Te Mahau

Te Tāhuhu o te Mātauranga
Ministry of Education

Me, Growing a Thriving World - A Guidance Booklet

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Tai Huki Consult Ltd

Tai Huki Consult Ltd is very privileged to support and grow understandings about Carbon Emission Reduction pathways within Kura, included within the resource *Me growing a thriving world!* We also acknowledge the wisdom of our tūpuna (ancestors), through the traditional Māori understandings which envelope this booklet.

Ngā mihi

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Me, growing a thriving world

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Ki Papatūānuku
Ka puta te ira tangata
Ki te whaiao, te ao mārama
Whano, whano, haramai te toki
Haumi e, hui e, tāiki e![1]

This karakia is key to framing the knowledge and information within this Guidance Booklet. The following sections from the karakia highlight the concept of Kaitiakitanga as well as the duty and responsibility of humanity to reduce our carbon footprint. These areas are:

1. **Tēnei Au – This is Me.**
2. **Te Hōkai Nei o Taku Tapuwae – The Breadth of My Footprint.**
3. **Ka Tiritiria, ka Poupoua ki Papatūānuku - To Embed and Strengthen here upon Earth.**
4. **Ka puta te ira tangata ki te Whaiao – Humanity enters the World of Enlightenment.**

[1] The Work of Addison et al. (2007 as cited by Wairarapa Moana, 2020) https://www.wairarapamoana.org.nz/waiata/
An English adaptation of the karakia has also been provided in Appendix One.

Me, growing a thriving world

'Me, growing a thriving world, Guidance Booklet' is a resource to support students, whānau, teachers and schools to further develop their understanding of actions that can be taken to grow a healthy, thriving world. The concept of 'Me, growing a thriving world' can either be approached as a question, or a statement of fact for each individual depending on the choices they make and their understanding of their carbon footprint.

No matter our current knowledge base, this Guidance Booklet aims to provide information to further support best practice for teachers and schools. As you read this booklet, consider the key steps needed to revitalise our environment, as well as any strategies and/or activities required which could ensure the further sustainability of our planet. This booklet highlights case studies schools can learn from, and points to several carbon reduction tools and resources for schools.

Tēnei Au – This is Me

'Me, growing a thriving world, Guidance Booklet', is underpinned by the karakia, 'Tēnei au, tēnei au', which follows Tānenuiarangi and his footsteps to gather the baskets of knowledge, and share these understandings here on Earth.

Much like Tāne, as he ascended the heavens to gather and bring the Baskets of Knowledge to Earth, the symbolism within this karakia suggests that every step a person makes, provides opportunity for them to discover further understanding, as well as share these knowledges throughout the world.

In this context the Guidance Booklet provides knowledge and understanding. These learnings include Kaitiakitanga, the carbon footprint and strategies which support carbon footprint reduction (carbon emissions reduction), as well as providing connections to the relevant curriculum areas.

This Guidance Booklet suggests and recommends initial steps to support schools. The summary of findings and recommendations provided, are based on examples of schools and organisations taking action. This booklet highlights a few of the many actions that schools can take.

The New Zealand Curriculum[2] and Refreshed Curriculum[3]

This guidance document aims to empower leaders, teachers and ākonga to think and act sustainably through whole school approaches to sustainability including decisions about curriculum.

The New Zealand Curriculum (NZC) sets the direction for teaching and learning. It guides individual schools to develop localised curriculum that best reflects their community and responds to the needs and aspirations of their ākonga. The NZC also ensures learning supports meaningful progress that is cumulative and strengths based.

At the time of writing this resource, the NZC is being refreshed to ensure that it maintains pace with our evolving future. Aotearoa and its place within the globe, continues to evolve and be impacted by challenges and opportunities including climate change and our transitioning to a sustainable future - our curriculum needs to reflect this. The refreshed curriculum will be ready to implement from 2026, although schools are able to begin using content as it is released in the meantime.

Te Mātaiaho is the name of the refreshed New Zealand Curriculum, *Te Mātaiaho* aims to give practical effect to Te Tiriti o Waitangi including prioritising meaningful connection with whānau, hapū and iwi. The refreshed content will ensure that attention is paid to diverse ways of being, understanding, knowing, and doing including the learning ākonga experience about climate change and sustainability.

[2]TKI, 2014
[3]Murphy et al, 2021 New Zealand Progressions Approach

Te Mātaiaho has retained the learning areas. Learning about climate change and sustainability is embedded within and across all learning areas in ways that respond effectively enduring local and global issues. Each learning area will consider the personal, participatory, and planetary value it contributes to the whole curriculum. Knowledge, skills, attitudes, and values that foster global and cultural competencies will be embedded within and across each learning area in a way that responds to the uniqueness and diversity of each learner, within the context of their family and their communities.

An example of how climate change and sustainability feature within learning areas can be seen within te ao tangata | social sciences. Teachers and kaiako are encouraged to design learning through climate change and sustainability as an example of a meaningful topic.

A meaningful topic involves social, economic and environmental challenges associated with human rights, inequity, mobility and sustainability. Through this meaningful topic, learning will:

- Deepen their understanding of big ideas (Understand) including **Interactions change societies and environments.**
- Explore these big ideas through the Know context **Te tūrangawaewae me te taiao | Place and environment** and **Ngā mahinga ohaoha | Economic activity.** Both of these contexts are asking ākonga to consider the interrelationships between human activity and the natural world and the consequences of competing ideas about the control, use, protection, and regeneration of natural resources.
- Use the practices that bring rigour to learning- the Do. These practices enable learners to think and act as experts in each learning area. Within te ao tangata | social sciences learners understand how societies work and how they themselves, and those around them, can participate as critical, active, informed, and responsible citizens.

In senior secondary schools, changes within NCEA include the introduction of a new Environments and Societies subject, as well as themes of environmental sustainability and environmental concepts as part of a number of other subjects.

Curriculum Resources

We are continuing to develop resources aimed at supporting schools to implement the refreshed curriculum. For te ao tangata | social sciences, resources are designed to enable teachers to plan and deliver meaningful learning experiences about climate change, regeneration, and sustainability.

There are a range of climate and environmental teaching and learning resources available:

- Education for Sustainability contains a range of resources that can empower learning communities with the values, knowledges, and skills they need to take meaningful action to ensure a thriving world.
- The curriculum resource Pūtātara A call to action encourages schools and teachers to create learning opportunities that expand learners' understanding of complex issues and take action for change. Pūtātara promotes place-based learning and learning through inquiry to develop critical thinking skills.

- The Ministry for the Environment has a range of educational resources to help students, teachers and communities contribute to the future wellbeing of the environment.
  - This includes resources for teachers and students on climate change.

Curriculum Areas and Levels

The information in this Guidance booklet supports the New Zealand Curriculum, particularly Education for Sustainability[4], Social Sciences[5], Health and Physical Education[6], Learning Languages, particularly Te Reo Māori[7], The Arts[8], Mathematics & Statistics[9], Science[10], and Technology.[11]

This resource also supports activities across all phases of learning. However, each school will need to ensure that further learning preparation is provided, specific to the curriculum being applied as well as the year group and curriculum level being taught.

New Concepts

Where there are relevant websites, hyperlinks are provided to further support learning.

Traditional Māori Knowledge

Traditional Māori knowledge provided within this guidance booklet are generalised and should be considered a beginning foundation for the schools which utilise them. Schools will need to localise learning by ensuring the activities and traditional Māori knowledge they source and provide are relevant to their local whānau, hapū and iwi.

[4]The Ministry of Education [MOE], 2022
[5]MOE, 2014d, [6]MOE, 2014, [7]MOE, 2014a, [8]MOE, 2014e, [9]MOE, 2014b, [10]MOE, 2014c, [11]MOE, 2018

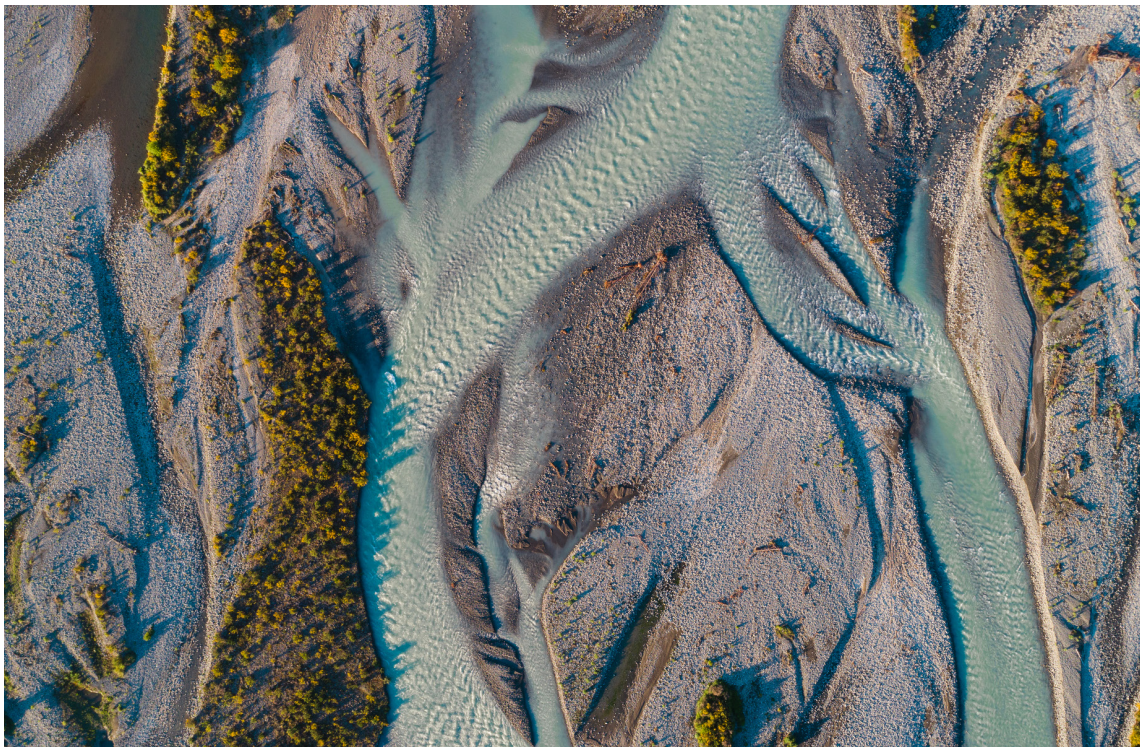
Te Hōkai nei o taku Tapuwae - The Breadth of my Footprint

Caring for and protecting the land, oceans, skies as well as everything above and in between is intrinsic to te ao Māori (Māori world view), which is particularly demonstrated within Māori creation stories, as a gift shared by Atua Māori (Māori Gods) and passed from generation to generation.

Humanity is considered the younger siblings throughout creation, which through a deeper understanding of whanaungatanga (relationships) and mana (authority), supports the view that it is our duty to care for and nurture all those within the natural world.[12]

Māori traditional understandings acknowledge that Atua Māori, tīpuna (ancestors) as well as the taiao (environment) are considered one in the same. From a te ao Māori lens, wherever you cast your gaze, you will find a being that is linked to, or embodies an Atua Māori or tipuna. Everything in the natural world has power and life essence.

As guardians we have a responsibility to ensure that Atua Māori and all things created by Atua Māori are cared for and nurtured. In caring for them, we also support their mana and mauri. If nurtured sustainably, they further prosper and thrive with vitality. If they are healthy, then we, the teina (younger siblings) are also healthy.



[12]Buck, 1949

These are the foundations of Kaitiakitanga, Kaitiakitanga requires us to actively and inactively care for and protect the power and life essence of places, spaces, beings and or matter throughout the natural world. Connections exist everywhere. Atua Māori are the land, forests, skies and oceans that interconnect to each other, as well as humanity. Therefore, a healthy and thriving world directly aligns to the care, protection and duty humanity engages to support the power and life essence of places, spaces, beings and or matter throughout the world.

Climate change is one of the greatest challenges of our time. A major contributor to climate change is human carbon emissions. We must consider our carbon footprint and reduce our carbon emissions. Ignoring this challenge continues to negatively impact upon our natural world.

As Kaitiaki we understand that nurturing and protecting our natural world is a reciprocal process between ourselves, individually and collectively, as well as those we are protecting. What was done yesterday, what we do today, impacts and influences upon what will happen and in turn what must be done for our future generations, 'what you put in, is what you get out of it'.

The Carbon Footprint

A carbon footprint is the amount of carbon that an individual, organisation or community's activities releases into the world. Carbon is an element that can be found widely throughout nature. When your carbon footprint is bigger, you use more carbon, meaning you release more carbon into the world.

The connection between the sustainability of the land and a carbon footprint can be identified in a carbon cycle. Within the carbon cycle we observe the movement of carbon through the ecosystem and atmosphere. This includes the release of carbon into the atmosphere, and its absorption from the atmosphere through the ocean and other organisms.

This system is natural to the environment and there are different biological and environmental processes which ensure the carbon cycle continues in this manner. In the last century this cycle has become more and more imbalanced. This means, there is more carbon used, which results in more carbon being released into the atmosphere, than is being absorbed.

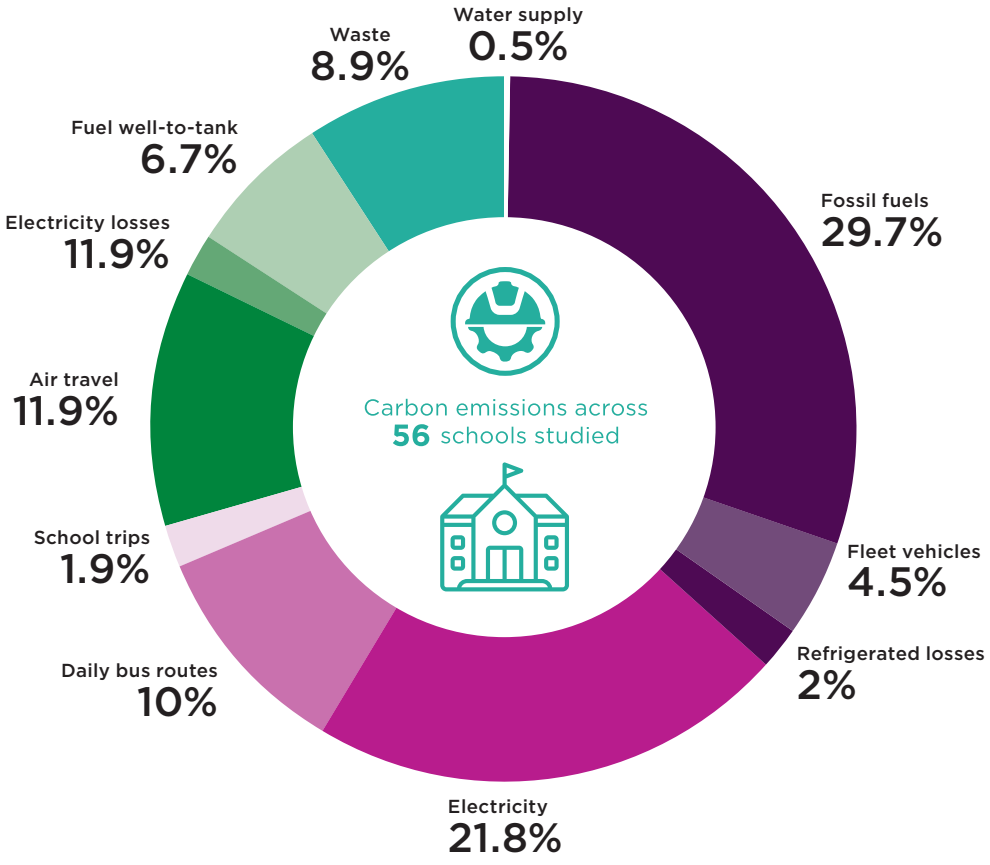
The key chemical in this context is the gas carbon dioxide, CO_2. It is known as a greenhouse gas that prevents the release of infrared radiation from Earth, increasing the greenhouse effect causing a warming of the surface temperature on Earth. The more greenhouse gases, the warmer the surface of the Earth. This correlates to a rise in sea level, unstable weather patterns, droughts, floods and a decrease in biological diversity. Other key greenhouse gases include water vapour (H_2O), methane (CH_4), nitrous oxide (N_2O), and chlorofluorocarbons (CFCs)

Much like the karakia we must consider the benefits and consequences our footprints might cause, wherever we go. The aim is to reduce our carbon footprint to minimise the release of greenhouse gases into the atmosphere and our ecosystems, ensuring our surface temperature on Earth stops rising further and/or decreases to previous levels for a healthier world.

Carbon Footprint at schools

Carbon emissions sources at schools, based on research the Ministry undertook on 2019 emissions across 56 schools, is summarised in the infographic below. The key carbon emissions sources are from energy use (fossil fuels and electricity), transport (air travel and vehicle travel) and waste. As Kaitiaki, we must take action, and provide sustainable strategies and plans to reduce carbon emissions, and grow a thriving world.

2019 Baseline Operational Carbon Emissions



Ka Tiritiria, ka Poupoua ki Papatūānuku - To Embed and Strengthen here upon Earth

Some schools and kura have already been taking action to reduce their carbon footprint. Many of the recommendations in this booklet are simple changes based off their knowledge and experience.

Summary of findings from the Case Studies

We acknowledge the following schools and organisations, and the work they have done to reduce carbon emissions, Ko Te Aho Tūroa[13], Enviro Schools[14], Taikura Rudolf Steiner[15], Auckland Councils Sustainable School Teams[16], Trident High School[17], Te Kura o te Pāroa[18], and Moanataiari School[19].

Below is a summary of the key findings and recommendations that these organisations took to reduce their carbon footprint:

1. Prepare a 'shut off' campaign which depending on the items, occurs daily, weekly, monthly and/or during the school holidays.
2. Organise a campaign to improve the energy efficiency of the school by updating or fixing resources, for example technology, machines, electrical appliances and the like.
3. Engage with experts and prepare your information to provide an accurate and comprehensive understanding of the schools' carbon footprint, to enable a sound and useful strategy and action plan.
4. Prepare a strategy and review annually.
5. A carbon emissions reduction strategy is more effective if everyone from the school is involved. This includes staff members, teaching and non-teaching, students, whānau, the community and where possible, hapū and Iwi.
6. Encourage and grow advocates for carbon reduction, this may include but is not limited to teachers, students, whānau, and where possible, Iwi, hapū and the community.
7. Prepare a Zero Waste campaign (Para Kore) and school gardens.

[13]Te Aho Tūroa, 2023. [14]Enviro Schools, 2023. [15]Taikura Rudolf Steiner, 2023. [16]Bolstad, 2021. [17]Trident High School, 2023. [18]Te Kura o te Pāroa, 2023. [19]Moanataiari School, 2023.

It is essential to make informed decisions, to ensure any strategy, plan or action is relevant, and effective. The diagram on page 12 shows an overarching profile of a group of schools, but individual schools may be different. The first step is to understand your unique school carbon footprint. Where are the biggest sources of carbon at a school? How big or small are the carbon emissions? It is important to gather data relevant to the carbon emissions at your school, and also to contact experts to support you to unpack the data. Experts will also be able to better inform schools of the next possible steps. In some schools this has meant engaging with energy and water companies to break down energy and water use. In other schools such experts have explained the connection of energy consumption to their carbon footprint.

Furthermore, you need to consider:

- why is it important to reduce energy consumption?
- what is your school doing well, and where could improvements be made?
- what are some major impacts occurring from carbon emissions at your school?

Once you have identified where your carbon emissions are coming from, you can identify ways of reducing them. This can be done by changing your fuel sources. For example, some energy systems are generated from fossil fuels which emit greenhouse gases into the atmosphere. Switching to a more renewable source of energy will help to reduce your school's carbon footprint.

Reducing the amount of resource that you use will also help to reduce your carbon footprint. In essence, if the energy produced is not used or used well it is wasted and realeases unnecessary carbon into the world. A key role of a Kaitiaki is to protect the mauri and mana (life essence and power) of places, spaces, beings and or matter throughout the world. When we are wasteful of such resources, we waste mauri as well as mana. Over time this will lead to serious degradation of these resources and in extreme situations resources being used up completely. Reducing power or energy use is a key way to support this outcome.

Through using experts, growing understanding, and maintaining our role as Kaitiaki, we can better develop and implement a strategy to reduce carbon emissions. According to the case studies, having everyone involved is integral to the longevity of any strategy. This includes the school, teachers, students, whānau and the community.

This type of approach is also a great opportunity for students and whānau to better understand their carbon footprint, why reducing your carbon footprint is important, and how to reduce or further prevent carbon emissions.

It is also important to encourage and grow advocates for the strategy or campaigns. These advocates will encourage, direct and also review the strategy and its relevance annually. Thus, reinforcing the role of students to grow a thriving world, assisting them to understand the importance that every footprint they step contributes, and supporting them to recognise the effort required to achieve such goals.

Many of the case studies established a campaign to improve the efficiency and sustainability of the energy consumed. If a resource is efficient, the amount of energy wasted is reduced, as well as the reduction of carbon emissions and the carbon footprint. Another bonus is the money saved by the school and whānau by ensuring efficiency of their resources. Some of the following recommendations may aid in achieving an energy efficient and sustainable school or home.

Actions

Energy Shut Down and Switch off Campaigns

- Make a plan or include in the school timetable a time to switch off devices, and shut down energy.
- Organise school walkthroughs before closing for the day, weekend and/or school holiday period.

Lighting

- Switch off lights where daylight is adequate and during intervals, lunch breaks or overnight when the room is not in use.
- Check whether the lighting is too bright in classrooms, and if possible adjust.
- Prepare signage to indicate these changes such as posters or large arrows, decorative frames for light switches.
- Where possible add timers to switches so that they can turn on and off automatically.

Power Sockets

Discuss with your electrician whether;

- the location of switches can be changed to make it easier to switch them off.
- timers can be added to particular switches so that they turn on and off automatically, for example equipment in technology rooms.

Standby Technology

- Check all standby items, and decide if they need to be switched on.
- Check if equipment can be can be switched to energy saver mode when not in use.

Heating

Check with your boiler technician whether any of the following boiler operating procedures can be implemented:

- tune natural gas boilers for low fire,
- switch off boilers at lower ambient temperatures,
- reduce operating time of boiler pumps,
- adjust heating hot water circulation pump controller.
- Where rooms are naturally ventilated with open windows make sure to partially open windows on cold days rather than have only one window that's opened wider.
- Where practical, turn off heating when it is not needed for example overnight and when classrooms are sufficiently warm or unoccupied.
- Consider adjusting the temperature of your heating to reduce energy consumption.

Cooling

- Use airflow to cool rather than heat pumps.
- Reduce solar gain into rooms by using blinds.

Hot Water Cylinders

- Is the storage temperature of your cylinder 65°C? If higher, reduce the temperature of your cylinder.
- Is the cylinder warm to the touch? If so, add an insulation jacket.
- Do the hot water pipes have insulation? If not, consider adding insulation.
- Are the cylinders nearing end of life? If so, talk to the plumber about more efficient options.
- At the end of life can the cylinder be moved closer to the taps to reduce heat loss between cylinder and taps.
- Are there extra hot water cylinders? If so, turn off cylinders to meet demand.

Hot Water Use

Is the delivery temperature of the hot water above 40°C? If so, engage a plumber to:

- reduce the delivery temperature of your hot water,
- check mixing valves.

Is the delivery temperature of the farthest tap from the hot water cylinder at a steady temperature within 30 seconds? If not, add insulation to hot water pipes.

Water Use

Check flow rates of taps. If flows are high, greater than 6 litres per minute, consider engaging a plumber to reduce flows by installing:

- Bubblers or flow restrictors.
- Push button or pull handle timed tap fittings for basins and on shower tap fittings.

Zero Waste Campaign (Te Para Kore)

Undertake a zero waste campaign at school to minimise the amount of food waste, plastics, papers and any other waste used at school and at home. Consider how waste could be recycled or reused in a garden.

Sustainable Gardens

Prepare a sustainable garden, by creating a water and feeding system to the garden using resources within the environment. For example

- Gathering rainwater to feed plants over the summer.
- Preparing compost to feed the garden.

Ka puta te ira tangata ki te Whaiao - Humanity enters the world of Enlightenment

Acknowledgement must be given to the schools and organisations who have advocated and actioned the reduction of carbon emissions. These strategies or plans should be considered foundational, however there are a variety of other actions that can be taken.

Undertaking one or more of the recommendations provided in this booklet is up to the schools, teachers, and whānau to decide. The key is starting and making progress. In order for us to be like Tāne, to be good Kaitiaki and gain further enlightenment whilst also growing a thriving world, we should ensure we engage with experts as well as research other sources of information and support. The following links will also provide further guidance, The Ministry for the Environment, Science Learning Hub, as well as NIWA.

Appendix

He Karakia - A Chant[20]

This is Me, this is Me
and the breadth of my footstep
the breadth of the land, the breadth of the heavens,
the breadth of our ancestor Tūmatauenga
My footstep, my great footstep is akin to Tānenuiarangi
who ascended to the isolated heavens,
to the summit of Manono
Where he came upon Io the Parentless alone,
and brought down the baskets of knowledge;
the basket of sacred knowledge,
the basket of ancestral knowledge,
and the basket of knowledge,
to embed and strengthen
here upon Earth.
Humanity enters
the world of enlightenment!
Together we hasten,
together we fasten,
and together we stand strong.

[20] https://maoridictionary.co.nz/search?idiom=&phrase=&proverb=&loan=&histLoanWords=&keywords=karakia

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