



Environment Aotearoa 2022 Summary

New Zealand's Environmental Reporting Series



Ministry for the
Environment
Manatū Mō Te Taiao

Stats ^{NZ}
Tatauranga Aotearoa

Environment Aotearoa 2022 is produced by the Ministry for the Environment and Stats NZ under the Environmental Reporting Act 2015. The triennial report synthesises the evidence base on the state of the environment contained in domain reports since *Environment Aotearoa 2019*. The report does not suggest any response as it is out of scope under the report's governing legislation. This is a summary of the full report.

► What's new in *Environment Aotearoa 2022*

Environment Aotearoa 2022 explores the importance of the environment to our lives and livelihoods

Three years on from the previous state of the environment report, our environmental indicators do not register much change. But we have changed the way we have approached and compiled the evidence.

Environment Aotearoa 2022 places environmental change in the context of our lives as individuals, families (whānau), and communities. We have pulled together a diverse set of evidence drawing on Māori knowledge (mātauranga Māori), environmental science, health science, and economics.

The integrated approach and wellbeing focus of this report supports us to reflect on our connections with the environment (te taiao) and our impacts on it.

The report advances the inclusion of mātauranga Māori in environmental reporting

Understanding how mātauranga Māori can inform environmental reporting is an active area of research. This report builds towards a more sophisticated understanding of how to bring different bodies of knowledge together in future reporting.

Environment Aotearoa 2022 uses Te Kāhui o Matariki (the Matariki star cluster) to organise the evidence in the report. As a signal of the Māori new year, it commemorates loss and celebrates hope for the future. Each star in the cluster represents a way that we connect with the environment. Bringing a Māori world view (te ao Māori) recognises the interconnectedness of all parts of the environment, including people, and speaks to something that connects us all to Aotearoa New Zealand.

► Wellbeing and our connection to te taiao

Our wellbeing is linked to a healthy environment

In *Environment Aotearoa 2022*, we view people as part of the environment.

Wellbeing means different things to each of us, and how we define and understand our relationship with the rest of the natural world is diverse and evolving.

In mātauranga Māori, wellbeing can be described using 'waiora'. The concept grounds human wellbeing in water (wai) as the source of life (ora). In this view, human wellbeing and te taiao are linked to one another.

Environment Aotearoa 2022 brings together diverse conceptions of wellbeing in relation to the environment, helping provide a richer understanding of our many connections with the environment.

► Key findings about the environment and wellbeing

Loss and pressures on species and ecosystems (represented by the star Pōhutakawa) have changed with human settlement. Each generation leaves a legacy effect on the environment, including pressures of land-use change and intensification, pollution, natural resource use, climate change, and invasive species.

Land and soil (Tupuānuku) support our economy, food production, and our health. Soils regulate the flows of nutrients, contaminants, and water. Soil quality sometimes does not meet target ranges and we are losing soils to erosion, development, and land fragmentation. Over time the area of highly productive land available for crops and livestock has decreased.

Biodiversity and land-based ecosystems (Tupuārangī) provide us with food, medicines, and materials. Access to nature and greenspaces has wellbeing benefits, decreasing stress levels and increasing attention, cognitive function, and memory. Access to greenspace is limited and unevenly distributed, especially in urban areas. In recent years native forest cover has remained fairly static overall, but with increases in some regions and losses in others. The majority of our rare ecosystems are threatened. Habitat destruction, along with the introduction of mammalian predators, has severely reduced the populations of many unique birds, reptiles, and plants. Many remain threatened with extinction or are at risk of becoming threatened. Even small changes to our environment can have important consequences for ecosystems and species, and therefore our wellbeing.

Freshwater (Waitī) is vital to our wellbeing through health, cultural identity, food harvesting, and recreation. Our freshwater sources are degraded in areas where land has been transformed by human activities. Twenty-year trends show improvements in nitrogen and phosphorus concentrations for river water quality at some sites, and worsening trends at others. We continue to see the loss of wetland ecosystems, with concerted efforts by communities to restore them.

The marine environment (Waitā) contributes to our wellbeing through providing food, opportunities for recreation, and cultural knowledge of ocean navigation. Coastal water quality is changing with variable trends in nutrient and sediment pollution, and the impacts of plastic waste on marine life. Climate change is affecting our oceans through ocean acidification and increased sea-surface temperatures, which will impact our marine ecosystems for generations.

Rain and frosts (Waipunarangi) show that shifting rainfall patterns (along with warming temperatures) threaten our agricultural economy, native ecosystems, Māori customs, and impact our mental wellbeing. Short-term drought frequency is increasing in some parts of the country and glacier ice volumes are decreasing.

Air, winds, and the sky (Ururangi) demonstrate how our wellbeing is influenced by air quality and practices related to the observation of the winds and skies. Air quality is slowly improving across Aotearoa, but air pollution at monitored sites is above the World Health Organization 2021 guidelines for most air pollutants some of the time. Light pollution from urban areas impacts some of our native species (such as wētā) and reduces our ability to see the stars. For some people, wellbeing is connected to the ability to use the night sky as a guide, and to celebrate Matariki. Connecting with the night sky is a universal human experience associated with psychological benefits and an increased sense of responsibility towards te taiao.

► Future outlook

Understanding future trends helps ensure the health of the environment and of future generations

Looking to the future (Hiwa-i-te-rangi) identifies many challenges that may impact the wellbeing of current and future generations. These include the impacts of climate change, population growth, risks to food and water security, and threats to ecosystems. The challenges ahead are complex and can play out in many ways, and sometimes beyond our direct control.

► Making better decisions about our environment

Building a robust environmental monitoring and reporting system supports New Zealanders' decisions and actions

The need for reform to better integrate the environment and intergenerational wellbeing in policy has been documented by the Parliamentary Commissioner for the Environment. Over time this will require investment, research, and continuous innovation to build our knowledge base.

This report helps to transition us towards a new system of reporting that can empower us to create the future we want, for ourselves and for future generations.

► Updated indicators

The following indicators have been updated for *Environment Aotearoa 2022*

- [Annual glacier ice volumes](#)
- [Extinction threat to indigenous freshwater species](#)
- [Extinction threat to indigenous land species](#)
- [Extinction threat to indigenous marine species](#)
- [Lake water quality](#)
- [River water quality: clarity and turbidity](#)
- [River water quality: Escherichia coli](#)
- [River water quality: macroinvertebrate community index](#)
- [River water quality: nitrogen](#)
- [River water quality: phosphorous](#)
- [Wetland area](#)

► Te Kāhui o Matariki

The cluster of stars that rise together in unison to mark a new year.



WAIPUNARANGI



URURANGI



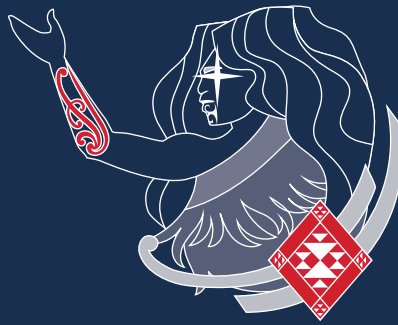
TUPUĀRANGI



HIWA-I-TE-RANGI



WAITĪ



MATARIKI

is the central star and mother of the other stars. She ensures they rise together to mark the new year. Matariki is associated with wellbeing.



WAITĀ



PŌHUTUKAWA



TUPUĀNUKU



PŌHUTUKAWA

is connected to those who have passed since Matariki the previous year. Pōhutukawa prompts us to reflect on the past year.

TUPUĀNUKU AND TUPUĀRANGI

'Tupu' means 'new shoot' or 'grow'. Tupuānuku is connected to food grown in the ground. Tupuārangi is connected to everything that grows above the earth or from the sky such as birds and berries.

WAITĪ

is connected to freshwater and all living things that inhabit rivers, lakes, streams, and wetlands.

WAITĀ

is associated with the ocean and represents the many types of food we gather from the sea.

WAIPUNARANGI AND URURANGI

Waipunarangi is connected to rain. Her name means 'water that pools in the sky'. Ururangi is connected to the winds. His appearance predicts the winds for the year.

HIWA-I-TE-RANGI

signals the promise of the new season. She is the youngest (pōtiki) of the cluster.



► Pōhutukawa

Reflecting on what we have lost can guide us into the future.



More than 80% of land was covered with native forest before human arrival. This was reduced to 27% in 2018.



At least 81 animal and plant species became extinct after human arrival.

62 bird species

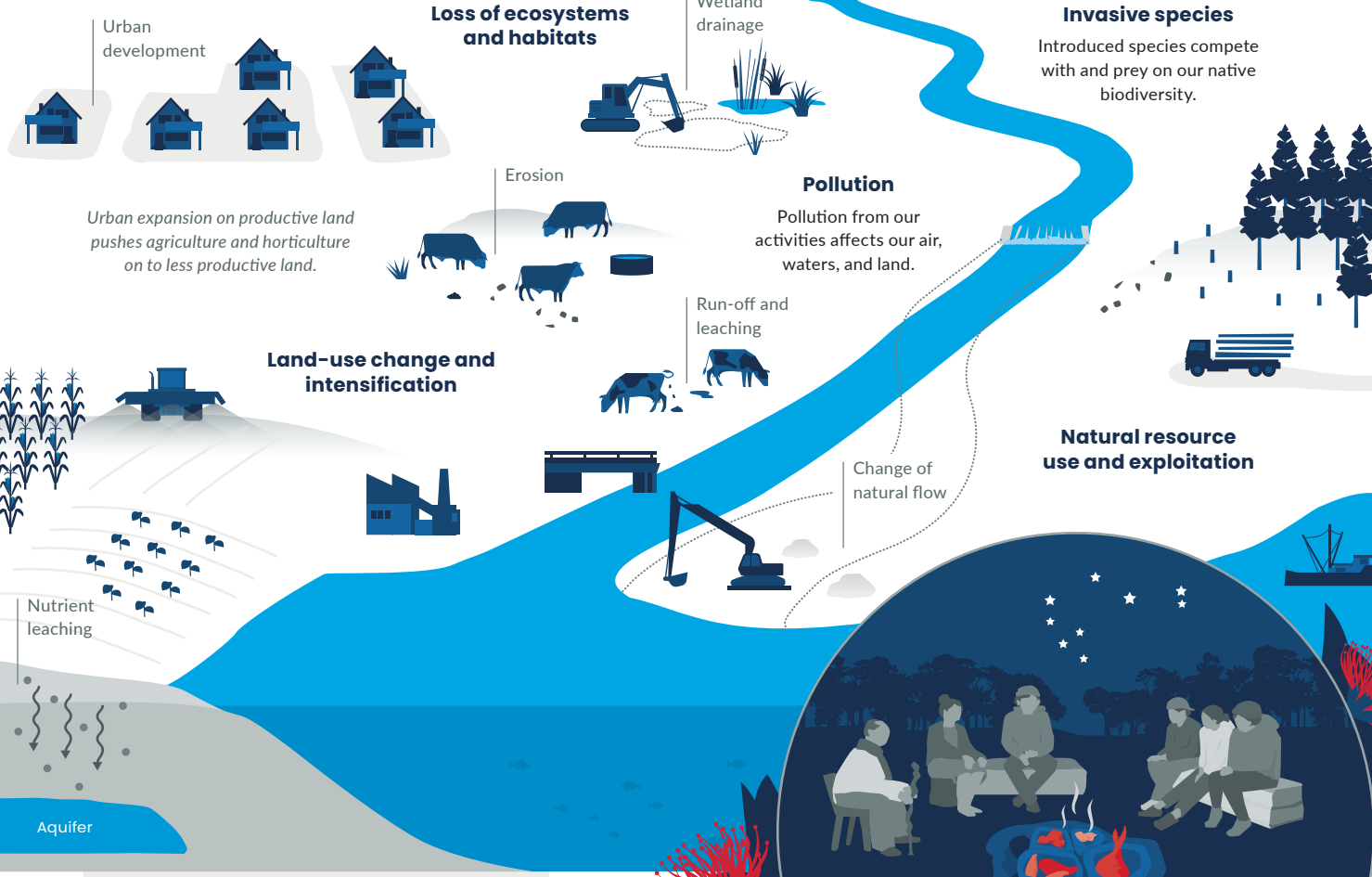


Over 80 exotic species brought by humans became established, contributing to the decline of the original ecosystems of Aotearoa.



PŌHUTUKAWA
When Matariki rises, we honour the memories of all those who have passed. Pōhutukawa is the star that is connected to the dead. She encourages us to reflect on the past and to be thankful for those who have contributed to our lives.

Climate change



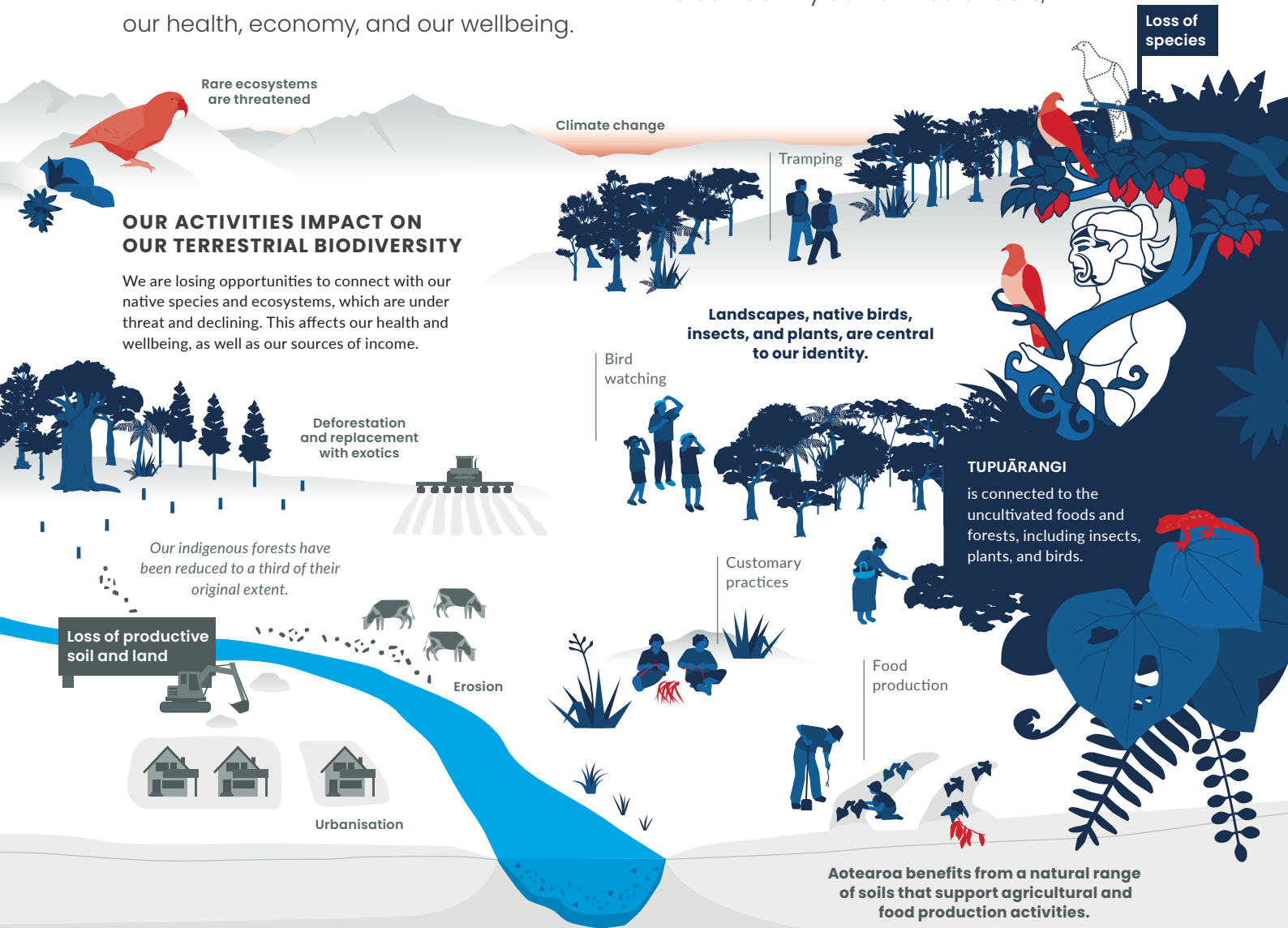
Cumulative impacts and legacy effects
The pressures combine with each other and compound over time. All parts of the environment (te taiao) are interconnected, and changes in one area can have flow on effects to others.



As we reflect on the changes we have brought to the environment and what we have lost, it presents an opportunity to consider how we give back to the environment and learn from the past.

► Our land and biodiversity

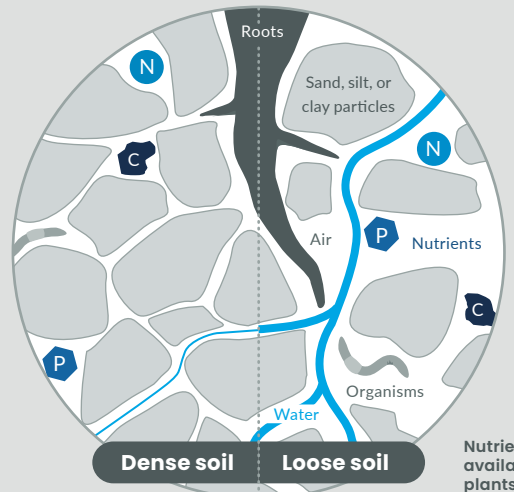
Our soils and forested environments are central to our identity as New Zealanders, our health, economy, and our wellbeing.



Excess soil, nutrients, and contaminants affect our freshwater and marine environments.

THE WAY WE USE OUR LAND IMPACTS SOIL QUALITY AND AVAILABILITY

Intensive use of the land that produces our food has led to degraded macroporosity (the number of pore spaces in the soil), especially in areas of dairy and drystock farming. Macropores are important because they provide air for roots and allow water to flow through the soil.



► Our freshwater environment

Our connections to freshwater are important to our identity. However, the state of our rivers, lakes, and groundwater is degraded in areas where land has been transformed by human activities.

BENEFITS FROM HEALTHY FRESHWATER

Providing habitat

Freshwater environments provide food, shelter, and breeding or spawning sites for many types of birds, invertebrates, fish, and taonga species.

Our culture

When we use our freshwater environments for recreation or to collect mahinga kai, or share knowledge of freshwater taonga species, we are connecting with Waiti.

Improving wellbeing

Spending time in or near rivers, lakes, and wetlands is good for our physical and mental wellbeing.

Regulating flows

Wetlands are like giant filters, they can remove nutrients and sediment from water, control floods, and are also important in combatting climate change.

PRESSURES ON OUR FRESHWATER ECOSYSTEMS

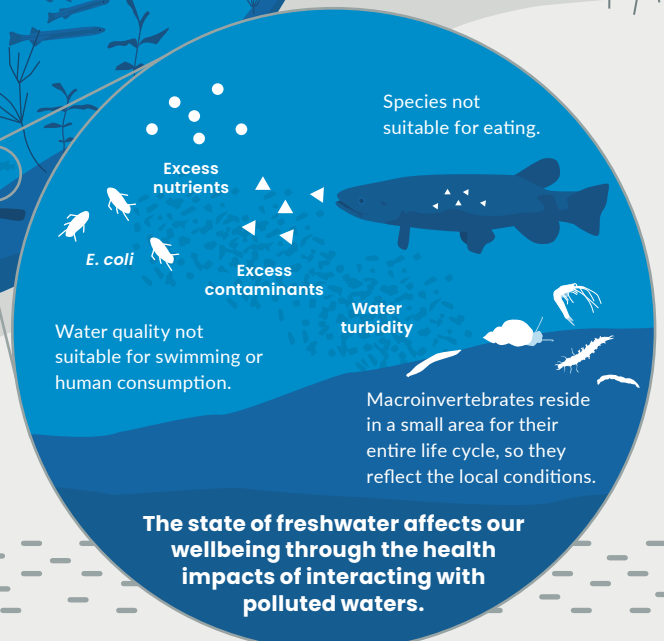


WAITI

is connected to freshwater as well as the plants and animals that live in the springs, streams, rivers, lakes, and wetlands. She sits above her sibling Waitā, who is connected to the marine domain, reflecting the interconnectedness of water (wai) between these domains.

Safe drinking water is vital to human health.

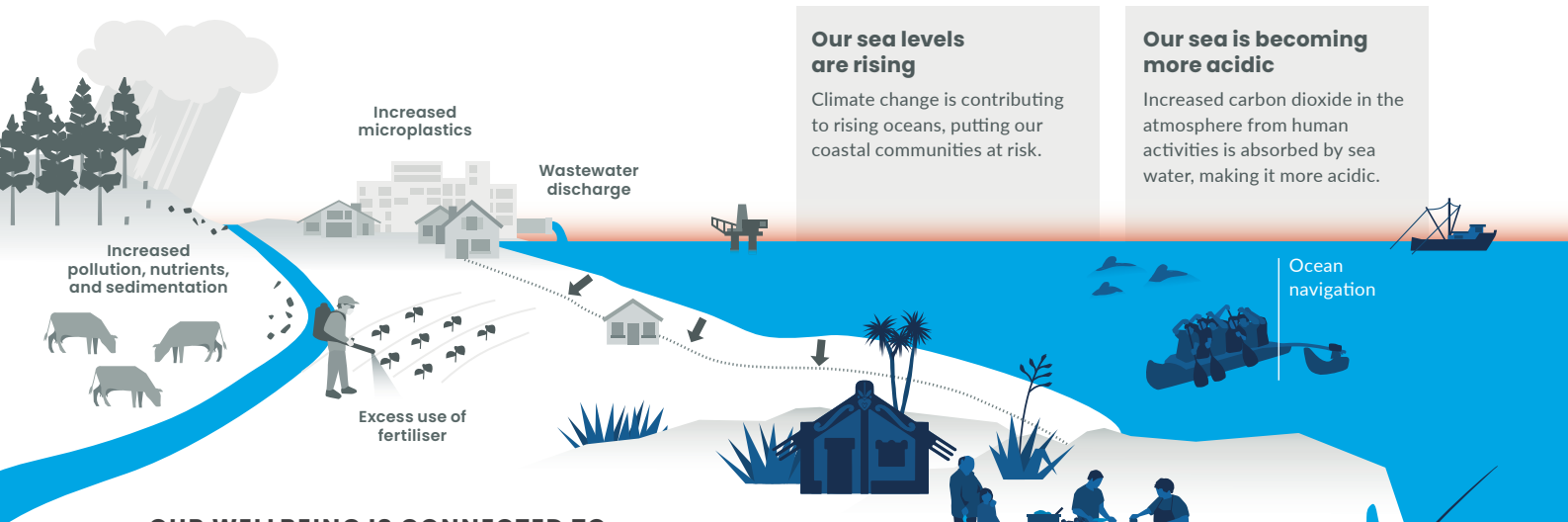
Maintaining water tables and recharging the groundwater.



► Our marine environment

Our oceans contribute to our health, our cultural identity, and our livelihoods. Some of our activities result in environmental harm, adding pressure on marine species.

PRESSURES IMPACTING THE MARINE ENVIRONMENT



Our sea levels are rising

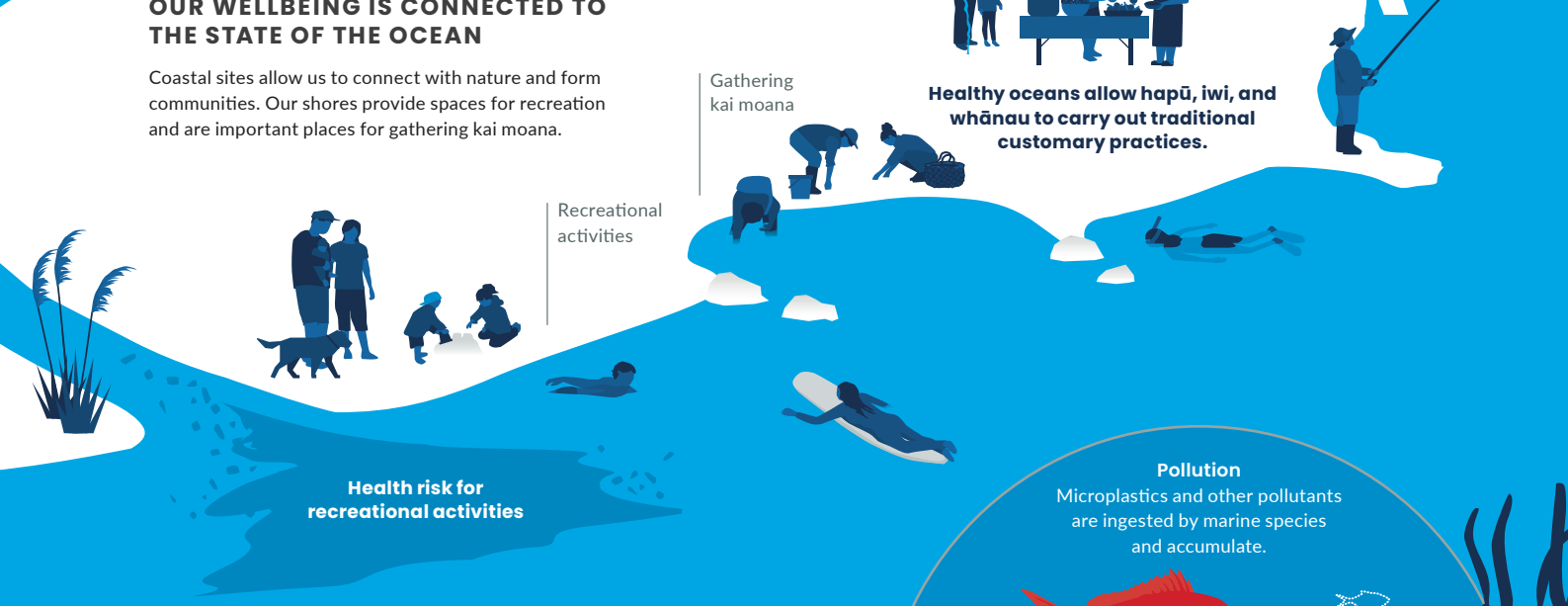
Climate change is contributing to rising oceans, putting our coastal communities at risk.

Our sea is becoming more acidic

Increased carbon dioxide in the atmosphere from human activities is absorbed by sea water, making it more acidic.

OUR WELLBEING IS CONNECTED TO THE STATE OF THE OCEAN

Coastal sites allow us to connect with nature and form communities. Our shores provide spaces for recreation and are important places for gathering kai moana.



Pollution

Microplastics and other pollutants are ingested by marine species and accumulate.

Warming waters
Changing populations and distributions of marine species.

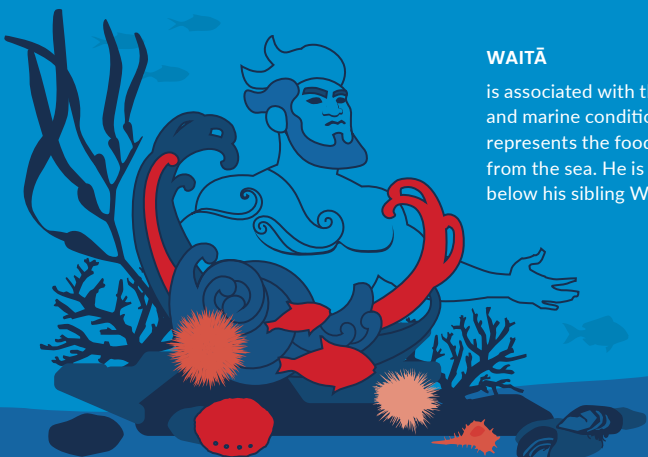
Ocean acidification

Leads to slower growth, smaller sizes, and abnormal shapes of shells and structures.

Declining water quality is impacting the health of marine life and harming kai moana species and their habitats.

WAITĀ

is associated with the ocean and marine conditions and represents the food gathered from the sea. He is situated below his sibling Waiti.



► Our atmosphere and climate

The air we breathe, the skies we observe, and the weather we experience, can affect our wellbeing.

URURANGI

means 'winds of the sky' and is connected to atmospheric conditions, winds, and the sky.



Navigation

Aotearoa has a strong connection to the winds through sailing and wayfinding using the stars.



WAI-PUNARANGI

means 'water that pools in the sky' and is connected to the rains and other atmospheric conditions.



RAINFALL AND WEATHER PATTERNS ARE CHANGING

Changes in future temperature and precipitation will have impacts on people and ecosystems.

Observing the sky

Some tikanga Māori practices rely on the observation of the sky to predict the correct times for planting and harvesting or hunting and fishing.



AIR QUALITY IMPACTS OUR HEALTH

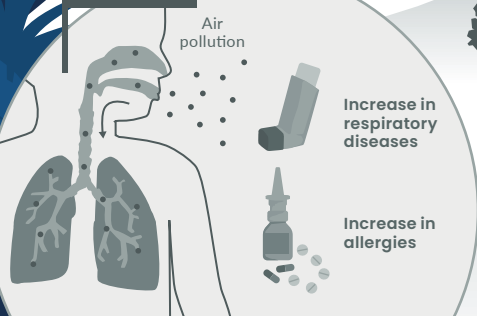
At times, poor air quality is negatively impacting people's health. How we generate and use energy and transport affects air quality.

Our culture

The ability to practice mahinga kai is intertwined with the weather, along with access to plants used for medicinal, practical, artistic, or ceremonial purposes.



Health risks



Air quality is slowly improving although pollution levels are above international guidelines at least some of the time.

Increase in extreme events

Damage to property and infrastructure

Impact on food production

Impact on mental wellbeing

Floods

Melting glaciers

Droughts

Increasing temperatures

Fewer frost days

Harm to people and the economy

Extreme winds

IMPACTS ON SPECIES

Changing temperature, rainfall patterns, and extreme events increase the vulnerability of taonga species by altering their distribution, life cycles, and migrations.

Altered species distribution and life cycles

