SUSTAINABLE SEAS | Ko ngā moana whakauka | National Science Challenges

Project Proposal Template

A. TITLE OF PROJECT

2.2.1 Creating value from a blue economy

B. IDENTIFICATION

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C. ABSTRACT

Marine economies create value from marine resources, but we know surprisingly little about them. A diverse mix of market and non-market economic activities and actors, they provide food, employment, minerals, recreation opportunities, export revenues and cultural values. From iwi-owned fishing corporations to tourism operations, recipients of mining royalties, recreational fishers, cultural subjects, and seafood gatherers, Maori are central to New Zealand's marine economies. These economies are expanding, complex and subject to uncertain and changing environmental and social processes. All this challenges us to think creatively about future risks and possibilities. To do so, we need to know more about how our marine economies actually work. This project will measure and map New Zealand's marine economies and create a range of tools designed to foster a "Blue Economy". Based on an ecosystem-based management approach to marine economic development, a blue economy commits to creating ecologically sustainable economic and social value.

D. INTRODUCTION

This project contributes to the theme 'adding value to the marine economy' by generating tools for fostering a "blue economy" in NZ. The concept of blue economy is designed to promote and develop an economy that works within the dynamics of marine environments to sustain, enhance, and create economic and social values [29, 30]. A blue economy approach

draws on key principles of social-ecological research [3] and ecosystem based management (relationships as dynamic, integrated, and place-based [4, 24, 2, 34].

Little is known about marine economy compared to land-based regional economies, especially from an ecological perspective [28, 30]. With notable exceptions (Statistics NZ 2006), NZ's marine economy is poorly documented, even in conventional terms. Recent studies of marine governance in NZ [26, 35] confirm the paucity of research and that there are no off-the-shelf methodologies for analysing blue economy opportunities. Business as usual approaches draw on standard economic analyses.

What is required for EBM are grounded and diverse analyses of marine economies that focus on investment trajectories, governance regimes, ecological relationships, the co-existence of diverse economic activities, and the interplay of environmental, economic, and social values [28]. They must engage seriously with Māori economy [4, 31]. We need measures and future-focused analytical tools that recognise social and environmental diversity, ecological limits, and non-human actors [8, 19, 25]. This project will develop such measures and tools.

We investigate the 'resourcefulness' of marine economies [23]. By this we refer to their social, political and environmental capacity to mobilise and sustain investment. This requires we ask what people are actually doing to produce value, how their activities are connected to environments, what compromises have been negotiated to enable investment, and what social, environmental and investment dynamics and connectivities are in play.

NZ marine economies involve uncertain and under-researched relationships with marine ecologies and environments [10], local land-based activities, and distant economies. They are commonly central to the economic and cultural well-being of coastal communities. Iwi are pivotal participants as established investors, small enterprises, cultural users, kaitiaki, and community members; and practice marine economy differently [4, 5, 6]. Measuring marine economies in standard ways misses this complexity and restricts creative thinking about future possibilities.

In this project, we break new ground by (1) using novel techniques to extend conventional economic analyses by focusing on a richer and more diverse set of measures of the *actual contemporary economy*; (2) assembling these different measures into a possibilities model of marine economy development; (3) validating this model by applying it to a 'live development concern' in the Challenge Study Area (CSA); and (4) developing tools to (a) measure the 'geographical rents' generated in blue economies (the added values generated by conducting an economic activity in 'this place' rather than 'elsewhere' - see Le Heron et al. 2013), and (b) identify and evaluate future opportunities, thresholds and limits for generating new value in a blue economy, fostering geographical rents, and making rents 'sticky' (ensuring that they accrue to the local communities, ecosystems and investors that generated them) [21].

E. AIM OF THE RESEARCH AND RELEVANCE TO OBJECTIVE

The primary aim of this project is to foster possibilities for a 'blue economy' in NZ. It brings 'enactive techniques' to economic development in an EBM framework [21], asking how economic actors (investors, producers, intermediaries, governmental actors, and consumers) might be invigorated to engage in a blue economy. Longer term the aim is to cultivate a marine economy that aligns economic activity with principles of EBM to foster the

creation of economic value and innovation and positive environmental and socio-cultural values. Achieving this aim will stretch into phase 2 of the Challenge research.

The first phase of research will involve documenting and measuring activities, developing understandings, initiating processes, and building tools designed to re-orientate marine economies. It will *demonstrate different ways of understanding and practicing marine economy* to economic actors. This is a fundamental first step in altering mindsets, investment priorities and decision making. Specifically the project aims to:

- Generate a set of empirically-derived 'mappings' of NZ's marine economy: an assemblage-based regional connectivities map; standard sectoral and input-output analysis; global production network/global value chain analysis; an ecosystem services analysis; a space of governance model; and a Māori economy mapping (integrating diverse and capitalist economies)
- Produce an integrated model of marine economy in the case study area, and deploy it to examine resourcefulness in the SS case study area
- Apply the integrated model of marine economy to address a current 'hot topic' economic development issue in the case study region
- Build tools that allow for interactive interrogation of these mappings to trace relations, investigate scenarios, and forecast in any other marine economy case
- Use public engagement approaches to enact resourcefulness in the focal area

F. PROPOSED RESEARCH

The research planned for Phase 1 of the challenge will take place in six overlapping domains (D1-6).

D1: Engaging stakeholders/communities to build blue economy networks (Engaging publics)

Building and sustaining connections with communities of interest is essential in enactive research that works with them to co-produce enactive knowledge. To foster opportunities for economic and environmental gains, the project must engage meaningfully with investment processes and actors (investors, regulators, and communities negotiating resourcefulness). Engagement will commence early in July 2016, will involve working with other Challenge Projects and will be an on-going feature of the research:

(i) Stakeholder familiarisation meetings (June 2016 – December 2016)
(ii) Field engagement and consultation meetings and hui (Dec 2016 — Jun 2017)
(iii) In-field testing workshop (January – June 2018)
(iv) Public presentations (at least two): case study area (Jul–Dec 2018)
(v) Participation in 4 workshops across Challenge (Jun 2016 - Jun 2019)

D2: Collate and review knowledge / best practice in blue economy (Review knowledge)

Survey, collate and review state of knowledge and best practice in marine economy, economic development and management. An initial team meeting (with external advisory group participation) and scoping exercise (Jun-Sep 2016), and project leader meetings with international partners (Mar-Dec 2016) will establish a programme of knowledge review (Oct 2016 - Mar 2017). Targets include: (a) blue economy thinking; (b) existing marine economy management and economic development approaches, including ecosystem services; (c) marine economy in New Zealand (measurement, analysis and development trajectories);

and (d) marine economy governance in NZ. To be led by Lewis, Kahui, Hikuroa/Le Heron, and James respectively (supported by summer student scholars).

D3: Measuring and mapping marine economies (Measuring and mapping)

The empirical phase of the research will measure and map the actual marine economy in the focal area (Apr 2017-Dec 2018). Initial work will include an in-field meeting of the full research team (with industry and other key stakeholders) (Apr-Jun 2017) and the commissioning of a baseline economic analysis using standard methodology[1]. (Jun-Dec 2017). The broader scale analyses derived will provide baseline data for a second round of case-study data collection that drills down into the marine economy in the CSA using qualitative methodologies (primarily document analysis and interviews with key producer-investor, policy and community actors; but also a targeted business survey and media analysis) (Oct 2017–Dec 2018). More detailed analyses of perceived assets (resource-based, ecological, regulatory, relational or community centred) and threats, key value chain relations, global production network structures, and investment possibilities and constraints will produce alternative models (or assemblage mappings[18]) of the CSA marine economy. A model of the 'governance space' [22] will also be generated from an analysis of marine legal/regulatory frameworks, a document analysis of relevant case-specific regional policy, and interviews with key informants (including industry). Assets and connectivities mappings will be completed by mapping Māori marine economy[2] in the CSA using qualitative case-study research (interviews with Maori entrepreneurs and other key informants, as well as hui) [1, 7, 21, 16, 18, 17, 31, 36]. An ecosystem services mapping [9, 17] will be conducted from a review of scientific material, governance documents, and material collected from the Māori economy and connectivities/assemblage mapping exercises and participatory processes in Challenge projects (2.1.2 and 1.2.2).

D4: Integrating diverse mappings of marine economy (Model building):

Co-led by Soliman, this initiative will apply modelling and visualisation logics and techniques to marine economy relationships and blue economy possibilities (prototype: Oct 2017-Jun 2018; model refined, tested and refined Jun 2018-Jun2019). Drawing on the more static analyses, models and 'mappings' derived in D3, an integrated and interactive *possibilities-centred model (PCM) of a blue economy* will be built using "fuzzy cognitive mapping" (FCM) techniques. FCM uses quantitative values derived from qualitative methodologies to define relationships (positive or negative) between economic entities (producers, consumers, government) or indicators (growth, consumption, unemployment, inflation, etc). These defined relationships can be used to simulate the changes of a system resulting from external shocks and address "what if" questions. Designed to be usable by economic actors (including communities) in *collective scenario exercises*, our PCM will identify potentially sticky geographical rents and combine quantitative and qualitative elements into a simple model [31]. Modelling will work with material derived in D3, and build on research team virtual workshops (Oct 2017-Mar 2018). It will integrate EBM research conducted across the Challenge, and draw on further input from the authors of commissioned economic analysis and the visualisation modeller.

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[1] This analysis will use ANZIC codes and a refinement of methodology adopted by Statistics New Zealand (2006)[32] to define and measure the marine economy at various levels of spatial and sectoral aggregation (preliminary discussions held with Market Economics about value added and input-output analysis at finer-grained resolutions).

[2] In conjunction with the Maori Moana, Mauri Tangata, Mauri Ora project.

D5: Field testing a blue economy model (Field testing):

The PCM will be tested into the field by applying it to a 'live' economic development issue (work-shopped with stakeholders). This co-production of knowledge strategy is risky and is not anticipated to offer a simple and final solution. Rather, it aims to disrupt business as usual in an applied setting and demonstrate the value of a resourcefulness approach to identifying possibilities. Two phases of work will be developed: identifying 'hot topic', background research, and workshop planning (Aug-Dec 2018); and applying the model in focal area workshop (Mar-Jun 2019).

D6: Building blue economy management tools (Tools)

Use field testing results to build tools that (1) allow for interactive interrogation of model to trace relational effects, investigate scenarios, and test future opportunities in NZ marine economy; (2) measure the production of geographical rent and its stickiness; and (3) facilitate interactive outreach. These tools will be educational and generative (encourage new activities). The tool development work will take place in the first half of 2019 (Feb-July 2019). It is anticipated that testing and validation will need to be stretched into the second half of 2019 and bridged into Phase 2 of Challenge research. The final model is scheduled to be released in 2020.

G. ROLES, RESOURCES

All researchers will be involved in annual meetings, the planned community workshop, field testing, and scientific symposium, and in pivotal publications. The team will meet prior to commencement of the research, and annually after that. Video conferencing facilities will be used to add a second annual meeting. In-field research will provide further opportunities for researchers to come together. The publication plan will allow opportunities for different researcher to lead publications. Specific roles are designed to build on particular expertise:

	Roles and responsibilities
Lewis	*Project leadership* (intellectual, budget, team organisation); *Engaging Publics* (co-leadership with Hikuroa, all elements); *Review Knowledge* (key concepts review supported by Le Heron E. – one summer student supervision [SSS]) ; *Measuring and mapping* (Connectivities mapping, global production network/global value chain analysis of key networks); *Model building* (overseeing process); *Field testing* (leading workshop); *Tools* (overseeing process); *Writing up* (co-leading process with Professor Le Heron)
Hikuroa	*Project leadership* (VM components); *Engaging Publics* (leading iwi engagement); *Review Knowledge* and *Measuring and mapping* (Leading Maori economy knowledge review and mapping, in liaison with Project 3.2.1 – supported by FitzHerbert); *Model building* (oversee incorporation of Maori economy components supported by FitzHerbert); *Field testing* (iwi engagement, support from FitzHerbert)
Kahui	*Review Knowledge* (environmental economics in marine economy, NZ applications, SSS); *Measuring and mapping* (leading ecosystem services mapping); *Model building*, *Field Testing* and Tools (support for Soliman)
Le Heron E.	*Project leadership* (co-ordination of summer school students, project management support); *Review Knowledge* (support Lewis); *Measuring and mapping* (co-ordinate field work organisation, support Lewis and Hikuroa); *Field testing* (co-ordinate workshop organisation)
James	*Review Knowledge* (lead review of regulatory/governance material - one SSS); *Measuring and mapping* (lead development of governance model); Model building (oversee incorporation of governance components)
FitzHerbert	Support for Hikuroa on Maori economy dimensions across project
Davies	*Project leadership* (administrative support, liaison with other Challenge projects); *Engaging Publics* (co-leadership with Lewis); *Model building* (support for Soliman); *Tools* (support for visualisation; *Field testing* (facilitating/leading workshop)
Le Heron R.	Project leadership (co-leadership intellectual and publication programme); *Review Knowledge* (marine economy in NZ); *Model building* (co-leadership with Soliman); *Tools* (co-leadership with Lewis [contracted provider])
Soliman	*Review Knowledge* (integrated quantitative-qualitative economic models); *Measuring and mapping* (support team information requirements); *Model building* (co-leadership with Le Heron R., with support from Davies, Kahui); *Field testing* (co-leadership with Lewis); *Tools* (support for MacDowall)

The team is cross-disciplinary and cross-institutional and is balanced across career stages. The team is based on established research relationships, and Lewis, Le Heron and Hikuroa have experience leading cross-disciplinary research. Other members also bring extensive experience of cross-disciplinary research. Hikuroa has extensive experience of building relationships with Māori researchers, communities, and stakeholders, and Kahui, FitzHerbert and Lewis all have experience working with Maori research participants in the field of environmental economies. The team has a balance of expertise in applied and theoretical science and includes experience in working closely with industry, government, and community. The team will be complemented by research commissioned from private sector providers, and expertise from elsewhere in the Challenge if necessary. An External Reference Group will be established, including representation from MPI, Environmental Defence

Society, Sustainable Business Council, Local Government New Zealand, the *Māori Economic Development* Advisory *Board*, and one international collaborator.

H. LINKAGES AND DEPENDENCIES

This project is dependent on, and will provide inputs into a number of projects in the Challenge. It will be guided by cross-cutting Vision Mātauranga project, and contribute to its leadership, while our work on Māori economy will draw from and contribute to P: 3.2.1 (Māori economy). This project will also derive insights from and contribute insights to P: 1.1.1 & 1.1.2 (participatory processes). More formally, the project will:

- share with 2.1.1 information derived from industry surveys and interviews with industry stakeholders
- contribute cross-funding to P: 2.1.1 (social licence) (a) fund Kai Chan and one other to scientific symposium; and (b) assist in developing outreach insights to be deployed in developing interactive tools. Lewis will participate in P: 2.1.1 research.
- co-fund a workshop conducted under P: 2.1.2 (values) and contribute to developing that workshop; and draw on and contribute to the participatory processes that develop understandings of values production (especially economic value)
- participate (Lewis) in scenario workshops in Project 1.2.2 (cumulative impacts), deriving and contributing insights about risk and uncertainty and scenario building tools (Davies is a named researcher on this project)

Further afield in the Challenge, this project will liaise with P: 4.2.1 about how thresholds, tipping points and surprise environmental and ecological shocks can all fundamentally alter socio-ecological relationships and resource bases, and thus shape resourcefulness as social and economic values shift and are destabilised.

I. COLLABORATIONS

This research project is designed to be self-contained and does not rely on the success or otherwise of other programmes. It is however designed to complement other programmes in the Challenge (see H.).

J. INTERNATIONAL LINKAGES

Linkages have been established with (Lewis to visit in 2016): Robin Kundis Craig, William H. Leary Professor of Law, University of Utah; Charles Mather, Professor of Geography, Memorial University of Newfoundland; Gordon Winder, Professor of Economic Geography and Sustainability, Rachel Carson Centre, Ludwig Maximillian University, Munich; Elspeth Probyn, Professor of Gender & Cultural Studies at the University of Sydney; Kai Chan, Professor Institute for Resources, Environment and Sustainability at University of British Columbia, Vancouver. Further linkages are being sought with Michael McGinnis, International Marine Policy and Science, Monterey Institute of International Studies (Marine policy); Michael Hudson, Professor of economics University of Missouri (rent theory)

K. ALIGNED FUNDING AND CO-FUNDING

L. VISION MĀTAURANGA (VM)

As partners in the management of New Zealand's environment and the development of its economies, the inclusion of Mātauranga Māori is essential to this project. As kaitiaki of land and sea, and pivotal marine economy actors, Māori have invaluable knowledge and expertise that must be incorporated into this programme, as well as significant interests in project outcomes. This research is designed to incorporate Māori values, principles, and practices into understandings of economy, economic modelling, and economic management. The linkages between this project and the *Vision Mātauranga (VM)* Challenge project which will be maintained by Dr Hikuroa, will ensure the team addresses and works within a VM policy framework, and develop research that explores the contribution that Māori knowledge, resources and people might to the project. Ensuring the wellbeing of Māori society and prosperity of Māori economy is central to the aims of the project.

Māori marine economy is assembled across both corporate and diverse alternative economy formations (Bargh 2014). The development of these economic relationships is a transformational opportunity for iwi and for New Zealand. It does, however, pose conceptual, methodological and empirical challenges – just what does the Māori marine economy look like; how is Māori participation in the conventional economy measured and accounted for; what possibilities, barriers and contradictions exist (and may arise) in co-articulating these different Māori economy formations; and how might blue economy initiatives best (and most appropriately) draw on the innovative potential of the alternative forms of economic organisation practiced by Māori communities.

This study will address dimensions of these questions and explore how possibilities are framed within the ideas and practices of Tikanga Māori, drawing lessons from work by the Māori Economic Taskforce and Ngā Pae o te Māramatanga's (NPM) Te Pae Tawhiti programme, which will play a role in framing the research. We will ask how they might be encouraged to flourish in a context where standard (business as usual) measures themselves carry their own values and assumptions, which not be commensurable with Tikanga Māori. The research team includes four members who have conducted research with Māori researchers and iwi partners and will bring with them to this project appropriate recognition of kaupapa Māori values and VM.

Our research has potential value for Māori knowledge. First, it brings Māori economy into conversation with standard and other economic analysis, putting VM at the core of the research. We will attempt to measure value creation as a material process involving cultural subjects and non-human actors, taking lessons from research calling for new concepts with which to explore Māori economy (Bargh 2012; Bargh et al. 2014). Second, our research seeks to reconcile different economic values by building shared commitments to values and distribution. Here it will draw on and seek to enhance Māori knowledge and experience of linking major corporate investments in NZ's marine economy to community economy values and practices. The example will inform the way market and non-market economies are incorporated into our blue economy model.

M. COMMUNICATION AND OUTREACH

Engaging with various publics is central to the methodology of this project, and a key dimension of its outputs. The project is designed to be enactive, and its success is tied to

effective forms of engagement that see publics take away and act upon new ideas. A pre-research initial consultation hui with stakeholders, a community-focused workshop, and two open seminars will be held with public participants in the case study area. Dr Hikuroa will lead iwi consultations. Engagement in one significant marine economy development issue is written into the design of the research. Further, the project will be outlined and advanced through various workshops and forms of engagement across the Challenge.

The tools and models designed as outputs from the project will provide on-going opportunities for outreach. This latter part of the project will be led by Dr Lewis in association with Dr Chris McDowall of the National Library of Museum, who is a geographical information science visualisation modeller and a leader in public education through visual media. Dr McDowall and he has expressed interest in the project and will continue conversations about visualisation possibilities in 2016.

N. CAPACITY BUILDING

The research team is built around commitments to capability building (team building exercises, co-leadership / distributed leadership, and early career researcher participation), and in this way to building long-term research expertise in the new and increasingly important field of marine economy studies. Expertise in standard economic analysis is well entrenched in private sector organisations. The aim of this project is to build capability in the more heterodox economic analysis necessary to allow economic decision making and governance that escapes business as usual in an emerging field of research. This capability will be essential for developing blue economy thinking and practice and its land-based equivalents as pressures to enhance resourcefulness in sensitive environments intensify and bio-physical environments become subject to greater uncertainty. Co-leadership roles have been built into dimensions of the project.

O. ETHICS APPROVAL

Ethics Approval is required and will be obtained from the University of Auckland Human Ethics Committee through the initial application round in 2016.