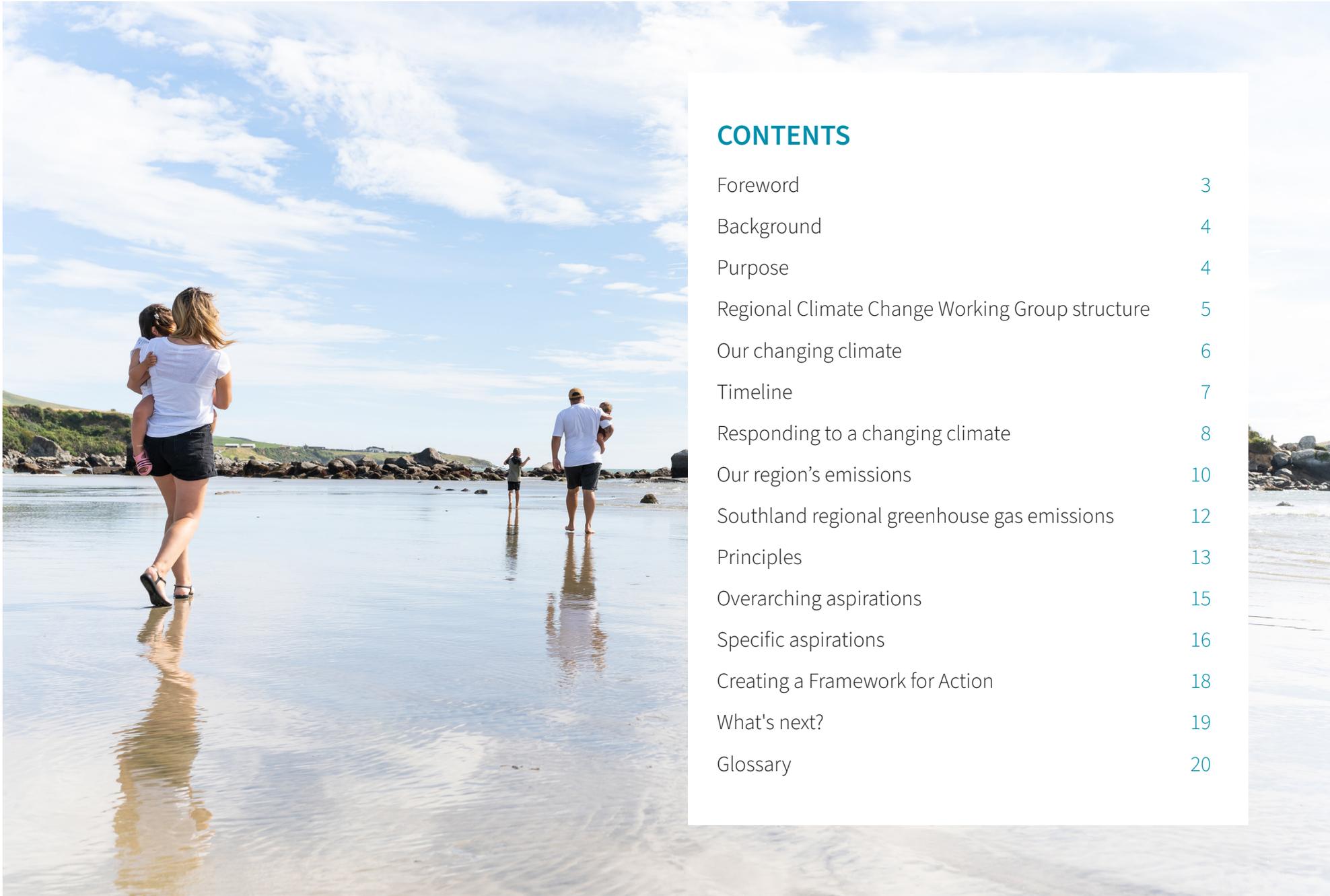


# Regional Climate Change Strategy for Murihiku Southland Phase One



## CONTENTS

Foreword	3
Background	4
Purpose	4
Regional Climate Change Working Group structure	5
Our changing climate	6
Timeline	7
Responding to a changing climate	8
Our region's emissions	10
Southland regional greenhouse gas emissions	12
Principles	13
Overarching aspirations	15
Specific aspirations	16
Creating a Framework for Action	18
What's next?	19
Glossary	20

# Foreword

Murihiku Southland Councils, alongside Te Ao Mārama Inc, are committed to a collaborative and inclusive approach in defining our regional strategic response to a changing climate.

We acknowledge the mandate from our communities to do so and recognise the role of local government in supporting community resilience. It is essential our regional approach continues to build trust, confidence and capacity for ongoing community cooperation.

While the scientific consensus supports the reality of global climate change and its impacts, we recognise that some individuals and groups within our community continue to question this. It is important to address these differing perspectives while firmly grounding our response in the best available science to ensure the resilience and well-being of our region.

Murihiku Southland is not alone in addressing the challenges and opportunities of a changing climate. We are part of a global community responding to a shared crisis. We are able to learn from the experiences and efforts of others, both within Aotearoa New Zealand and abroad. However, we also recognise the distinctive character of our regional needs. Our actions will be guided by an appropriate mix of global and local knowledge including mātauranga Māori, ensuring the choices we make remain tailored to our unique environment, economy, and communities.

In aligning with national policy, this strategy distinguishes between the two pillars of climate change mitigation and climate change adaptation. Mitigation involves the decarbonisation of our economy, as well as widespread behavioural change. This will be a challenging journey but it's an important pathway for our community to minimise the escalating impacts of a changing climate. There is significant scope to learn from others, benchmark, and leverage technology as we pursue our net-zero greenhouse gas goals. Our region is on a pleasing pathway, with the 2022 measurements indicating that regional emissions have been reduced by 14.8% since 2018.

Alongside mitigation, adaptation pathways may be the more demanding of the two. As New Zealand's Climate Change Commissioner, Rodd Carr, stated in a presentation at Environment Southland in September 2022: *“Adaptation is going to be one of the most challenging conversations local and regional governments have to have, because adaptation is inherently local – it is inherently about communities directly affected by the changed climate.”*

Accepting this challenge, it is important to recognise that the pursuit of climate change mitigation and adaptation are two pillars which often intersect, offering a path toward resilience and sustainability. While opportunities may not always be immediately evident, we embrace the notion that actions to reduce emissions might enhance our adaptive capacity, and adaptation measures may contribute to mitigation efforts. This synergy highlights the importance of a holistic and flexible approach in response to the complex challenges and opportunities posed by a changing climate.

Finally, it is recognised that this strategy is framed against a backdrop of uncertainty in an increasingly

changing world. Yet, given the potential consequences and costs of indecision, delay, and inaction, we need to do what we can with what we have now. Thus, we subscribe to the notion that local government agencies have a dual role – to lead as well as empower others to act. We understand that in navigating the complexities of a changing climate, we may not always ‘get it right’. But we believe that purposeful action accompanied by reflexive learning are essential elements of our response.

This challenge is ours to meet – and with humility *māhaki*, resolve *māia*, and commitment *manawanui*, together *kotahitanga*, we can secure Murihiku Southland for future generations. *Mō tātou, ā, mō kā uri ā muri ake nei.*

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**Environment Southland Councillor, Phil Morrison and Te Ao Mārama (TAMI) Kaupapa Taiao Manager, Dean Whaanga**  
*Co-chairs, Murihiku Southland Regional Climate Change Working Group*

# Background

At a regional hui held in July 2022, recognising our strong mutual interdependence, it was agreed that local government agencies need to work together to establish a regional approach to respond to Murihiku Southland's changing climate.

Environment Southland and Te Ao Mārama initiated discussions to create an inter-agency working group as a starting point for bringing Councils together – with Gore District Council, Invercargill City Council and Southland District Council being key partners in developing a regional approach. Great South, as Southland's regional economic development agency have also been involved.

This strategic collaboration will initially be defined and guided by two key documents as follows.

## Phase One

**Regional Climate Change Strategy for Murihiku Southland** (this strategy) defining how local government agencies will work together (principles) and toward what outcomes that work will focus (aspirations).

## Phase Two

**Regional Framework for Action** (being developed) which will define and prioritise the specific actions and initiatives needed to realise the outcomes being aspired to. It is expected the Regional Framework for Action will:

- Enable each individual local government agency to create Action Plans that align with the aspirations set out in this strategy.
- Evaluate the merits of and define the continuing or new collaborative actions to which local government agencies will commit.
- Identify opportunities for collaboration beyond local government – empowering the aspirations, energies, and creativity of communities and industry.

# Purpose

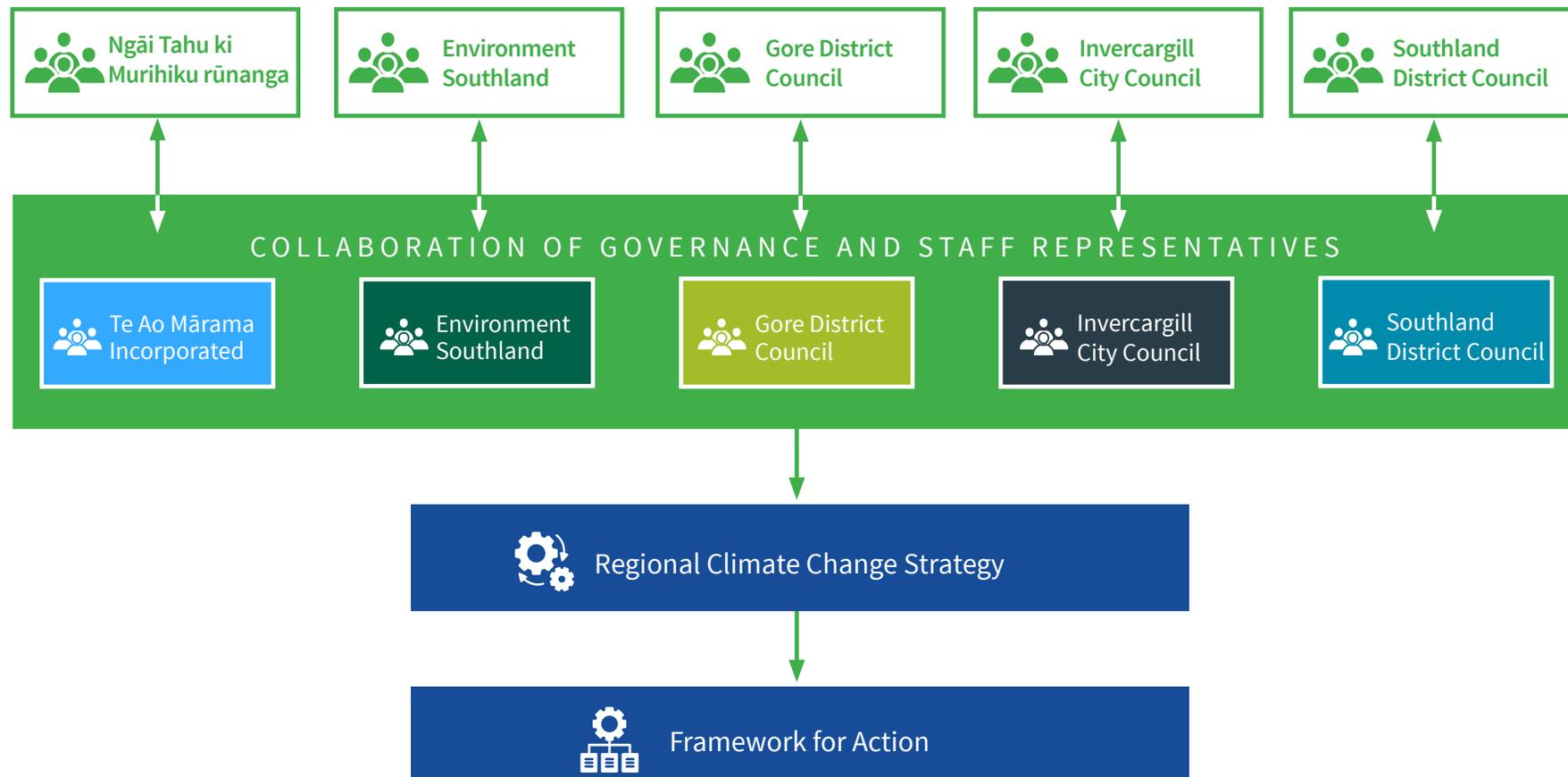
The purpose of this strategy is to unite the efforts of our four local government councils, Te Ao Mārama Inc and Great South to support a cohesive response to help protect our environmental, economic, cultural and social wellbeing against the effects of a changing climate by agreeing on broad principles and aspirations.

This strategy will enable local government agencies and our communities to work together efficiently and effectively, optimising the use of resources and expertise for the benefit of all ratepayers towards a resilient future for our region.



# Regional Climate Change Working Group structure

The Regional Climate Change Working Group (RCCWG) was established in early 2023 with governance representatives from each council and Te Ao Mārama Inc, supported by a staff level inter-agency group. This informal working group has been instrumental in enabling cross-agency discussions and collaboration to progress strategy development (phase one). It is envisaged that phase two will involve extending collaboration beyond the existing structure of this working group.



# Our changing climate

Our global, national and regional understanding of the changing climate has developed over time; though this has significantly accelerated during the past decade.

Within Murihiku Southland there are still some that dispute that human activities are contributing to a changing climate. However, it is generally acknowledged that our region is experiencing the effects of a changing climate, such as increasing severe weather events and sea level rise.

Some parts of Murihiku Southland are already prone to river flooding, coastal inundation and erosion. Recent events include the Mataura catchment flooding in February 2020 (which also affected Fiordland), as well as all catchments experiencing significant flooding in September 2023.

In contrast, during the summers of 2021-22 and 2022-23 dry spells and drought conditions were experienced in

many parts of our region.

These severe weather events often have serious economic, social and environmental impacts on the region. When these kinds of significant weather events are projected into the future, it can be daunting and overwhelming to consider.

Determining what on-the-ground action can be pursued as individuals and as communities right now, could change the course of this future. Understanding the opportunities (and opportunity costs) of investing in resilience versus the costs of post-event recovery will be an important consideration.

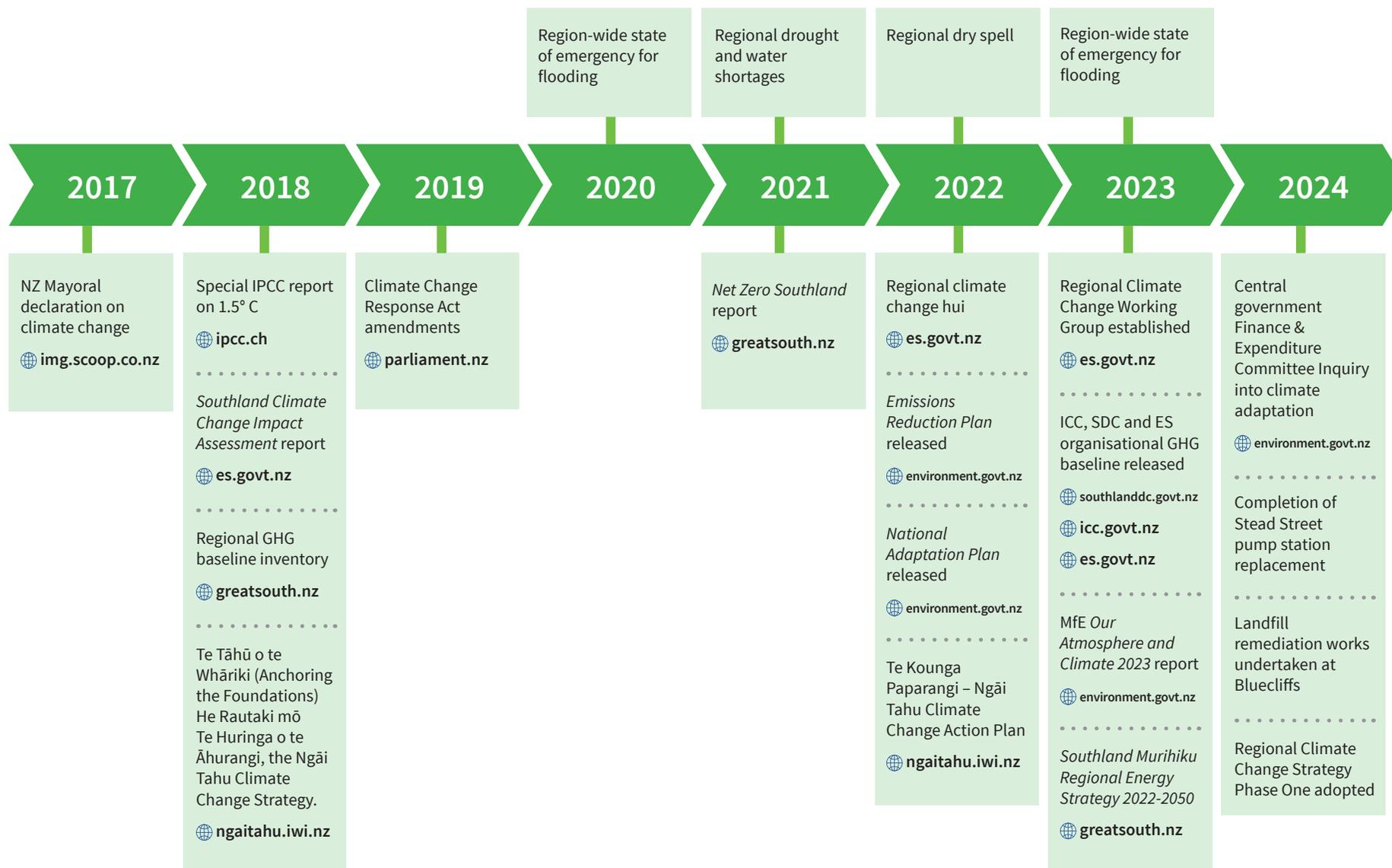
Regardless of the causes of changes to our climate, local government are obliged to respond proactively and ensure long-term community resilience. Southland must also be prepared to grasp opportunities arising from a changing climate.

This climate change strategy seeks to guide this journey for the Murihiku Southland region.



The Mataura River in flood at Gore, February 2020.

# Timeline



# Responding to a changing climate

## Local government's role

Collective and collaborative regional leadership is important to enable the implications of a changing climate to be considered for the Murihiku Southland region. A core purpose of local government is to promote community wellbeing in the present and in the future. This is at the heart of how our local government agencies need to work together towards a more resilient future.

The Climate Change Response Act 2002 directs the development of clear and stable climate change policies, in order for New Zealand to meet its international obligations and administer a greenhouse gas emissions trading scheme. While New Zealand's resource management legislation is in the midst of significant and ongoing reforms, national policy directions currently issued under the Resource Management Act 1991 relating to freshwater, biodiversity, and coastal management require decision-makers to consider the need for enhancing climate resilience. The resource management reforms aim to ensure that appropriate regard is given to the implications of a changing climate among other national priorities, including community wellbeing.

Environment Southland as the regional council, has specific responsibilities for example, managing flood risk under various pieces of legislation including the Local Government Act 2002 and Soil Conservation and Rivers Control Act 1941.

Gore District Council, Invercargill City Council and Southland District Council also have a range of obligations to consider natural hazard risks in planning and infrastructure decisions.

Emergency Management Southland has the responsibility for the delivery of emergency management responses if a significant climate related event was to occur.

While historically flood banks have been the main solution for protecting communities at risk, over the longer term there is a need to redesign the way we manage our catchments ensuring consideration of a wider range of solutions to help manage this risk.

Science and mātauranga are fundamental to guiding a regional response to a changing climate. It is acknowledged that there are divergent

views on climate change science, however local government is required to adopt best practice approaches, including using international science and national guidance to inform a precautionary approach towards adaptation.

While there is an abundance of international and national climate related science, there is currently still work to be done to ensure we understand the implications of this science for our region.

A crucial step towards regional leadership is an opportunity for each agency to carry out individual organisational efforts to support this work. This is important, not only for role modelling, but also ensuring each agency understands what is required to enable the support of others; as well as contributing towards a collective community effort.

For the Murihiku Southland region, this climate change strategy is a key step for local government agencies in undertaking this journey.

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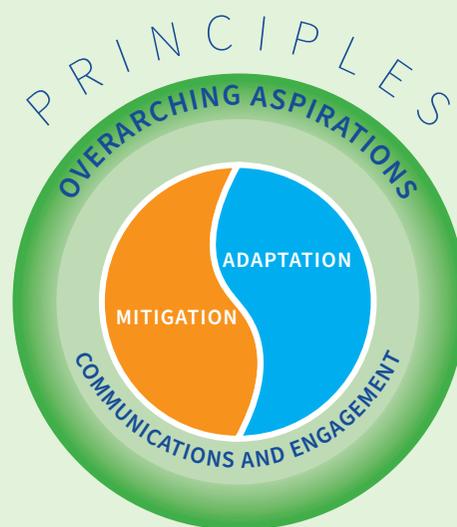
## Key components of this strategy

Following the international and national lead, this strategy focuses on two key strands – mitigation and adaptation. Communication and engagement are needed to support these two inter-connected strands of the climate change conversation.

### Mitigation

Mitigation is the human actions to reduce emissions by sources; or enhance removals of greenhouse gases. At a national level this is guided by the Emissions Reduction Plan. Examples include increasing the energy efficiency of homes and offices; or replacing a coal boiler with a renewable electric-powered one. An example of increasing the removal of greenhouse gases is growing new trees to absorb carbon from the atmosphere.

This strategy guides the development of future action in relation to each of these key components.



### Adaptation

Adaptation is the process of adjusting to actual or expected climate variability and its effects. At a national level this is guided by the National Adaptation Plan. Examples of adaptation include managed retreat, land-use changes, and investment in climate resilient infrastructure.

This process is inherently local and about communities directly affected by the changing climate. In addition, the inter-generational ramifications are an important consideration as our collective grandchildren and future generations will face increasing consequences of a changing climate.

## Strategy review

This strategy has been written within a national context of ongoing revisions to the legislative framework, not only for climate change policy, resource management but also local government reform. It will be reviewed by June 2025 to ensure it remains current and aligned with anticipated national legislative and policy changes.

The principles, aspirations and strategy as a whole are a starting point of a long-term partnership and journey. It is anticipated that the next iteration of this strategy will extend beyond the needs of local government with greater consideration of the needs of key stakeholders and our communities.

# Our region's emissions

## 1 Regional emissions inventory

## 2 Regional emissions modelling

## 3 Regional emissions reduction pathway

### Regional emissions inventory

In 2018, a baseline emissions inventory for the region was established\*, following the methodology in the Global Protocol for Community-Scale Greenhouse Gas Emissions Inventory (WRI, 2015), City Inventory Reporting and Information System (CIRIS) and the IPCC's AR5. Each time regional emissions have been measured, the baseline inventory has been updated to reflect changes in methodology, most recently to utilise the Global Protocol for Community Scale Greenhouse Gas Emissions Inventory (WRI, 2021) and Measuring emissions: A guide for organisations (MfE, 2023).

This baseline inventory highlighted that we all contribute to our regional emissions profile, as individuals, communities, businesses and industry.

This profile indicated that with 12% of New Zealand's total land area and producing 15% of New Zealand's tradeable exports, Southland (with only 2% of New Zealand's population in 2018) contributed 9.7% of New Zealand's gross emissions\*.

It is best practice for this kind of regional inventory to be updated on a regular 3 or 5-yearly cycle in order to monitor changes over time. This inventory has been repeated regularly by Great South\*\* since 2020, which has indicated a progressive downward trend in regional net emissions compared to the 2018 baseline. Great South will continue to report against the 2018 baseline annually and plays an important role in supporting local businesses to measure and reduce emissions, assisting the region's net zero greenhouse gas journey.

\* *Southland Regional Carbon Footprint 2018* – [www.greatsouth.nz/resources/southlands-greenhouse-gas-emissions-2018](http://www.greatsouth.nz/resources/southlands-greenhouse-gas-emissions-2018) (please refer to this report for an understanding of the methodology used and the data sources).

\*\* Great South is a council-controlled organisation, jointly owned by Invercargill City Council, Southland District Council, Gore District Council, Environment Southland, Invercargill Licensing Trust, Maitua Licensing Trust, Southland Chamber of Commerce, Southern Institute of Technology and Community Trust South. It is Southland's regional development agency which facilitates the implementation of the B2025 Southland Long Term Plan, as well as supporting the regional emissions reduction journey by working with businesses to reduce their greenhouse gas emissions across the region.

### Regional emissions modelling

Further to the emissions inventory work, Great South (working alongside MfE and the Tindall Foundation) has undertaken regional emissions modelling as part of developing a carbon neutral advantage programme. The Net Zero Southland 2050 report (March 2021) provides direction on potential economic mitigation pathways for Southland.

Part of this modelling seeks to understand the economic value of emissions reduction, which could enable our region to contribute towards achieving national net zero emissions by 2050. It also notes that a low emission economy would provide Southland with major opportunities to support economic and social prosperity while mitigating the risks posed by a changing climate.

## Regional emissions reductions pathways

The Climate Change Response (Zero Carbon) Amendment Act 2019, sets the national target to reduce net emissions of greenhouse gases (except biogenic methane) to zero by 2050.

Our region is already on a net zero greenhouse gas journey and while some progress has been made since the 2018 baseline inventory, achieving this goal will involve individuals, communities, businesses and industries all evaluating their contribution/s.

In 2018 our region contributed 9.7% of the country's emissions. This has reduced by 14.8%, to contribute 8.2% of the country's emissions in 2022. This is due to the decarbonisation of fossil-fuelled boilers and a systematic

reduction in emissions for agriculture, energy, transport, manufacturing and waste. Partnerships with EECA, Government, the private and public sector as well as educational outreach has created the impetus for the success of this programme.

Achieving net zero greenhouse gases by 2050, will require everyone to play their part. In the short-term, local government agencies in Murihiku Southland are focusing on ensuring each organisation is on track to achieving net zero goals; while the longer-term focus is determining how local government should best play its part regionally.



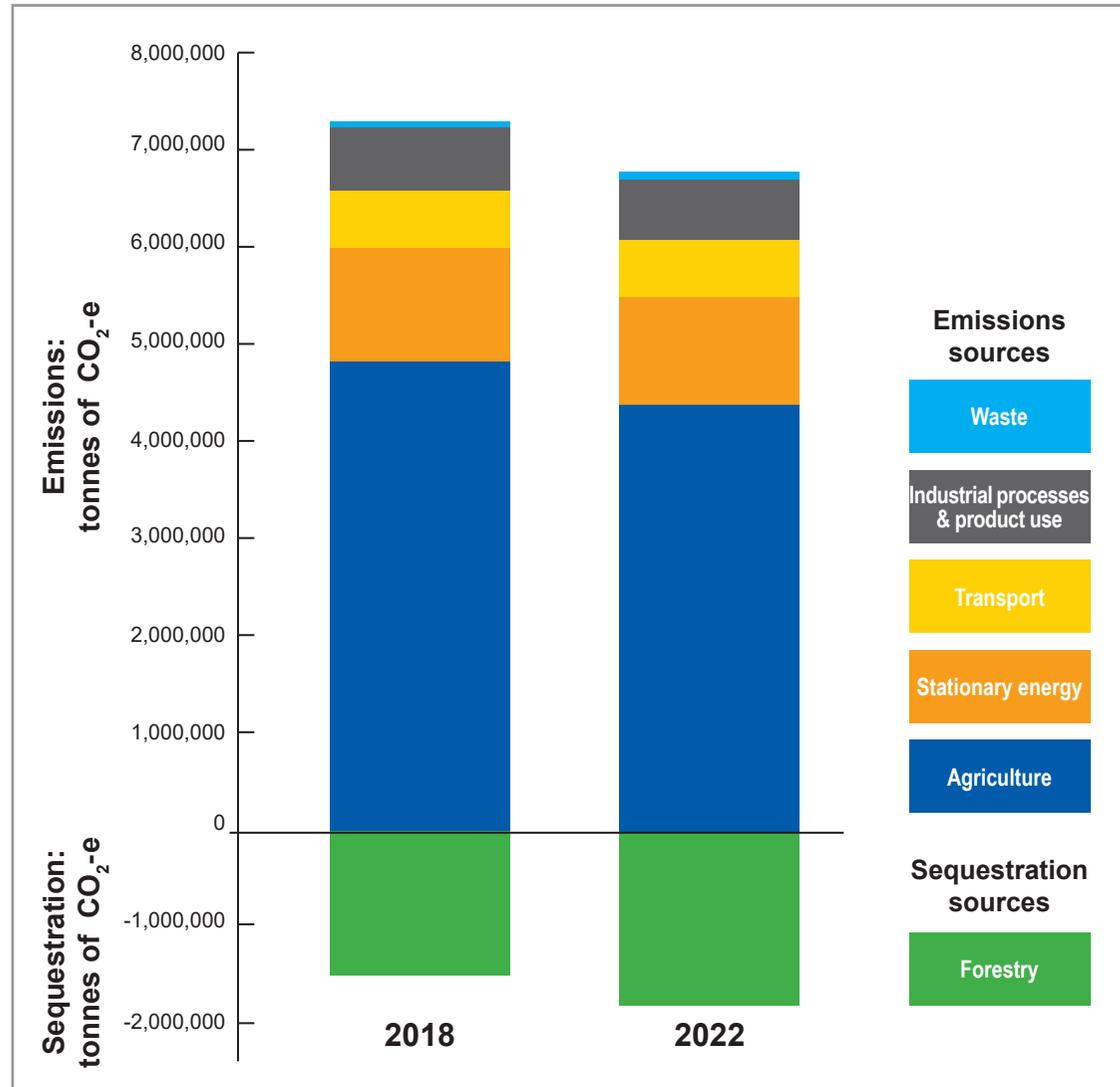
# Southland regional greenhouse gas emissions

Southland regional net greenhouse gas emissions 2018 and 2022 as measured by Great South. This graph illustrates that net regional greenhouse gas emissions have reduced by 14.8% from 2018 to 2022.

	2018	2022
Total GROSS emissions CO <sub>2</sub> -e*	7,308,128	6,753,059
Total CO <sub>2</sub> -e sequestered**	-1,498,508	-1,805,554
Total NET emissions CO <sub>2</sub> -e	5,809,620	4,947,505

\* CO<sub>2</sub>-e stands for 'carbon dioxide equivalent' to enable the comparison to six key GHG gases: carbon dioxide (CO<sub>2</sub>-e), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF<sub>6</sub>).

\*\* Carbon sequestration is the process of capturing and storing atmospheric carbon dioxide. The regional emissions inventory currently only includes forestry related sequestration (due to current regional data limitations for other sources of sequestration).



Southland Greenhouse Gas Emissions Inventory for 2022 – [www.greatsouth.nz/resources](http://www.greatsouth.nz/resources)

# Principles

Principles provide direction on ways of working together to create a regional response to the impact of a changing climate on Murihiku Southland. The seven principles provide the foundation for regional efforts to respond to the challenges and opportunities presented by our changing climate and associated environmental effects such as sea-level rise, indigenous biodiversity loss and biosecurity incursions.



**Kaitiakitanga Guardianship** – our responsibility to protect the essential life-supporting capacity of our environment, balancing the wellbeing of our present and future generations.

**Mōhiotanga Understanding** – effective risk evaluation and an evolving, iterative management approach, which fosters a future-focused community of learning.

**Whakamana Empowerment** – facilitate innovative and bold pathways for action while nurturing the resilience of our youth, in preparation for their future.

**Whakarāneinei Anticipation** – adopting a data-driven approach in developing proactive action plans, prioritising long-term thinking and reinvestment in our environmental capital.

**Hauora Wellbeing** – the interconnectedness of a healthy environment for community wellbeing and resilience.

**Kotahitanga Inclusivity** – transparent sharing of knowledge for a fair and equitable transition towards our future.

**Mahitahi Alignment** – a comprehensive, inclusive, collaborative approach that facilitates consistency and synergy and enables informed and balanced decision-making.

## Detailed principles

These principles will guide how Murihiku Southland local government agencies will work together, including prioritising to determine regional action.

They highlight the importance of recognising mutual dependencies and for example, taking a catchment focused and/or community focused approach to working across boundaries and prioritising the key issues.

These Murihiku Southland principles can be understood in more detail as follows.

### Kaitiakitanga *Guardianship*

- Recognise our duty of care to safeguard our environment's fundamental life supporting capacity.
- Adopt a precautionary approach towards mitigating and adapting to the effects of a changing climate.
- Create a balanced framework, which supports many inter-connected strands.
- Value the wellbeing and livelihoods of our present and future generations.

### Hauora *Wellbeing*

- Live with and understand how everything is connected.
- Recognise a healthy, functioning environment is inherent to our individual and collective wellbeing(s).
- Enhance community and environmental resilience in the face of change.

### Whakarāneinei *Anticipation*

- Think and act with a long-term perspective, valuing and reinvesting in our environmental capital.
- Create proactive pathways for action, doing what we can now with what we know now.
- Ensure relevant regional science and information underpins a data-led approach.

### Mōhiotanga *Understanding*

- Understand risks and look for potential ways to avoid, mitigate and manage risk.
- Pursue iterative management, adapting our approach as we learn and know better.
- Sow the seeds of how our future may be different, creating a broad community of learning.

### Kotahitanga *Inclusivity*

- Share knowledge widely and transparently.
- Proactively consider those most vulnerable and voices least heard.
- Create a fair and equitable transition to our future.

### Whakamana *Empowerment*

- Enable courageous pathways for action, inspiring individual and collective action.
- Look for opportunities and respond with innovation and creativity.
- Support our young people to understand, participate and be resilient in the face of their future – offering them hope.

### Mahitahi *Alignment*

- Think ki uta ki tai – mountains to the sea, considering the effects in every direction and across boundaries.
- Adopt a united, integrated, consistent, and holistic approach enabling informed and balanced decision-making.
- Foster collaboration among various stakeholders, businesses, community groups and individuals.

# Overarching aspirations

Our collective values spanning science, beliefs and hopes for the future, come together to form our aspirations for our regional response to a changing climate.

They provide an agreed ‘direction of travel’ for local government agencies, which can be improved and modified as the journey progresses.

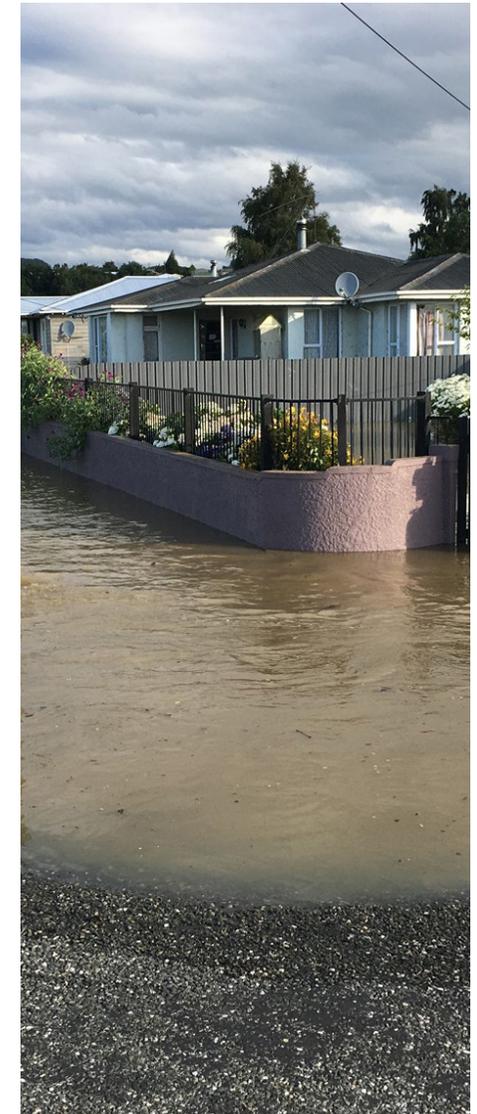
Ongoing cross-agency discussions will help develop and implement aligned pathways towards these aspirations. These pathways will include managing the effects of a changing climate as well as capitalising on potential opportunities that may benefit the region, keeping in mind the importance of ensuring that our future generations will also have the best possible opportunities. Additional specific aspirations may be developed, as part of the journey towards creating a Framework for Action.

The following aspirations reflect the collective intent of local government agencies to support and advocate for effective responses to our changing climate across Murihiku Southland.

In addition to these overarching aspirations, further aspirations provide a direction regarding mitigation, adaptation as well as communications and engagement as per the key focus areas of this strategy.

## Our aspirations

- 1 Te Mana o Te Ao Tūroa – the mana of the environment is valued and respected enabling our people to be responsive as our climate changes.
- 2 Science and Mātauranga underpins our response to our changing climate in Murihiku Southland.
- 3 We understand the changes, challenges and opportunities associated with our changing climate and will act courageously, building resilience to respond and thrive.
- 4 We will create meaningful change within our generation and inspire future generations to continue this work.



# Specific aspirations

## Mitigation

Local government agencies need to collectively contribute towards mitigating the changing climate by reducing organisational emissions, offsetting if necessary and becoming more sustainable organisations. This will also enable Councils to understand the challenges businesses and other organisations face in reducing emissions and aid the efforts towards developing a best practice consistent approach.

Each agency is on their own organisational learning journey, of which measuring organisational greenhouse gas emissions is a first step towards understanding how these emissions can be reduced.

Councils are also working on understanding their mitigation role within the community. This is an important step towards being able to support the aspiration of becoming a net zero region.

In setting the aspirations, Councils have chosen to align with national legislation and direction and work towards becoming a net zero region by 2050.

5 Environment Southland, Gore District Council, Invercargill City Council, Southland District Council and Great South will be net zero\* organisations by 2050 or earlier.

6 By June 2026\*\*, all four Councils will measure their organisational greenhouse gas baseline and develop emissions reductions targets for progressive reduction of greenhouse gas emissions toward 2050.

7 Councils understand their role in enabling Murihiku Southland to become a net zero region by 2050.

\* Net zero refers to the reduction of organisational greenhouse gas emissions to a net zero level.

\*\* This date is being referenced to ensure the direction resulting from organisational baseline measuring of greenhouse gas emissions, can be incorporated into planning as part of the LTP cycle 2027-2037.

## Adaptation

The changing climate will significantly impact our communities, ecosystems and natural resources. It is likely to result in changes to land use, not only in terms of where people live, but also the location of key infrastructure, where and how businesses operate and how natural resources are used. It is therefore important to ensure that local government agencies understand the risks and opportunities this presents, in order to consider the regional spatial planning implications.

Adaptation is about undertaking actions to minimise threats or to maximise opportunities resulting from the impact of a changing climate. A first step to this is that Councils will need to align on climate change scenarios to inform regional planning decisions; as well as collaborate to consider regional issues anew with a climate change lens.

8 We understand the risks and opportunities to our communities associated with the impact of our changing climate on Murihiku Southland.

9 Councils align on climate change scenarios to inform key regional decisions.\*

10 We collaborate to create regional pathways for action\*\*, acknowledging the inter-connectedness of specific issues.

\* This is important as local government agencies collectively work towards planning for the LTP cycle 2027-2037, however it is also relevant for regional decisions in a broader sense as well.

\*\* Examples are: carbon forestry, sustainable transport, water availability, waste management, biodiversity, nature-based solutions etc. The intention is that these RCCWG discussions will be ongoing and aligned pathways for action will be able to be incorporated into the planning for the LTP cycle 2027-2037 and beyond.

## Communications and engagement

It is clear that as a community we are all at different stages of learning and understanding about the implications of a changing climate for our region. It is important to bring people on the journey, of which Councils are also a part, so that we can learn from each other and contribute to increasing collective knowledge.

Councils have a role to play to find ways of supporting people's learning, wherever they might be at on their journey responding to our changing climate. In particular, our young people will face increasing implications as the climate changes and are therefore a key audience to engage and empower.

11 We build a regional community of learning; collectively and openly improving our understanding of the complexity of our changing climate and its implications for Murihiku Southland.

12 We support individuals, businesses, community groups, and organisations to start and progress their journey responding to our changing climate.

13 We engage our children and young people to empower active participation in ongoing climate change conversations.



# Creating a Framework for Action

This strategy sets out how local government agencies will work together towards these aspirations. The key next step for the Regional Climate Change Working Group is to develop a Framework for Action (phase two).

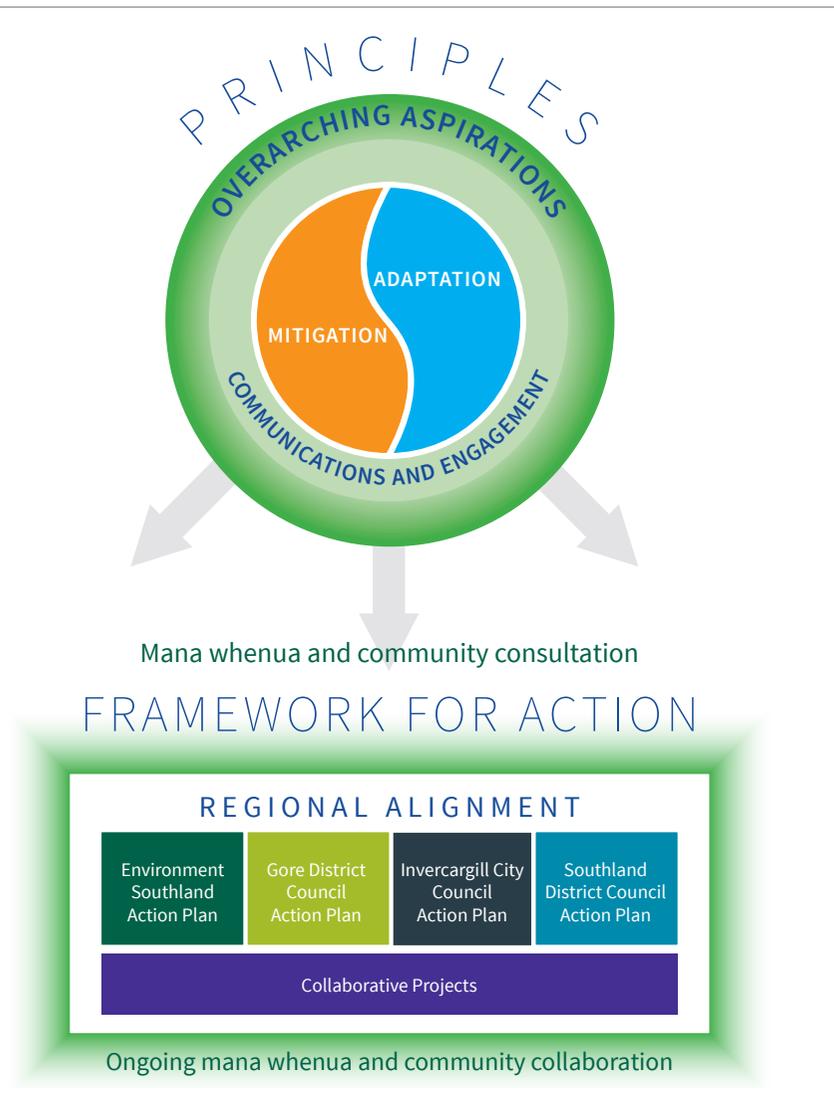
The purpose is to create 'regional action pathways' focusing on where there will be regional benefit. The pathways will highlight where agencies can collaborate and align, enabling each agency to progress these in their own way. It will be important to determine what the ongoing steps will be and the role and responsibilities of each agency to support these pathways.

The resulting pathways will inform the setting of regional priorities. There is a need for a balanced assessment and understanding of costs of action and inaction (economic, social, cultural and environmental) to help inform future long-term planning cycles; keeping in mind the agreed principle of doing what we can now, with what we have now.

Partnerships with key stakeholders and wider Murihiku Southland communities will be important to input, influence and support the progression of these pathways.

## Framework for Action

It is envisaged that the Framework for Action will follow the structured approach set out in this strategy. It will enable iterative planning, providing direction for both mitigation as well as adaptation pathways.



# What's next?

Science and information are very important to understanding the regional implications of a changing climate.

Regional LiDAR data mapping has been commissioned.

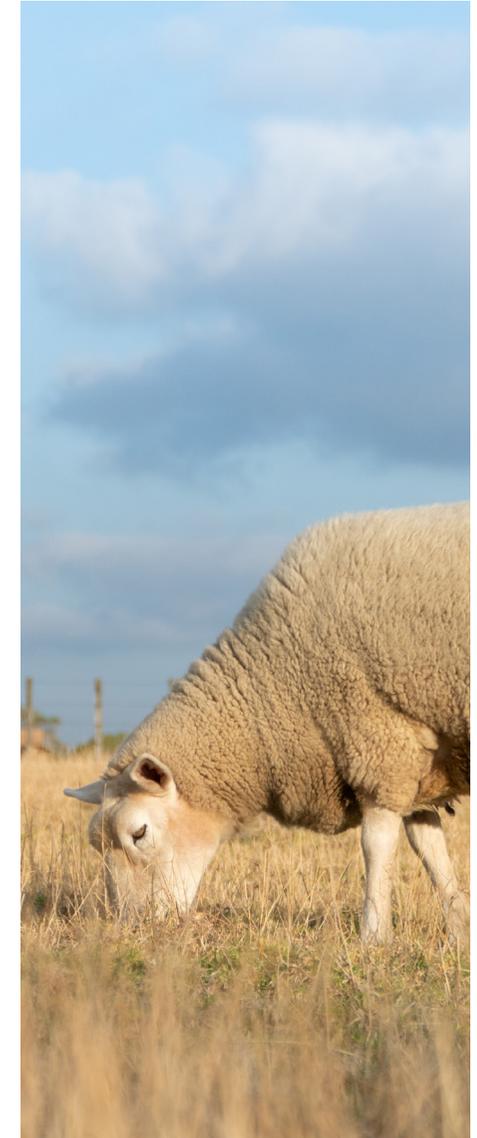
Work is also underway to develop a scope for updating and expanding the 2018 NIWA regional climate change report using updated global and national projections. Following the national work, regional climate, hydrological and sea level rise projections will be developed, which will increase the understanding of which areas of our region are most vulnerable and what this might mean for changes in land-use.

As our collective understanding of human risk, significance and environmental impacts develops, this will enable iterative risk assessment and reflexive learning.

The Regional Climate Change Working Group plans to develop a proposal for setting up a wider Murihiku regional climate change forum to enable this learning to be widely shared\*. The purpose of this forum will be to ensure the climate change conversation becomes more inclusive for individuals, businesses, community groups, and organisations that would like to be involved. This is likely to be a key initial stepping stone towards building a regional community of learning to support information sharing as well as on-the-ground action taking place.

It is also important to acknowledge that at any time our region may be subjected to a significant climate related event and preparation for these will aid our capacity for resilience. Emergency Management Southland provide significant resources enabling individuals, businesses and our communities to 'be ready' if this was to occur.

In the meantime, the Regional Climate Change Working Group will continue to progress a regional Framework for Action with a sense of urgency. Determining what on-the-ground action can be pursued as individuals and as communities is important to achieve a more resilient future.



\* The concept of a wider regional climate change forum was also a recommendation of the *Beyond 2025 Southland Regional Long Term Plan* prepared by Great South, June 2023.

# Glossary

<b>Adaptation</b>	In human systems, the process of adjusting to actual or expected climate and its effects, to moderate harm or take advantage of beneficial opportunities. In natural systems, the process of adjusting to actual climate and its effects. Human intervention may help these systems to adjust to expected climate and its effects. Ministry for the Environment (2022) National Adaptation Plan.
<b>Aspirations</b>	Aspirations provide a regionally agreed ‘direction of travel’ and do not specify how something will be achieved. Collective discussions will be ongoing to develop and implement aligned pathways for how these aspirations will be achieved.
<b>Baseline</b>	An initial set of critical observations or data used for comparison or a control. Ministry for the Environment (2022) National Adaptation Plan.
<b>B2025</b>	Beyond 2025 – the project lead by Great South to develop a Regional Long Term Plan for Murihiku Southland.
<b>Climate</b>	Informally, the average weather over a period ranging from months to thousands or millions of years. In more formal terms, a statistical description of the mean and variability of quantities, usually of surface variables such as temperature, precipitation and wind, averaged over a period (typically 30 years, as defined by the World Meteorological Organization). More broadly, climate is the state, including a statistical description, of the climate system. Ministry for the Environment (2022) National Adaptation Plan.
<b>Climate Change</b>	A change in the state of the climate that can be identified (eg, by using statistical tests) by changes or trends in the mean and/or the variability of its properties, and that persists for an extended period, typically decades to centuries. Includes natural internal climate processes and external climate forcings such as variations in solar cycles, volcanic eruptions and persistent anthropogenic changes in the composition of the atmosphere or in land use. The United Nations Framework Convention on Climate Change (UNFCCC) definition of climate change specifically links it to direct or indirect human causes, as: “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods”. The UNFCCC thus makes a distinction between climate change attributable to human activities altering the atmospheric composition and climate variability attributable to natural causes. Ministry for the Environment (2022) National Adaptation Plan.
<b>Climate Change Commission (CCC)</b>	A Crown entity that gives independent, expert advice to the Government on climate change matters and monitors progress towards the Government’s mitigation and adaptation goals. Ministry for the Environment (2022) Emissions Reduction Plan.
<b>Climate Change Scenario</b>	A plausible description of how the future may develop based on a coherent and internally consistent set of assumptions about key driving forces (e.g., rate of technological change, prices) and relationships. Note that scenarios are neither predictions nor forecasts, but are used to provide a view of the implications of developments and actions. IPCC (2023) AR6 Glossary <a href="https://apps.ipcc.ch/glossary/">https://apps.ipcc.ch/glossary/</a>
<b>Climate projection</b>	A potential future evolution of a quantity or set of quantities, often computed with the aid of a model. Unlike predictions, projections are conditional on assumptions concerning, for example, future socio-economic and technological developments that may or may not be realised. IPCC (2023) AR6 Glossary <a href="https://apps.ipcc.ch/glossary/">https://apps.ipcc.ch/glossary/</a>

<b>Climate resilience</b>	The ability to anticipate, prepare for and respond to the impacts of a changing climate, including the impacts that we can anticipate and the impacts of extreme events. It involves planning now for sea-level rise and more frequent flooding. It is also about being ready to respond to extreme events such as forest fires or extreme floods, and to trends in precipitation and temperature that emerge over time such as droughts. Ministry for the Environment (2022) National Adaptation Plan.
<b>Climate variability</b>	Deviations of climate variables from a given mean state (including the occurrence of extremes, etc.) at all spatial and temporal scales beyond that of individual weather events. Variability may be intrinsic, due to fluctuations of processes internal to the climate system (internal variability), or extrinsic, due to variations in natural or anthropogenic external forcing (forced variability) IPCC (2023) AR6 Glossary <a href="https://apps.ipcc.ch/glossary/">https://apps.ipcc.ch/glossary/</a>
<b>CO<sub>2</sub>-e</b>	CO <sub>2</sub> -e stands for 'carbon dioxide equivalent' to enable the comparison to six key GHG gases: carbon dioxide (CO <sub>2</sub> -e), methane (CH <sub>4</sub> ), nitrous oxide (N <sub>2</sub> O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF <sub>6</sub> ).
<b>Decarbonise</b>	Reduce greenhouse gas emissions e.g. through the use of low-emissions power sources and electrification. Ministry for the Environment (2022) Emissions Reduction Plan.
<b>Drought</b>	An exceptionally long period of water shortage for existing ecosystems and the human population (due to low rainfall, high temperature and/or wind). Ministry for the Environment (2022) National Adaptation Plan.
<b>Dynamic adaptive pathways planning (DAPP)</b>	A framework that supports climate adaptation decision-making by developing a series of actions over time (pathways). It is based on the idea of making decisions as conditions change, before severe damage occurs, and as existing policies and decisions prove no longer fit for purpose. Ministry for the Environment (2022) National Adaptation Plan.
<b>Emergency management</b>	The process of applying knowledge, measures and practices that are necessary or desirable for the safety of the public or property, and are designed to guard against, prevent, reduce, recover from or overcome any hazard, harm or loss associated with any emergency. Activities include planning, organising, coordinating and implementing those measures, knowledge and practices. Ministry for the Environment (2022) National Adaptation Plan.
<b>Emergency Management Southland (EMS)</b>	Emergency Management Southland (EMS) was established by the four local government agencies in Murihiku Southland and is responsible for the delivery of Civil Defence and Emergency Management responses throughout this region. As part of this, Emergency Management Southland coordinates the 24/7 operation of the Emergency Coordination Centre which facilitates planning and operational activity during an event. Emergency Management Southland (2023) About US
<b>Environment Southland</b>	Environment Southland is a regional council as defined under the Local Government Act 2002. Environment Southland is responsible for the sustainable management of Southland's natural resources - land, water, air and coast - in partnership with the community.
<b>Emissions</b>	In the context of climate change, emissions of greenhouse gases, precursors of greenhouse gases and aerosols caused by human activities. These activities include the burning of fossil fuels, deforestation, land use and land-use change, livestock production, fertilisation, waste management and industrial processes. Ministry for the Environment (2022) National Adaptation Plan.
<b>Emissions reduction plan</b>	A plan that sets out the policies and strategies to meet emissions budgets by reducing emissions and increasing removals. A new emissions reduction plan must be in place before the beginning of each emissions budget period. Ministry for the Environment (2022) Emissions Reduction Plan.

<b>Extreme weather event</b>	An event that is rare at a particular place and time of year. What is ‘extreme weather’ may vary from place to place in an absolute sense. The measure of what is ‘rare’ may also vary but it involves the occurrence of a value of a weather or climate variable above (or below) a threshold value near the upper (or lower) ends of the range of observed values of the variable. In general, an extreme weather event would be as rare as, or rarer than, the 10th or 90th percentile of a probability density function estimated from observations. When a pattern of extreme weather persists for some time, such as a season, it may be classified as an extreme climate event, especially if it yields an average or total that is itself extreme (eg, high temperature, drought or heavy rainfall over a season). Ministry for the Environment (2022) National Adaptation Plan. <i>While not explicitly stated, extreme weather events are linked to wider climatic changes as a whole, and as such, intertwined with our changing climate. The actual magnitude and frequency of events may continue to change and need to be assessed against new baselines as climate change takes effect.</i>
<b>Flood</b>	An event where the normal boundaries of a stream or other water body overflow, or water builds up over areas that are not normally underwater. Floods can be caused by unusually heavy rain – for example, during storms and cyclones. Floods include river (fluvial) floods, flash floods, urban floods, rain (pluvial) floods, sewer floods, coastal floods and glacial lake outburst floods. Ministry for the Environment (2022) National Adaptation Plan.
<b>Framework for Action</b>	Phase two: The Framework for Action will provide clarity on how local government agencies in Southland will collectively achieve the aspirations outlined in this strategy; as well as focusing where there will be regional benefit for agencies to collaborate and potentially align on.
<b>Gore District Council</b>	Gore District Council is a territorial authority as defined under the Local Government Act 2002.
<b>Great South</b>	Great South is a Council-controlled organisation, jointly owned by ICC, SDC, GDC, ES, Invercargill Licensing Trust, Maitua Licensing Trust, Southland Chamber of Commerce, SIT and its member Community Trust South. It is Southland’s regional development agency which facilitates the implementation of the B2025 Southland Long Term Plan; as well as supporting the regional emissions reduction journey by working with businesses to reduce their greenhouse gas emissions across the region.
<b>Greenhouse gases (GHG)</b>	Atmospheric gases that trap or absorb heat and contribute to climate change. The gases covered by the Climate Change Response Act 2002 are carbon dioxide (CO <sub>2</sub> -e), methane (CH <sub>4</sub> ), nitrous oxide (N <sub>2</sub> O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF <sub>6</sub> ). Ministry for the Environment (2022) Emissions Reduction Plan.
<b>Gross emissions</b>	Gross emissions include emissions from the following key sectors: Transport; energy and industry; agriculture; waste; fluorinated gases. Ministry for the Environment (2022) Emissions Reduction Plan.
<b>Hazard</b>	The potential occurrence of a natural or human-induced physical event or trend that may cause loss of life, injury or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources. Ministry for the Environment (2022) National Adaptation Plan.
<b>Invercargill City Council</b>	Invercargill City Council is a territorial authority as defined under the Local Government Act 2002.

<b>Intergovernmental Panel on Climate Change (IPCC)</b>	The United Nations body for assessing the science related to climate change. The IPCC is organised into three working groups and a task force: <ul style="list-style-type: none"> <li>Working Group I (WGI) – physical science basis</li> <li>Working Group II (WGII) – impacts, adaptation and vulnerability</li> <li>Working Group III (WGIII) – mitigation</li> <li>Task Force on national greenhouse gas inventories. Ministry for the Environment (2022) National Adaptation Plan.</li> </ul>
<b>LiDAR</b>	Light Detection and Ranging is a remote sensing method. It uses light in the form of a pulsed laser to measure ranges (variable distances) from the LiDAR instrument to the Earth. These are used to create 3D models and maps of objects and environments.
<b>Long Term Plan (LTP)</b>	Called the Long Term Council Community Plan (LTCCP) prior to 2012, the Long term plan is a document required under the Local Government Act 2002 that sets out a local authority’s priorities in the medium to long term.
<b>Mana</b>	Prestige, authority, control, power, influence, status, spiritual power, charisma. Ministry for the Environment (2022) National Adaptation Plan.
<b>Mātauranga</b>	Māori knowledge systems and worldviews, including traditional concepts. Ministry for the Environment (2022) National Adaptation Plan.
<b>MfE</b>	Ministry for the Environment
<b>Mitigation (of a changing climate)</b>	In the context of climate change, a human intervention to reduce the sources or enhance the sinks of greenhouse gases. Ministry for the Environment (2022) National Adaptation Plan.
<b>Nature Based Solutions</b>	Solutions that are inspired and supported by nature and are cost effective, and at the same time provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features (eg, vegetation and water features) and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions. For example, using vegetation (eg, street trees or green roofs) or water elements (eg, rivers or water-treatment facilities) can help reduce heat in urban areas or support stormwater and flood management. Ministry for the Environment (2022) National Adaptation Plan.
<b>Net emissions</b>	Net emissions refer to the overall balance of emissions and carbon dioxide removals (sequestration). Ministry for the Environment (2022) Emissions Reduction Plan.
<b>NEMA</b>	National Emergency Management Agency
<b>NIWA</b>	National Institute of Water and Atmospheric Research
<b>Net Zero</b>	A target of completely negating the greenhouse gas emissions produced by human activity. This can be done by balancing emissions and removals or by eliminating the production of emissions in the first place. Ministry for the Environment (2022) Emissions Reduction Plan.
<b>Pathway</b>	The evolution of natural and/or human systems over time towards a future state. Pathway concepts range from sets of quantitative and qualitative scenarios or narratives of potential futures to solution-oriented, decision-making processes to achieve desirable social goals. Pathway approaches typically focus on biophysical, techno-economic and/or socio-behavioural changes, and involve various dynamics, goals and participants across different scales. Ministry for the Environment (2022) National Adaptation Plan.

<b>Principles</b>	Principles provide direction on agencies' collective agreed way of working together to create a regional response to the impact of a changing climate on Murihiku Southland.
<b>Representative Concentration Pathways (RCPs)</b>	Scenarios that include time series of emissions and concentrations of the full suite of greenhouse gases and aerosols and chemically active gases, as well as land use/land cover (Moss et al.,2008; van Vuuren et al., 2011). IPCC (2023) AR6 Glossary <a href="https://apps.ipcc.ch/glossary/">https://apps.ipcc.ch/glossary/</a>
<b>RCCS</b>	Regional Climate Change Strategy (this strategy).
<b>RCCWG</b>	Regional Climate Change Working Group, which consists of governance representatives from Environment Southland, Te Ao Mārama, Gore District Council, Invercargill City Council and Southland District Council as key partners in developing a regional approach to a changing climate.
<b>Resilience/resilient</b>	The capacity of interconnected social, economic and ecological systems to cope with a hazardous event, trend or disturbance, by responding or reorganising in ways that maintain their essential function, identity and structure. Resilience is a positive attribute when it allows systems to maintain their capacity to adapt, learn and/or transform. Ministry for the Environment (2022) National Adaptation Plan.
<b>RSS</b>	Regional Spatial Strategy for which there is an expectation that this will be legislated for as a requirement to be produced regionally as part of the ongoing RMA reforms.
<b>Sea level rise</b>	Change to the height of sea levels over time, which may occur globally or locally. Ministry for the Environment (2022) National Adaptation Plan.
<b>Sequestration</b>	The process of storing carbon in a carbon pool. IPCC (2023) AR6 Glossary <a href="https://apps.ipcc.ch/glossary/">https://apps.ipcc.ch/glossary/</a>
<b>Southland District Council</b>	Southland District Council is a territorial authority as defined under the Local Government Act 2002.
<b>Southland Mayoral Forum</b>	The Southland Mayoral Forum includes the Mayors and Deputy Mayors from all four local government agencies in Southland. There is a standing invitation for all Rūnanga chairs or nominee, to attend meetings of the Southland Mayoral Forum. Te Ao Mārama Inc. also reports directly to their Board representing Ngāi Tahu ki Murihiku Rūnanga.
<b>Shared Socioeconomic Pathways (SSPs)</b>	A scenario that describes a plausible future in terms of population, gross domestic product (GDP), and other socio-economic factors relevant to understanding the implications of climate change. IPCC (2023) AR6 Glossary <a href="https://apps.ipcc.ch/glossary/">https://apps.ipcc.ch/glossary/</a>
<b>Te Ao Mārama Inc.</b>	Te Ao Mārama Inc. looks after mana whenua interests in resource management and other aspects related to local government in Southland. It is authorised to represent Ngāi Tahu papatipu rūnanga in Murihiku/Southland. It is involved in the protection of the spiritual and cultural values of the region, including wahi tapu (sacred places), mahinga kai (gathering of food and resources) and other natural resources. Te Ao Mārama Inc. reports directly to their Board representing Ngāi Tahu ki Murihiku Rūnanga.
<b>Wellbeing</b>	The health, happiness and prosperity of an individual or group. It can cover material wellbeing (eg, income and wealth, jobs and earnings, and housing), health (eg, health status and work-life balance), security (eg, personal security and environmental quality), social relations (eg, social connection, subjective wellbeing, cultural identity and education) and freedom of choice and action (eg, civic engagement and governance). Ministry for the Environment (2022) National Adaptation Plan.