# OUR AIR, CLIMATE & WASTE

# TŌ TĀTAU HAU, ĀHUARANGI, PARA HOKI

## HIGHLIGHTS

Air quality in Gisborne is generally good, with only one exceedance of the permissible level of the national environmental standard for PM10 (fine particles) in 2018 and 2019.

Our main cause of air pollution is smoke from woodburners during winter months and year-round from vehicle emissions.

Generally our air quality appears to be improving.

We are fortunate to be able to view the Milky Way, unlike 50% of New Zealanders whose ability to see the stars at night is diminished by light pollution.

A project using low-cost sensors over the winter of 2018 showed spatial differences in local air quality in Gisborne city, mostly related to proximity to main roads and residential valley terrain.

Gisborne district reflects many of the trends being seen nationally described in *Our Air 2018* published by the Ministry for the Environment<sup>1</sup>.

Agriculture and transportation account for 95% of our district's greenhouse gas emissions<sup>2</sup>.

Average waste sent to landfill in our region is 506kg per person per year, against a national average of 701kg.

In 2019 Council installed seven smart rubbish bins throughout our region.



# **OUR AIR & CLIMATE**

Current climate change projections for Tairāwhiti are showing a 2.1°C annual average temperature increase and a 5% reduction in annual average rainfall by 2090<sup>3</sup>. The frequency of frost days is expected to reduce and the frequency of hot days above 25°C is expected to increase. Expected decreases are expected to occur mostly during winter<sup>4</sup>. similar emission categories around New Zealand (for example, Wairarapa, South Taranaki and Stratford). During the 2018/19 reporting period, Gisborne district was responsible for 3,676,567 tCO<sub>2</sub>e gross emissions and 1,119,138 tCO<sub>2</sub>e net emissions (including forestry). Our population in 2018/19 was approximately 49,300, resulting in per capita gross emissions of 74.58 tCO<sub>2</sub>e/person.

The community carbon footprint reports

<sup>1</sup> Ministry for the Environment & Stats NZ (2018). New Zealand's Environmental Reporting Series: Our air 2018. Retrieved from www.mfe.govt.nz and www.stats.govt.nz.

<sup>2</sup> AECOM New Zealand Limited (2020). Gisborne district Council Regional GHG Inventory. A report prepared for the Gisborne district Council

<sup>3</sup> Ministry for the Environment (2018). Climate Change Projections for New Zealand. Atmospheric projections based on simulations undertaken for the IPCC 5th Assessment 2nd edition. Retrieved from www.mfe.govt.nz

<sup>4</sup> Ministry for the Environment (2018). Climate Change Projections for New Zealand. Atmospheric projections based on simulations undertaken for the IPCC 5th Assessment 2nd edition. Retrieved from www.mfe.govt.nz

- Stationary energy: Producing 112,432tC02e in the 2018/19 reporting year, stationary energy is Gisborne's third largest emitting sector. The emission source that contributes the most to this total is electricity consumption at 339,618,582kWh followed by petrol and diesel consumption, with the district consuming 9,876,191 litres and burning of natural gas, 435,176GJ. A per capita method was used in calculating coal emissions which is less than 1% of total emissions. The biggest consumer of coal would be the steam engine. Feedback from Council suggested the biomass figure might be underestimated due to no rules around domestic wood burners and outdoor burning. It is subject to the council to further investigate.
- Transportation: Producing 232,647tC02e in the 2018/19 reporting year, transportation is Tairāwhiti's second highest emitting sector. Transport-related consumption consists mainly of on-road and off-road petrol and diesel fuel, which combined represent 87% of total transport emissions. On-road and off-road petrol and diesel consumption is followed by emissions associated with Eastland Port activity and Gisborne Airport.
- Waste (solid and wastewater): Emissions from waste were 21,792tC02e in the 2018/19 reporting year. Tairāwhiti is currently sending waste to two operational solid waste landfill sites - Waiapu landfill which is located within Tairāwhiti and Tirohia which is in Paeroa (Bay of Plenty). Paokahu landfill was operated between 1974 and 2004. Our region's solid waste emissions represented 80.9% of the total waste emissions. During the reporting year 2018/19, Tirohia landfill has active gas flaring for the methane produced. The remaining 19.1% of waste emissions is produced by wastewater. Wastewater treatment plants in Gisborne city and Te Karaka service 31,604 members of our district and septic tanks serve the remaining population, the majority of which are in rural areas.
- Industrial processes and product use (IPPU): This sector produced 13,933tCO2e in the 2018/19 reporting year, and includes emissions associated with the consumption of GHGs for refrigerants, foam blowing, fire extinguishers, aerosols, metered dose inhalers, and sulphur hexafluoride for electrical insulation and equipment production. IPPU emissions do not include energy use from industrial manufacturing, which is included in the relevant stationary energy subcategory (such as coal, electricity and/or petrol and diesel).
- Agriculture: Tairāwhiti's highest emitting sector, producing 1,757,949tC02e (82.2% of our total emissions), consists of emissions from livestock, crops and fertiliser used. Our region is home to approximately 10,419 dairy and 248,151 non-dairy cattle and around 1,426,886 sheep, which produce methane (CH4) – the most significant agricultural emission source. This is followed by nitrous oxide (N20) emissions from agricultural soils and manure management.
- Forestry and land-use change: Tairāwhiti has a native forested area of 138,685ha, the largest proportion of this is manuka and/or kanuka and broadleaved hardwoods. Combined with exotic forests (155,617ha), our district's forestry equates to the sequestration of 6,481,992tC02e over the reporting year and harvest emissions of 3,912,470tC02e.

#### Gisborne District Council Regional Emissions Inventory (tCO<sub>2</sub>e)



AECOM (2020). Gisborne District Council GHG Emissions



The main Gisborne environmental weather station is located at Gisborne Airport. Analysis shows that the predominant wind direction is north, north-northwest and that it blows from that direction 53% of time. The weather station data also shows that Gisborne is a gentle to moderately windy city.

The data for 2015-17 is shown as a windrose. It shows the frequency of winds by direction and strength. The bars correspond to the 16 compass points – N, NNE, NE, etc. The bar pointing vertically upwards in the windrose diagram represents winds blowing from the north (ie. northerly winds). The length of the bar represents the frequency of occurrence of winds from that direction, and the widths of the bar sections correspond to wind speed categories, the narrowest representing the lightest winds.



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#### Gisborne environmental weather station windrose (2015-17)



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## **Topography of the Poverty Bay Flats**

Gisborne is located in a broad valley running northwestsoutheast and sits on the northern extent of Poverty Bay/ Tūranganui-a-Kiwa. The terrain around the Poverty Bay Flats also influences air quality. Areas located near the coast experience sea breezes in summer, created by thermal currents from the warming of the earth surface from the sun which draws in the cooler air from over the sea helping disperse localised pollutants. In winter, less warming of the earth surface occurs particularly in valleys or areas surrounded by hill. On clear nights, cooling near the ground's surface leads to cold air near the ground being overlaid by a layer of warm air, the opposite of the normal temperature gradient. This warm air acts as a lid, trapping pollutants (both particulate matter (PM) and gaseous pollutants), and allowing them to build up as smog. Inversion events are responsible for peak PM concentrations – natural sources of PM, such as sea salt, are low under these conditions so most of the air pollution is from emissions from domestic heating and vehicles.



# **OUR AIR QUALITY**

Air pollutants are either made up of gases or have particles within them. Gaseous pollutants are primarily emitted by industrial premises and traffic. Concerning pollutants include sulphur dioxide, nitrogen dioxide, ozone and carbon monoxide.

In Tairāwhiti all trade and industrial premises discharging pollutants are required to hold resource consents or be able to demonstrate an ability to meet stringent standards to control these pollutants. Vehicle emissions (nitrogen dioxide and carbon monoxide) are controlled by legislation administered by the New Zealand Transport Authority. As we do not have a large industrial base and we have a smallish urban area, our air quality is generally very good.

Sources of PM include windblown pollen, dust from agricultural practices and roads (particularly unsealed roads), smoke from controlled burn-offs/bush fires, domestic home heating using woodburners, cooking and sea salt. In Tairāwhiti, as our air quality is so good, unlike elsewhere in the country, there are no restrictions on the type of wood burner that may be installed, or on the use of backyard incinerators. This can lead to the burning of inappropriate materials such as plastics which generate odour complaints as well as discharging toxic pollutants.

Health issues related to particulate pollution largely depend on the size of the particle. The National Environmental Standard for Air Quality (NESAQ) requires Council to monitor PM10 (fine particles) due to their impact on respiratory health. As the science has developed the focus has turned to particles of PM2.5 or less as these have the ability to penetrate deep into lung



tissue. This can result in cardiovascular and respiratory problems such as heart attacks, stroke or emphysema. It can trigger asthma and wheeze in susceptible individuals, can lead to premature death and it has also been linked to cancer.

Growing evidence linking poor health outcomes to pollution from PM2.5 or

less may see changes in air quality regulations in the future. These could include rules such as bans on outdoor burning in some places, use of wet wood, use of fuels high in toxins (such as treated wood), modifications to solid fuel burners or restrictions on the type of wood burner that can be installed. Modern heating technologies such as heat pumps are not only reducing local emissions, but also leverage New Zealand's predominantly low carbon energy networks that are predominantly renewable energy sources such as hydropower. Ensuring buildings are properly insulated is also a great passive way to reduce home and office heating and cooling costs throughout the year.



Temperature inversion layer over Gisborne city showing the smoke from domestic fires being trapped under a layer of cloud

## Monitoring our air quality

Air quality in Gisborne is monitored from a representative site at Gisborne Boys High School which was established in 2004 to measure PM10 in the city.

The equipment measures levels of particulate matter in the air every minute, 24 hours a day, seven days a week and we have a record of PM10 data from this equipment since 2004. This equipment was upgraded to more modern technology in early 2020 in anticipation of a review of the National Air Quality Standard and is now measuring PM2.5 as well as PM10. Along with airborne particulate measurement, a weather station can show which direction this particulate matter comes from, and how wind speeds may affect the diffusion of pollutants. Relative humidity and cooler temperatures can also trap air pollution in 'inversion' layers during those calm and cold winter nights and mornings, which tends to be when people light their fires.

The graph (overleaf) shows the seasonal variation in  $PM_{10}$  levels (orange lines), with higher levels recorded during the winter months as households use their woodburners for heating as the temperature (blue line) drops. The red line is the 50 $\mu$ m/m<sup>3</sup> national standard annual average at which a region's air quality is described as 'polluted'.

Hourly average of PM10 during winter (May - August) at the air quality site at Gisborne Boys High School (**page 121**) shows that the lowest PM10 values are typically around 7-8am, with the highest PM10 peaks occuring at around 6-9pm with average values ranging around 21-25  $\mu$ g/m<sup>3</sup>. There is a small peak seen at 10-11am possibly due to traffic movements during the day, but this is not as pronounced as the high morning PM10 volumes seen during ODIN monitoring on **page 123**. This site is located away from roads, so is more indicative of background air quality. This distribution reflects a typical working day for people in an urban environment.



Gisborne Boys High School air quality measuring site



#### Annual PM10 levels January 2014 - April 2019.

Average PM10 by hours of the day across the whole year



# Winter air quality screening programme 2018

Domestic woodburners are a significant source of PM2.5 which is a combustion product from burning wood. Council undertook a monitoring programme in different locations throughout Gisborne city in the winter of 2018 to understand whether the spatial data reflected the data seen from the representative site at Gisborne Boys High School.





Outdoor Dust Information Nodes (ODINs)

## **ODIN air quality sensor study**

The programme placed 17 low-cost sensors called Outdoor Dust Information Nodes (ODINs) at various locations within Gisborne city with the aim of measuring PM (both 2.5 and 10) and nitrogen dioxide ( $NO_2$ ) from vehicle exhausts every five minutes. Monitors were attached to lamp posts at an approximate height of 2.5m.  $NO_2$  was recorded from 16 May to 16 August 2018 and particulates were measured from 22 June to 16 August 2018.

## Particulate matter in winter

The ODINs recorded several nights with localised PM10 values greater than the National Environmental Standard for Air Quality limit of 50 µg/ m<sup>3</sup>. However, our regulatory equipment at Gisborne Boys High School recorded no exceedances of the NES during this period. Although the low-cost monitors are not as accurate as the regulatory equipment, the study showed that there is wide spatial variation in air quality of Gisborne, with areas between Outer and Inner Kaiti and Whataupoko recording higher PM concentrations than the area around the measurement site at Gisborne Boys High School. The highest concentrations were recorded at the site located in Wainui Road which is not surprising given the large volume of traffic (particularly diesel vehicles) that use this road.

As a result of the 2018 study, two additional low-cost monitors were installed in two locations in Whataupoko and Kaiti during winter 2019. Data from these monitors shows that although on occasion there was some difference to that recorded at the Gisborne Boys High School site, it was not significant enough to warrant relocating the representative site and so breaking the length of record of data. As the NES is currently under review (with a signalled change to monitoring to using a PM2.5 standard), this may require some changes of Tairāwhiti

Resource Management Plan rules that will address some aspects that are creating localised pockets of pollution.

### Average hourly PM10 levels June - August 2018

The results of our winter screening study showed two distinct peaks in average daily PM10. The first PM10 increase of the day begins at about 5am at most sites as early commuters start and some wood fires are started again to warm the house at the morning. Interestingly, this rise in the morning starts an hour earlier at the corner of Wainui Road and Crawford Road at 4am. The particulate matter then has a morning peak at most sites at 7am (except Boys High) as people commute to work and drop their children off at school. The air quality drops off to low levels during the day but increases across all sites from 3pm as school pickups begin and people head home for the day. Once people get home they may start their household woodburners which add to the air quality particulates from vehicles, and maximum particulate levels at most sites between 8pm and 10pm, gradually reducing in level until 5am the next morning.

Most of these ODIN sensors were mounted on streetlight poles next to roads, which may explain why the morning PM10 volumes are so pronounced when compared to Gisborne Boys High School. The Gisborne Boys High School location is in the middle of a city block, so its air quality can be considered more 'background' relative to the ODIN sites next to roads. This is evident in the graph on page 123 where the morning traffic related particulate matter is not so noticeable.



#### Average PM10 by hour during ODIN study June - Aug 2018

Average hourly PM10 levels Jun-Aug 2018 (PM2.5 results showed a similar distribution)



#### Nitrogen dioxide (NO<sub>2</sub>) monitoring



 $\mathsf{NO}_2$  is a pollutant produced by the burning of fossil fuels, particularly diesel.

The results of the NO<sub>2</sub> monitoring during June - August 2018 reflected the expected distribution with no location breaching the World Health Organisation NO<sub>2</sub> health guideline of  $40 \ \mu g/m^3$  average per year. As expected, sites with the highest NO<sub>2</sub> were those located along arterial roads with port traffic to the east of town centre and the town centre itself. The town centre has the majority of stop-start traffic, and pollutants will linger in the area because of the taller buildings. The area to the east of the town centre has a greater proportion of heavy duty diesel traffic than other areas which is reflective of the port logging traffic.

New Zealand Transport Authority data shows that  $NO_2$  levels are highest during winter, and the annual  $NO_2$  average seem to be increasing since 2012.

There are a number of possible reasons for this, including:

- increasing number of heavy vehicles using our roads (correlating to the increasing amount of forestry harvesting)
- people using their cars in the cooler months, rather than choosing to cycle or walk
- winter months produce temperature inversion layers in the air, which help trap pollutants so they cannot disperse.

NZTA monthly NO<sub>2</sub> data





NZTA annual NO<sub>2</sub> average

Gladstone Road vehicle counts (Tairāwhiti Roads)



NZTA NO<sub>2</sub> data show peak levels of NO<sub>2</sub> during winter. Annual NO<sub>2</sub> average shows an increasing trend with about 12% increase from 2014 to 2017. This coincides with the observed increase in the number of vehicles using our roads from 2012 to 2018.

In some parts of our district, the night skies are pristine and we must actively work to make sure this taonga is preserved for future generations



Our region's history has been shaped by navigation. This was explored by Tuia 250 commemorations which in October 2019 recognised two extraordinary voyaging nations and cultures. Without access to the night skies, these stories would not have converged on Kaiti Beach. While over 50% of New Zealanders cannot see the Milky Way, in our region we have relatively low light pollution. In some parts of our district, the night skies are pristine and we must actively work to make sure this taonga is preserved for future generations.

## PROTECTING OUR AIR QUALITY What next and how can you help?

Council has purchased new monitoring equipment. This equipment is able to measure both PM10 and PM2.5 which nationally is emerging as a pollutant resulting in chronic health conditions. The NESAQ review has signalled an intention to introduce a new standard for PM2.5 standards as the main regulatory tool to manage the health effects associated PM. Our air quality may not be able to comply with this standard which will require some new rules in the Tairāwhiti Resource Management Plan.

#### What you can do to keep our air clean

- Burn dry, seasoned and untreated wood. Buy your firewood from trusted supplier
- Use clean home heating appliances, such as a heat pump, pellet burners or ultra-low emission burners. Don't dampen down the fire at night, let it burn out cleanly to ash
- Clean your chimney annually
- Where possible, take advantage of home insulation subsidy schemes and insulate your home
- Recycle plastics where possible. Do not burn these in your fireplace or incinerator at home. They release high volumes of toxicants such as dioxins, sulphur dioxide, furans, styrenes, heavy metals as well as particulates
- Use alternative forms of transport to a vehicle. Walk, cycle, or use public transport
- Consider buying an electric car or scooter/bike
- Keep your car tuned and running smoothly
- Have your say on air quality policies and plans. The Ministry for the Environment is currently consulting with the public on the review of the NESAQ until July 2020.

"Why should one say that the machine does not live? It breathes, for its breath forms the atmosphere of some towns." — **Benjamin Disraeli** 

## NOTABLE EVENT Tolaga Bay burn-off

In June 2018, our region experienced a significant weather event with heavy localised rainfall around Tolaga Bay. This event mobilised forestry slash from the interior plantation forests and deposited a vast amount of wood on the Tolaga Bay Beach. Estimated volume of the log/woody debris was in the vicinity of 47,000m<sup>3</sup> and covered much of the foreshore. As the wood had been soaked in salt water, recovery of the wood for firewood was not an option due to the corrosive nature of the emissions and formation of dioxin that occurs at low temperature burning.

The forestry industry, principally Aratu, paid for and managed the clean-up, with consents and monitoring managed by Council. Disposal was achieved through controlled, high-temperature incineration. This method involves a large fan, coupled to a steel pipe. The pipe is directed through an earth wall into a pit dug into the ground, and blows air into the base of the pit. Once a fire is lit in the pit, the fan is turned on and logs are grappled into the pit where they burn at very high temperatures in a clean incineration process resulting in minimal smoke and low emission of dioxins. Real-time monitoring using three temporary instruments showed a correlation of an increase in levels of PM10 and PM2.5 with the lighting of the fires, but the air quality remained well within health guidelines.



Machinery used for controlled high temperature incineration of forestry slash on Tolaga Bay Beach



Smoke emitted at start-up – but once the fire was burning strongly emissions were low



# WASTE MANAGEMENT & MINIMISATION

Council ensures sustainable management of our district's waste by minimising waste generation and maximising opportunities to use waste as a resource.

#### Key activities

- Urban and rural kerbside collection
- Rural transfer station operations
- Waste minimisation and education
- Recycling initiatives
- Cleaning public places
- Landfill operations and aftercare.

## Waste Management and Minimisation Plan 2018-24

Council's Waste Management and Minimisation Plan 2018-24 (WMMP) proposed the following targets:

- 20% reduction in the total waste sent to class 1 landfills by 2024
- 40% decrease in organic waste by 2024 (kerbside collections)
- 20% increase in recycling by 2024.

In 2017, 296kg of waste per person was sent to class 1 landfill

## **Waste Minimisation Fund**

Council provides up to \$10,000 annually for community-led initiatives that reduce waste in our district.

"The funding comes from Council's share of the levy that the government puts on waste going to landfill," says waste minimisation facilitator Darnelle Timbs.

"Some of the best ideas and deliverers of waste minimisation initiatives are within our community. We look for projects that minimise, reuse, recycle, repurpose or compost waste, using resources wisely and without harm to the environment. We encourage anyone with a new initiative that reduces waste to check the assessment criteria and apply."

For more information, please visit **www.gdc.govt.nz**.

from our region. Including waste sent to class 2 landfills, the total waste disposal per person increases to 506kg per year against a New Zealand average of 701kg. A total of 122kg per person, per year, was collected by our current rubbish bag collection.

There is only one class 1 landfill disposal facility in the Gisborne district at the Waiapu Landfill in Ruatoria (consented until 2025), which receives waste from the rural transfer stations at Tokomaru Bay, Te Puia Springs, Ruatoria, Tikitiki, and Te Araroa as well as Council's Ruatoria kerbside waste collection. All waste from the Gisborne Resource Recovery Transfer Station is transferred to a class 1 landfill, Tirohia Landfill (near Paeroa), 300km away.

Since 2015, there has been an increase in the amount of waste our community sends to landfill. The amount of material we recycle has also dropped slightly. This matches a national trend in increasing waste to landfill and declining recycling.

#### **Rural transfer stations**

Our region has nine rural transfer stations. Six transfer stations are located along the coast (Tolaga Bay, Tokomaru Bay, Te Puia, Tikitiki, Ruatoria and Te Araroa), while three transfer stations are located inland (Te Karaka, Whatatutu and Matawai).

### Change to plastic recycling

2019 marked a significant change to our recycling due to global market changes that have impacted plastic recycling worldwide - since June 2019 only plastic grades 1 and 2 are accepted at kerbside collections, the Waste Management Ltd drop-off centre and rural transfer stations. Plastic grades 3-7 are now sent to landfill.

#### Illegal dumping

Illegal dumping has increased considerably, with 65 tonnes in just half the 2019/20 financial year - twice the average of the past seven years.

## Waste minimisation and education initiatives supported by Council

- Rethink Centre located at the Tairāwhiti Environment Centre
- Workshops at the Tairāwhiti Environment Centre (for example, composting)
- The Rubbish Trip Tour helping residents reduce household rubbish, held in Gisborne, Tolaga Bay, Tokomaru Bay and Ruatoria
- Waikanae Beach clean-up (Plastic Bag Free Tairāwhiti)
- Waste-free living workshop (Kate Meades)
- Tairāwhiti Enviroschools: rethinking waste workshop
- BYO Bottle campaign.

# #01 CASE STUDY | HE TAUIRA

## SUSTAINABLE DISPOSAL OF FARM WASTE Agrecovery rural recycling event

In September 2019, East Coast farmers and growers had the opportunity to sustainably dispose of farm waste at a recycling and recovery event in Gisborne. The Agrecovery event allowed farmers to dispose of a range of materials including agrichemical containers, unwanted agrichemicals, used motor oil, seed and feed bags, and soft plastics like silage and bale wrap. With backing from the Ministry for the Environment, Agrecovery has sustainable recovery options for waste that can't be recycled. Feedback was overwhelmingly positive. The Gisborne event had the most registrations of similar events across the country, with 68 attendees. Gisborne had a high number of respondents disposing of agrichemicals. Unfortunately, the event will not return to Gisborne in 2020, but a good relationship has been established between Agrecovery and Council and future collaboration is in the pipeline.

Event	Registrants	Containers (HDPE)	Chemicals	Oils	P0PS*	Silage wrap (LDPE)	Fertiliser bags (PP)	Total kg
Westport	17	699	344	87	0.3	350	350	1,830
Southland	58	1,200	1,490	1,410	4	4,260	420	8,780
Selwyn	61	1,500	2,705	820	75	875	1,015	6,915
Geraldine	42	1,200	1,726	1,562	2.5	765	990	6,243
Matamata	38	2,030	958	997	4	270	720	4,975
Gisborne	67	1,400**	4,842	1,327	5.8	525	800	8,894
Total	283	8,029	12,065	6,203	91.6	7,045	4,295	37,637
Average	47	1,438	2,011	1,034	15	1,174	716	6,273

\* Persistent Organic Pollutants (Included in Chemicals) \*\* Gisborne Estimate as shredding unit malfunctioned at end of the event



# #02 CASE STUDY | HE TAUIRA

## ENVIROSCHOOLS WORKSHOP Rethinking waste through a Māori perspective

Engaging tamariki through a kaupapa Māori lens, and sharing concepts of atua, tikanga,whakawhānaunga, and mātauranga, helped develop their understanding of sustainability.

Enviroschools facilitators Kirsty Gaddum and Kauri Forno created a day at Titirangi (Kaiti Hill) that used examples of traditional Māori living, gardening and cooking, and created very little waste, while encouraging students to consider their daily choices.

Uncle Albie from Ngāti Oneone shared the stories of Maia bringing hue to Tūranganui-a-Kiwa, and Te Maro, the legendary gardener, growing kai for his people. This pūrākau related to the sculptures at Puhi Kai Iti and on Titirangi.

Students from seven schools participated in the day, which included a visit to the Seabin and stormwater grate at the harbour. The Seabin is emptied a few times a day as it filters mostly plastic waste from the surface of the harbour.

The stormwater grate had a Coke can and more plastic trapped in it. Students witnessed the link between how plastic travels via Tāwhirimātea (wind) and Tangaroa (water).

Schools were encouraged to stop waste entering their stormwater drains and to use art to raise awareness at their school about why it is important to keep waste out of our ocean.

"The recent Enviroschools workshop gave students an opportunity to view zero waste through a kaupapa Māori lens. It incorporated the local history of the Tairāwhiti region and weaved these ideas to our present time and how we can look at reducing our waste. The students were engaged during the whole process and found the experiences relevant to the projects they were exploring in their school, which they will take back and share as inspiration... It was a great day!" — Emma McFadyen (Makauri School) The day also included a visit to a midden site where Whaia Titirangi shared their knowledge. Jordan and Mihi from Whaia Titirangi work full-time on the maunga, planting native trees, weeding and spraying, supporting education and looking after pest control.



Uncle Albie, Ngāti Oneone, shared the story of Te Maro, the legendary gardener, growing kai for his people on Titirangi



Rawinia Kingi, Poutautoko from Te Aho Tū Roa, helped plan the day and ran an inspiring workshop about the story of how kūmara came to Tairāwhiti and how we can grow it

# #03 CASE STUDY | HE TAUIRA

SMART RUBBISH AND RECYCLING BINS TO REDUCE LITTER Let's put litter in its place

Gisborne Mayor Rehette Stoltz tries out the set of bins at Waikanae Beach with (from left) Be a Tidy Kiwi programme manager Rick Leckinger, Andre Charbonneau of EYEFI, Tilley Group (who designed the bins) managing director Rory Bremner and The Packaging Forum project manager Lyn Mayes.

### In 2019, Council secured seven smart bins for our region as a part of the 'Let's Put Litter in its Place' project, a joint initiative between The Packaging Forum and Be a Tidy Kiwi.

A series of smart rubbish and recycling bins have been installed in prominent locations around our region, as part of a nationwide campaign to reduce litter.

The smart technology and features reduce contamination, litter and make it easy for our people to recycle correctly. Each bin is fitted with "EYEFI" smart technology that sends a signal to our contractor when the bin is full. This prevents bins from overflowing while also minimising Council costs.

The bins are bilingual and colour-coded in nationally agreed rubbish and recycling colours.

The bins can be found at the Gisborne i-Site, the Titirangi summit, Botanical Gardens, Waikanae Beach, and outside the public toilets at Te Araroa, Tolaga Bay and Matawai.

