

Project Proposal Template

A. TITLE OF PROJECT

CP1.1 Ecosystem Based Management (EBM) within New Zealand's existing legislative framework

B. IDENTIFICATION

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C. ABSTRACT

To achieve the Sustainable Seas Challenge objective of enhancing utilisation of our marine resources within environmental and biological constraints, we need to develop an understanding of the current frameworks under which decision-making is made within New Zealand's marine realm. There is a breadth of legislation established through the Resource Management Act 1991 (RMA) and Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (EEZ) for managing New Zealand's marine resource sector. Numerous institutions interact at local, regional, national and international scales, with varying mandates from resource enhancement to environmental sustainability. This cross-programme project will summarise New Zealand's existing legislative and decision-making frameworks and practices, to determine how Ecosystem Based Management (EBM) is currently enabled and potential future directions to enhance EBM.

D. INTRODUCTION

Ecosystem Based Management (EBM) is a strategy for the integrated management of natural resources (Crowder & Norse 2008, Folke et al. 2004) that recognises the full array of interactions within an ecosystem, including human, and promotes both sustainable use and conservation in an

equitable way. The goal of EBM is to maintain a healthy, productive and resilient ecosystem so that it can provide the services and goods humans want and need, both now and in the future. It differs from many current strategies that manage single species' or sectors by using an integrated approach that considers all of the activities that affect the marine environment, taking into account rapid global change, including ocean acidification, global warming and climate change. Engagement between researchers, resource users, managers and regulators, Māori and communities is a key element of EBM. While many countries are attempting to implement an EBM approach to the management of their marine resources, comprehensive working models underpinned with appropriate research have yet to emerge (Vince et al. 2015).

While New Zealand has been a world leader in sustainable management of fish stocks (Worm et al. 2009; Alder et al. 2010), marine conservation (Ballantine 2015) and marine biosecurity management (Williams & Grosholz 2008; Hewitt et al. 2009), it is unclear whether our current governance framework qualifies as an EBM approach. Rather, some have suggested that there are strong divides between sectoral management strategies, conflicting policies, and poorly coordinated decision-making across sectors and across local, regional and national scales (Le Heron et al, forthcoming; Thrush et al. forthcoming; Lundquist et al. forthcoming). In addition, how current policy enables stakeholder and public participation and integration of non-economic values is a critical aspect of EBM. For EBM to be successful, it requires societal engagement and choices based on shared and contested visions and principles.

The ability of the current frameworks to prevent exceedance of thresholds or tipping points resulting in ecological (or economic) collapse is also questioned (Thrush et al. forthcoming). Decisions about natural resource use are informed by scientific evidence to provide an understanding of the proposed activity and its potential environmental effects. The disparity in the time scales and resources required for substantive research and that available to make a decision means that the science is inevitably incomplete and uncertain. In these circumstances, decision-makers must make use of the "Best Available Science" (BAS), but there is often limited guidance or tools for proponents of new activities to anticipate the right amount and quality of scientific information that is needed to arrive at a sound decision. Poor coordination across sectors has resulted in limited availability of scientific information to inform decision-making, particularly for new offshore industries. However, it is unclear how much additional research is required to reduce critical areas of uncertainty, and whether the benefits of acquiring this data exceed the costs of acquiring it. Moreover, careful consideration needs to be given to how to integrate the BAS into institutionalized planning and decision-making processes in the most effective way.

Implementation of an EBM approach requires an enabling framework grounded in legislation, policy and professional practice. This imperative requires that we identify how we are currently implementing EBM, and whether there are better EBM approaches that fit within the New Zealand context. In this project, we will investigate: A) Can we work with current institutional and legislative constraints, by perhaps tweaking elements of what we already have in place? This is essentially an incremental change approach, which requires detailed knowledge of those structures and processes and how they are working. There are diverse and often divergent views amongst governance actors about how manage marine resources, including within and between the agencies who currently are charged with management and iwi, resource users, other stakeholders, and the public. B) Where more transformative change is necessary to enable EBM, what are the barriers and enablers for such change, and how might we re-imagine future arrangements that promote sustainable seas? This stretches beyond current structures and asks if there is a new and better way to implement policy and provide legislative and other institutional support for EBM.

E. AIM OF THE RESEARCH AND RELEVANCE TO OBJECTIVE

Successful implementation of a full EBM approach by marine resource managers within New Zealand represents an enormous opportunity to achieve a global first and provide potential competitive advantage across multiple marine sectors and products. This project will identify how far existing New Zealand ocean management and practice within the current sectoral approaches to marine resource use can get us within the realm of an EBM approach. This project will use a case study approach to review legislative and policy frameworks to determine: whether we can currently manage for cumulative impacts, risks, and uncertainties; effectively use BAS; and whether management practices allow for the human element of EBM; and do they include a wide range of stakeholder, iwi and public viewpoints included in marine decision-making.

We will review and summarise the existing NZ framework, and compare it to a number of successful EBM approaches internationally. As the mission of the Challenge is to enhance economic growth within environmental limits, understanding what our current limitations are in implementing EBM is a critical step toward further development of an EBM framework that both works with, and fosters, the evolution of current law, policy and practice. Full implementation of an EBM framework is envisioned to be truly transformative, resulting in New Zealand regaining its position as a world leader in sustainable marine economic development, with a reputation that encourages investment in New Zealand's marine estate.

F. PROPOSED RESEARCH

In order to determine the potential for Ecosystem Based Management within New Zealand's existing legislative framework this project will 1) identify the key elements of an EBM decision-making framework and 2) verify the extent to which New Zealand's current legislative and institutional frameworks support EBM.

Document and literature review

National, regional, and local policy frameworks, including statutes and case law within which decision-making occur will be reviewed, informed by a review of relevant scholarship. These reviews will consider how New Zealand's estuarine, coastal and ocean ecosystems are currently regulated and how this enables or constrains the potential for EBM. In parallel the project will review and identify what the key elements of an EBM decision-making framework for New Zealand might be. These reviews will be desktop and broad-sweeping to allow for comparative analysis across organisations, marine species, legal cases, scales and timeframes.

A portfolio of case studies

A portfolio of case studies will be developed out of this review. Case study research is designed to examine "how" and "why" questions in real-life settings where the researcher has little control over the events being investigated. Insights will be drawn from understanding the factors shaping 'real-world' decision-making and the institutional setting in which governance actors and networks interact. Governance in this context refers to the social choices we make about our seas through interactions between the state (government), civil society (e.g., community based organisations, NGOs) and the private sector, and the scientific community, media and other actors and networks through formal (e.g., the law) and informal (e.g., social norms and 'rules') institutional structures and processes (see e.g., Kooiman 1993). These choices are made in the face of complexity, uncertainty and dynamic change, sudden shocks and contestation (e.g., Thrush et al., forthcoming).

The portfolio will evaluate how past and current decision-making has or is shaping a range of potential uses of the marine environment. Some case studies will be retrospective and could review a past

precedent setting decision based on a desktop analysis with selected key informant interviews. Other cases might address pivotal current issues that could necessitate institutional reform to enable EBM. Such a case or cases will require active partnerships between research, industry and regulatory decision-making actors, resource users, and other stakeholders. These case studies will be co-designed to account for the range of interests relevant to advancing EBM in NZ. Different research methods will need to be used for the different case studies.

A 'toolbox' of research methods will be used to enable triangulation of different types of primary data and validation across these data sets to provide a rich and robust information base. Particular methods range from approaches rooted in Bayesian decision-theory to narrative and discourse analysis. The choice of methods will be tailored to the issues being investigated and will include those relevant to legal, policy and institutional analysis; and draw upon and complement research underway in other streams of work in the Challenge.

Moreover, the portfolio of case studies will enable both specific and more generalized recommendations to be made that might be applied in appropriate settings in NZ. The portfolio of case studies will generate new insights about how EBM might be institutionalized in New Zealand, based on real-world experience through applied and engaged research. At this stage of initiation we envisage the portfolio will include thematic studies documenting and assessing:

Science interfaces: to support understanding of how uncertainty, transparency and the availability of science is currently dealt with. The importance of the creation of the best science from which decisions can be based is fundamental. The processes around this, from which best practice may be adduced are increasingly common overseas, although far from standard in New Zealand. In particular, the creation of mechanisms and protocols for ensuring transparency, suitable levels of inclusion, peer-review and conflicts of interests are all essential foundations in building both legitimate and defensible scientific processes. This study will present an overview of these principles and then work to identify how New Zealand practice is, or is not, consistent with international practice. Our approach will be informed by general decision-theory frameworks (e.g., Possingham et al. 2001, Yokota & Thompson 2004) and retrospective analysis of situations (e.g. deep sea mining), in which additional research may have contributed further to the legal process by reducing sources of uncertainty. We will document transactional costs of science provision so that CP 1.2 can be designed to facilitate evaluation of situations in which additional scientific information would add value to the decision outcome.

Emergence: to document and inform implementation of the EEZ Act. We will examine how the Act's various mechanisms for promoting sustainable management of the natural resources of the EEZ and continental shelf were dealt with by the EPA's decision-making committee in its decision on Chatham Rock Phosphate's application for a marine consent to mine phosphorite nodules on the Chatham Rise. In particular, it will consider how the decision dealt with other marine management regimes, conflicts with other activities such as the fishing industry and the protection of benthic protection areas, and uncertainty of information. Another review may consider how the Act is implemented through regulations that remove the need for an application for a marine consent by providing that some activities are permitted.

Institutionalization of EBM: to identify how to institutionalize EBM given contestation, connections and contrasts across scales. Comparative analyses will facilitate exploration of the efficacy of governance arrangements across different marine resource sectors and ecosystems, with a focus on barriers and enablers for institutionalizing EBM. Insights will be drawn from international experience in integrating formal (e.g., legislative) and informal institutions and practices (e.g., traditional marine

resource uses) across scales and reconciling conflicting interests (e.g. through marine spatial planning).

Precaution: to assess how risk, precaution and cumulative impacts are being considered and responded to through the current framework. This case will evaluate how environmental impacts and cumulative effects are being dealt with across ecosystems and within different statutes (e.g. EEZ, RMA, Fisheries) for different institutions and sectors. Limited work has been done on some individual components (e.g., Iorns (2015), Scott, (2015), Severinsen (2014a, b, & c)). However, there has been no broad or comprehensive assessment of the current framework. This case will also assess how Māori approaches to risk, caution and cumulative impacts in EBM are incorporated in our current framework and how they might be better incorporated. It will compare the NZ results with selected international frameworks to better enable identification of possible alternative approaches that would better facilitate EBM.

Precariousness: to assess potential for incremental change towards EBM. This case study will assess how precarious the current framework is by identifying institutional thresholds or tipping points and the path dependencies of the current framework. Current legal frameworks will be evaluated to determine how 'locked-in' they are, the potential 'lifespan' of current legislation as well as which elements of EBM are already enabled. A driving question is: 'Is the legal framework adequate but implementation poor; or is the legal framework inadequate?' If CP1.1 finds that implementation is a problem then CP1.2 will be designed to test ways to resolve implementation challenges (which may require more directive legislation and/or better systems, education and support for practice). CP 1.1 will look for less formal changes in the practices and cultures of organisations as well as formal legal or policy changes. Another focus will be whether current spatial and sectoral fragmentation of decisions make implementation of EBM difficult or even impossible (i.e. splitting the regime across the territorial sea; between land and sea; and between fisheries and other activities). As a result this study will be able to determine the extent to which the current framework is able to operate at an ecosystem level and secondly what thresholds exist which could be triggers for incremental or major change (to be tested in CP 1.2).

Potentiality for participation: the identities, roles, capabilities and responsibilities of current participants in decision-making and the potentiality of current pathways for participation will be assessed. This case study will help to address the question of whether Māori capacity allows participation within current decision-making and management. We will identify who does and doesn't get involved in decision-making and how pathways for participation are enabled or disabled.

Interviews

Semi-structured interviews (approx. 15 per case study, total n=90) with science, regulatory and industry decision-making participants, public commentators plus appropriate Treaty partners will inform the portfolio. The suite of interviews (with oversight from Alison Greenaway) will provide depth and breadth across the portfolio of case studies. Interviews will vary in length and sequencing. Some may last only 20 minutes, be undertaken over the phone and repeated 3 times in the year as the analysis is developed. Other interviews may be one off, lasting 2 hours and face to face. The style of interview will be determined by the availability of interviewees and their areas of expertise, plus crystallisation of lines of inquiry as some of the case studies are co-designed with colleagues in the challenge as well as other stakeholders.

The purpose of the interviews is to provide insight about the ways in which statutory frameworks have been applied and responded to. The interview questions will be designed (through literature review

and testing with challenge collaborators) to evaluate the extent to which decisions have utilised or not the key elements of a EBM decision-making framework with respect to: incorporation of cumulative impacts on the eco-system elements and functioning from multiple direct and indirect impacts; addressing the interconnections between different elements of the ecosystem; the application of the precautionary principle; dealing with uncertainty and the application of adaptive management; definition and application of 'best available science'; scale of application and of relevant impacts; and stakeholder and public involvement. Interviews will also help to identify ways in which the current framework, and its application, could be improved. Interviews will be audio or video recorded and transcribed as appropriate. Edited and approved audio/video recordings can be shared via the Challenge website.

Data repository

The repository and accessibility of data collected will be investigated to determine whether case study information is providing ongoing benefit through availability for application elsewhere. Case study summaries will be made available via the Challenge website. We will explore opportunities for resourcing other web platforms through interviews and other engagements (e.g. workshops and meetings). A shared drive will enable the co-production of data sets and outputs where appropriate.

Publications

Publication via an e-book plus at least 3 peer-reviewed journal papers will disseminate findings and build engagement with this evaluation of the current legislative framework. The e-book will be co-authored and will support integrative analysis across the case studies and ultimately across a number of dimensions of the Challenge.

G. ROLES, RESOURCES

Alison Greenaway, Manaaki Whenua Landcare Research. Project Lead. Case study lead: Potentiality for participation. Liaison with *Our Seas*.

Al Gillespie, University of Waikato, Case study lead: The science interface. Liaison with *Dynamic Seas*. Working with Graeme Inglis, NIWA.

Bruce Glavovic, Massey University, Case study lead: Comparative advantage and institutionalization of EBM. Liaison with Valuable Seas. Working with a Massey University PhD student.

Carolyn Lundquist, NIWA/University of Auckland, Our Seas Programme Lead. Liaison across case studies and with Our Seas projects.

Catherine Iorn Magallanes, Victoria University of Wellington, Case study lead: Precaution. Liaison with Tangaroa. Working with James Whetu (Whetu), Linda Faulkner, Tutaioa and LL.M Hons student.

Gillian James, Massey University, Case Study lead: Emergence.

Raewyn Peart, Environmental Defence Society, Case study lead: Precariousness. Liaison with Managed Seas.

Oshadhi Samarasinghe, Manaaki Whenua Landcare Research. Project assistant. Supporting analysis of best available science and value across the case study portfolio.

H. LINKAGES AND DEPENDENCIES

This Cross-Programme project includes coordinated research that links across all Challenge Programmes. Within *Our Seas* it will identify how science, stakeholders and policy makers engage with policy and management, and the underpinning policy and legislative frameworks under which the oceans are currently managed; within *Valuable Seas* it will identify barriers to the development of commercial activities, and in the identification and mitigation of environmentally detrimental effects. Within *Tangaroa* and *Vision Mātauranga* it will determine how Māori values and perspectives are integrated into decision-making frameworks, and whether Māori capacity allows participation within decision-making and management. Key linkages to further explore Māori perspectives in this marine governance and decision making will be provided through Projects 3.1.1, 3.1.2 (*Understanding kaitiakitanga*), Project 3.3.1 (*Understanding the dynamic between Māori lore and law*), and Project 3.3.2 (*Innovatively improved pathways*). Within *Dynamic Seas* it will identify data requirements and the uncertainty related to insufficient data availability, and how this influences EBM decision-making. Within *Managed Seas* it will analyse links between the policy framework and the decision-making tools provided within *Managed Seas*.

I. COLLABORATIONS

Decision-makers from agency partners (DOC, MPI, MfE, EPA, regional authorities) will inform this project through co-design of some of the case studies and where possible co-learning. In-kind contributions of their expertise are envisioned as a necessary aspect of this project, to both identify and summarise institutional frameworks, and contribute experiences with respect to RMA and EEZ decision-making contexts.

J. INTERNATIONAL LINKAGES

Collaborations with TEEB (The Economics of Ecosystems and Biodiversity) and the Future Earth programmes will allow learnings from international innovations and best practice to be easily accessible to determine suitability within a New Zealand context. As incoming Co-Chair of the Scientific Steering Committee for Future Earth Coasts, Bruce Glavovic will provide a direct link between this Challenge and this network of ocean and coastal scholars as well as other programmes under the Future Earth umbrella. A long-term partnership with the Centre for Ocean Solutions, Stanford University, amongst others, will also contribute to identification of international best practice, in addition to formulation of potential innovations in EBM policy and management that could be implemented in a New Zealand context. Catherine Iorns Magallanes provides a link to the Aboriginal law program at Thompson Rivers University, Kamloops, Canada.

K. ALIGNED FUNDING AND CO-FUNDING

One VUW Law Honours student will be directly supported by this project. This brings co-funding in the form of supervision (estimated at academic 200hrs), support for student research and use of resources for research and student supervision. There is great potential to support a cutting edge PhD aligned with the Cross-Programme (supervised through Massey University – 200 hours of in-kind funding) if a scholarship is provided at the Challenge level.

L. VISION MĀTAURANGA (VM)

CP 1.1 will link to VM 2.1 through the case studies, interviews and evaluation of best available science, and the assessment of ways to integrate mātauranga Maori in law, particularly surrounding approaches to risk, caution and cumulative impacts in EBM.

M. COMMUNICATION AND OUTREACH

We will use stakeholder workshops in *Our Seas* and *Valuable Seas* and hui in *Tangaroa* as important vehicles for communication and co-learning. We will engage directly with stakeholders, investors, managers and policy makers to ensure of scientific findings are translated and considered in the context of choices and actions. The afore-mentioned e-book will document the evaluation of the current legislative frameworks which will help to support ongoing engagement with the Challenge.

N. CAPACITY BUILDING

This transdisciplinary project directly supports one university student through a co-funded scholarship, one junior researcher, one early career researcher and three practitioners. Furthermore, the research is designed to link with the work programmes of managers, and decision makers across a range of backgrounds and disciplines. Designed to build trust and enhance co-learning, the project will establish new networks crossing institutional boundaries, enabling new partnerships and the integration of knowledge to better inform decisions. Insights gained through this project will also be shared through the teaching work of the investigators. The focus on building partnerships with Māori will also ensure that this capacity building will be transferred to future generations of decision-makers.

O. ETHICS APPROVAL

Ethics approval meeting the requirements of all collaborating organisations will be gained either through the lead organisation for each case study or directly through the Manaaki Whenua Landcare Research Social Ethics process.

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