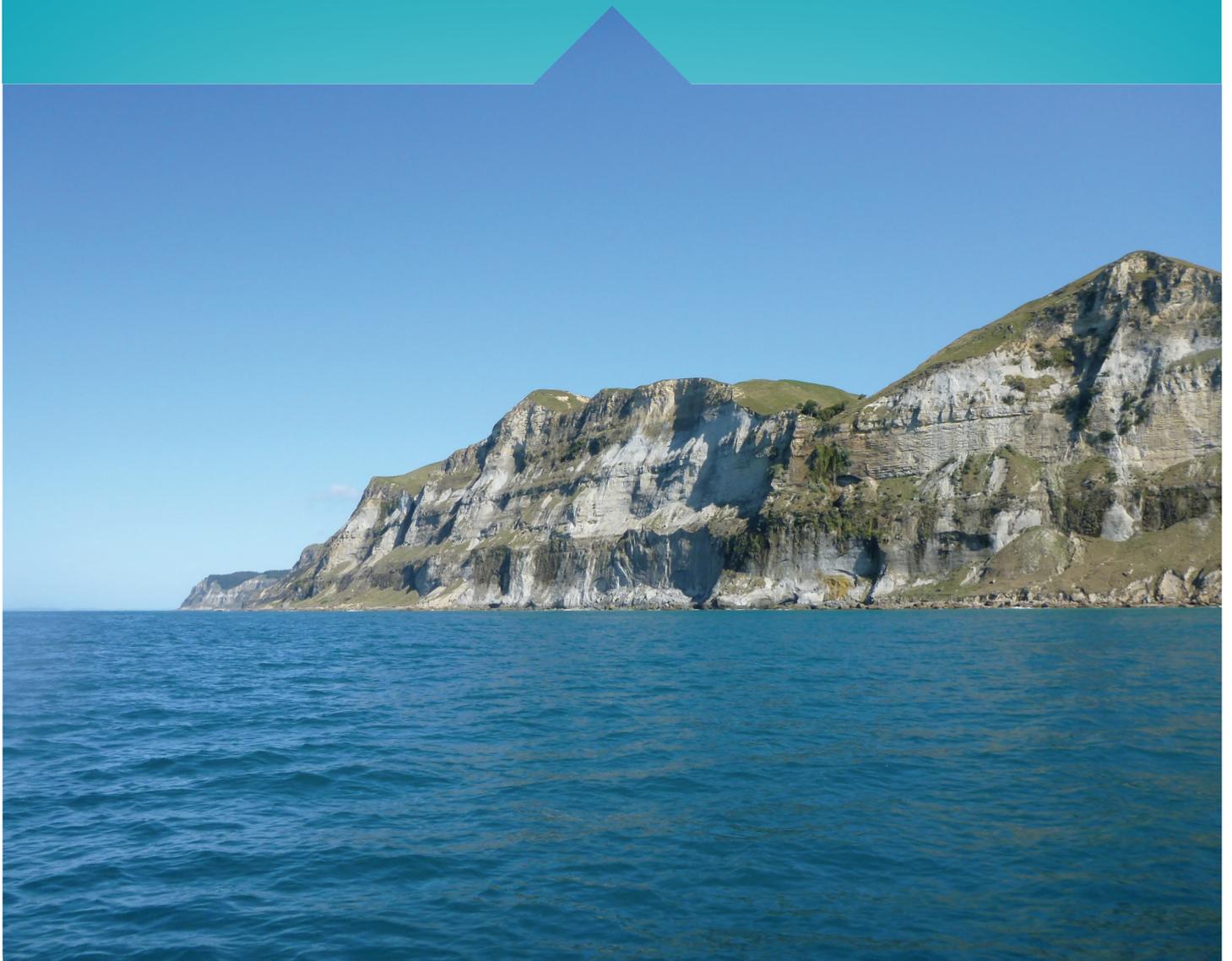


# GUIDING COASTAL AND MARINE RESOURCE MANAGEMENT

The Coastal Special Interest Group  
Research Strategy



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## The Coastal Special Interest Group Research Strategy

Prepared for Coastal Special Interest Group (C-SIG) on behalf of regional councils  
and unitary authorities of New Zealand

Funded by Envirolink Advice Grant 1535-HBRC207

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## GLOSSARY

Term	Definition
Kaitiakitanga	Guardianship, stewardship
Mana whenua	Power from the land, authority over land or territory
Mānaakitanga	The nurturing of relationships: protection, blessings, show respect or kindness
Mātauranga Māori	Ancestral knowledge, including the Māori world view and perspectives, Māori creativity and cultural practises
Mauri	Life force/life principle that ensures the continual life and quality of all living things that reside within it
Te Ao Māori	The Māori world
Tikanga	Custom, correct procedure, method, practice
Tino rangatiratanga	Self-determination, absolute chieftainship
Whakapapa	Geneology, lineage, descent

## LIST OF ACRONYMS

Acronym	Definition
ANZECC	The Australian and New Zealand Guidelines for Fresh and Marine Water Quality guidelines 2000
APF	Aquaculture Planning Fund
CMA	Coastal Marine Area
C-SIG	Coastal Special Interest Group
EBM	Ecosystem-based management
ES	Environment Southland
MBIE	Ministry of Business, Innovation and Employment
MPI	Ministry for Primary Industries
NPS-FM	National Policy Statement for Freshwater Management
NZCPS	New Zealand Coastal Policy Statement
RMA	Resource Management Act 1991
SoE	State of the Environment
SWIM	Surface Water Integrated Management
SWIM-SIG	SWIM Special Interest Group

# INTRODUCTION

## Purpose of the research strategy

This research strategy identifies both short- and long-term national science research needs that will provide regional councils and unitary authorities with information required to sustainably manage New Zealand's natural resources in the Coastal Marine Area (CMA)<sup>1</sup>. The information will also enable councils to fulfil their statutory responsibilities under the New Zealand Coastal Policy Statement 2010 (NZCPS) and the Resource Management Act 1991 (RMA).

Through this strategy, councils will achieve a more unified and effective approach to research. This document will also facilitate alignment of science research providers' research, with the research needs of regional councils and unitary authorities—organisations that are significant end-users of central government-funded research.

Furthermore, the strategy will be an important resource for funding providers, and is intended to help guide funding into avenues that address the needs of the coastal/marine sector.

The document was developed by the Coastal Special Interest Group (C-SIG) that is made up of coastal scientists and planners from New Zealand's regional councils and unitary authorities. It was completed by Cawthron Institute (Cawthron) (see Appendix 1 for project scope and methods).

Through this strategy the C-SIG will be able to inform and influence decision-making on research and investments and promote national collaboration to achieve common objectives in coastal management.

## Vision of the C-SIG strategy:

*The C-SIG strategy will enhance and support the sustainable management of New Zealand's CMA. Implementation of the strategy will result in robust science and a nationally consistent approach to monitoring and reporting in the CMA.*



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<sup>1</sup> The Coastal Marine Area (CMA) is defined as the coastal environment extending from mean high water springs to 12 nautical miles out to sea.

## SCIENCE RESEARCH GOALS

### Goal 1:

# Mātauranga Māori and kaitiakitanga

Assist councils to integrate mātauranga Māori and kaitiakitanga into state of the environment and biodiversity statutory functions.



## Context

Mana whenua are important contributors to the management of our natural environments. The concepts of te ao Māori represent an important paradigm shift in terms of how councils integrate mātauranga Māori and collaborate with mana whenua to co-manage the natural environment. Councils are required under sections 7 and 8 of the RMA to take into account the principles of the Treaty of Waitangi. Objective 3 Policy 2 of the NZCPS requires councils to incorporate mātauranga Māori in regional policy statements and plans and to consider mātauranga Māori in decision-making on applications for resource consent. Specifically, mātauranga Māori relates to Māori customary knowledge, traditional knowledge or intergenerational knowledge. Research is needed on ways in which this knowledge can be captured, in accordance with tikanga Māori, and incorporated into coastal and marine monitoring and management frameworks. In addition, important Māori environmental values will need to be captured that relate to kaitiakitanga, whakapapa, tino rangatiratanga and mānaakitanga. The development of appropriate indicators would enable the aspirations of mana whenua (e.g. kaitiakitanga, tino rangatiratanga).

### Research needs

- Provide lessons where mātauranga Māori and science have been used collectively to understand environmental issues— particularly with regard to coastal and marine management. This research need will allow for the development (where needed), and strengthening of relationships with mana whenua.
- Investigate processes to co-develop appropriate indicators and supporting monitoring programmes for Māori environmental frameworks.
- Determine the generality and applicability of currently developed indicators (such as, but not limited to, the Cultural Health Index) across the many hapū and iwi of Aotearoa (New Zealand).



## Goal 2:

# Monitoring and reporting

Achieve nationally consistent and effective monitoring and reporting to allow for effective management of the CMA.



## Context

There is a need for consistency amongst councils to support national state of the environment (SoE) monitoring, and achieve more effective recreational water quality monitoring, and plan effectiveness monitoring and reporting. In addition, high quality monitoring and reporting frameworks are needed in many regions to establish regional monitoring programmes. At present it is often difficult to make good management decisions because regional monitoring and reporting is based on very limited and, in some cases, inappropriate data. Data are required to establish appropriate baselines and enable application of monitoring frameworks based on limit setting and/or thresholds (see Goal 3). Data management and sharing within and between councils and with stakeholders can be difficult, and effective linkages between councils and other stakeholders are needed. The advantages of good coordination between councils can include more efficient use of resources, and 'nesting' regional monitoring within a national scale. There is also a need for better quality assurance of data, including that obtained from historical and other (non-council) sources.

### Research needs

- Develop nationally consistent frameworks (including determining core parameters<sup>2</sup> and quality assurance) for both regional and spatially-targeted monitoring (e.g. estuaries) that incorporates cost-effective technologies.
- Identify relevant and meaningful indicators to describe the state and condition and assess change over time of the CMA.
- Develop support and continually improve systems that facilitate data exchange and dissemination among councils and communities.
- Develop practical methodologies to recognise ecosystem services of the CMA.
- Contribute to an effective understanding of ecosystem-based management and its implementation.
- Investigate the application of novel technologies for environmental monitoring in the CMA.



<sup>2</sup> 'Parameters' is used here in a broad sense, and may include biophysical parameters as well as community values and priorities.

### Goal 3:

# The response of coastal ecosystems to stressors

Understand the response of coastal ecosystems to stressors in order to effectively manage the CMA.



## Context

Building on Goal 2, in order to manage ecosystems and resources, we need to understand how the CMA and associated organisms and habitats respond to various stressors (both natural and anthropogenic). Coastal waters are the ultimate receiving environment for a range of contaminants derived from upstream catchments and sea-based industries. Activities such as fishing, tourism, shipping, coastal development and land-based activities present multiple stressors that cumulatively interact with each other and with natural processes. Particular challenges are the management of the synergistic effects of multiple stressors and cumulative environmental change. This is further complicated by the fact that many activities (and in their turn effects) operate on different spatial and temporal scales. This is a very complex issue. Research and data collection will need to target specific areas and indicators need to be developed that enable more informed decisions and policy development. In addition, research is needed around the development of tools for identifying key drivers of change, elucidating complex interactions and supporting resource management. This will help councils prioritise those issues that can be addressed in the short term, versus those that need to be planned for in the long term. This goal also relates to providing the underpinning science to inform ecosystem-based management and related tools such as marine spatial planning.

### Research needs

- Characterise the existing CMA<sup>3</sup> by collecting appropriate data for establishing baselines.
- Identify the effects of stressors within both a spatial and temporal context. Understand the synergistic and cumulative effects of multiple stressors and develop tools to manage these effects.
- Predict and measure the impact of freshwater flows, loads and limits on the coastal receiving environment.
- Develop approaches for the enhancement and restoration of degraded environments in the CMA.
- Identify indicators and determining response of ecosystem attributes (e.g. biodiversity, biological and physical processes, water quality) to stressors (individual and cumulative).
- Investigate the feasibility and ecological implications of potential biodiversity offsetting in the CMA.
- Research environmental thresholds and establish appropriate and relevant limits and standards for stressors impacting on the CMA, including those derived from land-based activities.

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<sup>3</sup> Characterising the CMA includes classifying and mapping habitats and water bodies (e.g. boulder habitat, cobble habitat, river mouth vs tidal lagoon, hydrodynamics and flushing characteristics). Also includes characterising and mapping the CMA within the context of ecosystem services and natural character/cultural values, and vulnerability (risk) to stressors.

## Goal 4:

# Climate change and coastal and ocean acidification

Understand the regional impacts of climate change and acidification on the CMA to inform decision-making.

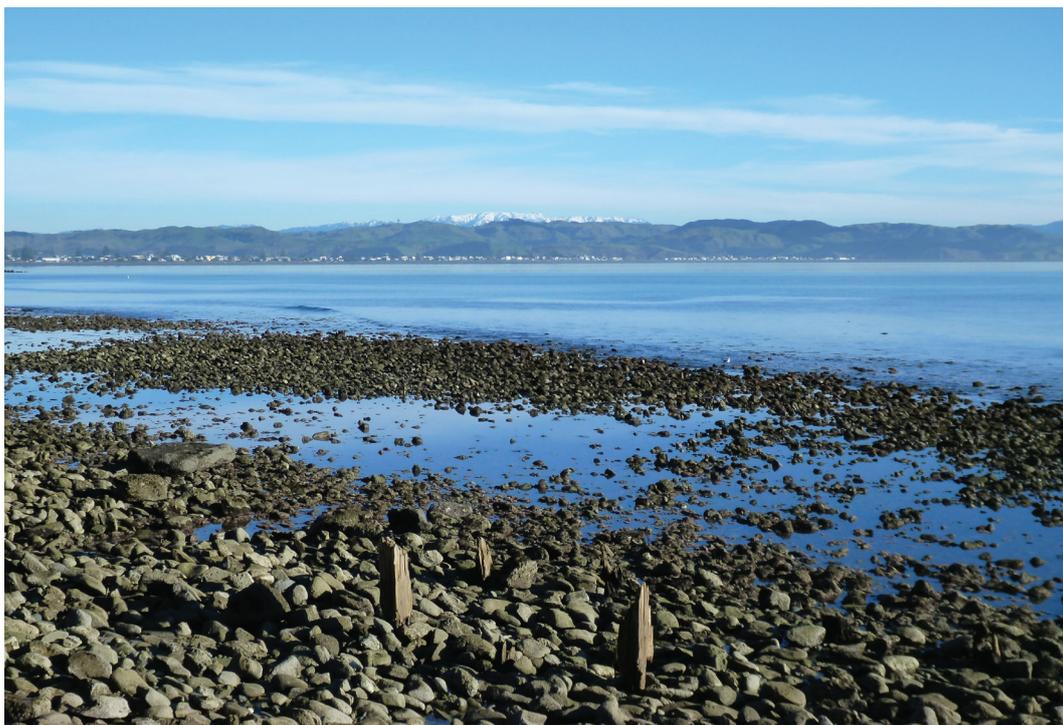


## Context

The CMA is physically dynamic, and conditions are inherently variable in response to topography, weather and climate-related processes. Therefore, climate change will also contribute to long-term environmental change and could influence the extent to which various human activities (and associated stressors addressed in Goal 3) impact on the marine environment. Council policy, planning and resource management efforts must therefore account for a changing ocean and climate, which in turn requires knowledge around the nature and intensity of changes that will occur over space and time. While largely considered a global issue and commonly referred to as 'out of New Zealand's control', there are local (regional) issues that need to be addressed with regard to mitigating and adapting to effects of climate change. These climate change-related issues may be influenced on regional scales due to the compounding effects of land use, coastal development, run-off and the water chemistry in coastal water bodies. An integrated consideration of effects on biodiversity when determining climate change, and mitigation and adaptation responses may allow unintended biodiversity impacts to be minimised or avoided.

### Research needs

- Forecast the nature and extent of environmental changes in the CMA in response to global climate change. Identify ecosystems and areas that will be more vulnerable than others.
- Investigate capacity for organisms and ecosystems to adapt to climate change.
- Delineate to what extent regional influences may interact with or further exacerbate effects associated with climate change (e.g. run-off and ocean acidification, coastal hazard risks, biosecurity).
- Identify and prioritise adaptation and mitigation opportunities that are feasible in a regional policy context.



# RESEARCH PRIORITIES

The research needs were prioritised by C-SIG using the assessment criteria outlined in Table 1. The five highest scoring research needs were as follows:

1. Develop nationally consistent frameworks (including determining core parameters and quality assurance) for both regional and spatially-targeted monitoring (e.g. estuaries) that incorporates cost-effective technologies.
2. Characterise the existing CMA by collecting appropriate data for establishing baselines.
3. Identify relevant and meaningful indicators to describe the state and condition and assess change over time of the CMA.
4. Research environmental thresholds and establishing appropriate and relevant limits and standards for stressors impacting on the CMA, including those derived from land-based activities.
5. Identify the effects of stressors within both a spatial and temporal context. Understand the synergistic and cumulative effects of multiple stressors and develop tools to manage these effects.

There was very little difference in priority scores between the top five research needs and they are all considered to be fundamental research questions for enabling the sustainable management of the CMA.

Appendix 2 shows the priority for all of the research needs identified in this strategy.

Table 1. Assessment criteria for prioritising the research needs. Research needs were scored against the criteria on a scale of 1 (low) to 4 (high).

CRITERIA	REGIONAL RELEVANCE	COUNCIL RESPONSIBILITY	LIKELIHOOD OF SUCCESS	NATIONAL POLICY REQUIREMENTS	EVALUATION OF STRATEGIC IMPORTANCE
LOW SCORE MEANS	Relevant/important for only a few councils	Not the responsibility of council	High dependency on other research needs being completed.	Poor fit within NZCPS	Low strategic importance for individual council
HIGH SCORE MEANS	Relevant for all councils	Council responsibility under statutory requirements	Low dependency on other research needs being completed.	Good fit with NZCPS	High strategic importance for individual council

# IMPLEMENTATION

Following on from this project, and depending on the funding available, it is intended that the C-SIG will expand on the research needs and seek ways to implement work programmes addressing the research priorities. We envisage that there will be different implementation pathways for each of the research goals. Whilst some of the research may be done within councils, it is likely that a large portion will be undertaken by external science providers in collaboration/consultation with the C-SIG (e.g. as part of Ministry of Business, Innovation and Employment [MBIE] funded research programmes).

The enactment of the C-SIG Research Strategy should be guided by a detailed implementation plan that will outline, as a minimum, the following:

- How the strategy will be communicated, and to whom (e.g. internally across councils, externally to funding providers, government departments, and research providers).
- A logical sequence of research activities over the life-time of the strategy and opportunities for quick success. The planning of research activities needs to take into account identified research priorities and areas of commonality between individual council science strategies and associated research.
- Key individuals in the C-SIG group, or commissioned by the group, who will be responsible for the scoping and planning of activities to address the research goals and needs.
- Alignment/linkages between the goals and research needs of the strategy with potential sources of research funding (including government agencies, industry partners and community stakeholders). As an example, some of these linkages are outlined in Appendix 3.
- How progress on the research needs will be monitored, evaluated and reported.



# STRATEGY REVIEW

It is recommended that the C-SIG Research Strategy be reviewed five yearly by the C-SIG. Through this iterative approach, a focus will be maintained on the strategy, ensuring that it continues to meet its purpose and remains appropriate to ongoing changes in the external environment.

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- New Zealand Government 2015. National Science Challenges, Sustainable Seas. Retrieved 13 January, 2015 from <http://www.sustainableseaschallenge.co.nz/>

# APPENDIX 1: PROJECT SCOPE AND METHOD

## Project scope

Cawthron, in conjunction with Karen Bell of Enviro Solutions NZ Ltd, was engaged by Hawke's Bay Regional Council to undertake the following scope:

1. Conduct a facilitated workshop with a working group of C-SIG, in order to identify council-based strategic research priorities that reflect a nationally agreed position.
2. Document these priorities in a draft research strategy.
3. Circulate the draft research strategy with C-SIG members and relevant outside agencies for review.
4. Review key reports, legislation, and other current strategic documents that may align with this strategy.
5. Map potential and preferred implementation pathways to identify opportunities to leverage, align and speed delivery.
6. Finalise the C-SIG research strategy.

The project was funded by a MBIE Envirolink grant (Advice number 1535-HBRC207) and was undertaken from October 2014 to May 2015.

## Methods

A workshop was held with C-SIG members at Hawke's Bay Regional Council, Napier, on 21 October 2014. The workshop was facilitated by Karen Bell and was attended by:

- Hilke Giles–Waikato Regional Council
- Steve Urlich–Marlborough District Council
- Megan Oliver–Greater Wellington Regional Council
- Lesley Bolton-Ritchie–Environment Canterbury
- Oliver Wade–Hawke's Bay Regional Council
- Natasha Berkett–Cawthron Institute

Attendees identified four overarching science goals and the research needs for each at the workshop. These were written into the draft research strategy, which was then reviewed by the wider C-SIG. The views of staff from a number of external agencies (e.g. the Department of Conservation, Ministry for the Environment and Ministry for Primary Industries) were also sought.

Subsequent to the drafting of the research strategy, the C-SIG undertook further work to prioritise the research needs, using the assessment criteria outlined in Table 1 Section 3 (also see Appendix 2).

## APPENDIX 2: RESEARCH PRIORITIES

RESEARCH NEED	RANK
Develop nationally consistent frameworks (including determining core parameters and quality assurance) for both regional and spatially-targeted monitoring (e.g. estuaries) that incorporates cost-effective technologies	1
Characterise the existing CMA by collecting appropriate data for establishing baselines	2
Identify relevant and meaningful indicators to describe the state and condition and assess change over time of the CMA	3
Research environmental thresholds and establishing appropriate and relevant limits and standards for stressors impacting on the CMA, including those derived from land-based activities	4
Identify the effects of stressors within both a spatial and temporal context. Understand the synergistic and cumulative effects of multiple stressors and develop tools to manage these effects	5
Identify indicators and determine response of ecosystem attributes (e.g. biodiversity, biological and physical processes, water quality) to stressors (individual and cumulative)	6
Investigate processes to co-develop appropriate indicators and supporting monitoring programmes for Māori environmental frameworks	7
Provide lessons where mātauranga Māori and science have been used collectively to understand environmental issues—particularly with regard to coastal and marine management	8
Determine the generality and applicability of currently developed indicators (such as, but not limited to, the Cultural Health Index) across the many hapū and iwi of Aotearoa (New Zealand)	9
Develop support and continually improve systems that facilitate data exchange and dissemination among councils and communities	10
Predict and measure the impact of freshwater flows, loads and limits on the coastal receiving environment	11
Develop approaches for the enhancement and restoration of degraded environments in the CMA	12
Identify and prioritise adaptation and mitigation opportunities that are feasible in a regional policy context	13
Investigate the application of novel technologies for environmental monitoring in the CMA	14
Delineate to what extent regional influences may interact with or further exacerbate effects associated with climate change (e.g. run-off and ocean acidification, coastal hazard risks, biosecurity)	15
Forecast the nature and extent of environmental changes in the CMA in response to global climate change. Identify ecosystems and areas that will be more vulnerable than others	16
Investigate the feasibility and ecological implications of potential biodiversity offsetting in the CMA	17
Develop practical methodologies to recognise ecosystem services of the CMA	18
Contribute to an effective understanding of ecosystem based management and its implementation	19
Investigate capacity for organisms and ecosystems to adapt to climate change	20

# APPENDIX 3: LINKAGES BETWEEN THE C-SIG STRATEGY, RELEVANT DOCUMENTS AND FUNDING AVENUES

It is recognised that the C-SIG strategy sits within a framework of relevant planning legislation/ documents (e.g. the RMA, the NZCPS and the National Policy Statement for Freshwater Management), other strategy documents (e.g. the Marine Research Strategy) and relevant guidelines that are used by regional council and unitary authorities in day-to-day decision-making processes (e.g. the ANZECC guidelines). Funding for the research priorities identified in this strategy are likely to come from a variety of sources including Sustainable Seas National Science Challenge and other MBIE funding avenues. Figure 1 shows some of the linkages between the C-SIG strategy and potential sources of funding, as well as alignment with key documents from other agencies and central government legislation. This is followed by a review of relevant legislation, and other current strategic documents that may align with the strategy.



Figure 1. Alignment between the C-SIG research strategy and some of the potential sources of funding, and linkages with other relevant documents. Figure provided by Marlborough District Council.

## Legislation

### **Resource Management Act 1991 (RMA)**

Under the RMA, regional councils and unitary authorities are required to establish policies and methods to achieve the integrated management of natural resources, including coasts, under their jurisdiction. Section 35 of the RMA requires every local authority to gather such information, and undertake or commission such research, as is necessary, to carry out effectively its functions or regulations under the Act.

### **New Zealand Coastal Policy Statement 2010 (NZCPS)**

The NZCPS is a national policy statement under the RMA. Councils must give effect to the NZCPS in the development of regional policy statements, coastal policy statements, and regional plans.

While there are no explicit policies in the NZCPS that require councils to undertake coastal research, several policies require councils to investigate aspects of coastal management through monitoring, forecasting, and identification of important coastal features at risk of change. For example, policy 7(2) states that councils must:

*identify in regional policy statements, and plans, coastal processes, resources or values that are under threat or at significant risk from adverse cumulative effects. Include provisions in plans to manage these effects. Where practicable, in plans, set thresholds (including zones, standards or targets), or specify acceptable limits to change, to assist in determining when activities causing adverse cumulative effects are to be avoided.*

Policy 28 states that:

*to monitor and review the effectiveness of the NZCPS in achieving the purpose of the Act, the Minister of Conservation should:*

- *in collaboration with local authorities collect data for, and, as far as practicable, incorporate district and regional monitoring information into a nationally consistent monitoring and reporting programme*

### **Environmental Reporting Bill**

The Environmental Reporting Bill received its second reading in Parliament in early 2015, with a select committee reporting back to Parliament. The aim of the Bill is to implement a national-level environmental reporting system to ensure that reporting on New Zealand's environment occurs at regular intervals. There is no requirement to generate new information under the Bill and no requirement for councils to undertake coastal research. Instead, reporting is based on a collation of best available information (Environmental Reporting Bill 2015, No. 189-1).

A new reporting framework will be implemented under the Bill, whereby reporting will be divided into five environmental domains: air, atmosphere and climate, land, fresh water and marine. Three types of information will be considered for each domain: pressures, states and impacts. Pressures explain the human activities that are affecting natural environments. States describe the biophysical condition of the environment. Impacts explain the social, economic, and environmental implications of the observed environmental states. One domain will be reported every six months, with a synthesis of all domains every three years (Ministry for the Environment 2014).

## Other strategy and framework documents

### Regional Council Research Science and Technology Strategy

The vision of the Regional Council Research Science and Technology Strategy is to move councils from being end-users to strategic research partners with key Government departments and research providers. The responsibility for the strategy is vested with the Science Advisory Group, which is mandated by, and answerable to, regional councils. The strategy identifies the critical issues and research needs of strategic importance over the next 20 years. Two critical issues directly related to coasts are:

1. understanding the impacts of nutrients and sediments on estuaries and coastal environments—both urban and rural context.
2. determining the assimilative capacity of estuarine/coastal receiving environments and ascribing land-based contaminant management standards and targets.

The strategy was revisited in 2011 with the **Regional Council Special Interest Groups Research Priorities Report**, which summarised the critical issues and research needs in order to provide further detail to support the strategy.

Several other strategic documents link to the Regional Council Research Science and Technology Strategy. **The Surface Water Integrated Management (SWIM) Science Strategy**, for example, has a vision to achieve integrated management of freshwater resources. The SWIM Special Interest Group (SWIM-SIG) comprises representatives of regional councils and unitary authorities who work together to achieve five goals related to freshwater management. The role of the SWIM-SIG is to:

- facilitate communication and exchange of freshwater science within and between regions.
- support and encourage the development of novel methods to better manage freshwater resources.
- promote and transfer new scientific knowledge.
- make recommendations to regional councils on surface water management issues.

The **Strategic Roadmap for Biosecurity and Biodiversity Research**, provides a framework from which to define research science and technologies priorities for biosecurity and biodiversity as related to regional councils and unitary authorities in the medium- to long-term (10–20 years). There are five objectives of the roadmap, one of which is to reduce the impacts of invasive species on marine ecosystems forms.

### Department of Conservation: Marine Monitoring and Reporting Framework

The Department of Conservation (DOC) has been developing a monitoring and reporting framework for the marine environment, as part of a broader biodiversity assessment framework for New Zealand. The monitoring framework is based around indicators of ecological integrity and seeks to provide a broader understanding of the condition of marine biodiversity, in particular, in marine protected areas. The framework includes not only a suite of indicators, but also includes work around development of monitoring methodologies as well as a system for reporting on ecological integrity. There is potential for this work to not only support monitoring undertaken by councils (for example, by

providing guidance around consistent methodology) but the framework could also provide a mechanism for coordination among monitoring activities. For example, monitoring undertaken by councils, DOC and others could collectively comprise ecological integrity monitoring at some sites.

## Potential funding avenues

### National Science Challenge—Sustainable Seas

The National Science Challenge was implemented by the Government to take a more strategic approach to science investment. The Challenge is a funding mechanism to enable scientific research on topics as diverse as housing, health, land and water, and nutrition.

The Challenge that relates most to the C-SIG research strategy is 'Sustainable Seas', which has the following overarching goals:

- Well managed and enhanced use of our marine resources
- A healthy and strong marine economy
- Marine industries operate effectively and responsively
- Māori values are included and the Māori marine economy is strong
- New Zealand as a world leader in sustainable marine production and stewardship
- New Zealand society understands and is engaged in marine issues.

Sustainable Seas has five key research programmes that contribute to the achievement of these goals: Our Seas, Valuable Seas, Māori and the Sea, Dynamic Seas and Managed Seas. Sustainable Seas will receive approximately \$31.5 million funding over the next five years. The goal is to implement ecosystem-based management.

Additional relevant science funding by the **MBIE** that can align with the C-SIG research strategy includes targeted rounds within the environment and biological industries portfolios. For example, the recent call for proposals targeted areas such as marine biodiversity and biosecurity, ocean acidification, and estuary health and restoration, all of which are key issues for councils. The MBIE Smart Ideas programme may also be aligned to council priorities; however, this mechanism has a more short-term, commercial focus.

**Envirolink** small and medium advice grants, and more importantly Envirolink Tool grants, will continue to be an important funding mechanism for councils and the C-SIG.

Funding through the **Ministry for Primary Industries (MPI)** Sustainable Farming Fund and Aquaculture Planning Fund (APF) can be sought for projects that facilitate sustainable development of primary industries and aquaculture, respectively. There have been a number of APF supported projects carried out by Councils that relate to the C-SIG strategy, such as the development of marine management models (Waikato Regional Council, Marlborough District Council), integrated monitoring frameworks (Waikato Regional Council) and assessing potential areas for aquaculture (Environment Southland).

**Seafood Innovation Ltd**, a consortium funding body for the seafood industry, is also a source of matching funding that can support projects that meet the needs of both industry and council. For instance, development of microbial source tracking tools for shellfish, and

tools for monitoring effects associated with aquaculture, have received support through Seafood Innovation Ltd.

Government funding is limited, and there is a need to diversify funding sources to carry out the science required to adequately manage marine resources. **Private sources of funding** are playing an increasingly important role in supporting science that aligns with Council needs. Examples include the support of LAWA (<http://www.lawa.org.nz/>) by the Tindall Foundation, and a project funded by NEXT ([www.nextfoundation.org.nz](http://www.nextfoundation.org.nz)) targeting river restoration. The Pacific Ocean Initiative (POI: [www.pacificoceaninitiative.org](http://www.pacificoceaninitiative.org)) was recently established as an independent charity to connect ocean users, knowledge providers and funders to work towards wise use of a healthy Pacific Ocean. One year on, POI has established a board of trustees and assembled an advisory group for guiding the prioritisation and development of projects. There are a number of project concepts currently in development for securing further investment through non-government funding sources ranging from individual donors to foundations to sponsorships. Some of the areas currently being pursued include estuary and shellfish restoration, marine biosecurity, and citizen-based science initiatives. In most cases, councils will need to be a key participant in these projects to ensure outcomes align with end user needs.

## Other programmes

### **Marine Environmental Monitoring Programme (Ministry for Primary Industries)**

Long-term datasets that track persistent change in the environment are a critical component of any modern ecosystem-based approach to natural resource management and sustainable growth. NIWA has built the New Zealand Catalogue of Marine and Environmental Monitoring Programmes, which holds information about data owners and their contact details, variables monitored, where they are collected and how often. The data from these datasets provides context for policy development around management actions, spatial and temporal planning, and a basis for looking ahead at different scenarios. For more information and links see:

<http://www.niwa.co.nz/coasts-and-oceans/projects/marine-environmental-monitoring-in-new-zealand>

# **GUIDING COASTAL AND MARINE RESOURCE MANAGEMENT**

The Coastal Special Interest Group Research Strategy