OCEAN GOVERNANCE:
THE NEW ZEALAND DIMENSION
SUMMARY REPORT






Michael Vincent McGinnis, PhD.

Emerging Issues Programme, Institute of Policy Studies
School of Government, Victoria University of Wellington

Ocean Governance:
The New Zealand Dimension

Summary Report

Michael Vincent McGinnis, PhD

Emerging Issues Programme
Institute of Policy Studies
School of Government
Victoria University of Wellington

Acknowledgments

This project was funded by the Emerging Issues Programme (2010–2012), overseen by the Institute of Policy Studies at Victoria University of Wellington. The opinions expressed in this report are those of the author. The author would like to thank the members of this project's advisory committee who provided valuable input and direction in the development of this study:

- Dr. Jonathan Boston, Professor, School of Government, Victoria University of Wellington
- Daniel Brown, Senior Policy Analyst, Ministry for the Environment
- Dr. Jonathan Gardner, Reader in Marine Biology, School of Biological Sciences, Victoria University of Wellington
- Dr. Alison MacDiarmid, Group Manager, Marine Ecology, NIWA
- John Marshall, Manager, Environmental Research and Analysis, Maritime New Zealand
- Jim Nicolson, Policy Manager, Department of Conservation
- John Pfalert, Executive Officer, Petroleum Exploration and Production Association
- Cathy Scott, Deputy CE Fisheries Management, Ministry of Fisheries (now MAF)
- Dr. Charlotte Severne, Chief Scientist, Ocean Science and Maori Development, NIWA
- Bob Zuur, WWF - New Zealand's marine protection team

In addition, the author thanks the following reviewers who provided valuable suggestions and recommendations on how to improve a draft of this report:

- Dr. Randall Bess (MAF)
- Dr. Jonathan Boston (VUW)
- Meghan Collins
- Sean Cooper (and other staff members at the DOC)
- Dr. Chris Cornelisen (Cawthron Institute)
- Raewyn Peart (EDS)
- Cristine Stevenson (and other staff members with the Marine and Environmental Governance Team at the MfE)

Copy Editor: Vic Lipski

About the author

Dr Michael Vincent McGinnis received a PhD in Political Science in 1993. He is an Associate Professor in International Marine Policy and Science at the Monterey Institute of International Studies and the National Center for the Blue Economy in California, USA. He is also a Senior Associate of the Institute of Policy Studies in the School of Government at Victoria University of Wellington. He was Director of the Ocean and Coastal Policy Center at the University of California Santa Barbara from 1995-2010. He has published over 100 journal articles, essays, books, government reports and technical documents. From 1993-2000 his research, funded by three awards from the USA National Science Foundation, focused on the role of worldviews, values, beliefs, and science in the development of ecosystem-based planning. From 1999-2008 he was an advisor to federal agencies in the development of marine ecosystem-based planning in California. In 2008 he was a Fulbright Scholar in south-eastern Europe, and conducted a comparative study of marine governance supported by the European Union.

Citation

McGinnis, M.V. (2012). *Ocean Governance: The New Zealand Dimension*. A Summary Report. Emerging Issues Programme. School of Government. Victoria University of Wellington. 58 p.

ISBN: 978-1-877347-47-4 IPS 176

TABLE OF CONTENTS

LIST OF FIGURES AND TABLES

FOREWORD

During 2006-11 the Institute of Policy Studies (IPS) at Victoria University of Wellington was funded by some 40 public sector organizations in New Zealand to undertake policy-oriented research on a range of important contemporary issues. Over these years, the Emerging Issues Programme (EIP), as it was known, funded more than a dozen research projects covering economic, social, and environmental issues. The topics included population ageing, Pacific governance, climate change, migration, post-Treaty settlement issues, performance management, and public sector reform.

One of the last of the EIP projects to be commissioned – but by no means the least – addresses the demanding topic of ocean governance, and in particular the prudent management and protection of the large marine resources surrounding New Zealand. The aim of this two-year study is to provide a coherent overview of the types of planning tools and policy instruments that are needed to protect marine life and to foster the sustainable use of marine resources. The study is both timely and relevant given the country's recent legislative initiatives in relation to the management of our extensive Exclusive Economic Zone and other marine-related programmes and plans.

The IPS was very fortunate to have Dr Mike McGinnis to lead this project. Dr McGinnis has two decades of experience as an academic and practitioner in the area of coastal and marine policy; he is thus well qualified to conduct this study. As a Californian he has a personal connection to the subject matter of this Report. He has surfed since he was seven years old, and grew up fishing the waters of southern California. He was the Director of the Ocean and Coastal Policy Centre in the University of California Santa Barbara for 15 years. He has been a primary advisor to a number of resource agencies on a range of environmental matters, including management plans for islands and major river basins. Given his wide experience of marine management issues on the other side of the Pacific, Dr McGinnis brings not only a great deal of expertise but also an informed, independent outsider's perspective to the task in hand. This Summary Report represents the initial fruits of his investigations during 2010-12. A much fuller account will be published in due course.

Without doubt, the management of marine resources is among the most significant environmental issues facing New Zealand. To many, the marine environment represents one of the last frontiers to be developed. Indeed, the future economic prosperity of New Zealand may well be strongly influenced by how our extensive marine resources are used. Yet New Zealand's marine environment also includes some of the rarest marine species on the planet, and encompasses hundreds of small islands that are essential habitats for a range of seabirds and marine mammals. Their vulnerability was highlighted in October 2011 with the grounding of the Rena in the Bay of Plenty. A critical policy challenge, therefore, is how best to address future conflicts over the use and protection of the marine environment. In particular, there is a need for a comprehensive and multi-sector approach to marine areas. Equally, there is a need to build our institutional capacity and capability to manage our extensive marine resources. This is not just an issue for regional councils. As this Report shows, there is an important role of central government in future marine policy-making.

During the last 20 years in New Zealand, policy-makers have sought out a more holistic and ecosystem-based approach to marine resource use and marine life protection. While many of these efforts have been delayed or stalled, a window of opportunity currently exists for this country to learn from international best practice in the area of marine management and planning. Both developed and developing countries across the world are creating new ecosystem-based approaches to marine policy and planning. New Zealand should do likewise. It should establish a clear policy framework to

support an integrative, ecosystem-based approach to the marine environment. The primary aim of this Report is to provide a general overview of the planning tools and management actions required to develop and sustain such an approach. In so doing it sets out a series of recommendations for strengthening and improving New Zealand's marine management framework. These recommendations deserve serious scrutiny and debate.

I am greatly indebted to Dr McGinnis for his leadership of this EIP project. He has brought not only deep wisdom and expertise to this important study but also a great passion and love for the marine environment. I am also enormously appreciative of all those, both in government agencies and civil society organizations, who have assisted him with this research – contributing to seminars and workshops, attending meetings, providing advice and reviewing draft papers. As with other EIP projects, this study has been very much a joint effort of 'town and gown'. I sincerely hope that similar endeavours will continue to flourish over the coming years.

Jonathan Boston

Professor of Public Policy

School of Government

Former Director of the Institute of Policy Studies

Good Friday, 2012

EXECUTIVE SUMMARY

The primary goal of this report is to provide interested members of the public and policymakers with a general overview and a description of the types of principles, planning tools and policy instruments that can be used to strengthen and improve marine governance in New Zealand. As extractive uses (hydrocarbons and minerals, in particular) ramp up and others are explored and brought on line in the marine areas of New Zealand, the need will increase for a more integrative, ecosystem-based approach to marine governance.

The study includes the following types of analysis:

- a review of the literature on the existing governance framework in New Zealand
- a comprehensive review of the scientific literature on integrative, ecosystem-based marine governance
- an evaluation of case study materials on offshore oil and gas development, marine aquaculture, marine life protection, and marine minerals exploration
- an examination of New Zealand's marine policies and legislation
- a synthesis of materials and input from participants in the project's four workshops on the subjects of marine farming, aquaculture, marine science and technology and marine governance
- an assessment of the information and materials gained from a series of confidential, one-on-one and group interviews, conducted in person or by telephone during 2010 and 2011, with a selection of ocean stakeholders, including academics, members of non-government organizations, regional and national resource managers, members of the public service, and representatives of major ocean industries, such as offshore oil, commercial fishing, and mining interests.

The major findings of this study are that the existing marine governance framework in New Zealand emphasises a traditional sector-by-sector approach to management and planning and that this fragmented governance framework contributes to a number of institutional challenges, such as:

- a spatial and temporal overlap of human activities and their objectives, causing conflicts (user–user and user–ecosystem conflicts)
- a lack of connection between the various authorities responsible for individual activities
- a lack of connection between offshore activities and resource use and onshore communities that are dependent on them
- a lack of protection of culturally and ecologically sensitive marine areas.

In addition, the study identifies a number of factors that influence marine planning and decision-making in the country, including but not limited to:

- a lack of institutional capacity and capability to govern marine resources and address ecosystem issues across administrative jurisdictions and management sectors
- general scientific uncertainty and a paucity of information with respect to the resources and the more general ecological features of the marine area
- competing relationships between economic use of marine resources and the maintenance of marine ecosystem services and goods

- Māori interests, perspectives and treaty obligations
- increasing pressures from the use of marine areas, including the impacts of terrestrial inputs from coastal waterways on nearshore marine ecosystems and resources
- the role of international treaties and conventions
- the synergistic and cumulative impacts of multiple use and climate disturbance on marine ecosystems
- the role of scientists and science in marine planning and decision-making.

This report makes two general recommendations. First, with respect to the territorial sea (which includes the marine area out to 12 nautical miles) the report recommends that regional councils develop integrative marine plans where conflict between users and users-ecosystems is likely to develop in the future. Second, the report recommends the adoption of a new role for central government to support an ecosystem-based approach to integrative marine planning and decision-making. In central government stronger interagency coordination and new public policy are needed to address future marine resource conflicts and to support an ecosystem-based approach to integrative marine planning and collaborative decision-making for the Exclusive Economic Zone (EEZ).

There is also a new role for place-based collaborative decision-making and planning to address conflicts in marine areas that are likely to be developed in the future. A range of new principles of marine governance, planning tools, and policy instruments are described that support a marine ecosystem-based approach to integrative planning across management sectors for the EEZ.

A general summary of the major recommendations described in this report is presented in the table below. The report describes a number of planning tools, policy instruments, and associated strategic elements that can strengthen collaborative, ecosystem-based, and integrative marine governance at both regional and central government levels.

Summary of Short-Term Recommendations

PRESSURE	RESPONSE (Management Principle)	PLANNING TOOL/POLICY INSTRUMENT/MANAGEMENT ACTIONS
Synergistic impacts associated with multiple-use	Maintenance of marine ecological integrity	• Ocean Health Index (to be created) • Planning tools, such an InVEST and SeaScape (to assess ecosystem services) • Comprehensive cumulative impact assessment effects and synergistic impacts
Loss of marine biodiversity	Clear statutes in support of the creation of networks of marine reserves that can protect marine life	• The Marine Protected Areas Policy and Implementation Plan (MPA Policy) should be amended • Use of marine zoning tools • Marine Protected Area designation • Adoption of a compatible use criterion • Creation of an Ocean Protection Council under the new EPA • DOC's PlanBlue (to be further developed and implemented)
Expanding scope of conflict across management sectors and user	Clear statutory requirements and resources that foster integrative,	• New marine policy (to support place-based marine spatial planning) • Place-based, ecosystem-based collaborative planning (to be supported)

groups	ecosystem-based planning	
Climate disturbance	Adaptive planning	• Climate Adaptation Plans to be developed at regional scales of governance that can address threats from climate change on the marine and coastal environment
Fragmented governance	Clear statutory requirement for well coordinated ecosystem-based planning and decision-making Strengthened institutional capacity and capability at regional and central government levels	• Marine spatial planning (by regional councils and with assistance from central government) • Place-based collaborative planning • Development of a public trust doctrine for the EEZ • Administrative reorganization to foster intergovernmental coordination and consistency across sectors and management authorities
Role of science and scientists	Evidence-based decision-making	• Establishment of interdisciplinary scientific partnerships that include social and physical scientists • Establishment of Māori advisory body under EPA • Creation of an ocean science trust under EPA • Creation of a publicly accessible web-based information clearinghouse • Creation of a national centre for ecological analysis and synthesis
Offshore energy development, fossil fuels, and minerals	Passage of the Environmental Effects Bill and other EEZ policies and statutes	New regulations that support: • Compatible use • Integrated risk assessment • Creation of MPAs for sensitive marine areas used by birds, mammals and fishes • Development of a public trust doctrine for the EEZ • Establishment of a Living Permit Process • The creation of mitigation funds to support independent scientific monitoring and enforcement • Independent review of permitting applications and environmental assessments under the EPA
Water pollution	Integrative coastal planning and management	• Strengthened and improved capability and capacity of regional councils to respond to the drivers of impacts from terrestrial inputs on marine areas • Clear development of best practices for land-use activities that influence marine areas • Water quality monitoring and enforcement • Development of catchment-oriented indices • Marine spatial planning
Protection of cultural values	Clear support of Māori Treaty obligations	• Integration of Māori values and traditional ecological knowledge in marine policies, programmes, and plans

1. INTRODUCTION[1]

When in a boat, we may see the details of the interaction of marine life and coastal-dependent species, such as the sooty shearwater, sea lions, and commercially valuable species such as squid. From a satellite image our perceptions and observations change. We may see the larger-scale interactions between a river's plume brought on by a rain event, or the changes in sea surface temperature that is supported by data generated by technologies such as remote sensing. When we combine observations of larger and smaller ecological scale interactions we may be able to identify the relationship between changes in sea surface temperature, the abundance and distribution of plankton, and the presence of a fished species.

Recognizing the interdependence of economic values and the maintenance of marine ecosystem services is the foundation to marine ecosystem-based approach to integrative planning and decision-making.[2] Ecosystem-based planning is a process that aims to conserve major ecosystem services while meeting the socioeconomic, political and cultural needs of current and future generations. The principal objective of ecosystem-based planning is the efficient maintenance and ethical use of natural resources. Ecosystem-based planning is a multifaceted and holistic approach to planning that requires a significant institutional change in how the human uses of ecosystems are managed.

Economic use of marine resources is irrevocably connected to the maintenance of the ecological health and integrity of the marine environment.[3] The protection of ecosystem services is the foundation to a 'green' economy, as a number of governmental, scientific, and technical documents and plans emphasize the need for an ecosystem-based approach to marine resource use and biodiversity protection.[4]

A recently published report by the United Nations Environmental Programme (UNEP) entitled *Restoring the Natural Foundation to Sustain a Green Economy*[5] describes a number of advantages in the use of an ecosystem-based approach to further implement the country's Blue Green Agenda:

> *(a) Natural ecosystems provide the life-support systems for humans and the natural foundation for a sustainable green economy, yet their health is under increasing threat.*
>
> - Cutting-edge science has proven that ecosystems provide the essential 'life support systems' we all depend on.
> - Recent economic analysis of ecosystems reveals that ecosystems provide the natural capital and lay the foundation for the development of a green economy.

---

[1] This Summary Report is based on a longer report for this study, and briefly provides the major findings and recommendations. The full report includes analysis of case study materials; information from interviews with stakeholders and policy makers conducted during 2010 and 2011; and a review of existing policies and new marine legislation. The study incorporates valuable input from participants at four public workshops that were facilitated by the author from 2010 to 2011, and also draws on feedback received during presentations given by the author in the USA and New Zealand.

[2] UNEP, *Restoring the Natural Foundation to Sustain a Green Economy: A century long journey for ecosystem management.* International Ecosystem Management Partnership [IEMP], 2011.

[3] United Nations Environment Programme (UNEP) FAO, IMO, UNDP, IUCN, World Fish Center, Gridarendal, *Green Economy in a Blue World*, 2012 available at www.unep.org/greeneconomy and www.unep.org/regionalseas

[4] S. Naeem, D. Bunker, A. Hector, M. Loreau, C. Perrings, eds., *Biodiversity, Ecosystem Functioning, and Human Wellbeing: An ecological and economic perspective*. Oxford: 2009.

[5] UNEP, 2011, *op cit.*

- There is mounting evidence that many ecosystems are in various states of degradation and face unprecedented pressures from unsustainable exploitation, unplanned or poorly planned development, invasive species, climate change and population growth. This will not only jeopardize economic development, but also impose increasing threats to the survival of human beings, with the poor being most vulnerable.

(b) The ecosystem-based approach plays a critical role in addressing substantial challenges of green economic development, including promoting the sustainable use of natural capital and providing cost-effective environmentally-friendly approaches.

- As an integral part of green economic development, ecosystem management is essential to ensure a sustainable flow of ecosystem goods and services, while also maintaining healthy and fully functional ecosystems.
- It is critical to ensure that ecosystem management meets the needs of the poor, especially those in developing countries who are highly dependent on ecosystem goods and services and are most vulnerable to ecosystem degradation.
- Ecosystem management can help retain the balance between economic growth, societal development, and ecosystem health to ensure long-term sustainability.

(c) The already available scientific, economic and political means need to be institutionalised, and emerging champions supported, to promote the role of ecosystem management approach in the green economic development.

- Methods and tools for assessment, valuation of, and payment for ecosystem services have been developed to help improve the current economic model.
- In the transition to a green economy policymakers should ensure that the full range of goods and services provided by ecosystems, including those that are currently non-monetised, are fully integrated in decision making and public policy.
- New systems of governance of global public goods and new institutional structures will be required to link ecosystem services with a green economy because the generation of, and benefits derived from, ecosystem services frequently cross political and geographic borders.
- Many market mechanisms have been piloted which would engage the private sector and harness market forces.

(d) Green economic development will help improve ecosystem health and sustain its functionality.

- Placing a value on ecosystem services through mechanisms that facilitate investment in ecosystems will at the same time benefit local people and the private sector who are rewarded for good environmental stewardship.
- Developing a green economy within ecosystem capacity can be planned by better understanding of the science of ecosystems.

(e) Challenges and opportunities in applying an ecosystem-based approach in green economic development remain.

- Ecosystem services are not valued in the current economic model.
- Current governance and institutional structures have been inadequate in preventing the decline in ecosystem health.
- Urgency is needed: the slow rate of developing solutions is not keeping up with the rate of degradation.

- Equity is essential: there is need for a balanced sharing of benefits, including among different groups of stakeholders and generations.

(f) Ecosystem management is both a local task and determined by higher level decision, policies, and legal frameworks. There must be concerted coordination of top-down and bottom-up approaches.

(g) The interactions between ecosystem management and green economic development are multi-faceted and mutually supportive, which provides the basis for enhanced synergies in pursuing global sustainability.

In this time of growing interest in the use of marine resources the development of an integrative, ecosystem-based framework to guide the future of New Zealand's marine resource use and marine life protection activities is needed.

1.1 New Zealand's Exclusive Economic Zone (EEZ)

New Zealand is an oceanic archipelago remote from other land masses for more than 80 million years. Species have adapted and evolved to dynamic and complex changes in biology, oceanography, and climate.

This report describes the territorial sea, the EEZ, and extended continental shelf as New Zealand's ocean jurisdiction. Planning for New Zealand's EEZ represents a particular challenge because of the biophysical scale of the country's ocean jurisdiction. With its declaration of an EEZ in 1978, New Zealand's jurisdiction spans over 3 million kms^2 of ocean, and the country's coastline exceeds 19,000 km in length. Although compared to other developed countries New Zealand has a relatively small population, it is responsible for the management of one of the most biologically and culturally important parts of the world's oceans.

An exclusive economic zone is the marine area that stretches from the seaward edge of the state's territorial sea, 12 nautical miles (nm) out to 200 nm from its coast. In casual usage, the term may include the territorial sea and even the continental shelf beyond the 200-mile limit. New Zealand's EEZ is the fifth largest in the world, with an area of about 15 times that of the land mass (or 5.7% of the world's EEZ).[6] With the legal continental shelf extensions, New Zealand's current ocean area jurisdiction is more than 20 times larger than the area of its land, or 1.2% of the earth's surface area.

The marine areas of New Zealand are a 'Noah's Ark' of species diversity with the abundant marine life sensitive to human activities and impacts that occur at diverse scales.[7] New Zealand's ocean jurisdiction contains between one-third and three-quarters of its endemic species. Many of these

[6] Ministry for the Environment. *Improving regulation of environmental effects in New Zealand's exclusive economic zone.* Wellington, 2007.

[7] Information on marine areas has been gathered and synthesized by Land Information New Zealand (LINZ) and the National Institute of Water and Atmospheric Research (NIWA). In 2005 the Ministry for the Environment, the Ministry of Fisheries and the Department of Conservation commissioned NIWA to develop environmental classifications covering both New Zealand's EEZ and the Hauraki Gulf region collectively known as the Marine Environment Classification (MEC). In addition, the Ocean Survey 20/20 is to be completed by 2020 by LINZ, and will represent an ocean survey that will provide New Zealand with information on its ocean jurisdiction. The geographic area covered by the programme is primarily New Zealand's EEZ, the ECS, and the Ross Sea region. See: http://www.niwa.co.nz/news-and-publications/publications/all/wa/12-3/species and the three volume book series *New Zealand Inventory of Biodiversity.* D. Gordon, ed. 2009.

species are unique to New Zealand.[8] The high level of endemic species and the range of coastal and marine habitats associated the county's ocean jurisdiction is recognized as one of the top hot spots for biodiversity in the world.[9] New species are found every year off the coast.[10]

Zealandia *refers to the New Zealand continent, which is a nearly submerged continental fragment that sank after breaking away from Australia 60–85 million years ago, having separated from Antarctica between 85 and 130 million years ago. It may have been completely submerged about 23 million years ago, and most of it (93%) remains submerged beneath the Pacific Ocean.*

Over 17,000 species of marine life are identified in New Zealand's seas, including over 4,000 that have been collected but have yet to be described. This comprises just over 30% of all known biodiversity associated with the country.[11] For instance, the number of identified fishes has doubled over the past 15 years and is increasing at a rate of 15 species per year.[12] The number of undiscovered marine species in New Zealand's ocean jurisdiction likely exceeds the number of species that have been identified.[13]

New Zealand's ocean jurisdiction hosts a very high diversity of seabirds and marine mammals. Almost three-quarters of the world's penguin, albatross and petrel species, and half of the world's shearwater and shag species are found in the islands and coastal areas of the country. In addition, nearly half the world's species of whales and dolphins have been sighted in New Zealand, including nine species of baleen whales, 17 members of the dolphin family and 12 species of beaked whales.[14]

1.1.1 The Multiple Values of the EEZ

A range of values are carried by healthy marine ecosystems. These values are not limited to economic or consumptive use of marine space. A range of instrumental and non-consumptive values exist including the values of biodiversity and the services that they provide to humans. Few people dispute the intrinsic values of marine systems, which are often reflected in maritime stories, ritual, and other ceremonies of maritime peoples.

While we often focus on the economic values of the ocean, we also recognise the natural values associated with the marine environment, such as aesthetic, scientific, recreational, spiritual, and sacred values. For instance, a sea in a wild storm is valuable beyond the human capacity to understand it, while a sanctuary on a coastal estuary for feeding shorebirds embodies spiritual and sacred significance. Such diverse maritime values need to be sustained. Marine management is not merely a question of balancing uses or addressing environmental effects or mitigating the impacts of a

---

[8] For a comprehensive review of the marine environment, see Ministry for the Environment. *The New Zealand Marine Environment Classification.* Wellington: 2005, and D.P. Gordon *et al.*, "Marine Biodiversity of Aotearoa New Zealand", 5 *PLoS ONE* e10905, 2010. doi:10.1371/journal.pone.0010905.
[9] R.T. Kingsforce, *et al.*, "Major Conservation Policy Issues for Biodiversity in Oceania", 23 *Conservation Biology* 2009: 834.
[10] Based on new models, for instance, there is a more comprehensive understanding of synergistic impacts on coastal marine ecosystems, see: B.S. Halpern *et al.*, "A Global Map of Human Impact on Marine Ecosystems", 319 *Science* 2008: 948 and E.L. Miles, "On the Increasing Vulnerability of the World Ocean to Multiple Stresses", 34 *Annual Review of Environment and Resources* 2009: 17. With respect to new planning tools that can address the synergistic impacts, see K. St. Martin and M. Hall-Arber, "The missing layer: Geotechnologies, communities, and implications for marine spatial planning", 32 *Marine Policy* 2008: 779.
[11] Gordon *et al.*, at 3.
[12] *Idem.*
[13] *Idem* at 12.
[14] *Idem* at 10.

proposed resource use. Successful marine governance is ultimately a question of how well society can integrate the multiple values supported by life-giving character of marine areas.

The level of resource use and the scale of marine life protection influence the general health and integrity of the ocean. New Zealand needs to respond to the increasing pressures, threats, and associated impacts that human beings have on marine ecosystems. A particular threat or pressure should be understood within a much broader range of impacts for there are synergistic effects associated with the cumulative impacts of the multiple-use of marine areas. A particular resource use does not occur in isolation from other marine activities. Therefore, marine management and planning for marine activities requires a multi-sector approach to address environmental effects and impacts.

1.2 Purpose of this Report

The primary purpose of this report is to describe the challenges and opportunities that exist today for integrative spatial planning, including zoning, and the further development of an ecosystem-based approach to marine resource use and marine life protection in New Zealand's ocean jurisdiction. Government should ensure that desired resource utilisation occurs while meeting international obligations and increasing public expectations for biodiversity protection.

With respect to marine planning, ecological integrity is defined as the institutional capability and capacity to support and maintain an adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of the natural habitat of a marine ecosystem. It includes relationships between terrestrial, coastal and marine areas. It also requires the maintenance of the ecosystem services and goods that are provided by healthy marine ecosystems.

This report provides an overview of recommendations that can improve and strengthen New Zealand's framework for ocean governance. The goals of the summary report are twofold: 1) to promote the scholarly analysis of management options for achieving responsible marine stewardship; and 2) to present, on the basis of such analyses, a characterization of the planning tools and policy instruments that can contribute to a more integrative, ecosystem-based approach to marine governance.

1.3 Approach

Human beings benefit from a range of ecosystem processes. These benefits are known as ecosystem services. These services are groups by the United Nations 2005 Millennium Ecosystem Assessment (MEA) into four broad categories:

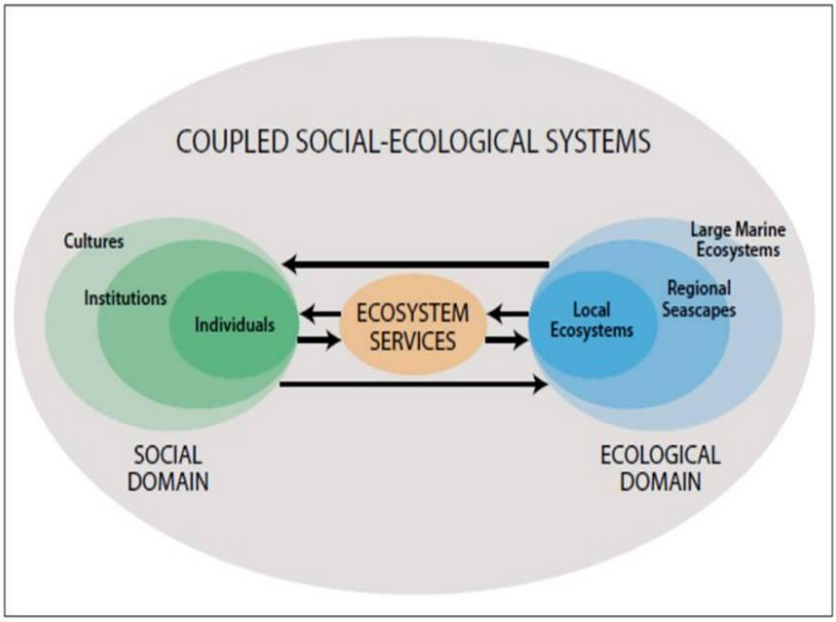
- *provisioning*, such as the production of food and water
- *regulating*, such as the control of climate and disease
- *supporting*, such as nutrient cycles and crop pollination

- *cultural*, such as spiritual and recreational benefits.[15]

One challenge of marine governance is to maintain these ecosystem services across generations. To maintain ecosystem services, it is important to promote greater integration of social and ecological processes within formal strategic planning and decision-making in ocean governance (Figure 1).

This report is based on a systems perspective in which the linking of ecosystem pressures and threats to management responses reflect the interactions among multiple biophysical and human drivers. The need to develop a more integrated, ecosystem-based approach to manage multiple pressures across sectors in New Zealand's ocean jurisdiction is one common theme of the recommendations described in this report.

Figure 1. The Social and Ecological Domains of Ecosystem-Based Planning



Source: Lubchenko and Petes, 2010

[15] The Royal Society of New Zealand. *Emerging Issues: Ecosystem services*. Wellington: July 2011. The Royal Society of New Zealand describes the importance of biodiversity in the maintenance of sustaining the goods and services: 'Biodiversity is often valued for providing resilience to environmental change. More biodiversity generally leads to more resilience, but the relationship is rarely simple. Ecosystem functions, such as nutrient regulation, are provided by the traits of organisms within that ecosystem. Greater genetic diversity provides a greater reservoir of traits that can replace traits lost if particularly important species are lost. More diversity also provides more opportunity for functions to operate across a broader range of conditions. In this way, biodiversity provides the insurance value that future environmental changes will not reduce services. Biodiversity itself provides existence value and option value (in this case, the value of preserving the benefits of unknown future uses of currently unused species and the opportunity for current use of those species).'

2. THE CHANGING SOCIO-ECOLOGICAL CONTEXT

Ocean governance requires the institutional capacity to deal with socio-ecological systems that are complex, heterogeneous, dynamic, and prone to non-linear and often abrupt changes.[16] Scientists also note that there are biophysical limits to marine resource use. When these limits are exceeded by the level of impact, ocean ecosystems can reach tipping points where the function, structure and complexity of an ecosystem changes dramatically. Lubchenco and Petes warn, 'Many ocean ecosystems appear to be at a critical juncture. Like other complex, nonlinear systems, ocean ecosystems are often characterized by thresholds or 'tipping points', where a little more change in a stressor can result in a sudden and precipitous loss of ecological functionality.'[17] The Royal Society of New Zealand notes, 'The past fifty years have seen a substantial and largely irreversible loss of biodiversity. New Zealand's unique endemic biodiversity has similarly seen serious decline – an unknown but large loss of common wealth and natural heritage.'[18]

New Zealand will likely face increasing conflicts over marine areas and sectors as the country continues on a trend for a 'race for marine space' in the territorial sea and in the deeper waters of the EEZ. While marine governance in New Zealand has not embraced the principles of management and the planning tools used elsewhere, it should be stated that to date the need has been relatively low, given that there have been few conflicts arising from multiple uses. But as certain extractive uses (hydrocarbons and minerals, in particular) ramp up and others are explored and brought on line, the need will increase for a more integrative, ecosystem-based approach to marine governance.

The level of use and proposed future of marine activities include offshore oil and minerals development, an increase in marine areas used for aquaculture or marine farming within the territorial sea, the impacts of commercial vessels on marine life, and other activities such as the impacts of terrestrial inputs and pollution on marine areas. There is also increasing evidence of the impact of a range of factors associated with climate disturbance on marine areas, such as changes in the pH level of the oceans (i.e., ocean acidification).[19]

Scientific studies identify four primary threats to marine ecosystems across the Pacific Ocean: pollution, overfishing, habitat destruction, and climate change.[20] MacDiarmid and colleagues note that the primary pressures on marine ecosystems of New Zealand are from climate change, terrestrial

---

[16] O.R. Young *et al.*, "Solving the Crisis in Ocean Governance: Place-based management of marine ecosystems", 49 *Environment* 2007: 8; L. Crowder *et al.*, "Resolving Mismatches in U.S. Ocean Governance", 313 *Science* 2006: 617; H. Tallis *et al.*, "The Many Faces of Ecosystem-Based Management: Making the process work today in real places", 34 *Marine Policy* 2010: 340; and A.A. Rosenberg, "Regional Governance and Ecosystem-Based Management of Ocean and Coastal Resources: Can we get there from here?" 16 *Duke Environmental Law & Policy Forum* 2006: 179.

[17] J. Lubchenco and L.E. Petes, "The Interconnected Biosphere: Science at the ocean's tipping points" 23 *Oceanography* 2010: 115, 116.

[18] Royal Society of New Zealand, *op cit.*, 2011: 5.

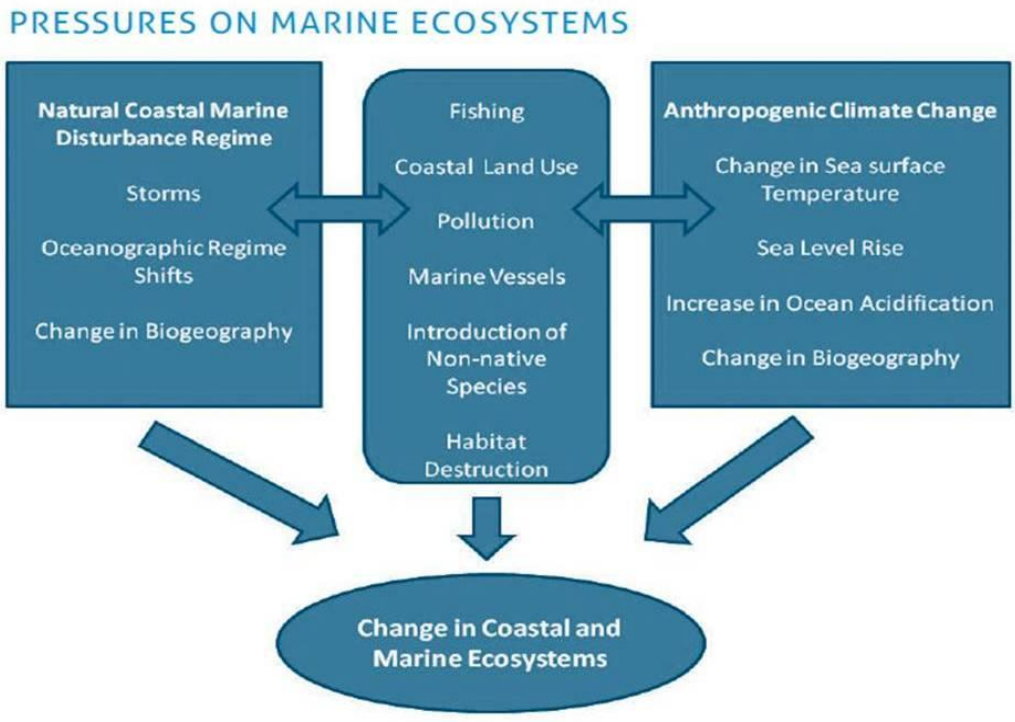
[19] Alison MacDiarmid *et al.*, *Assessment of Anthropogenic Threats to New Zealand Marine Habitats: Final project report*. Wellington: Ministry of Fisheries 2010.

[20] A study conducted by researchers at Stanford University's Center for Ocean Solutions in 2008 reviewed over 3,400 peer-reviewed articles that provide analysis of the primary threats to the Pacific Ocean. Center for Ocean Solutions, *Pacific Ocean Synthesis: Scientific literature review of coastal and ocean threats, impacts and solutions* 2009; *available at* http://centerforoceansolutions.org/PacificSynthesis.pdf.

inputs including water pollution, and overfishing.[21] MacDiarmid and colleagues based their study on a survey of perceptions of diverse scientists who work in New Zealand. In addition to pressures associated with climate disturbance, scientists perceive the top threats and pressures as:

- Human activities in catchments that discharge into the coastal and marine environment were among the highest scoring threats to New Zealand's marine habitats. Foremost was increased sedimentation resulting from changes in land-use, which was third equal among these threats over all habitats and was the highest-ranked threat for five coastal habitats including harbour intertidal mud and sand, sub-tidal mud, seagrass meadows, and kelp habitat. Other threats deriving from human activities in catchments include sewage discharge, increased nitrogen and phosphorus loading, and heavy metal pollution. Three other highly ranked threats (algal blooms, increased turbidity, and oil pollution) stem in part from human activities in catchments.
- Seven threats to New Zealand marine habitats were directly related to human activities in the marine environment, including commercial fishing (e.g., trawling operations), the introduction of non-native marine species, coastal engineering, and aquaculture. The most important of these was bottom trawling, which was the third equal highest ranking pressure on marine ecosystems. The second highest ranking marine activity was dredging for shellfish which, although destructive, usually operates over a smaller spatial scale than bottom trawling.

Figure 2. Factors Contributing to Ecosystem Disturbance



[21] MacDiarmid *et al., op cit.* A comprehensive survey of important ecological indicators for New Zealand's oceans can be found at M.H. Pinkerton, *Headline Indicators for the New Zealand Ocean. Paper prepared for NIWA*. Wellington: NIWA 2010.

Human impacts exacerbate an ecosystem's ability to withstand stress and disturbance associated with short-term and long-term climate events.[22] For example, the multiple impacts of human beings on marine ecosystems exacerbate the ability of indicator species, such as birds and mammals, to adapt to climate-related disturbance caused by sea level rise, an increase in sea surface temperature, ocean acidification, and changes in ecological productivity (e.g., changes in the availability of prey species).[23] Moreover, climate change interacts with and accelerates the cumulative pressures on marine biodiversity.

To avoid tipping points, international best practice emphasizes the need to develop integrative, ecosystem-based approaches. The scholarly literature identifies a number of planning tools and planning instruments that can be used by marine planners and managers to sustain marine ecosystems and marine resource use.[24]

2.1 Biophysical Scale and the Expanding Scope of Conflict

Conflict in marine areas will likely be influenced by two interdependent factors: the level of marine resource use, and the proximity and/or access of users to marine areas. Biophysical scale and the scope of conflict shape the politics of coastal marine planning and decision-making. The outcome of conflict is often predicated on the level of conflict between diverse participants in a decision-making situation. For example, the scope of conflict is shaped by different political contexts associated with marine life protection that includes user-user conflicts (e.g., commercial versus recreational fishing interests) and user-marine ecosystem conflicts (e.g., fisher versus marine mammal protection advocates). The larger the scale needed to sustain resource use and protect marine life the more political contentious the political process becomes.

One response from government to a high degree of value-based conflict is an attempt to control the scope of conflict by limiting the range of diverse voices and interests that are associated with a particular decision-making situation.[25] Conflict, however, cannot be effectively and responsibly resolved without a more comprehensive and integrative approach to marine governance that cuts across management sectors and reflects the multiple values that are carried by healthy marine systems. Political processes are influenced by the values that are held by members of resource agencies, user groups and the public. Planning is more than a scientific enterprise.

---

[22] B.S. Halpern *et al.*, "Understanding Cumulative and Interactive Impacts As a Basis for Ecosystem-Based Management and Ocean Zoning", 51 *Ocean and Coastal Management* 2008: 203; B.S. Halpern *et al.*, "A Global Map of Human Impact on Marine Ecosystems", 319 *Science* 2008: 948; and E.L. Miles, "On the Increasing Vulnerability of the World Ocean to Multiple Stresses", 34 *Annual Review of Environment and Research*: 2009: 17.

[23] NIWA, *Climate Change Projections for New Zealand* (August 2008). With respect to climate change and the world's ocean, see R. Schubert *et al.*, *The Future Oceans – Warming up, rising high, turning sour*. German Advisory Council on Global Change. Berlin: 2006. For a characterization of the impacts of climate disturbance on New Zealand's biodiversity, see W. Gren, *Climate Change Impacts on New Zealand's Biodiversity. A background paper prepared for the Parliamentary Commissioner for the Environment.* Wellington: 2006; and more generally M. McGlone, T. Clarkson, and B. Fitzharris, *Unsettled-Outlook: New Zealand in a Greenhouse World.* Wellington: 1990.

[24] IOC/UNESCO, IMO, FAO , UNDP, *Summary for Decision-Makers: A blueprint for ocean and coastal sustainability* (2011).

[25] See, for instance, M.V. McGinnis, "Learning from California's Experience in Marine Life Protection", 26 *Ocean Yearbook* 2012: 458.

Government's response to an expanding scope of conflict between diverse interests and values often includes an attempt to control the conflict by limiting the range of voices, values and interests in the planning process.[26] Government's attempt to control conflict can lead to support of a sector-based approach to marine planning and decision making rather than the more difficult and potentially contentious multiple-sector approach to governance. In general, there are three potential results of conflict management:

- government shifts the focus of decision making from multiple issues to single issues (e.g. a shift from biodiversity considerations to fishery issues)
- government shifts the focus from multi-sector or multi-scale governance to single-sector or single-scale governance (e.g. a shift away from integrated, ecosystem-based planning to a resource-based mentality)
- government shifts the focus from multi-stakeholder decision-making to client-based decision -making.

The preference for a sector-by-sector approach to marine management cannot sustain marine ecosystems; a traditional reliance on a sector-based approach to marine management and planning rarely captures the range of issues, interests and values that are often associated with marine ecosystems. Lester *et al.* write: '[T]here is a historical legacy of piecemeal management that has largely focused on single sectors of activity and failed to consider marine ecosystems as interconnected wholes.'[27] As Rosenberg and Sandifer maintain, '[u]nder sector-by-sector management, trade-offs within a sector may be considered, but those among sectors are largely ignored and often remain unaccounted for'.[28] Similarly, Norse argues: 'This situation was hardly problematic when ample distance remained between swinging fists and noses, but in the face of today's increasing demands, a system of ocean governance less likely to give us healthy oceans and sustainable economies would be difficult to design. Without strong interagency coordination, sectoral management cannot work.'[29]

The existing marine governance framework in New Zealand emphasises a traditional sector-by-sector approach to management and planning. This governance framework contributes to a number of institutional challenges, such as:

- a spatial and temporal overlap of human activities and their objectives, causing conflicts (user–user and user–ecosystem conflicts)
- a lack of connection between the various authorities responsible for individual activities or the protection and management of the environment as a whole
- a lack of connection between offshore activities and resource use and onshore communities that are dependent on them
- a lack of protection of biologically and ecologically sensitive marine areas.

As governments encourage economic development of marine areas in the future, the socio-ecological context will inevitably expand to include more diverse interests and values. Value-based conflict

---

[26] *Idem.*

[27] S. Lester *et al.*, "Science in Support of Ecosystem-based Management for the US West Coast and beyond", 143 *Biological Conservation* 2010: 577.

[28] A.A. Rosenberg and P. A. Sandifer, "What do managers need?" K. McLeod and H. Leslie, eds., *Ecosystem-Based Management for the Oceans*, 13. Cambridge: 2009.

[29] E.A. Norse, "Ecosystem-based Spatial Planning and Management of Marine Fisheries: Why and how?" 86 *Bulletin of Marine Science*. 2010: 179 at 184.

between competing interests, international jurisdictions and within-state government jurisdictions will expand, as do the scale and level of resource use. It will be difficult to resolve conflict over marine resource use and biodiversity protection without a more comprehensive and integrative approach to marine ecosystem-based planning and decision-making.

2.2 International Obligations

Under international conventions and framework agreements it has ratified, New Zealand is responsible for and has management jurisdiction over an essential part of the ocean used by a range of species and maritime peoples.[30] UNCLOS lays down the fundamental obligation of all states to protect and preserve the marine environment.[31] It further urges all states to cooperate on a global and regional basis in formulating rules and standards and otherwise take measures for the same purpose. States are empowered to enforce their national standards and anti-pollution measures within their territorial sea. They also have the obligation to control, prevent, and reduce marine pollution from dumping, from land-based sources or seabed activities subject to national jurisdiction, or from or through the atmosphere. Accordingly, New Zealand has access and right to use marine resources of the EEZ, but this use is predicated on the protection of marine areas.

While there is a need to reflect international best practice in the area of marine policy in New Zealand, it is important to recognize that future marine policy development should reflect the unique and special characteristics of New Zealand's cultural and natural heritage.

2.3 Marine Policy Innovation

The management of the ocean jurisdiction of New Zealand is very different from most countries. New Zealand's political system is:

- a management system that embraces a strong emphasis in regionalism (and the role of regional councils in the management of catchments and the territorial sea)
- a unicameral parliamentary and Westminster system
- without a formal written constitution.

The management of public resources remains under the Crown. Furthermore, New Zealand's governance framework is influenced by obligations set forth in the Treaty of Waitangi, which was negotiated between the British and Māori in 1840.

In the late 1980's, driven by a growing free-market ideology, inspired leadership, the widespread desire to shrink central government, and facing an overly complex and prescriptive regulatory system, New Zealand undertook a massive effort to restructure its environment-related legal framework and local government structure.[32] An extensive stakeholder consultation effort led to an unprecedented alignment among business, government, and the public interest community in support of the reforms.

---

[30] Oceans Policy Secretariat, *Setting the Scene: New Zealand's oceans-related obligations and work on the international stage*, Working Paper One (Wellington: 2003) and Oceans Policy Secretariat, *International Ocean Issues*, Working Paper Eleven (Wellington: 2003).

[31] D. Rothwell and T. Stephens, *The International Law of the Sea*. Oxford: Hart, 2010.

[32] N.J. Ericksen, "New Zealand Water Planning and Management: Evolution or revolution" in *Integrated Water Management: International experiences and perspectives*, ed., Bruce Mitchell. London: Bellhaven, 1990.

Under the government sector reforms more than 800 governmental and quasi-governmental agencies were dismantled or reorganized. In their place, three primary central government agencies and 86 local government authorities (comprised of 12 regional councils based on watershed boundaries, and 74 territorial authorities called district or city councils) were established, which were collectively responsible for all aspects of environmental, natural resource, and land use planning and management. In addition, over 55 statutes and 19 sets of regulations were eliminated and replaced by a single legislative enactment – the Resource Management Act 1991 (RMA or Act) – encompassing environment, natural resources, and land use beneath one umbrella for the purpose of promoting the 'sustainable management of natural and physical resources.'

Sustainable management was defined in a way that addressed social, economic, and cultural considerations, meeting the needs of future generations, safeguarding the life-supporting capacity of natural resources and ecosystems, and avoiding, remedying, or mitigating the adverse environmental effects of human activities.

The RMA, in conjunction with local government reforms, was designed to create an 'effects-based' system in which environmental 'bottom lines' were established that could not be compromised. The system allowed government and the regulated community greater flexibility in achieving environmental outcomes as long as they operated above those bottom lines. The RMA also established a uniform system of planning and administrative processes and set forth a strategic planning hierarchy requiring statutory policy and planning documents developed at the central, regional, and district/city government levels.

In the early 1990s, the scientific community considered New Zealand's approach to catchments as in the forefront in the creation of an integrative approach to coastal management.[33] New Zealand now needs a new era of marine policy development that reflects international best practice, and builds on its history of environmental policy innovation.[34] The country can draw from experience in catchment-based planning with a renewed focus on integrative development strategies and the creation of ecosystem-based marine plans and programmes.[35]

Marine policy innovation requires a strengthening of the role of regional councils to address the land-sea interface and the range of problems associated with water pollution and increased use of marine areas in the territorial sea. In addition, marine policy innovation requires leadership and the political will to strengthen the role of central government in planning, management, and programmatic development.

Today, most marine management in New Zealand is regulatory. While some aspects of fisheries management have been contracted out the sector remains a regulated industry. Co-management and collaborative approaches to marine planning and decision-making may become more prevalent in future policy development.[36] Ultimately a combination of management tools and policy instruments

[33] H.G. Rennie, "The Coastal Environment", *Environmental Planning in New Zealand,* P.A. Memon and H.C. Perkins, eds. Palmerston North: 1993. Chapter 7 provides a detailed on the development of integrated coastal management (ICM) in New Zealand under the Resources Management Act of 1991.

[34] Raewyn Peart, Kelsey Serjeant, and Kate Mulcahy, *Governing Our Oceans: Environmental reform for the exclusive economic zone.* Auckland: Environmental Defence Society Policy Paper, 2011.

[35] Hauraki Gulf Forum, *Spatial Planning for the Gulf: An international review of marine spatial planning initiatives and application to the Hauraki Gulf* (2011).

[36] J. Vince and M. Haward, "New Zealand oceans governance: Calming turbulent waters?" 33 *Marine Policy* 2009: 412.

are needed – including the use of market-based, regulatory, collaborative, and co-management tools and instruments.

2.3.1 A Window of Opportunity

Early development of an integrated, ecosystem-based approach to oceans policy in New Zealand resulted from concern that existing legislation and regulation dealing with the ocean jurisdiction did not provide an integrated or holistic approach. A 'window of opportunity' opened in 1999. Following the New Zealand election of 27 November 1999, when a new Labour government took office, the 'first wave' of early support for action on management of New Zealand's marine jurisdiction occurred when the Parliamentary Commissioner for the Environment released the report, *Setting Course for a Sustainable Future: The Management of New Zealand' Marine Environment*, in December 1999.

Despite the early interest in the development of oceans policy in the late 1990s, the process stalled in 2003, only to be reignited to some degree in 2005. It is assumed that the primary reason for the termination of the development of a new oceans policy framework was the debate over Māori rights to coastal and marine resources in 2003. Government took the view that issues regarding ownership of the foreshore and seabed between Māori and the Crown needed to be resolved before further development of new oceans policy.

To some degree this issue has been resolved by the Marine and Coastal Area (Takutai Moana) Act 2011, which declares the foreshore and seabed area a commons incapable of ownership, protects public use rights (access, recreation, navigation and fishing), and re-establishes the right of Māori to claim customary marine use rights and title.[37] The Marine and Coastal Area Act does not provide for ownership, Māori or otherwise, but provides for non-ownership title and significant input into RMA consent processes within the titled area, which is not the same as the common idea of control through ownership.

A general summary of marine-related bills, policies, and events that will likely influence future policy development is described below.

- Over the last ten years governments have granted licences and permits to explore offshore oil and mineral resources. These include: two permits for mining petroleum; 21 permits for exploring for petroleum; a prospecting licence for phosphate on the Chatham Rise; and a prospecting licence for iron sands off Taranaki.
- In August 2007 the first step towards a legislative component to the oceans policy was explored through the release of the discussion paper *Improving Regulation of Environmental Effects in New Zealand's EEZ*. Instead of an 'umbrella act', the discussion paper recommended two options: the establishment of legislative mechanisms focused on filling key gaps in EEZ environmental regulation and promoting a consistent approach across statutes, including the assessment of cumulative effects; or the development an entirely new regime for managing all activities in the EEZ.

[37] R. Makgill and H. Rennie, "The Marine and Coastal Area Act 2011", *Resource Management Journal,* April 2011: 1, 2-7; and R. Makgill, *Feeling Left out at Sea? Navigating no ownership, customary rights & resource management.* 2011, available at: http://www.nsenvironmentallaw.com/resources/MCAA_Robert_Makgill.pdf

- The Resource Management (Simplifying and Streamlining) Amendment Act 2009 sets out several amendments which make up the first phase of the review of the Resource Management Act 1991 (RMA). In the view of the Minister for the Environment, this first phase improves the resource consent process by, among other things, restricting opportunities for frivolous, vexatious and anti-competitive objections, and having projects of national significance considered at a national level. Work has begun on the more complex second phase of review, which aims to have central government provide better direction for regional councils and to improve alignment of the RMA with existing legislation. The second phase also aims to improve the management of infrastructure, urban design, aquaculture (including improved allocation of coastal space) and water (including both quality and allocation).
- The passing of the Marine and Coastal Area (Takutai Moana) Act (MCCA) on 24 March 2011 established a new regime for recognition of customary rights and title over the foreshore and seabed (see note above).
- The Exclusive Economic Zone and Continental Shelf (Environmental Effects) Bill was introduced on 24 August 2011 and referred to Select Committee. The Environmental Effects Bill intends to fill the gaps in the regulation of 'environmental effects' for the country's EEZ and extended continental shelf (ECS).[38] The Bill also provides for the development of natural resources in the EEZ and ECS, while identifying and assessing adverse effects of activities. It sets out an obligation for adverse environmental effects to be avoided, remedied, or mitigated. Environmental assessments would be developed under the new Environmental Protection Authority (EPA), which will have jurisdiction over permitting uses within the marine area beyond 12nm. This Bill would put in place an effective consenting process for oil and gas exploration, deep sea aquaculture and marine energy projects. It establishes a framework for regulations that will classify activities as permitted, discretionary or prohibited; sets out decision-making criteria that recognise biological values; and requires decision makers to take a precautionary approach when information is limited.
- The Rena tanker spilled fuel oil in the Bay of Plenty in October 2011.
- On 1 October 2011 aquaculture legislative reforms came into effect. The reforms make changes to the Aquaculture Reform (Repeals and Transitional Provisions) Act 2004, the Fisheries Act 1996, the Māori Commercial Aquaculture Claims Settlement Act 2004, and the Resource Management Act 1991. These legislative reforms provide a framework for the aquaculture industry. The law maintains protections for the environment and balances aquaculture with other uses of the coastal space.

There are also proposals made by members of non-governmental organizations that encourage a new approach to marine governance. These proposal include calls for the creation of a special Royal Commission on Oceans; the development of pilot projects for integrated marine spatial planning (e.g., for the Hauraki Gulf); and the establishment a separate overarching Ministry for Oceans that could include a new ocean council and ocean strategy for the EEZ.[39]

---

[38] Office of the Minister for the Environment, Cabinet Economic Growth and Infrastructure Committee, *Proposal for Exclusive Economic Zone Environmental Effects Legislation* (June 2011).

[39] These proposed activities were discussed during workshops for this project.

2.3.2 Recent Marine Planning Activity

It is also important to note the progress made in the natural resource sector (NRS) of central government to establish a more integrated marine management framework with more inclusive decision-making. These recent activities largely focus on resource allocation. There is much to commend regarding the country's marine management and planning efforts. With respect to the EEZ, a number of planning efforts are underway, including the Department of Conservation's PlanBlue, and the extensive research undertaken by the Ministry of Forestry and Agriculture (formerly the Ministry of Fisheries) to facilitate planning for biodiversity protection in the EEZ.[40] These developing planning activities include the mapping of biodiversity values and the trawl footprint in the EEZ, and new conservation strategies that include assessment of marine ecological integrity and ecosystem services. New Zealand is also recognized as a leader in the management of commercially valuable fishes[41] and in integrated coastal management.[42]

New Zealand is moving toward international best practice in the area of marine conservation planning. For example, the Department of Conservation's (DOC) Marine Unit is currently developing key science themes under PlanBlue, a new ecosystem-based conservation management plan.[43] The Marine Conservation Team has developed a new strategy for DOC's conservation management of New Zealand's marine environment and includes three research themes: marine conservation planning; ecological integrity; and mapping and mitigation of threats to the marine environment. The development of marine ecological indicators to assess the integrity of marine ecosystems and the services they provide is an encouraging sign that the country has begun to develop a strategic plan to assess ecosystem services and maintain the integrity of marine ecosystems. DOC's effort to strengthen and improve the department's understanding of the ecosystems services provided by healthy marine ecosystems should be supported because the strategy is a reflection of international best practice in marine planning and decision-making.

Within DOC's Marine Conservation Planning theme, SeaSketch, a platform for collaborative ocean GeoDesign is being used as the decision-making tool under PlanBlue for the Hauraki Gulf marine planning process.[44] In SeaSketch, users are able to (1) initiate a project by defining a study region, (2) upload map layers from existing web services, (3) define 'sketch classes' such as prospective marine

---

[40] A useful overview of this research commitment is given in the Ministry of Fisheries, *Fish Biodiversity Medium Term Research Plan 2007/08 to 2011/12*.

[41] New Zealand is recognised as having one of the best fisheries management systems in the world. See Boris Worm *et al.*, "Rebuilding Global Fisheries", 325 *Science* July 2009: 578. That study highlights that there is much commendable work being done worldwide to improve the status of several fish stocks. See also Jacqueline Alder *et al.*, "Aggregate Performance in Managing Marine Ecosystems of 53 Maritime Countries", 34 *Marine Policy* 2010: 468.

[42] N.J. Ericksen, "New Zealand Water Planning and Management: Evolution or Revolution", in *Integrated Water Management: International experiences and perspectives*, Bruce Mitchell, ed. London: Belhaven Press, 1990. See also R. A. Makgill and H. G. Rennie, "A Model for Integrated Coastal Management Legislation: A Principled Analysis of New Zealand's Resource Management Act 1991", 27 *The International Journal of Marine and Coastal Law* 2012: 135, 165. Makgill and Rennie describe key components of Integrated Coastal Management (ICM) policy and show how the Resource Management Act 1991 (RMA) implements ICM in New Zealand. They also provide a comprehensive overview of the basic tenets of ICM and the key planning tools that support ICM. The authors also describe the ability of ICM to address conflict in light of New Zealand's experience with the RMA.

[43] Sean Cooper and Carolyn Lundquist, "Marine Conservation in New Zealand". Presentation at the Marine Science Institute, University of California Santa Barbara, February 10, 2012.

[44] For a characterization of SeaSketch, see: http://mcclintock.msi.ucsb.edu/projects/seasketch.

protected areas, transportation zones or renewable energy sites, (4) author sketches and receive automated feedback on those designs, such as the ecological value or the potential economic impacts of a marine protected area, and (5) share sketches and discuss them with other users in a map-based chat forum.

To understand the threats and pressures on the Hauraki Gulf, DOC and other management sectors are have begun to work with stakeholders, NIWA, and regional councils to incorporate the use of SeaSketch and other planning tools in future decision-making processes. SeaSketch can collate and map information on uses of the marine environment, with goals of understanding the impacts of these threats on ecosystem goods and services that can be used to inform marine planning. In addition, DOC is developing indicators of ecological integrity that will be applicable across diverse marine ecosystems of New Zealand.

These are promising first steps toward marine ecosystem-based planning and development. The Hauraki Gulf planning effort may be an important pilot project for marine spatial planning in the country, and could provide valuable lessons in decision-making. The planning effort should be encouraged and supported across the relevant management jurisdictions and by non-governmental organizations and private interests.

This report acknowledges the important steps that DOC is taking with respect to PlanBlue – it represents a positive step in the direction of marine ecosystem-based planning and should be supported by other sectors insofar as the plan reflects international best practice. As in the case with most ecosystem-based planning efforts, serious obstacles will need to be overcome with respect to intergovernmental coordination, given the fragmented nature of marine governance. A coordinated and ecosystem-based planning effort for the Hauraki Gulf would represent an ideal pilot project to develop an integrative planning and decision-making framework at regional levels of governance.

3. INSTITUTIONAL CHALLENGES AND OPPORTUNITIES

To identify major pressures and needed management responses this study includes analysis based on the following:

- a review of the literature on the existing governance framework in New Zealand
- a comprehensive synthesis of the major findings from the scientific literature on the important principles of integrative, ecosystem-based marine governance
- case study material on offshore oil and gas development, marine aquaculture, marine life protection, and marine minerals exploration
- evaluation of marine policies and legislation
- input from four workshops and presentations in the USA and New Zealand information from a series of confidential, one-on-one and group interviews.[45]

[45] Interviews were conducted in person or by telephone during 2010 and 2011, with a selection of ocean stakeholders including academics, members of non-government organizations, regional and national resource managers, members of the public service, and representatives of major ocean industries, such as offshore oil and mining interests, and fishers. Most interviews lasted approximately one hour, while some were conducted for several hours across several days. The interviews drew from a common set of questions. Because the interviews were so varied, with different backgrounds and expertise in ocean policy, a strict script was not used. Rather, the conversation flowed in an uninterrupted pattern while covering as many core questions as possible.

This section describes the major findings from the analysis of materials and information gathered by interviews, case studies, workshops, government and technical documents. Based on an analysis of these materials, there is general support for not only the adoption of some type of integrated, holistic and comprehensive permitting authority, but the need for New Zealand central government to develop new principles and approaches that support a multi-sector and ecosystem-based approach to marine governance. There is also a general sentiment that successful integrative ocean governance means overcoming particular institutional and structural challenges, such as those related to institutional capacity and capability, information sharing, regulatory authority, improving the role of science and scientists, new enforcement and monitoring strategies, and the need for collaboration and new partnerships between members of the scientific community. Interviewed stakeholders and policymakers also note that there is a need to strengthen the capacity and capability of regional councils to address issues associated with the land-sea interface and the territorial sea.

The following major institutional challenges were identified:

- fragmented ocean governance
- offshore energy development, fossil fuels, and minerals issues
- marine life protection
- the role of regional councils in marine management.

3.1 Fragmented Ocean Governance

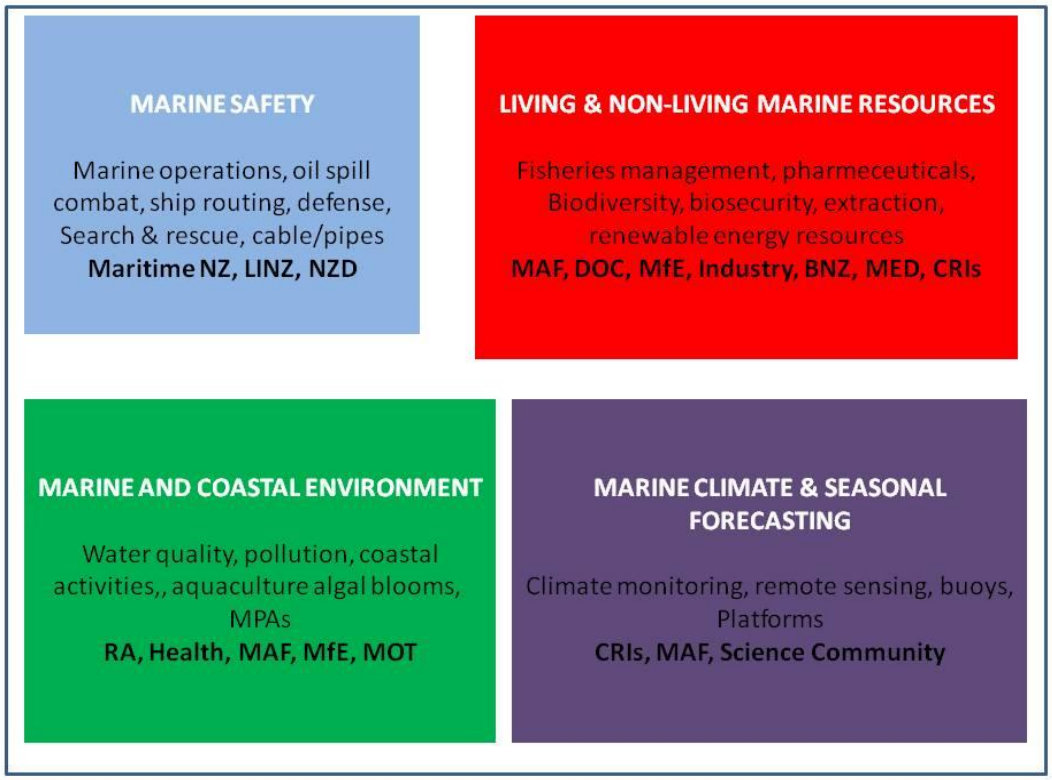
Marine governance in New Zealand shows symptoms of the problem facing many states – resource management remains highly 'balkanized'. Governmental attempts to mitigate or adapt to particular resource uses on a sector-by-sector approach has been proven to be ineffective and unresponsive to the cumulative and synergistic impacts and pressures from human activities. The management challenge is not simply a matter of improving the management of commercial or recreational fishing activities or permitting marine areas to be used for oil, gas or minerals exploration and development offshore. Some typical statements from interviewees on this issue are:

- 'There is no governance framework that cuts across sectors, values, and interests – there is no ocean policy that can remedy spatial conflicts'
- 'We are losing accountability and responsiveness'
- 'We need a public trust responsibility clearly defined for the global commons'
- 'There is no point to creating new structures without institutional capacity and resources'
- 'Sectors are going parallel, we need a more holistic approach'
- 'There are no ways of reconciling competing rights for ocean space'
- 'Government has not articulated its standards and criteria for ocean governance'
- 'There are tensions between recreational and commercial fishing activities and Māori interests'
- 'Marine policy is industry-driven, and there is a breakdown between marine industries and science'
- 'There is a lack of incentives to develop comprehensive marine policy; the benefits of a comprehensive approach need to be made clearer'

- ‘There are some agreement on goals and objectives of new comprehensive ocean governance, but there is no agreement on outcomes desired’.

Figures 3 and 4 depict the major management sectors of New Zealand as of 2011, and the major jurisdictional boundaries of key marine policies.[46]

Figure 3. Marine Management Sectors



3.2 The Role of Marine Science and Scientists

Evidence-based policymaking is one goal of marine planning and decision-making. Sir Peter Gluckman, the Chief Science Advisor to the Prime Minister, notes:

> It is important to separate as far as possible the role of expert knowledge generation and evaluation from the role of those charged with policy formation. … A purely technocratic model of policy formation is not appropriate in that knowledge is not, and cannot be, the sole determinant of how policy is developed. We live in a democracy, and governments have the responsibility to integrate ... societal values, public opinion, affordability and diplomatic considerations while accommodating political processes.[47]

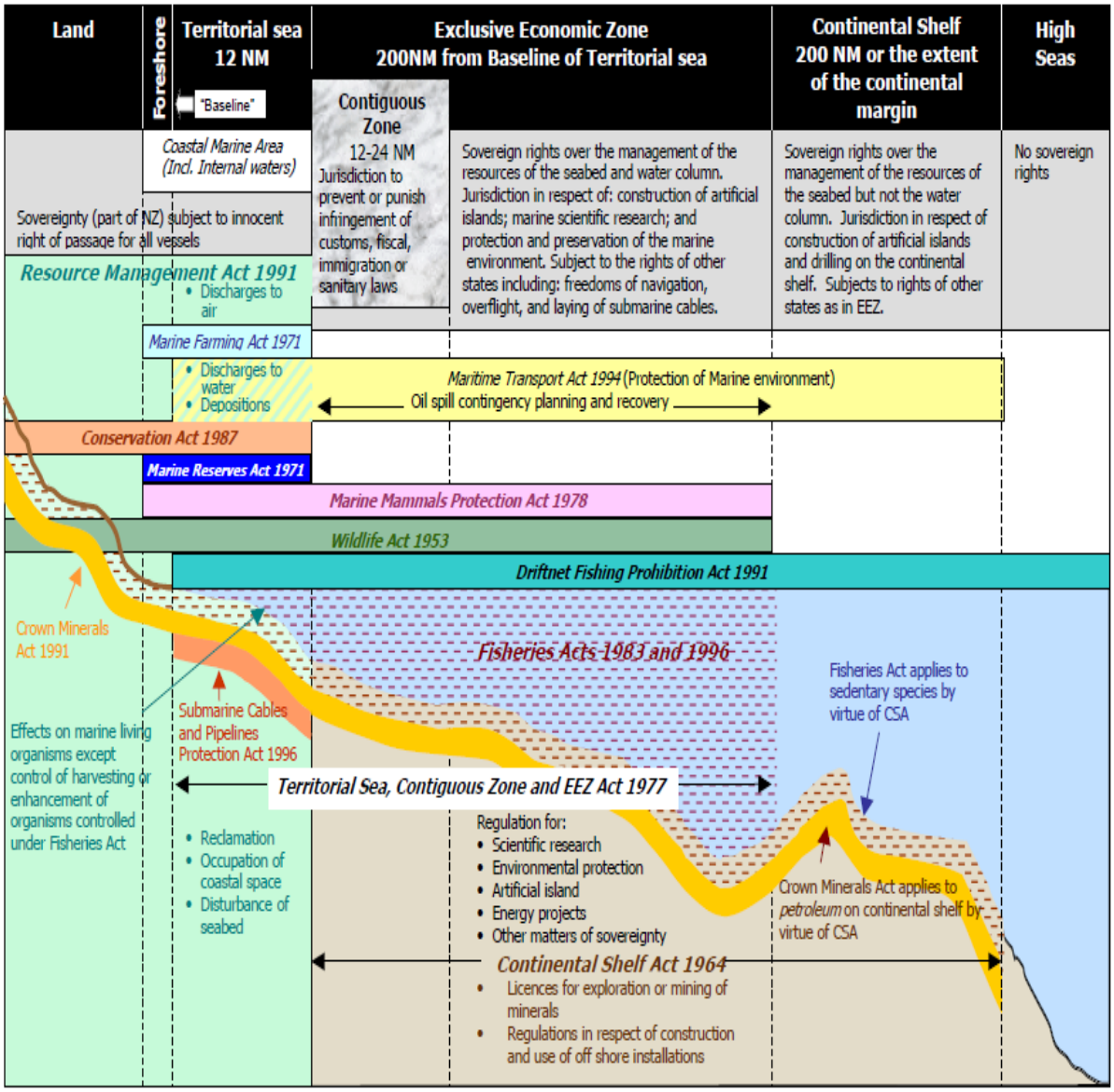
---

[46] For a complete review of the major policies and marine management jurisdictions, see *Oceans Policy Stocktake Part 1 – Legislation and policy* (Review Prepared for the Oceans Policy Secretariat, November 2002) available at http://www.mfe.govt.nz/publications/oceans/stocktake-report-dec02/report.pdf

[47] Sir Peter Gluckman, *Towards Better Use of Evidence in Policy Formation: A discussion paper*. Office of the Prime Minister’s Science Advisory Committee: 2011. Available at http://www.closingthegap.org.nz/wp-content/uploads/2011/07/Gluckman-evidence-based-policy-disc.-paper20112.pdf.

Figure 4. Schematic Representation of Jurisdictional Boundaries of Key Statutes

(Note: the legislative landscape of the oceans is highly complex and, of necessity, has been simplified to present an overview of jurisdictional boundaries.)



Source: Oceans Policy Stocktake Part 1 – Legislation and Policy (Review Prepared for the Oceans Policy Secretariat November 2002), page 17.

Maintaining the objectivity of science so that scientists can inform policy decisions in diverse socio-ecological settings is one goal of evidence-based decision-making and planning. As the Chief Science Advisor recommends, the utilization of science for decision-making should be based on the unbiased advice 'free from conflicts of interest, provided apolitically and independent of any particular end-

user perspective'.[48] Gluckman states that it is necessary to have an 'acceptance of the notion that science is a process that establishes the incontrovertible and absolute fact'.[49]

Scholars describe scientists and their use of biophysical and social sciences as a fundamental part of marine planning and decision-making.[50] Scientific information including the use of TEK can inform the policymaking process but there is no guarantee that additional scientific information and a strengthening of knowledge about specific ecosystems and human activities can resolve the inevitable conflicts that often arise over resource use and marine life protection. Indeed, there may be differences between the methods used by diverse members of scientific communities and how scientists interpret results from their marine studies. For example, an earth scientist analyzes global climate change through the lens of geologic time. Atmospheric scientists take many detailed measurements of the present-day climate and believe that such measurements are the key to predicting climatic change. Both approaches are valid. However, the results of the two models may yield different conclusions and advocates of each approach may disagree with each other.

The translation of scientific and traditional ecological knowledge into a form that is accurate and serviceable for policy, management, or education purposes is influenced by the values that are held by members of resource agencies, user groups and the public.[51] Scientists may raise issues and problems that marine managers may not want to know about – as it requires them to allocate scarce resources to resolving them – and because new information may inevitably involve conflict between diverse interests that marine managers and planners would prefer to avoid if possible. In other words, unfavourable information may threaten existing intergovernmental relationships and contribute to conflicts over resource allocation and access to marine space. For instance, marine conservation science notes the importance of large networks of reserves to protect marine biodiversity, but there are economic interests and marine managers who may not support the science of reserve designation.[52]

In addition, science does not always answer the questions that matter to user groups because the research community does not understand such needs or recognize them as priorities. Understanding and appreciating the significance of the ecological functions is generally low among the general public and decision makers. Policymakers may not view science as relevant; therefore, scientists do not always have a seat at the table in contexts in which they could make fundamental contributions.

Scientific studies are not generally seen as persuasive communications, but in practice they are. Scientists and their studies make factual claims and sometimes offer policy recommendations. In the field of marine ecology they also make value-based judgments.[53] Scientific claims and recommendations may be disputed by other scientists or by non-scientists who participate in the marine planning and decision-making processes. Both scientists and their critics are attempting to persuade the decision makers to believe their version of the facts and accept their recommendations. Social scientists studying persuasion have found a strong tendency among people to accept scientific information that is consistent with their ideologies and values, and to reject messages that are

---

[48] *Idem*, p. 14.
[49] *Idem*, p. 7.
[50] K.S. Shrader-Frechette and E.D. McCoy. *Method in Ecology: Strategies for Conservation* (Cambridge, 1993).
[51] For a characterization of the diverse value orientations associated with the role of science and scientists in marine reserves decision making in New Zealand, see David N. Wiley, *Increasing the Social Power of Scientific Information Used for Decisions on Marine Protected Areas in New Zealand.* Fulbright New Zealand: 2011.
[52] *See*, for instance, M.V. McGinnis, "Negotiating Ecology: Marine bioregions and the destruction of the Southern California Bight", 38 *Futures* 2006: 382.
[53] Shrader-Frechette and McCoy, 1993, *op cit.*

inconsistent with these value orientations.[54] Research investigating the influence of knowledge and beliefs find that prior beliefs (e.g., recent declines in fish populations are natural fluctuations) have a substantial influence on the acceptance of information in planning.[55] People will be more likely to accept scientific recommendations and trust scientists when the scientific recommendations are consistent with their values and core beliefs.

Therefore, we cannot expect that scientific information will be accepted without challenge in the political process. This is especially so in highly charged political debates over resource use and marine life protection. The scientific and technical aspects of disputes over issues such as access to marine resources, the legal right to use a resource, or the protection of a 'public good' are part of the marine planning process. Underlying values are the ultimate arbiters of political decision-making, even when a plethora of scientific information and facts are available. Substituting scientific and technical information does not void the making of value choices or the conflicts that may exist between competing interests. Rather, it more fully informs the value choices that need to be made by creating data-driven points of reference.

Conflicts over the use and protection of marine areas are also rarely caused by scientific or technical information per se. More often they tend to be about perceived or actual competition over interests; different criteria for evaluating ideas or behaviours; differing goals, values, and way of life; misinformation, lack of information, and differing ways of interpreting or assessing data; and/or unequal control, power, and authority to distribute or enjoy resources.[56] Stakeholders and resource managers often use scientific and technological issues as a strategic or tactical weapon.

There were several issues and concerns raised by interviewees regarding the use of science and the role of scientists in marine planning and decision-making. There is a perceived lack of interface between scientists and policymakers. There is also a perceived lack of consultation and buy-in with respect to the best available scientific information. Difficult marine issues are not often addressed in a 'public' process. Several interviewees remarked:

- 'Science has been divisive since 1991; highly competitive, with very little integration across disciplines'
- 'There is very little interface between scientists and policymakers'
- 'Science is part of political horse trading; it supports one's perspective in politics'
- 'The rhetoric of the scientific process is that it is clean, but science has become an industry'
- 'Research is under-funded, and industry gets taxed for research'
- 'There is a need for a decision-making framework that addresses scientific uncertainties'
- 'There is limited national-scale scientific information'
- 'Information is not available and accessible'

---

[54] R.M. Alvarez and J. Brehm. *Hard Choices, Easy Answers: values, information, and American public opinion*. Princeton: 2002.

[55] R.J. MacCoun and S. Paletz, "Citizens' Perceptions of Ideological Bias in Research on Public Policy Controversies", 30 *Political Psychology* 2009: 43.

[56] Peter S. Adler, "Science, Politics, and Problem Solving: Principles and practices for the resolution of environmental disputes in the midst of advancing technology, uncertain or changing science, and volatile public perceptions", 10 *Pennsylvania State Environmental Law Review* 2012: 323.

- 'Data is privatized but it is supposed to be publically available'
- 'Lack of communication across scientific communities threatens progress'
- 'There has been an erosion in the role of science in planning and decision-making'
- 'The source of funding needs to be rethought to increase the certainty of scientific support'
- 'There is a need for data and information sharing to address increasingly complicated problems or issues'.

3.3 Offshore Energy Development, Fossil Fuels, and Minerals Issues

New Zealand is a country surrounded by eight massive sedimentary sub-ocean basins. The largest basin, and the one geologists say has the greatest potential, is the Great South Basin. The Great South Basin holds more than 100,000 square miles of potential oil and gas reserves. (Exxon-Mobil pulled out of exploring the field in October 2010.)[57] The current explorers of leased marine areas are Discovery Geo, Global Resources, L&M Energy, TAG, Kea Petroleum, Anadarko, Petrobras, Westech, Horizon Oil. The current producers and explorers are AWE, Todd, OMV, Origin, Greymouth, NZOG and Shell. The Ministry for Economic Development (MED) has leased marine areas for offshore oil exploration.[58] The petroleum exploration permit for 52707 Petrobras off the east coast of the north island represents an area of 12,330 km^2 in marine waters to a depth of 3000m. The Crown is also encouraging oil development by investing through MED $35M in frontier seismic surveying operations.

As of 2011, the existing offshore production is Maui A and B; Pohokura; Tui; Maari/Manaia; and Kupe. Oil production represents the 4th largest export earner (2009), employing roughly 1500 direct employees, with $985M in company tax and paid royalties. The Maui field produced $3B in export earnings in 2009. Overall, the infrastructure for existing offshore oil production and associated onshore activities include: five offshore facilities; ten onshore facilities; offshore and onshore pipelines; and the marine space used for development. For instance, the Kupe field covers about 15 hectares. The Maui platform is at a depth of approximately 110m located 35km offshore. The gas being developed is 3000m below the seafloor. There remain concerns that New Zealand is not equipped to address the risks of a major oil spill off Taranaki.[59]

The MED has recognized a number of institutional constraints associated with future offshore oil and gas activity. In a recent agency review conducted in 2010, MED found that there are limited resources available at present to meet statutory needs. The current institutional capacity and capability is insufficient to meet objectives for petroleum and mineral estates. There is also difficulty in attracting and retaining skilled staff with the necessary professional expertise in offshore minerals development. There is a need for more staff and resources over the next 2-3 years.

There is public opposition to oil drilling and increasing pressure to protect additional marine areas from the impacts of potential oil spills.[60] As Bob Zuur from World Wildlife Fund-New Zealand writes, 'And if New Zealand is serious about being a world leader in environmental protection, we

---

[57] James Weir, "Manaia field starts production at 4000 barrels a day", *The Dominion Post,* 14 October 2010, at C1.

[58] Ministry for Economic Development, *New Zealand Petroleum Reserves,* August 2010.

[59] Rob Maetzig, "Taranaki at risk of a major marine spill", *Taranaki Daily News,* 4 February 2011, at 5.

[60] "East Cape oil-drilling plans raise concerns", *New Zealand Herald,* 13 October 2010. See also Kim Knight, "What lies beneath", *Sunday Star Times,* 29 May 2011, at C4-C5.

must also have laws in place setting out principles and standards for managing marine resources and the ocean environment as a whole'.[61]

Proposed marine mining exploration and development shares many of the policy-related concerns and issues noted above. Marine mining is limited by technical and economic feasibility and constraints.[62] But as the technology for marine mining development continues to be explored, the potential economic return from proposed marine mining activities continues to foster interest from industry. The range of economic return from potential mining activity in New Zealand's marine environment varies considerably. The Crown is funding and supporting the exploration of a range of minerals, including the extraction of deep-sea methane hydrates. There has been no other such development in the world. The environmental impact of marine mineral resource development and mining, however, remains significantly uncertain and will be influenced by technology. Scientists have only begun to understand the ecology of the benthic areas of the country.

Despite this scientific and technological uncertainty, large areas off of New Zealand have been permitted and leased by MED for marine mining exploration. For instance, Trans-Tasman Resources Ltd received an additional licence in January 2011 to prospect for iron ore in the continental shelf; the licence granted by the Crown Minerals Group covers 3,314 km^2 of areas off the west coast of the north island. London-based Neptune Minerals has three prospecting permits covering more than 50,000 km^2 of New Zealand's continental shelf, northeast of the Bay of Plenty.[63] As with proposed offshore oil and gas activity, there remains a strong and building opposition to these activities in many places. It is not uncommon to see 'No Marine Mining' signs posted along such coastal towns as Raglan. Particular concern is over the potential mining of sensitive areas associated with the Kermadec Islands and the mining of iron sands off the west coast of the north island.

Particular ecological concerns are associated with the impacts and effects of mining operations on the sea floor or benthic areas.[64] Existing Benthic Protected Areas (BPA) do not protect these designated areas from marine mining. Even though the Kermadec Islands are part of the existing BPA network, marine mining is not restricted. Marine ecosystems and particularly life at the seabed of every depth of the ocean floor have yet to be explored and inventoried. The significance of these marine areas is poorly understood. Deep sea mining can cause threat to these fragile ecosystems.[65] Malcolm Clark, a scientist with NIWA who has extensive experience in studying the benthic and deep sea areas around New Zealand, writes, 'We need to describe the natural seafloor biota before any changes are caused by human activities, and to evaluate the full spatial footprint of the predicted impacts.'[66]

Interviews indicate there remain critical issues and concerns with respect to oil and minerals development in the EEZ. There is no existing regulatory framework to address particular physical

---

[61] Bob Zuur, "Think first, drill later", *The Dominion Post*, 23 June 2010.

[62] James M. Broadus and Porter Hoagland III, "Marine Nonfuel Minerals in the US Exclusive Economic Zone: Managing information as a resource", 13 *Ocean & Shoreline Management* 1990: 275.

[63] Anthony Doesburg, "Hot prospects in deep water", *New Zealand Herald*, 16 November 2009.

[64] Commercial fishing operations have extensively trawled the continental shelf and sea floor of the EEZ. The impacts of commercial fishing activity should be carefully evaluated and assessed with respect to current and future disturbance of the benthic marine areas by the mining and offshore oil and gas industries. There are likely synergistic and cumulative effects on marine ecosystems that are caused by commercial trawling operations and other resource-related exploration and development activities.

[65] NIWA, "Ocean's treasure", *Water & Atmosphere*, February 2011, at 10-19.

[66] *Idem*, p. 17.

constraints or potential cumulative impacts of proposed offshore energy (from exploration to decommissioning of structures) or minerals (e.g., benthic areas) extraction in the EEZ. An administrative framework is needed to address health, safety, and environmental constraints in energy and minerals decision making and planning. There is also a lack of contingency planning and emergency response to potential offshore oil spills. Finally, there is also a need for a comprehensive policy to address the decommissioning of existing offshore oil platforms and associated structures. As stated in interviews:

- 'A more holistic approach to offshore minerals development is needed'
- 'Need expertise, credible professionals; we need independent regulators'
- 'There is a lack of expertise or legal authority to implement environmental conditions across sectors and to enforce regulatory controls'
- 'There is a lack of depth in the public sector to address marine issues; distrust, conflict and fear drive the process'
- 'The capacity of the civil service to review permitting of oil and monitor existing activities are major problems'
- 'The emergency response is not clear, there are no contingency plans to address spills'
- 'There seems to be an overlap between the areas that can be mined offshore and those areas that are fished – this will need to be worked out'.

3.4 Marine Life Protection

The scale or level of marine life protection in New Zealand remains an issue of debate. This debate reflects different values and interests held by scientists and managers of the marine ecosystems of New Zealand.[67] A range of planning tools and zoning strategies, including the designation of Marine Protected Areas (MPAs), and other protection and management measures have been used in New Zealand. The New Zealand Marine Protected Area Policy is currently one of the major drivers of biodiversity protection, as it was developed, in part, to deliver the country's obligations under the Convention on Biological Diversity. Key components of the MPA Policy are:

- A consistent approach to classification of the marine habitats and ecosystems
- Mechanisms to co-ordinate a range of management tools
- Inventory to identify areas where MPAs are required

[67] There remain significant differences in opinions over the existing level of marine life protection provided by marine reserves and other protective measures. These differences are primarily based on the different criteria and values used to scientifically assess the level of coverage of existing protective measures. For instance, the level of protection provided by BPAs in the EEZ remains a major issue of scientific debate. A recent report by B.R. Knight, R. Sneddon, W.M Jiang, *New Zealand's Marine Protected Areas: Classification under the IUCN protected area scheme* (Prepared for Ministry of Fisheries, Cawthron Report No. 2042, 2011) notes a large amount of sea area protected under the criteria established by the International Union of the Conservation of Nature (21.22% for territorial waters and 30.59% of the New Zealand EEZ). This is a very large increase from figures commonly quoted for New Zealand marine protected areas by other marine scientists and DOC (7% and 0.3% respectively). The report highlights some of the weaknesses and ambiguities in New Zealand's classification system. This debate over the level or scale of protection should be resolved by a more integrated, coordinated and ecosystem-based approach to marine life protection. A more comprehensive and ecosystem-based monitoring program to assess the effectiveness of the existing protective measures is warranted, with particular focus on the substantive long-term ecological outcomes of these protective measures on biodiversity that should include a range of indicators, such as the abundance and distribution of marine mammals and birds.

- A nationally consistent basis for planning and establishing new MPAs.[68]

The New Zealand Marine Protected Area Policy does not currently allow for establishing marine reserves outside the territorial sea.[69] A discussion of the full suite of protection measures that are available or in place, such as marine mammal sanctuaries, seamount closures, marine components of nature reserves, is beyond the scope of this report.[70] But it is important to recognize that marine reserves are just one example of the type of protective measures used in New Zealand. New Zealand has created particular plans to protect species, such as the listing of marine species as protected under the Wildlife Act. Other protection and management mechanisms can be or have been established in the EEZ, including marine mammal sanctuaries and fisheries closures, such as seamount closures and BPAs. There are also other protected measures in place, such as the marine components of nature reserves. The existing range of protective measures is ambiguous and unclear.

Tracking the trend in the abundance and distribution of important keystone species, such as marine mammals, suggests the ultimate success of the existing protective measures. There is growing uncertainty about the future of special status species including the Maui dolphin, New Zealand sea lion and other keystone species. According to Linklater the ongoing decline of Maui dolphin, one of the most endangered marine mammals of New Zealand, shows that current measures are not sufficient to protect the breeding population. He notes:

> If we lose Maui dolphin it is likely that the effects will cascade through the food chain to radically change the community of plants and animals off our coasts. The loss of fish predators like dolphin can actually reduce ocean productivity for fisheries in the long-term ... We need to understand that the loss of dolphin can be a bad thing for the economy as well as a bad thing for the quality of our environment and our enjoyment of it ... The slowness with which the fishing industry and our political representatives act is a part of the problem.[71]

A keystone species is a species that has a disproportionately large effect on its environment relative to its abundance. Marine mammals and sea birds play a critical role in maintaining the structure of a coastal and marine ecological community, affecting many other organisms in an ecosystem and helping to determine the types and numbers of various other species in the community.

Overall, there is increasing debate in the country about the need for stronger biodiversity protection measures and whether or not the existing range of protective measures support the value of marine life protection.[72] Sea birds and marine mammals are especially vulnerable to many marine activities, such as offshore oil and gas activity and commercial fishing operations, and climate-related disturbance.

---

[68] Department of Conservation and Ministry of Fisheries, *Marine Protected Areas Policy And Implementation Plan* (2005) available at http://www.biodiversity.govt.nz/seas/biodiversity/protected/mpa_policy.html#mpapolicyplan

[69] The Marine Reserves Act 1971 allows marine reserves to be set up within the 12-mile limit. It is important to note that there changes incorporated in the Marine Reserves Bill that has been under consideration for ten years sets forth establishment of marine reserves in the EEZ. The Bill published in June 2002 is available at: http://www.doc.govt.nz/upload/documents/about-doc/role/legislation/marine-reserves-bill.pdf

[70] See B.R. Knight *et al.* (2011), *op cit.*

[71] Wayne Linklater, "Maui dolphin—act now or lose a species", *Victoria News*, 14 March 2012. With respect to other New Zealand marine mammals, see B.C. Robertson and B.L. Chivers, "The Population Decline of the New Zealand Sea Lion Phocarctos Hookeri: A review of possible causes", 41 *Mammal Review* 2011: 253.

[72] See note 66.

The scientific literature on the benefits of MPAs also shows that the expansion of reserve networks and other protective measures, including the use of marine zoning strategies, is needed as a climate adaptation strategy.[73] Scientists have shown that small marine reserves and other protective measures rarely protect keystone species, such as sea birds and marine mammals, which are vulnerable to large-scale changes in the marine environment.[74]

The current level of marine life protection provided by existing statutes and plans also continues to be debated. A number of studies have noted that New Zealand has thus far designated less than 10% of its marine area as MPAs. By the end of 2010 only 0.3% of the EEZ and 7.6% of the territorial sea was protected in some type of MPA, and most of this protection exists in the Kermadec Marine Reserve and the Auckland Islands Marine Reserve: these two areas represent approximately 99% of the total existing protected area in New Zealand marine waters.[75] The existing marine reserves associated with Kermadec Islands protect marine life and natural features within the territorial sea around the Islands. With respect to the benthic protected areas in the EEZ, scientists indicate that these areas are of low habitat value for biodiversity protection.[76]

The Department of Conservation and former Ministry of Fisheries recently completed a gaps analysis and inventory of marine protected areas in New Zealand waters (one of the key tasks under the New

---

[73] R.T. Kingsford and J.E.M. Watson, "Climate Change in Oceania: a synthesis of biodiversity impacts and adaptations", 17 *Pacific Conservation Biology* 270 (2011).

[74] MPAs will need to be designated as one tool among a range of other policy instruments. In addition, MPAs can contribute to an ecosystem-based approach to coastal marine governance by reducing the adverse impacts of climate disturbance, but this contribution is based on the scale, design and management of connected networks rather than individual protected areas. See also G. Kelleher, *Guidelines for Marine Protected Areas* (1999). Kelleher argues that MPA design and governance should be used in conjunction with other management strategies, such as stronger limits on the use of fisheries, sustainable coastal development, the reduction in nutrients and other forms of land-based pollution. There has also been a characterization of the importance of MPAs as potential areas for future refugia in D. Herr and G.R. Galland, *The Ocean and Climate Change: Tools and guidelines for action* (2008). See also B.S. Halpern *et al.*, "Placing marine protected areas onto the ecosystem-based management seascape", 107 *PNAS* 18312 (2010) who describe the importance of MPAs as a tool for the further development and implementation of coastal marine ecosystem-based planning and marine zoning. Halpern and colleagues found that fishing activities are responsible for more than fifty percent of the overall impact to coastal marine ecosystems across the world, and that in some areas, more than eighty percent of the cumulative impact on ocean health comes from over-fishing (at 18314). Additional support on the need for large networks of MPAs for birds and mammals can be found in A. Hastings and L.W. Botsford, "Comparing Designs of Marine Reserves for Fisheries and for Biodiversity", 13 *Journal of Applied Ecology* 2003: S65; C.M. Roberts *et al.*, "Application of Ecological Criteria in Selecting Marine Reserves and Developing Reserve Networks", 13 *Journal of Applied Ecology* 2003: S215; and *Global Ocean Protection: Present status and future possibilities* (C. Toropova, *et al.*, eds. IUCN, 2010; http://data.iucn.org/dbtw-wpd/edocs/2010-053.pdf. The Global Oceans Protection Report accounts for the level of protection of New Zealand waters. There remains some discrepancy over the level or scale of protection provided by the marine reserves that have been established in the ocean jurisdiction of New Zealand.

[75] In 2007 New Zealand declared over 1 million km^2 of Benthic Protection Areas in off-shelf waters. These sites were declared for biodiversity protection and while their focus is to prevent trawling on the benthos and overlying 100 m, there are also regulations on fishing activities in the entire water column. These sites are in the World Database on Protected Areas (WDPA). The WDPA lists the Kermadec Benthic Protection Area, extending over some 617,000 km^2, as the world's largest MPA.

[76] J. Leatherwick *et al.*, "Novel Methods for the Design and Evaluation of Marine Protected Areas in Offshore Waters", 1 *Conservation Letters* 2008: 96-99. See also J. Leatherwick, K. Julian, and M. Francis, *Exploration of the Use of Reserve Planning Software to Identify Potential Marine Protected Areas in New Zealand's Exclusive Economic Zone*, NIWA Client Report HAM2—6-064.

Zealand Marine Protection Act Policy).[77] The study provides a list of marine areas that meet the protection standard defined in the New Zealand Marine Protected Areas Classification, Protection Standard and Implementation Guidelines, and which can therefore be considered to be marine protected areas. The completion of this analysis and inventory will likely inform future implementation of marine protected areas and other protective measures in the ocean jurisdiction of New Zealand.

With respect to the above government issues, those interviewed expressed the following:

- 'Levels of biodiversity protection are inadequate: there is a need to identify and protect special areas'
- 'We need to upgrade our ability to protect marine life'
- 'There is a lack of resources provided to monitor biodiversity'
- 'We need to work together to create partnerships across sectors and CRIs to monitor and protect marine life'
- 'The regulatory option in management and resource protection has been removed from the tool box'.

3.5 The Role of Regional Councils

One general view expressed by many interviewees is that regional councils lack the institutional capacity to effectively and responsibly address issues associated with the coastal-marine interface or, more generally, marine areas out to 12 nm. The marine programmes (e.g., water quality testing, marine park designation, etc) established by regional councils vary dramatically and are dependent on the levels of resources that are available. A number of other issues and concerns associated with regional marine planning and decision-making were expressed, including:

- 'There is a lack of place-based ownership'
- 'We need good freshwater policy to support marine planning'
- 'Many are frustrated by regional planning processes'
- 'Allocation issues for marine areas are very different from those to address land use issues'
- 'A potential problem exists when you increasingly rely on regional decision-making and at the same time centralize management and planning'
- 'Regional councils have been captured by water interests and the dairy industry'
- 'There is very little expertise in oceans at regional levels of governance'
- 'A major overhaul in personnel working on the ground has taken place during the last several years'
- 'Planning processes are closed'

[77] Department of Conservation and Ministry of Fisheries, *Marine Protected Areas Classification, Protection Standard and Implementation Guidelines*, 2008: available at http://www.biodiversity.govt.nz/pdfs/seas/MPA-classification-protection-standard.pdf

- 'The erosion of technical and environmental skills has taken place, and there has been no replacement of individuals who have left the public service'
- 'Turnover rate is high among civil service employees'
- 'The lack of resources contributes to the lack of collaboration'.

4. RECOMMENDATIONS

Table 1 includes a list of the major short-term recommendations that are described in this final section. It is based on a pressure-state-response (PSR) model of marine planning and management. Pressures include threats and impacts, and other institutional issues and concerns. Responses include strategic elements, policy innovations, and management actions that can be developed at regional and central levels of marine governance.[78]

Table 1. Summary of Short-Term Recommendations

PRESSURE	RESPONSE (Management Principle)	PLANNING TOOL/POLICY INSTRUMENT/MANAGEMENT ACTIONS
Synergistic impacts associated with multiple-use	Maintenance of marine ecological integrity	• Creation of Ocean Health Index • Planning tools, such an InVEST and SeaScape (to assess ecosystem services) • Comprehensive cumulative impact assessment effects and synergistic impacts
Loss of marine biodiversity	Clear statutes in support of the creation of networks of marine reserves that can protect marine life	• The Marine Protected Areas Policy and Implementation Plan (MPA Policy) should be amended • Use of marine zoning tools • Marine Protected Area designation • Adoption of a compatible use criterion • Creation of an Ocean Protection Council under the new EPA • DOC's PlanBlue (to be further developed and implemented)
Expanding scope of conflict across management sectors and user groups	Clear statutory requirements and resources that foster integrative, ecosystem-based planning	• New marine policy (to support place-based marine spatial planning) • Place-based, ecosystem-based collaborative planning (to be supported)
Climate disturbance	Adaptive planning	• Climate Adaptation Plans to be developed at regional scales of governance that can address threats from climate change on the marine and coastal environment
Fragmented governance	Clear statutory requirement for well coordinated ecosystem-based planning and decision-making	• Marine spatial planning (by regional councils and with assistance from central government) • Place-based collaborative planning • Development of a public trust doctrine for the EEZ

[78] The intent of this Summary Report is not to provide a detailed description of recommendations. A complete description of recommendations is found in the full report.

	Strengthened institutional capacity and capability at regional and central government levels	• Administrative reorganization to foster intergovernmental coordination and consistency across sectors and management authorities
Role of science and scientists	Evidence-based decision-making	• Establishment of interdisciplinary scientific partnerships that include social and physical scientists • Establishment of Māori advisory body under EPA • Creation of an ocean science trust under EPA • Creation of a publicly accessible web-based information clearinghouse • Creation of a national centre for ecological analysis and synthesis
Offshore energy development, fossil fuels, and minerals	Passage of the Environmental Effects Bill and other EEZ policies and statutes	New regulations that support: • Compatible use • Integrated risk assessment • Creation of MPAs for sensitive marine areas used by birds, mammals and fishes • Development of a public trust doctrine for the EEZ • Establishment of a Living Permit Process • The creation of mitigation funds to support independent scientific monitoring and enforcement • Independent review of permitting applications and environmental assessments under the EPA
Water pollution	Integrative coastal planning and management	• Strengthened and Improved capability and capacity of regional councils to respond to the drivers of impacts from terrestrial inputs on marine areas • Clear development of best practices for land-use activities that influence marine areas • Water quality monitoring and enforcement • Development of catchment-oriented indices • Marine spatial planning
Protection of cultural values	Clear support of Māori Treaty obligations	• Integration of Māori values and traditional ecological knowledge in marine policies, programmes, and plans

4.1 Principles, Policy Instruments, and Planning Tools

A number of principles of marine governance can be adopted to strengthen and improve ocean governance in New Zealand. Below is a general depiction of the major recommendations that may be needed to respond to the threats and pressures described in this report. With respect to several of the recommendations below, management principles are supported by a further characterization of the types of planning tools that can be used to address the pressures on marine ecosystems.

(1) Policy instruments and planning tools that include a combination of community-oriented governance structures (such as collaborative decision-making), market incentives, and new regulatory tools (such as the creation of new permitting authorities) should be used to address future conflict between users and user-ecosystems in the EEZ and territorial sea. A more comprehensive, multi-sector approach to ecosystem-based planning and integrative management is recommended in addition to new permitting authorities under the EPA.[79]

(2) The strengthening of the role of science and scientists in marine planning and decision-making should include statutory language that requires the creation of an Ocean Protection Council, an Ocean Science Trust, or the development of an Interdisciplinary Coastal and Marine Science Advisory Council. Such an advisory body could support the EPA and regional councils in marine planning and decision-making.

With respect to the use of scientific information and reliance on scientists in a more comprehensive, ecosystem-based approach to marine governance, the United Nations Environmental Programme (UNEP) offers the following recommendations:

- Be careful that appraisals of available scientific information do not present excuses for not taking management measures
- Utilize both natural and social sciences to generate the information needed to support management
- Embrace uncertainty by making it apparent, but do not let it distract attention from the things that are known. Marine management should not be held to a higher standard of certainty
- Ensure that the science used to support planning and management is defensible – i.e., relevant, credible, and legitimate
- Be aware that the scientific input should not stop when management is implemented
- Use science effectively and judiciously. Do not let science become an objective in itself, or allow technical expertise to displace social dialogue and participatory decision-making.[80]

(3) New Zealand should develop and strengthen communication tools to ensure that ocean science is better understood and used by society, such as the creation of a web-based marine information clearinghouse that is available to the public. Note that a similar web-based information network is currently under development for catchments. Access and use of scientific information and data remains one challenge to effective and responsible assessment of environmental effects, and to a more reliable understanding and assessment of the values of ecosystem services and of the importance of maintaining ecological integrity.

Historically, agencies and local communities have received a portion of revenues generated from the private use of public resources, making them dependent on the funding and jobs created by industry. Consciously or not, environmental goals and the scientific enterprise can be short-changed under

---

[79] S.F. Thrush and P.K. Dayton, "What Can Ecology Contribute to Ecosystem-based Management?" 2 *Annual Review of Marine Science* 2010: 419. Thrush and Dayton write, 'Managing for functional resilience draws attention to ecological dynamics across scales of space and time. It also quantitatively links the dynamics of ecosystem state and the dynamics of use and values. Until our ability to predict shifts in resilience improves, management and policy should focus on insurance and capacity maintenance, emphasizing the need to provide ecological buffers to change…' (at 436).

[80] UNEP, *Ecosystem-Based Management: Markers for Assessing Progress* (UNEP Ecosystem Program, 2006).

these circumstances. Revenues should be pooled in a larger fund, along with general tax revenues and distributed to agencies and affected communities according to budget requirements, to decouple funding for scientific investigation and joint fact finding activities from marine planning and decision making.

One general view of those interviewed is that scientific information remains relatively privatized and there is a lack of collaboration between scientists. Publicly funded science should be publicly available for marine planning and decision-making. Clear statutory language is needed that supports the sharing of socio-economic and biophysical information and data.

(4) The strengthening of the procedural processes for planning and environmental assessment should include the following tools.

> (a) Creation of a Living Permit to Ensure Adaptation and Learning – a living permit would allow for new information to be gathered and synthesized during the monitoring phase that can be used by policymakers to ensure that the impacts of marine activities do not significantly affect public health, safety and environment. Similar permitting tools have been used in the USA for offshore oil and gas activities. With respect to the consent authorization, the intent of the living permit is not closure via the planning and regulatory processes but rather to recognize the need for further information during the operation and activity of particular aspects of marine resource use, such as the health-related impacts of the use of a pipeline or the environmental effects on habitats from the operation of a structure.
>
> (b) Integrated Risk Assessment – a major failure of risk assessment is the fragmentation of risk analysis into particular aspects of a marine resource use, such as offshore oil exploration and development. Given the fact that large-scale offshore oil activities are often supported by a number of sub-contractual arrangements, one planning tool to assess risks is to integrate the analysis across different activities. This planning tool is being used in the United Kingdom and Norway to strengthen the analysis and assessment of risks for offshore oil and gas activities.
>
> (c) Independent Production and Review of Environmental Assessment – one major concern in environmental assessment is the independence, reliability and credibility of the information used in the analysis. Special advisory bodies can be used to support the independent review of environmental assessments under the EPA.

(5) Marine planning and decision-making should incorporate careful consideration of the biological and natural heritage values of marine areas. This is particularly important with respect to New Zealand, with its diverse cultural characteristics that include the traditional ecological knowledge (TEK) of Māori. The maintenance of ecosystem services requires that cultural forms of TEK are used in planning and decision-making.[81] Integration of Māori values and TEK in marine policies and programmes at each stage of the planning process is recommended.

(6) Cumulative impact assessment of effects should incorporate information on the threats of a range of marine activities on species, including the range of impacts associated with commercial fishing, vessel traffic, and marine-related noise. Human activities, such as fisheries by-catch or entanglement and the effects of terrestrial inputs, are recognized as the major threats to marine habitats. Threatened

[81] F. Berkes, *Sacred Ecology*. London: 2008, and K. Painemilla *et al., Indigenous Peoples and Conservation: From rights to resource management*. Arlington, VA: 2010.

marine mammals, birds and other sensitive species are currently protected under the Wildlife Act and other statutes. But there is also evidence that many of these species continue to be at risk.

In addition to the pressures from commercial fishing and terrestrial inputs, there are a range of pressures associated with commercial vessels. For instance, marine noise from vessel activities (and the use of sonar technology for exploring offshore oil) remains an under-evaluated impact to marine life, and should be explored further by marine scientists in New Zealand, given the importance of the marine areas associated with the country for marine mammals.[82] Collision with ships is a key mortality factor for large whales, many of which are endangered.[83] An increase in the rate of detected collisions between whales and ships in the past few decades corresponds to an increase in the number, size and speed of ships over the same time period. Without intervention the problem is expected to exacerbate as already high levels of oceanic shipping continue to rise.

(a) To address the cumulative impacts and effects on marine habitats and species, a number of planning tools are needed to better assess the vulnerabilities of marine ecosystems to synergistic human activities. An important part of maintaining ecosystem services is to strengthen and improve the various tools that assess the cumulative effects of proposed marine activities in the EEZ. InVEST, MarineMap, and SeaScape are examples of planning tools that can be used in a more comprehensive decision-making approach so that managers can better respond to the multiple threats and pressures associated with human use and associated impacts. These planning tools should be used by regional councils to address multiple-use impacts and protect marine life within the territorial waters. Pilot projects should be developed across diverse regional councils where the race for marine space is causing conflict between users and users-ecosystems.

(b) New Zealand should strengthen the institutional capacity and capability to address the impacts of terrestrial inputs in marine areas. For improved effective integrated coastal and marine planning, New Zealand needs to: develop tools to assist in understanding, forecasting, and managing the effects of multiple stressors (cumulative effects) that cut across terrestrial, coastal and marine ecosystems; understand the spatial and temporal aspects of river and stream plumes and their role in the transport and fate of land-derived contaminants; establish standardized monitoring programmes for assessing ecosystem health and integrity over time (you cannot manage what you do not measure); avoid compartmentalising what is happening on the land from what is happening in the sea.

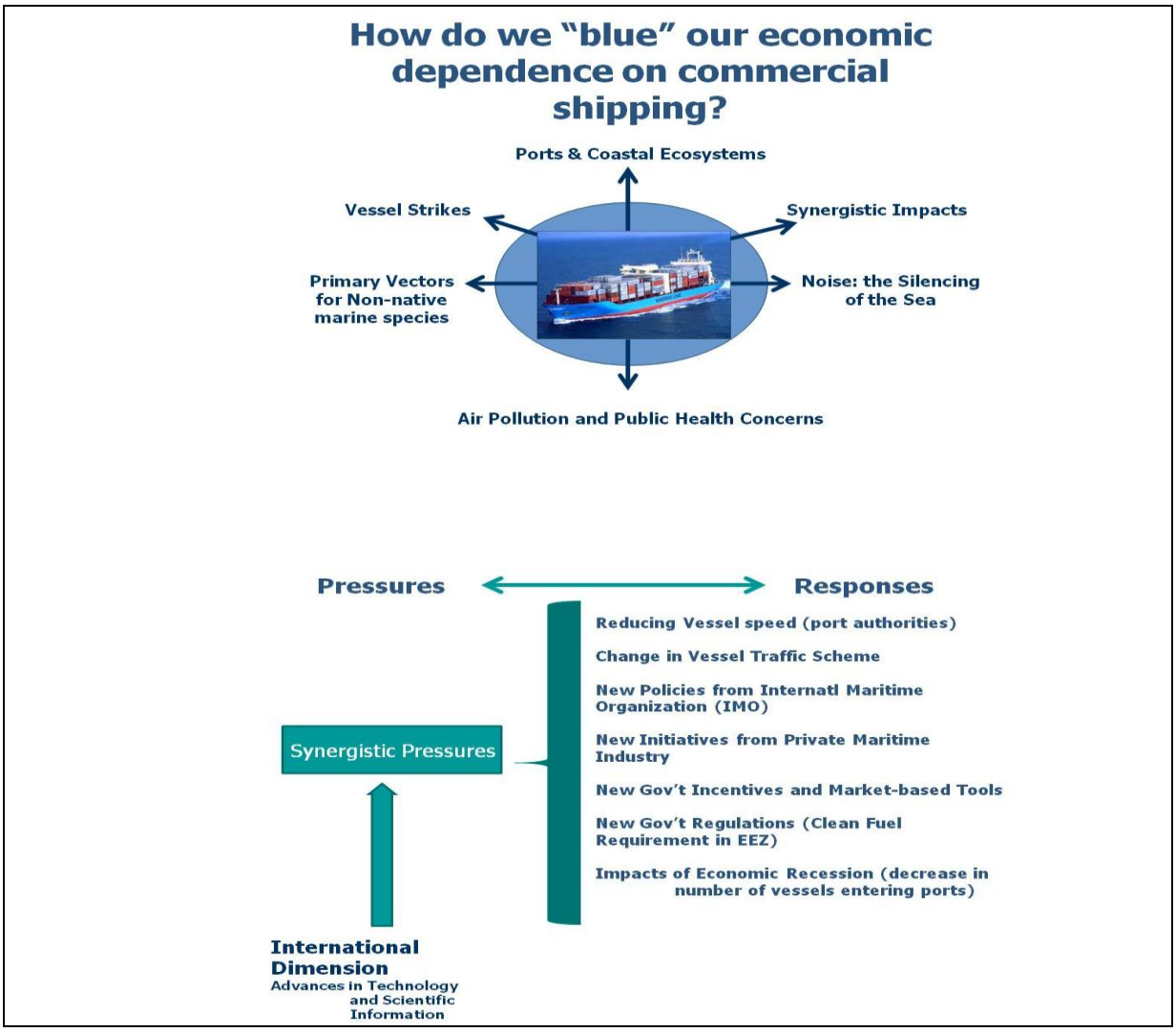
(c) The further development of integrated management instruments based on an ecosystem-based approach is recommended. Several planning instruments can provide upstream and downstream integration. For instance, spatial planning systems allow for management of large ecosystems with long-, medium-, and short-term perspectives and can incorporate other decision-making elements such as ownership or user fee systems. Today's spatial planning systems need to address shortcomings in the areas of biodiversity, climate-change adaptation, water resources management, and marine ecosystems. Integrated spatial management can improve the involvement of stakeholders and increase its focus on water and marine resource management. Spatial planning also must incorporate biodiversity management, particularly when the area in question includes or influences protected zones (both terrestrial and marine).

---

[82] See the recent studies by Cornell University's Bioacoustics Research Program which includes the work of Dr. Christopher Clark at http://www.birds.cornell.edu/brp/publications/impact-of-human-made-sound/

[83] David N. Wiley *et al.*, "Modeling Speed Restrictions to Mitigate Lethal Collisions between Ships and Whales in the Stellwagen Bank National Marine Sanctuary, USA", 144 *Biological Conservation* 2011: 2377.

Figure 5. Identifying Pressures and Responses for Commercial Vessels



(7) Clear statutory support for the public trust doctrine should be developed in future central government marine policy. Though the public trust concept can be located in the legal systems of many countries, it robustly manifests in the USA and the Commonwealth countries[84], where it has historically protected the public's rights to fishing, navigation, and commerce in and over navigable waterways and tidal waters. In its most basic form, the doctrine obliges governments to manage common natural resources, the body of the trust, in the best interest of their citizens, the beneficiaries of the trust. Public rights over the foreshore and seabed are recognised at common law as the rights of navigation and fishing.[85]

[84] M. Turnipseed *et al.*, "The Silver Anniversary of the United States' Exclusive Economic Zone: Twenty-five years of ocean use and abuse, and the possibility of a blue water public trust doctrine", 36 *Ecology Law Quarterly* 2009: 1.

[85] Robert A Makgill, "Public Property and Private Use Rights: Exclusive occupation of the coastal marine area in New Zealand", *Water and Sustainability in Australasia*. Klaus Bosselmann and Vernon Tava, eds. Auckland: New Zealand Centre for Environmental Law, Monograph Series, Vol. 3 (2011).

In New Zealand private rights to the foreshore and seabed frequently relate to use and occupation rather than ownership, and the foreshore and seabed is seldom alienated by the Crown. Today the public trust doctrine is integral to the protection of coastal ecosystems and beach access. Securing the place of the public trust doctrine in New Zealand oceans management would be valuable, given the immense pressure to exploit EEZ resources, the failure of the current fragmented governance framework, improved scientific understanding of the interconnected nature of ocean ecosystems, and the growing demand for sustainable management of ocean resources. The public trust doctrine can provide the missing catalyst for marine governance in New Zealand, and the principles of the doctrine can also provide a unifying concept for the country's marine governance framework. Joseph Sax, a legal scholar in the USA, defines the public trust principles as follows:

> [T]he idea of a public trusteeship rests upon three related principles. First, that certain interests – like the air and the sea – have such importance to the citizenry as a whole that it would be unwise to make them the subject of private ownership. Second, that they partake so much of the bounty of nature, rather than of individual enterprise, that they should be made freely available to the entire citizenry without regard to economic status. And, finally, that it is a principal purpose of government to promote the interests of the general public rather than to redistribute public goods from broad public uses to restricted private benefit.[86]

Bringing public trust law into the central government's ocean management framework helps clarify that the controlling duty of the governmental trustee is to act as a long-term steward of the public trust. Protecting public uses of trust resources ultimately requires protecting ecosystems. In turn, protecting ecosystems often requires limiting access and use to sensitive and unique marine areas. Under a public trust mandate, ocean managers could allocate access to marine resources as long as the corpus of the trust was not substantially impaired. A clear extension of the public trust doctrine to the EEZ would help the government manage marine resource use in a more cohesive, sustainable way.

Ocean waters, coastal waters, and ocean resources should be managed to meet the needs of the present generation without compromising the ability of future generations to meet their needs. The most robust public trust doctrine for ocean resources could be established through recognition of a national public trust doctrine via statutory codification of a strong suite of public trust principles. Enacting statutory laws would enable citizens, marine managers, and courts to best apply the public trust doctrine to the long-term stewardship of marine resources.

(8) New Zealand should establish an Ocean Health Index (OHI) in conjunction with the development of EEZ policy. An OHI may be one useful tool to better understand the cumulative and synergistic impacts of marine resource use over time. The index can be based on recognition of thresholds of significance and tipping points that are key considerations in ecosystem-based planning and decision-making. The OHI is a new quantitative way to measure whether the ocean's health improves or declines over time. It is a composite index based on indicators drawn from international agreements, intergovernmental panels and other high-level recommendations regarding marine conservation and resource use. Its indicators measure the most critical ocean stressors (climate change, fisheries, habitat destruction, pollution and invasive species) as well as their effects on the ocean's ability to provide ecosystem services and to support human well-being. Trends in the value of OHI and its indicators stimulate deliberate, performance-based ocean improvement by helping managers and the public to:

- identify unfavourable ocean trends
- select the most strategic goals and actions to reverse them

---

[86] J.L. Sax, *Defending the Environment: A strategy for citizen action*. New York: 1971, at 165.

- evaluate the success of remedial actions through data-driven outcomes assessment.

The OHI can thus play a focal role in efforts to rebuild the ocean's ability to support abundant populations, rich biodiversity, robust ecosystem services and improved human well-being. The OHI should be developed in conjunction with current international efforts to establish such an index. It will likely be a new world standard for gauging ocean health – a measuring stick to show whether our efforts to improve ocean governance and health are successful. An OHI can also be used to evaluate the effectiveness of the existing protective measures.

(9) Marine planning and decision-making should clearly support the use of an adaptive approach to ecosystem-based management. Achieving the management goals of striking a balance between competing marine uses, assessing multiple and cumulative environmental effects of proposed resource use, and receiving the benefits of marine life protection are made more difficult in a context of scientific uncertainty. With less than 5% of the sea floor having been studied there is a paucity of scientific information on the values of marine ecosystems. In addition, there is a lack of information on the socio-economic values of these marine areas. Because few studies have been conducted to assess the ecosystem services of marine areas, including the non-consumptive and natural values carried by marine systems, there remains a lack of information on the socio-economic values of the marine areas of New Zealand.

Therefore, baseline information on the EEZ and ECS is lacking. The absence of baseline information can lead to an under-evaluation and inadequate assessment of environmental effects and impacts from proposed marine resource use. Without the scientific information on the values associated with marine ecosystems, it is difficult to balance use-values with less tangible ecological ones, such as the non-consumptive values that are supported by healthy marine habitats. The general trend is to support economic development without a clear understanding and recognition of the ecological ecosystem goods and services and other values that may be threatened as resources are increasingly used and developed. A more concerted effort to assess and evaluate the non-consumptive worth of marine areas is warranted.

(10) Marine policy should incorporate a compatible-use criterion in the assessment of environmental effects. Compatible use is a management principle that in many ways reflects the cultural epistemology of kaitiakitanga. Kaitiakitanga is recognized as an important part of environmental management and planning in New Zealand, and is noted in legislation as follows: '[T]he exercise of guardianship by the tangata whenua of an area in accordance with tikanga Māori in relation to natural and physical resources, and includes the ethic of stewardship' (section 2, Resource Management Act 1991); and 'The exercise of guardianship; and, in relation to any fisheries resources, includes the ethic of stewardship based on the nature of the resources, as exercised by the appropriate tangata whenua in accordance with tikanga Māori' (section 2, Fisheries Act 1992). Article II of the Treaty guarantees that hapu will retain the authority of rangatiratanga to continue to exercise kaitiakitanga. Intergenerational sustainability is consistent with the traditional ecological knowledge of iwi and the importance of kaitiakitanga.[87]

The values of intergenerational sustainability and intergenerational equity should be primary principles of marine planning and decision-making. These values are consistent with the TEK of iwi

[87] The author is indebted to Keir Volkerling and discussions with iwi on the importance kaitiakitanga. See Keir Volkerling, *Kaitiakitanga and Integrated Management* (26 October 2006).

and the importance of kaitiakitanga.[88] In a review of the relationship between management integration and iwi values and TEK, Volkerling describes the many elements of kaitiakitanga. Kaitiakitanga:

- is mahi tapu: god-given and handed down through our tipuna
- is founded in whakapapa
- includes the relationship between everything and everybody in the natural world: there is no distinction between people and their environment
- is exercised on behalf of and for the benefit of all who are related through whakapapa
- establishes a set of inalienable responsibilities, duties and obligations that are not able to be delegated or abrogated
- recognises a web of obligations: to the taonga, to the atua and to ourselves and our uri: kaitiaki have a responsibility to provide for everyone and ensure everyone benefits
- remains independent of 'ownership' in a European sense: kaitiaki responsibilities are independent of others who hold 'ownership' or use rights under the law. For example, although as kaitiaki, iwi/hapu may 'own' only a percentage of the total marine farming space in a region under existing law, they still hold kaitiaki responsibilities over the whole area in accordance with tikanga
- is seamless and all-encompassing: making no distinction between moana and whenua
- is given effect at whanau and hapu level
- is expressed in ways that are appropriate to the place and to the circumstances, according to tikanga
- is enabled through rangatiratanga, which includes the authority that is needed to control access to and use of resources, and to determine how the benefits will be shared. This means that it can be expressed in part through the concepts of 'ownership', 'property', 'title' or 'stewardship'; however, it is much wider than any these.[89]

The challenge is to establish best practices in marine planning and decision-making that can assist managers in determining whether a proposed use is compatible with the maintenance of ecosystem services and the cultural values of kaitiakitanga. When an increased level of current use becomes 'incompatible' with, for instance, a cultural value, managers and planners will need to prioritise cultural resource protection.

To further support the value of kaitiakitanga in marine policy, a system of standards or framework to determine whether or not a use should be allowed if it has not already been categorically prohibited or restricted should be developed. Statutory language in support of the multiple goals associated with a compatible-use criterion could be adopted and these goals determined on a case-by-case basis, using planning tools to manage uses based on a set of standards for acceptable resource use developed under the EPA and in consultation with iwi. For example, an activity's compatibility may depend on the following issues and concerns.

> (a) the activity maintains the natural biological communities in the national marine sanctuaries, protects and, where appropriate, restores and enhances natural habitats, populations, and ecological processes.

---

[88] M. Roberts *et al.*, "Kaitiakitanga: Māori perspectives on conservation", 2 *Pacific Conservation Biology* 1995: 16.
[89] Volkerling 2006, *op cit.*

(b) the activity enhances public awareness, understanding, appreciation, wise and sustainable use of the marine environment, and the natural, historical, and cultural resources.

(c) the activity supports, promotes and coordinates scientific research on, and long-term monitoring of, the resources of marine areas.

(d) the activity facilitates (to the extent compatible with the primary objective of resource protection) all public and private uses of the resources of these marine areas not prohibited, pursuant to other authorities.

(e) the activity assists in the development and implementation of coordinated plans for the protection and management of important cultural areas.

(f) the activity will not substantially injure sensitive resources and qualities.

The range of values associated with a compatible-use criterion could be used as part of an environmental impact assessment to carefully consider unique and sensitive cultural and natural areas within the EEZ. For example, the criteria do not emphasise the use of an area, but support a proposed resource use or activity's compatibility with the maintenance of ecologically and culturally significant areas. In the absence of an evaluation of non-consumptive and natural values carried by ecosystems, an analysis of environmental effects can translate into an outcome that favours short economic gain. The balance and trade-offs between the multiple-uses of marine resources may not address the cultural and ecological needs that support the maintenance of healthy ecosystems. The challenge is to determine whether a proposed use in association with existing uses or actions in the EEZ is 'compatible' with the maintenance of ecosystem services. When an increased level of current use becomes 'incompatible' managers and planners need to prioritize resource protection. The adoption of a compatible use criterion, as opposed to an approach that purely enables resource development, supports a precautionary approach to environmental assessment and decision-making.

(a) A compatible use criterion for coastal marine governance would support the protection of sensitive natural and cultural areas as refugia. There is a lack of region- or ecosystem-specific adaptation policy in New Zealand that can support climate refugia areas and prevent the loss of biodiversity and culturally significant areas. Recent recommendations in the scientific literature emphasize the need to identify and protect climate refugia areas across ecological regions or biomes. Accumulating evidence emphasizes the importance of protecting climate refugia that have historically supported ecological resilience during periods of dramatic climate disturbance, such as long-term changes in environmental conditions.

(b) To resolve the potential tension between the value of preservation and multiple-values that is often part of marine policy, a compatible use criterion should be integrated into new legislation for the EEZ. The criterion should facilitate, to the extent compatible with the primary objective of resource protection, all public and private uses of the resources of these marine areas not prohibited pursuant to other authorities. This statement is unambiguous insofar as it prioritizes a 'primary purpose' of resource protection, and could be put in place for special habitat and cultural areas.

(11) The cultivation of ocean leadership and political will is needed to support marine policy innovation. Institutional capacity and capability is often a product of leadership and political will. Ocean leadership requires the development of a broad vision and skills set so that the thorny issues related to oceans, coasts, biodiversity, and climate are addressed across sectors and in an integrated manner.

(a) To foster the continued development of current ocean leaders, in-service training and ocean awareness workshops would be a preferred avenue for fostering the further development and skills needed to develop and implement appropriate policy measures to manage oceans sustainably.

(b) Professionals in marine management and planning need three primary traits: the ability to communicate to a broad audience of user groups, sectors and scientists; the capacity to integrate across sectors and disciplines to support a broader, ecosystem-based perspective in planning and decision-making; and leadership skills to cultivate stronger alliances and collaborative social networks that can sustain community-based and place-based planning and decision-making. New Zealand should create a state-of-the-art professional graduate programme in Coastal Marine Affairs that emphasizes an interdisciplinary approach to science, planning and policy.

(12) New Zealand should adopt principles of international best practice to support a more integrative and coordinated approach to conflict between marine resource users and users-ecosystems. The following institutional characteristics can contribute to successful integrative, marine ecosystem-based planning and decision making:

(a) clear regulatory authority and enabling legislation in support of integrated ecosystem-based planning;

(b) accountability of regulatory agencies and departments that are charged with coastal and marine governance;

(c) use of formal planning activities that integrate different forms of knowledge (scientific information, local knowledge and traditional ecological knowledge) into decision making;

(d) cultivation of decision-making processes that are legitimate and that do not favour one interest or value over another;

(e) use of adaptive planning strategies to learn from new information and data;

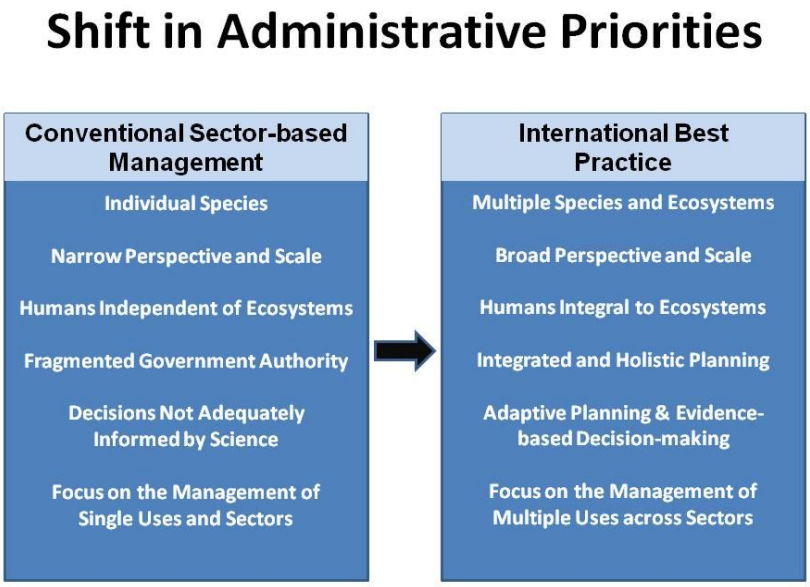
(f) establishment of dependable and sufficient sources of funding for each stage of the planning and policy-making process including collaborative activities, monitoring, enforcement and evaluation; and,

(g) use of well-structured stakeholder-based public processes.[90]

To sustain marine ecosystems, for example, national and international organizations and governments are realigning marine governance frameworks to reflect the values of ecosystem 'health and integrity', collaborative stakeholder-based planning, evidence-based decision-making, adaptation, sustainability, and precaution. International best practice in marine governance also emphasizes a shift in administrative principles from the more conventional approach to single sector, single species, single use approaches to an ecosystem-based integrative approach to marine life protection and resource use. These values are the new pillars of marine ecosystem-based planning, and are examples of the types of principles shaping a new era of international best practice in marine governance.

[90] M. Caldwell *et al., Key Considerations for Establishing a Framework for Effective Marine Spatial Planning in the United States*. Submitted to the Interagency Ocean Policy Task Force, February 2010: 3-4.

Figure 6. International Best Practice



(13) New Zealand should adopt a collaborative approach to marine ecosystem-based planning. One common institutional characteristic of marine ecosystem-based management is the adoption of collaborative approaches to planning (CP).[91] CP is an important part of New Zealand's Blue Green Agenda, and is therefore worth describing in further detail as it pertains to future marine policymaking, planning and management.

CP is not a panacea and may not fit all circumstances in marine policymaking. It is often not an easier or less costly process than more traditional administrative or judicial decision-making approaches. However, in many circumstances collaboration can enhance people's understanding, narrow the range of disagreements, build concurrence about necessary direction, and produce on-the-ground marine environmental improvements. CP has four major uses in marine resource planning and decision-making:

- Building understanding: by fostering exchange of information and ideas among agencies, organizations, and the public and providing a mechanism for resolving uncertainty
- Effective decision making: by providing a mechanism for effective decision making through processes that focus on common problems and build support for decisions
- Coordinating across boundaries: by generating a means of getting necessary work done, fostering joint management activities, and mobilizing an expanded set of resources through coordination of activities across boundaries
- Capacity building: by developing the capacity of agencies, organizations, and communities to deal with the challenges of the future.

With CP responsibility for preparing marine plans may be delegated directly to affected stakeholders who work together in face-to-face, interest-based negotiations to reach a consensus agreement. Collaborative planning is more likely to result in high quality agreements that are more stable,

[91] J.M. Wondolleck and S.L. Yaffee, *Making Collaboration Work: Lessons from innovation in natural resource management*. Washington: Island Press 2000.

enduring, and more easily implemented then those created under traditional processes. In addition, CP creates additional benefits such as improved skills, knowledge, and increased trust and cooperation among participants resulting in new ideas, new networks, and long-term partnerships.

The adoption of CP in marine planning, decision-making and management faces a number of obstacles that challenge its ability to be effective and can limit its applicability. These obstacles include the following:

- the lack of resources for collaborative planning processes which include time required by stakeholders to participate in the process, financial support, and personnel
- participant's lack of understanding and ability for operating in collaborative planning approaches
- mistrust among group members and negative group attitudes about one another
- organizational cultural barriers to the use of CP.

An effective CP process should:

- ensure inclusive representation
- provide clear ground rules
- reduce inequities among stakeholders
- ensure process accountability
- remain flexible and adaptive
- provide sound process management
- provide realistic timelines
- provide implementation and monitoring processes
- use multiple-objective evaluation. [92]

A number of strategic elements are recommended below to support the future use of CP as an approach to marine ecosystem-based planning and management.

(a) Purpose and Incentives: The process is driven by a group's shared purpose and provides incentives to participate, to work towards consensus and to work for practical goals.

(b) Inclusive Representation: All parties with a significant interest in the issues and outcomes are involved throughout the process.

(c) Voluntary Participation: Affected or interested parties participate voluntarily and are committed to the process**.** All parties are supportive of the process and committed to invest the time and resources necessary to make it work.

(d) Self-design: The parties involved work together to design a process to suit the individual needs of that process and its participants.

(e) Clear Ground Rules: As a process is initiated, a comprehensive procedural framework is established including clear terms of reference and ground rules.

(f) Equal Opportunity and Resources: The process provides for equal and balanced opportunity for effective participation of all parties.

---

[92] R.D. Margerum, "Getting Past Yes: From capital creation to action", 56 *American Planning Association Journal* 1999: 181; R.D. Margerum, "Collaborative Planning: Building consensus and building a distinct model for practice", 21 *Journal of Planning Education and Research* 2002: 237.

(g) Principled Negotiation and Respect: The process operates according to the conditions of principled negotiation including mutual respect, trust, and understanding.

(h) Accountability: The process and its participants are accountable to the broader public, to their constituents, and to the process itself.

(i) Flexible, Adaptive, Creative: Flexibility is designed into the process to allow for adaptation and creativity in problem solving.

(j) High-Quality Information: The process provides participants with sufficient, appropriate, accurate, and timely information, along with the expertise and tools to incorporate it into decision making.

(k) Time Limits: Realistic milestones and deadlines are established and managed throughout a process.

(l) Implementation and Monitoring: The process and final agreement include clear commitments to implementation and monitoring.

(m) Effective Process Management: The process is coordinated and managed effectively and in a neutral manner.

(n) Independent Facilitation: The process uses an independent, trained facilitator, acceptable to all parties, from its beginning to its end to assist the parties in reaching an agreement.

(14) To support a collaborative, ecosystem-based approach to marine governance, New Zealand should adopt Integrative Marine Spatial Planning (MSP) in marine areas where conflicts between users and users-ecosystems exists, and where conflicts between management sectors is likely to develop. The use of collaborative strategies to reach agreement on where to designate marine reserves is a good example of such marine planning. There is a burgeoning literature in support of MSP as a planning tool that can address intergovernmental fragmentation and facilitate integrated strategic and holistic management across diverse sectors and uses of coastal marine areas.[93] MSP is a 'process of analyzing and allocating parts of three-dimensional marine spaces (ecosystems) to specific uses, to achieve ecological, economic, and social objectives that are usually specified through a political process'.[94] While MSP is characterized as a tool that can support integrative ecosystem-based planning[95] it is unclear whether MSP can move industrial society toward a more sustainable, ecological relationship with the more-than-human oceanic commons.[96]

---

[93] C. Ehler and F. Douvere, *Visions for a Sea Change, Report of the First International Workshop on Marine Spatial Planning.* UNESCO 2007.

[94] Ehler and Douvere, 2007, *op cit.*

[95] For a comprehensive overview of the strengths and weaknesses of MSP see M. Gopnik, *Integrated Marine Spatial Planning in U.S. Waters: The path forward*. A Paper prepared for the Marine Conservation Initiative of the Gordon and Betty Moore Foundation, 2008; available at http://www.msp.noaa.gov/_pdf/Gopnik_MSP_in_US_Waters.pdf. Gopnik shows that there are a number of concerns over the use of MSP. One particular concern he describes is that 'the environment will lose if it has to compete with users' at 22. A similar sentiment is expressed in this article.

[96] MSP may represent a means by government to sell off the commons to private interests and other competing user interests (e.g., oil, mining, aquaculture, wind farm interests), and as potentially anti-conservation.

National ocean frameworks are being developed in France, US, England, Canada, Vietnam, Japan, Australia, Brazil, China, Germany, Jamaica, the Russian Federation, the Netherlands, Norway, Portugal, India, Mexico, and the Philippines. CP has been an important part of many of these national efforts. The literature in support of MSP emphasizes the need for the use of collaborative processes that combine scientists and stakeholders in all stages of decision-making.[97]

(a) As a planning tool, the use of MSP could be developed by regional councils that are facing increasing pressures from resource use and the need for increased marine life protection as pilot projects. The developing of MSPs at regional levels, however, should be supported by central government in a range of ways, including the contribution of important resources for planning and decision-making and the development of clear statutory language that supports the planning tool.

As with all planning tools, the promise of multi-sector and ecologically integrated governance strategy is not without its critics.[98] MSP may become a planning tool that fosters unsustainable growth and furthers economic development of marine resources. Marine managers using MSP often carefully consider the designation of MPAs as well in order to protect area and species from resource use and impacts. Some MSPs are being developed to cite particular types of resource use, such as alternative wind energy turbines, or to consider diverse services and proposed ocean uses within a marine area.[99] For example, as a geospatial planning tool, MSP can identify resources in marine areas for economic development, such as deep sea bed minerals, ports, marine fishes, aquaculture, and offshore oil deposits among other industries.

(b) In general, the main strategic elements found in many MSP efforts include the following goals. MSP can:

- provide protection for important habitats and ecological processes
- separate conflicting human activities and ensure use is compatible with the goal of marine life protection
- allow reasonable human use of marine areas
- allocate resource use across time and space
- support public trust values, including traditional cultural values and customs. [100]

(b) MSP should also support participatory and collaborative processes that can broaden the planning effort so that it is not limited to those who receive economic benefit from marine resource use.[101]

---

[97] B.D. Gold, "Marine Spatial Planning as a Framework for Sustainably Managing Large Marine Ecosystems", in Sherman and Adams, *supra* note 4; at 224. Gold is the Program Director for Marine Conservation with The Gordon and Betty Moore Foundation. Gold recommends that MSP for LMEs should be based on the following: effective monitoring and data sharing; comprehensive stakeholder involvement; coordination across political, economic and administrative boundaries; clear enabling legislation; and adaptive and integrative planning mechanisms in the face of scientific uncertainty.

[98] J. Eagle, "Regional Ocean Governance: The perils of multiple-use management and the promise of agency diversity", 16 *Duke Environmental Law & Policy Forum* 2006: 143.

[99] C. White, B.S. Halpern, and C.V. Kappel, "Ecosystem service trade-offs analysis reveals the value of marine spatial planning for multiple ocean uses", *PNAS* March 2012: 1

[100] C. Ehler and F. Douvere, *Marine Spatial Planning: A step-by-step approach toward ecosystem-based management. Intergovernmental oceanographic commission and man and the biosphere programme*. UNESCO 2009. *See also* UNESCO Initiative on Marine Spatial Planning, *available at* http://www.unesco-ioc-marinesp.be/msp_guide

The costs to development of MSP should not be the responsibility of government alone. The private sector will benefit from the reduction of uncertainty and in the potential reduction of conflict associated with the proposed use of marine areas. Accordingly, industry should carry part of the burden of the cost to develop and implement these plans. It is also recommended that international support of MSP activities be sought out, such as funds from the Moore Foundation which continues to support these types of planning activities across the Commonwealth and in other countries.[102] *Note that one primary condition for obtaining support from the international community is the existence of a national policy that supports marine ecosystem-based planning and management.*[103] *Without a clear statute in support of marine ecosystem-based planning and the use of integrative planning tools, international funding sources are less likely to support a New Zealand pilot project in MSP.*

(c) The primary objective of the MSP should be to maintain the coastal and marine ecosystems of New Zealand, in accordance with the requirements of various regional, national, and multilateral agreements to which New Zealand is party, and which are pertinent to MSP.

(d) MSP should be designed to overcome the fragmentation inherent to single sector management, and is intended to result in a collaborative approach to marine planning and decision-making that yields a sustainable long-term relationship between human development activities and resulting human and naturally-induced environmental changes over time. The key to success in MSP is based on the promise of integration across sectors. While the current government's preference is to balance competing interests and users, MSP may provide a mechanism to integrate across diverse values and interests. The key functions of integration must occur in:

- establishing the objectives of the MSP process
- selecting processes, procedures, products, and data requirements needed to meet these objectives
- identifying the appropriate policy areas, regulatory arenas, and administrative levels for their application
- understanding the terrestrial and marine components of the coastal zone, including activities in one component that affect or are affected by the MSP policy and regulatory regimes
- understanding of the views and issues of importance to the major stakeholders and other interested groups
- analyzing and interpreting data assembled from disparate information sources (including user group values and use patterns) into a coherent and easily understood format, including state-of-the-art GIS databases and cartographic representations (including the use of such decision-making tools as SeaScape, MarineMap and InVEST).

---

[101] F. Douvere and C.N. Ehler, "New Perspectives on Sea Use Management: Initial findings from European experience with marine spatial planning", 90 *Journal of Environmental Management* 2009: 77.

[102] For instance, see PacMARA (the Pacific Marine Analysis and Research Association) in Canada British Columbia available at: http://pacmara.org/about

[103] This note is based on a discussion between the author and program directors at the Moore Foundation in April, 2011.

(e) A national policy in support of MSP could foster geographic integration across marine management jurisdictions while providing the necessary national guidance and resources to regional councils to support integrative planning activities. To foster the development of MSPs, the following recommendations are made:

1. That a national centre for the analysis and synthesis of ecological and socio-economic information to support information sharing and public access to data be established.
2. That a national plan for collaborative planning and decision-making that supports MSP be created.
3. That ocean management problems (causes, effects, solutions), management objectives, and development opportunities be reviewed and characterised.
4. That threats and opportunities, taking into consideration technical and financial feasibility and availability of personnel that can support future MSP be identified and characterised.
5. That clear policies and principles to guide MSP be described.
6. That new management measures such as zonation schemes, which may be needed to strengthen regulatory programmes and to establish market-based incentives be described.
7. That suitable government arrangements, including intersectoral and intergovernmental coordination mechanisms be created.
8. That the initial management objectives and goals, including important milestones that should be part of future MSP be identified and adequately described.
9. That funding and staffing requirements (e.g., adequate financial resources to carry out the planning and implementation of MSP efforts) be characterised.

5. CONCLUSION

This report emphasizes the need for clear management principles, policy tools and policy instruments that can strengthen and improve integrative, ecosystem-based marine governance in New Zealand. A range of relevant principles have been described, including the need to support a public trust doctrine, a compatible-use criterion, and the maintenance of ecosystem services. In many cases these management principles should be embodied in law. These governing principles are part of a range of marine policies and programmes that are developing and being implemented in a number of countries, and reflect international best practice in various Commonwealth countries, including Australia and Canada. New Zealand can learn from the experiences and practices of other Commonwealth countries.

Given the resource constraints endemic to islands countries such as New Zealand, future integrative, ecosystem-based marine governance in New Zealand should also be supported by international funding organizations, such as the Moore Foundation, and private industry. A more concerted effort to attract additional funding opportunities is warranted today. But there is a clear need for clear public policy that supports the types of planning tools and policy instruments in central government before international funds can be pursued.

New Zealand also has the rare opportunity to build on policy innovation developed in the 1990s that supported integrative coastal planning, such as the reorganizational efforts that emphasize a catchment-based approach to land-use policy. One challenge today is that regional councils lack the institutional resources and expertise to address marine issues.

Ultimately, marine governance depends not only on the capacity and capability of institutions to address the synergistic impacts and pressures of multiple impacts and uses, but on the cultivation of a broad ocean constituency in the public realm that supports a more sustainable ecological approach to planning, decision-making and policy making. This is where a hope for change resides.

All the peoples of New Zealand arrived by boat or waka. Māori have inhabited Aotearoa for over 800 years. New Zealand's rich indigenous history, in combination with the maritime cultures of the country, represents a foundation for establishing a restored ocean constituency. Accordingly, translating the principles and multiple values that are associated with marine ecosystems into a comprehensive and holistic governance framework should be an important part of future marine planning and decision-making in New Zealand.

Historically, the hope that led to the migration across the wild ocean to New Zealand is a shared value that is part of the country's rich and diverse maritime heritage. Policy innovation is part of the history of New Zealand environmental governance. Risk-taking, experimentation and adaptation are required traits of island cultures. Today the wild ocean is reflected in the brand of New Zealand 100% Pure – a brand that New Zealanders embrace and that is celebrated abroad. But as the grounding of the Rena showed, it is a very vulnerable brand. Living up to the brand requires a renewed responsibility to adapt to and sustain the life-giving blue planet.

Appendix: Activities in Support of this Project

Support for this project has contributed to the publication of a number of articles and proceedings, and a number of public presentations including but not limited to the following:

Publications by McGinnis (unless otherwise noted)

- *Ocean Governance: The New Zealand Dimension. A Full Report.* Emerging Issues Programme. School of Government. Victoria University of Wellington (Forthcoming, 2012). 200 p.
- California's Experience in Coastal Marine Ecosystem-based Planning and Management. *Ocean Yearbook* 26 (2012): 485-508.
- Meghan Collins, *What is the relationship between science and politics in aquaculture? A New Zealand case study in environmental controversy* (Master's Thesis, Victoria University Wellington, New Zealand, 2012).
- Living up to the Brand: Greening Aotearoa's Marine Policy, *Policy Quarterly* 8, 1 (2012): 17-28.
- *Ocean Governance in Aotearoa New Zealand: The need for an integrated, ecosystem-based approach.* First International Marine Conservation Think Tank, International Congress for Conservation Biology, December 3-4, 2011. Auckland, New Zealand.
- Mindfulness of the Oceanic Commons, *Pacific Ecologist* 20 (2011): 55-60.
- California's Experience in Coastal Marine Ecosystem-based Planning and Management, Environmental Defense Society, Coastlines: Spatial Planning for land and sea, 10 June 2011.
- Developing Adaptive Responses to Threats to Coastal Marine Biodiversity across the Pacific Rim: The Need for a Bioregional Approach. Peer reviewed and published in the official conference proceedings of the 4th Oceanic Conference on International Studies. Auckland, New Zealand. July 2, 2010.
- Marine Ecosystem-based Planning: Past, Present, and Future, and Negotiating Ecology: Science, Politics and Planning for the World's Oceans. Plenary Session, 'Future of NZ Marine Environments'. New Zealand Marine Science Society. Marine Environments: Past Present and Future. 50th Anniversary Conference. Wellington, New Zealand. July 9, 2010.
- Marine Biodiversity: Ecosystem-based Management. ECO Annual Conference Environment, Conservation & Economy: Foundations for the future. 2 – 4 July 2010. Living Springs Conference Centre, Christchurch, New Zealand.

Community Service

- Member, New Zealand Marine Science Society, Ocean Government and Policy Portfolio Group, October – present.
- Participant, Developing a National Aquaculture Strategy and Action Plan, Aquaculture Unit, Ministry of Fisheries, 18 March 2011. New Zealand.
- Participant, Developing Decommissioning Policy for Offshore Oil Structures, Maritime New Zealand, 2011.
- Participant, Symposium on Resource Management in a Context of Scarcity, Ministry for the Environment, 4 March 2011. New Zealand.
- Participant, Maritime Environment Group, Monthly Meetings with Stakeholders and Government Agencies. 2010 - 2012.
- Member, Indicator Expert Panel, Ministry of Fisheries, New Zealand, 2010.

Presentations and Workshops

- Panelist, Biodiversity Protection in New Zealand's Exclusive Economic Zone. Society for Conservation Biology Annual Meeting. Auckland, New Zealand. 6 December 2011.
- Focus Group Coordinator and Chair, Marine Conservation Think Tank. Ocean Governance in Aotearoa New Zealand: The Need for an Integrated, Ecosystem-based Approach. First International Marine Conservation Think Tank, International Congress for Conservation Biology. Auckland, New Zealand. 3-4 December 2011.
- Speaker, International Best Practice in Integrative, Ecosystem-based Planning and Management of Oceans. Sponsored by the Ministry of Foreign Affairs. Wellington, New Zealand. 30 November 2011.
- Participant, Kava Bowl Ocean Summit 2011, How much is the ocean worth to you? Sponsored by Okeanos (Foundation for the Sea), East-West Center, Honolulu, Hawaii. 29 June – 5 July 2011.
- Speaker, Understanding the Limits to the Oceanic Commons. Symposium on Biophysical Limits and their Policy Implications, Hosted by Victoria University of Wellington and Landcare Research, 9 June 2011.
- Speaker, Lessons Learned from California's experiment in Coastal Marine Ecosystem-based Planning. Coastlines: Spatial Planning for Land and Sea, Environmental Defence Society. Auckland, NZ, 1-2 June 2001.
- Speaker, Unveiling the Green Veneer: Ocean Governance in New Zealand. Sponsored by Stanford Coastal Society, 26 April 2011. USA.
- Seminar Speaker, Future Ocean Governance in [Aotearoa] New Zealand. Monterey Area Research Institutions' Network for Education (MARINE). Sponsored by Stanford University's Center for Ocean Solutions, Woods Institute for the Environment, & Hopkins Marine Station. 25 April 2011. USA.
- Panelist, Agriculture, Land-use and Environmental Worldviews, Annual Meeting of the Western Political Science Association. San Antonio, Texas (with Smith, Glasgow, Cleveland, and Copeland). 22 April 2011. USA.
- Speaker, Unveiling the Green Veneer: The Future of Wild Places in New Zealand. UC Santa Barbara Interdisciplinary Humanities Center, Geographies of Space Program. April 7 2011. USA.
- Speaker, Future Ocean Governance in [Aotearoa] New Zealand: Linking Science to Policymaking. US National Center for Ecological Analysis and Synthesis, 7 April 2011. USA.
- Poster, Strengthening Relationships: Scientific and Traditional Ecological Knowledge about Marine Environments. Conference of the New Zealand Ecological Society, Dunedin, New Zealand (with Lekan, Gardner, Bell, Hastilow). April 2011.
- Speaker, New Tools to Improve New Zealand's Ocean Governance and Science. Cawthron Institute, Nelson, New Zealand, 15 February 2011.
- Workshop Coordinator and Chair, Mining, Oil and Gas Development in New Zealand's Offshore Continental Shelf. Emerging Issues Program. Ocean Governance: The New Zealand Dimension. Institute of Policy Studies, Victoria University of Wellington. 23 November 2010. http://ips.ac.nz/events/completed-activities/Emerging%20Issues%20Programme/Ocean%20Governance.html
- Workshop Coordinator and Chair, Future Aquaculture in New Zealand: Science, Politics, and Economics. Emerging Issues Programme. Ocean Governance: The New Zealand Dimension. Institute of Policy Studies, Victoria University of Wellington. 9 November 2010.
- Speaker, Watershed-based Planning Across the USA. Cawthron Institute, Nelson, New Zealand, 10 September 2010.

- Chair, Mining in the Conservation Estate. Institute of Policy Studies, Victoria University of Wellington, 23 August 2010.
- Workshop Coordinator and Chair, Scientific Monitoring to Improve Coastal and Marine Governance. Emerging Issues Programme. Ocean Governance: The New Zealand Dimension. Institute of Policy Studies, Victoria University of Wellington. 10 August 2010. http://ips.ac.nz/events/completed-activities/Emerging%20Issues%20Programme/Ocean%20Governance.html
- Speaker, Decommissioning Offshore Oil Platforms. Maritime New Zealand and Ministry of Economic Development, Wellington, New Zealand, 4 August 2010.
- Speaker, Watershed-based Planning in the USA. Landcare Research, Lincoln, New Zealand, 30 July 2010.
- Speaker. Marine Ecosystem-based Planning: Past, Present, and Future, and Negotiating Ecology: Science, Politics and Planning for the World's Oceans. Plenary Session, 'Future of NZ Marine Environments'. New Zealand Marine Science Society. Marine Environments: Past Present and Future. 50th Anniversary Conference. Wellington, New Zealand. July 9, 2010.
- Speaker, Marine Biodiversity: Ecosystem-based Management. ECO Annual Conference Environment, Conservation & Economy: Foundations for the future. 2 – 4 July 2010. Living Springs Conference Centre, Christchurch, New Zealand.
- Panel Chair, Maritime Issues and the Law of the Sea, The Oceanic Conference on International Studies (OCIS). Thursday, 1 July 2010, Auckland, New Zealand.
- Panelist, Developing Adaptive Policy to address Expected Threats to Coastal Marine Biodiversity across the Pacific Rim: The Need for a Bioregional Approach. Panel on Development, Diversity, and the Environment. The Oceanic Conference on International Studies (OCIS). Friday 2 July 2010, Auckland, New Zealand.
- Speaker, Politics and Ecology: Case studies in negotiating ecology in conservation, preservation and restoration. New Ideas for Old Problems. Building Capability in the Public Sector. School of Government. Victoria University of Wellington, June 25, 2010. http://ips.ac.nz/events/downloads/2010/Negotiating%20Ecology%20M%20McGinnis.pdf
- Speaker, California Adaptive Climate Change Policy - The Importance of regional biodiversity in an age of climate disturbance. New Zealand Climate Change Research Centre, Victoria University of Wellington, June 2, 2010.
- Speaker, Ecosystem-based planning in coastal marine governance across the world's oceans. New Zealand National Institute of Water and Atmospheric Research. 25 May 2010.
- Speaker, Catastrophe in the Making - Oil Spills and their Political and Ecological Consequences, Building Capability in the Public Sector. School of Government. Victoria University of Wellington, 3 May 2010. http://ips.ac.nz/events/downloads/2010/Oil%20presentation_McGinnis.pdf

Cover Design by James Binaski

Cover photographs by Lou Hunt, Mike McGinnis and Trevor Penfold

ISBN: 978-1-877347-47-4

IPS 176

The School of Government,
Victoria University of Wellington