conference and associated conference workshops and field trips.



Photo 2: Left: Horizons Councillor Sam Ferguson speaks as part of opening proceedings at Coastal Restoration Conference. Right: Scotty Moore from Horizons Freshwater Team lends a helping hand to conference attendees during field trip.

3.1.33 The New Zealand Land Treatment Collective Annual Conference was held in early May in Palmerston North. Horizons sponsored the event, staff from our **Natural Resources and Partnership Group (NRP)** and the Consenting Team attended.

SCIENCE COMMUNICATION

- 3.1.34 An air quality educational social media post was made in March 2021, to increase public understanding of a good wood burning practices for better air quality outcomes. A follow-up campaign is scheduled for June to remind people how they can do their bit to keep the air clear and reduce the risk of releasing particulate matter caused by smoky fires.
- 3.1.35 A guest lecture was given in February 2021 to environmental health students at Massey University in Wellington for the paper 214.312 Environmental Monitoring and Investigative Methods. The presentation focused on Horizons' contact recreation programme and how we work collaboratively with MidCentral District Health Board, in particular, to ensure that water quality in relation to human health is communicated to the public throughout the season. The course provides a pathway for students to become Environmental Health Officers with territorial authorities and/or Health Protection Officers with district health boards.
- 3.1.36 A guest lecture was given by Stephen Collins on Groundwater Allocation and Management as part of the 121.213 Applied River Management paper at Massey University in April 2021. This lecture is given annually.
- 3.1.37 Stephen also spoke at the annual LandWISE conference in Havelock North in May. LandWISE is a collective, mainly made up of farmers, which seeks to coordinate and promote on-farm research and development, primarily in the vegetable and arable cropping industries. Stephen presented his nitrogen attenuation research as part of his PhD study with Massey University (Farmed Landscapes Research Centre).

Staci Boyte

SCIENTIST - LAND

Amber Garnett

ENVIRONMENTAL SCIENTIST – NATURAL RESOURCES

Harold Barnett

ENVIRONMENTAL SCIENTIST

Lizzie Daly

SENIOR SCIENTIST - ECOLOGY

Jon Roygard

GROUP MANAGER NATURAL RESOURCES AND PARTNERSHIPS