Phase II Research Proposal

A. PROJECT TITLE	T3 Ngā Tohu o te Ao: Utilising maramataka as a framework for marine management
"SHORT" TITLE	Ngā Tohu o te Ao: Maramataka and marine management
B. THEME / PROGRAMME	Tangaroa Programme

C. PROJECT KEY RESEARCHERS			
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D. CO-DEVELOPED WITH	
Organisation / company / agency	Level of partnership
Te Whanau o Tauwhao ki Otawhiwhi, Te Rungana o Ngai Te Rangi, Manaaki Te Awanui	Advisor & Iwi, Hapu Partner
Pirirakau, Ngati Hangarau, Ngati Ranginui Incorporated Society, Manaaki Te Awanui	Advisor & Iwi, Hapu Partner
Ngati Kau, Ngati He, Manaaki Te Awanui	Advisor & Iwi, Hapu Partner
Tauranga Moana Iwi Customary Fisheries Trust	Hapu Partner
Ngai Tukairangi	Hapu Partner
NIWA	Project Link & Dissemination
Cawthron Institute	Project Link & Dissemination
Haunui Tech, Mahia Mataitai Committee	Advisor, Project Partner & Tech Development
Manaaki Whenua – Landcare Research	Project Link & Dissemination
Parliamentary Commission for the Environment	Project Link & Dissemination
Tauranga City Council	Project Link & Dissemination
Bay of Plenty Regional Council	Project Link & Dissemination
University of Waikato	Project Link & Dissemination
Biological Heritage NSC	Project Link & Dissemination
Te Kotahitanga o Te Atiawa	Project Link & Dissemination
Paepae o He'eia Fish Ponds, Hawaii	Project Link & Dissemination

E. ABSTRACT

The Māori moon calendar or Maramataka is an ancient knowledge system developed over many millennia though an intimate connection with the environment. Maramataka is a natural timekeeping system that utilises the movement of the moon through any given month or season to determine appropriate times for various customary activities. Although maramataka are not as widely applied in today's modern times, the knowledge and practices surrounding moon calendars have been preserved in indigenous communities across and Pacific. Here in Aotearoa maramataka is still applied by indigenous practitioners and it continues to inform interaction with the environment and guide ecosystem management practices. The survival of maramataka throughout time has established it as a recognised instrument for indigenous ecological knowledge development and preservation.

This research program aims to inform EBM through reclamation of maramataka theory and practice. Maramataka will be used as a tool to explore indigenous ecological knowledge specific to coastal and marine ecosystems. This project will investigate the use of maramataka as a framework for development of cultural coastal indicators and will look to inform culturally responsive practice in marine monitoring.

This project will be developed over three case study areas throughout Aotearoa. These case study groups will set the foundation for collective inquiry into maramataka and indigenous ecological knowledge. Wananga will be utilised as the method for indigenous knowledge inquiry. A series of wananga will be held throughout the program with the research collective to explore maramataka and indigenous knowledge based coastal indicator development.

F. RELEVANCE TO CHALLENGE OBJECTIVE

The following project aims to directly contribute to the key measures of success outlined by the challenge. Key processes will be outlined and will give precedence to meaningful engagement where shared learnings will be synthesized. Reclamation and of maramataka matauranga

Sustainable Seas Challenge sees success as:

- Sustainable Seas research being incorporated into policy frameworks to support EBM.
- Tools and knowledge developed being used in decision-making for the marine environment.
- Proof of concept for an EBM approach to marine management has been successfully demonstrated.
- A vibrant blue economy is developing regionally and nationally, enabled by Sustainable Seas research.
- Māori knowledge, rights, interests and values underpin our outputs.
- Science from the Challenge has been published in high-quality international journals.

G. OUTPUTS	This project will produce the following Outputs:	Linked to which Theory of Change Outputs:	Explain briefly your plan to ensure uptake by iwi and stakeholders:
1	Infographic Report is completed describing the process of engagement, co-development, kawa and tikanga for the project.	B, C & K	The major findings from wananga will be collated by the collective research group. Findings will be presented in an Info graphic report. This report will be published and disseminated through the research group (case study, advisory and research)
2	Digital resource is completed describing the process of engagement, co-development, kawa and tikanga & uploaded to the Nga Tohu o te Ao project digital	B, C & K	All Digital Resources will link with Te Tahuhu Matatau (T4) Program and will contribute to a Nga Tohu o Te Ao digital collection. These resources will be made available to the research group for dissemination in their respective areas and to public audiences.

	collection		
3	Infographic report is created disseminating collated indigenous knowledge regarding Maramataka and the practical applications to the coastal environment.	A, B, C & K	The major findings from wananga will be collated by the collective research group. Findings will be presented in an Info graphic report. This report will be published and disseminated through the research group (case study, advisory and research) networks, and will be presented at local, regional and national hui.
4	Digital resource is completed describing the learnings of the collated indigenous knowledge regarding Maramataka and the practical application to the coastal environment.	A, B, C & K	All Digital Resources will link with Te Tahuhu Matatau (T4) Program and will contribute to a Nga Tohu o Te Ao digital collection. These resources will be made available to the research group for dissemination in their respective areas and to public audiences.
5	Coastal indicator framework is developed based on localised Maramataka for the case study groups.	A, B, C & K	The coastal indicator framework will be developed alongside each case study group. The collective learnings will be collated and presented in a written report. This report will be published and disseminated through the research group (case study, advisory and research) networks, and will be presented at local, regional and national hui.
6	A resource is created and uploaded to the Nga Tohu o te Ao digital collection disseminating the process to develop localised maramataka.	A, B, C & K	All Digital Resources will link with Te Tahuhu Matatau (T4) Program and will contribute to a Nga Tohu o Te Ao digital collection. These resources will be made available to the research group for dissemination in their respective areas and to public audiences.
7	The application and use of maramataka based coastal indicators are described within a technical report	A, B, C & K	The major findings from wananga will be collated by the collective research group. Findings will be presented in a Technical Report. This report will be published and disseminated through the research group (case study, advisory and research) networks, and will be presented at local, regional and national hui.
8	Digital resources describing the application and use of maramataka based coastal indicators is uploaded to the Nga Tohu o te Ao Collection	A, B, C & K	All Digital Resources will link with Te Tahuhu Matatau (T4) Program and will contribute to a Nga Tohu o Te Ao digital collection. These resources will be made available to research group for dissemination in their respective areas and to public audiences.
9	A technical report is completed with a synthesis of key learnings, process, frameworks of the project describing recommendations for EBM.	A, B, C, K & L	The major findings from the whole project (7x wananga, interviews, tool development and data collection/data analysis) will be collated Findings will be presented in a Technical Report. This report will be published and disseminated through the research group (case study, advisory and research) networks, and will be presented at local, regional and national hui.
10	A digital resource of the key learnings, process, frameworks of the project describing recommendations for EBM is uploaded to the Nga Tohu o te Ao resource.	A, B, C, K & L	All Digital Resources will link with Te Tahuhu Matatau (T4) Program and will contribute to a Nga Tohu o Te Ao digital collection. These resources will be made available to research group for dissemination in their respective areas and to public audiences.
11	Scholarly Publication synthesising key learnings and describing recommendations for EBM	A, B, C, K & L	The key findings from the whole project will be collated Findings will be presented in a journal article. This article will be submitted to an indigenous studies journal.

H. OUTCOMES	This project will contribute to the following Theory of Change Outcomes:
	(3) Knowledge from the Challenge (science and mātauranga) is used in decision making to improve ecological health and influences Aotearoa New Zealand's marine management practice and policy (F03).
	(4) The complementarity of local expressions of Kaitiakitanga and EBM are well understood and enabled (F02, F04).
	(8) Researchers and iwi and stakeholders involved during the life of the Challenge continue to actively promote, research in, and use knowledge from the Challenge (F01, F04).

I. INTRODUCTION

The cultural marine and coastal seascapes of Aotearoa have undergone rapid ecosystem change. Understanding the extent of change and the associated impact to social, economic and cultural wellbeing is critical to effective Ecosystem Based Management (EBM) implementation. One of the seven key principles of EBM aims to develop management systems that are 'knowledge-based'. This principle requires both science and matauranga Maori (MM) knowledge development and integration into EBM. This research program addresses the need to reposition MM as an integral and vital knowledge system for understanding coastal ecosystems and informing knowledge-based EBM.

Modern western science coastal indicator frameworks go some way to supporting collection of empirical data to allow analysis of coastal ecosystems both temporally and spatially [2,4]. These frameworks apply scientific processes and methods which have been developed, and refined overtime and provide useful frameworks for western science knowledge development. Although these tools are progressive in nature, their underlying intent is to contribute to advancement of western science theory and knowledge, and when applied to indigenous knowledge (IK) inquiry, these quantitative tools fail to provide for exploration of indigenous ecological knowledge (IEK). These western science frameworks are limited in their ability to support reclamation of MM and can create science research practice where marginalisation of MM is perpetuated.

Mātauranga Māori integrated frameworks have made some progress towards repositioning MM in environmental monitoring. Cultural health indicator frameworks have been developed with the aim of 1) creating more holistic understanding of environmental wellbeing, 2) upholding and empowering cultural values, and 3) facilitating greater participation of MM in environmental management and environmental indicator development [6,8]. These modern cultural frameworks provide successful exemplars for reclamation of IEK and set today's standards for cultural indicator frameworks. This project looks to further develop theory around cultural indicator development through exploration of maramataka (Māori moon calendar).

Maramataka is an ancient knowledge system, born out of an intimate connection with the environment, fostering a deep understanding of the natural rhythms of localised environmental ecosystems. Maramataka were introduced to Aotearoa by our Polynesian forebears and further adapted and refined here in Aotearoa [1, 7] Maramataka served as vital timekeepers which guided appropriate times for activities on land and sea. Ancient maramataka shaped practices that are still active in some Māori communities today. Although the knowledge preserved in those communities is only a remnant of the whole body of knowledge surrounding maramataka, the ability to apply maramataka as a framework in modern times suggests that it has endured attestation over time, and is a proven model for preservation of old and new MM knowledge.

This research program aims to utilise indigenous knowledge to inform EBM through reclaiming knowledge of maramataka theory and practice. This project will place particular focus in how maramataka can 1) provide a framework for reclamation of MM, 2) support the development of culturally appropriate coastal marine indicators and 3) inform transformative marine monitoring practice.

J. AIMS

This project aims to advance theory in cultural coastal indicator development and inform marine monitoring practice. The maramataka framework will be used to support reclamation of indigenous ecological knowledge, reframe and reposition matauranga Maori as a critical body of knowledge for informing ecosystem-based management. This project will investigate three key research questions:

RA1: How do we reclaim maramataka knowledge and practices to inform transformative praxis in coastal and marine assessment?

RA2: How can maramataka be used as a catalyst to reclaim matauranga Maori for the coast and marine environment?

RA3: How do we utilise both the maramataka and reclaimed matauranga Maori to reframe cultural indicator framework development?

K. PROPOSED RESEARCH

Collective development/co-development of knowledge and practice:
This project will adopt a co-operative approach to research whereby the inquiry process will be positioned around a collective steering group. This group will comprise of 1) three case study groups, 2) an advisory group and 3) a research group.

Each case study group will develop research objectives specific to their local coastal environment. This project will facilitate collective exploration of locally derived MM in each case study area. Three case study groups have been identified, and their distribution will provide a broad perspective of maramataka theory and practice in Aotearoa. The case study group areas are listed here:

1. Tokomaru Bay
2. Taitokerau
3. Tauranga Moana

The advisory group will be made up of experts in MM, maramataka and marine ecology. The advisory group will support the collective steering group to 1) achieve research goals, 2) guide maramataka inquiry and 3) support safe practice for exploration of maramataka, IK, MM and integration of science methodology.

The research group will support the research collective through co-ordinating and facilitating exploration of maramataka and cultural coastal indicator development. Researchers will be tasked with collating collective learnings, guiding deep inquiry and disseminating research findings (links to Tangaroa Project 4)

Wānanga/semi structured interviews

Wānanga have been utilised successfully as a method for reclamation of MM [3,5]. Wānanga will provide a kaupapa Māori method of inquiry that acknowledges and upholds traditional Māori values and practices, allowing collective exploration of knowledge in a unique Māori way. This project will utilise wānanga as a method of MM inquiry. A series of wānanga will be held throughout the program with the research steering group (case study group, advisory group and research group).

During the wānanga participants will engage in the process of sharing, reflection and creation of new knowledge for maramataka practice in the coastal environment. Wānanga will provide the basis for co-development of the research program. At each stage of the project, progress will be collectively reviewed, and research priorities defined. Wānanga will be supplemented by semi-structured interviews with participant case study leaders, the advisory team and maramataka experts. These interviews will allow further development of research themes and learnings.

Pūnaha akoako framework

This project will be guided by the Pūnaha Akoako framework, developed by Te Aho Tū Roa [10]. This framework is based on a five-stage participatory action focused process. The Pūnaha Akoako follows a reflective process of collective planning and action. The six stages of the Pūnaha are listed here

1. Whakatau kaupapa – What are our guiding principles?
2. Nō hea? Where did we come from?

3. Kei hea? Where are we now?
4. Me ahu pēhea? Where are we going?
5. Whakatinana? What action do we need to take?
6. Pūmahara? What did we learn?

These stages will provide the framework for exploration of maramataka and will track the projects progress and development. The Pūnaha will provide a step wise process for fulfilling research objectives, outcome and outputs. Each stage of the Pūnaha is detailed here:

1. Whakatau Kaupapa – Grounding the research
Build a collective understanding of the project
Define kawa and tikanga for engagement and conduct.
Define key priorities for each case study group

The first stage of the Pūnaha akoako will look at building a strong collective research group. Whakatau kaupapa acknowledges the need to establish kawa and tikanga, principles of Māori kaupapa research to guide and protect the overall wellbeing of the project and provide a basis on which reflection and evaluation can be made. Whakatau kaupapa will be facilitated through wānanga.

2. Nō hea? Where did we come from?
Explore and reclaim indigenous knowledge regarding use of Maramataka in Aotearoa and the Pacific

Indigenous ecological knowledge (IEK) is the result of intimate connections, explorations and interactions with the natural environment and ecosystems. IEK is culminated over many generations and passed down via various modes of cultural transmission. IEK is directly linked to the lands and seas for which it is developed, and it holds knowledge distinctive and specific to place and people. IEK is a source of invaluable information that continues to inform theory and practice around coastal ecosystem protection and management. This research project will look to reclaiming IEK around maramataka to build a broad understanding of the origins and development of maramataka knowledge, theory and practice. To do this we will explore three levels of IEK reclamation, 1) IEK of the Pacific, 2) mātauranga Māori (MM) and 3) tribal ecological knowledge (TEK).

Knowledge and practices surrounding maramataka has been preserved in indigenous communities throughout the Pacific Islands. We will look to these communities for 1) a broader indigenous understanding of maramataka, 2) contextualise the ancient origins of maramataka, and 3) understand theory and practice for preservation and reclamation of maramataka knowledge. This project will connect with maramataka practitioners in Hawaii and Tahiti and will network with maramataka practitioners and experts to facilitate the sharing of maramataka knowledge, old and new.

Mātauranga Māori (MM) is intricately linked with the culture, customs and traditions of Māori people. Mātauranga Māori encompasses the Te Ao Māori world view which acknowledges the interconnected holistic nature of the living world. Maramataka is both a branch of MM and a framework for which MM can be collected, developed and preserved. Exploration of MM in this project will look at reclaiming traditional and contemporary knowledge surrounding maramataka theory and practice in Aotearoa. Exploration of MM literature, archives and traditional forms of knowledge preservation (Pūrakau, waiata, moteatea, whakairo etc) will form the initial base of understanding. This project also acknowledges people, pūkenga (experts) and maramataka practitioners as valuable repositories of maramataka knowledge. This project will connect with maramataka practitioners and pūkenga who are actively practicing maramataka in their own communities. We aim to gain insights into how maramataka have been preserved through time in Aotearoa and its relevance and application in contemporary coastal management.

3. Kei hea? Where are we now?
Reclaim localised Maramataka. Plan and apply use of maramataka to reclaim local TEK. Define localised cultural coastal indicators

Tribal ecological knowledge (TEK) is tribally positioned and is born and developed over time through intimate interactions with a tribal area (lands mountains rivers and seas). TEK is grounded in place and forms the basis for tribal traditions and tribal customary practice. TEK is held within repositories of knowledge for the benefit and wellbeing of the tribal collective. TEK is fundamental in its contribution to the larger body of MM and IEK.

To support TEK exploration, this project will reclaim localised maramataka specific to each case study area. During this stage local TEK will be combined with the broader understandings of maramataka gained in the earlier stages of the project (Nō hea? Where did we come from?) to inform development of localised cultural coastal indicators.

4. Me ahu pēhea? Where are we going?
Define localised cultural coastal indicators and plan baseline surveys

Baseline survey data can provide a snapshot of the current state of an ecosystem. Combined with ongoing monitoring programmes, baseline data can provide the foundation for understanding ecosystem cycles over temporal scales. Standard baseline data however does not account for historical ecological change and is limited in its ability to capture understand the influence of natural environmental cycles. This project aims to utilise TEK captured in the earlier stages of this project to provide historic data for baseline analysis. The application of TEK in baseline investigations will provide a more robust understanding of the current baselines and will attempt to address uncertainties around false and shifting ecological baselines.

Maramataka is an attested framework which legitimises observation-based monitoring through grounded TEK based principles and standards. Maramataka will provide the foundation for development of TEK based monitoring. Where appropriate we will look to the maramataka to guide integration of western scientific investigation into TEK knowledge development. Baseline survey plans and methods for each case study area will be designed during wānanga and will be supported by the research collective.

5. Whakatinana? What action do we need to take?
Conduct baseline surveys based on localised coastal indicators and maramataka explorations

During this stage of the project baseline surveys will be conducted in each case study area. Data will be collected and analysed to feed into TEK development. Data collection methods will be reviewed based on 1) practicality of use to case study group, 2) efficacy in collecting valid meaningful data and 3) ability to feed back in into the larger body of maramataka knowledge.

6. Pūmahara- What did we learn?
Reflect, synthesis of collective learnings

The final stage of the Pūnaha framework looks to reflect on the project's collective learnings. During the final wananga key research themes will be collated and a final evaluation of the projects overall progress will be made, with particular focus on reclamation of indigenous knowledge (IK, MM and TEK) and the advancement of theory and practice for coastal monitoring.

.. LINKS TO PHASE I RESEARCH

The Nga Tohu o te Ao will adopt and enhance learnings from three projects identified in phase 1. This includes:
Mauri Moana Mauri Tangata Mauri Ora – Reclamation of matauranga through maramataka gives precedence to establishing kaupapa maori based tools (Te Ao Maori side of the waka taurua) to support kaitiaki to communicate responses to degradation and management of the marine and coastal environment.

Te Tāhuhu Matatau o Tangaroa, mai Tauranga Moana ki te Ao – Meaningful engagement has been identified as a critical factor when working within a kaupapa maori research paradigm. Our project aims to enhance and document this process to ensure each the case study group collective are leading all facets of the project. Additionally, we will begin to investigate how we can store and share synthesised information for easy uptake and dissemination.

He Poutokomanawa – The He Potokomanawa project identified the importance of reclaiming traditional knowledge and the necessity to investigate modes of repositories so that information can be synthesised and then disseminated to inform decision making within the coastal environs. Our project aims to consolidate this thinking by investigating how maramataka can be used to reclaim traditional knowledge and also guide discussion for safeguarding and storing traditional knowledge within digital repositories.

M. LINKS TO & INTERDEPENDENCIES WITH PHASE II RESEARCH PROJECTS

The Nga Tohu o te Ao project will directly connect to all Tangaroa projects (T1, T2, T4 & T5) and will share learnings and discussions on the effectiveness of engagement models and project implementation with hapu and iwi. At a more defined level this project is organized in conjunction with Tangaroa project (T4) and will be dependent on the development of appropriate methods for storage, synthesis and sharing of reclaimed matauranga.

This project will also play an integral part to identify a process for each case study group to form traditional baselines of the marine environs and more importantly create a space for the case study groups and the research team to identify kaupapa maori based frameworks to collate environmental indicators of change. This creates an opportunity for the case study groups and the research team to work closely with projects 1.1 "*Understanding ecological responses to cumulative effects*" and 1.2 "*Tools for incorporating ecological responses to cumulative effects into management action"* by sharing kaupapa maori examples and process to define place specific indicators and work with the research teams of 1.1 and 1.2 to conceptualise methods and tools for identifying, incorporating and interpreting ecological responses to cumulative effects that will inform management action.

This project will also aim to work closely with project 3.2 "*Communicating risk and uncertainty to aid decision-making"* through a shared learning approach via invitation to wananga and continued existing relationships. It is envisaged that this project will be a catalyst to providing insight to cultural evaluations of the environment and how such evaluations will be integral to understanding adherent risks to indigenous values reciprocal to the state of the environment. More importantly this project will give advice to project 3.2 by contextualising how traditional knowledge can be formed, communicated and implemented to inform of risks and uncertainties to cultural landscapes of the coastal marine area.

The management of the marine environment rests upon the ability to produce robust data, synthesize knowledge, and clearly present findings to decision makers. We envisage that this research program will allow for the development of matauranga Maori based tribal tohu monitoring programs which will ultimately build the foundation to inform tribal decision making within ecosystem-based management. We envisage that discussing key findings from this project will contribute to project 4.2 "*Options for policy and legislative change to enable EBM across* scales" by drawing out key differences between kaitiakitanga and EBM.

N. VISION MĀTAURANGA (VM)

Partnerships

Evidence of newly established, or effectively leveraged existing partnerships and/or relationships with iwi, hapū and/or Māori entities: Nga Tohu will engage with case study leaders in three rohe. We will look to build newly established partnerships (Tokomaru Bay and Taitokerau) and will also leverage existing partnerships (Tauranga moana, Tamaki Makarau). The case study leaders from each rohe will make up a portion of the collective research group.

The development of 2-way capability resulting from the project: The Nga Tohu project aims to build collective capability in coastal monitoring, utilising kaupapa maori frameworks. By the end of the project each case study group will have had the opportunity to 1) explore māramataka from a broad and localised context, 2) develop and apply localised cultural coastal indicators for monitoring coastal environments and 3) develop a digital knowledge repository for tribal ecological knowledge.

Distinctive Contribution

Evidence that mātauranga Māori has contributed to the design, development and testing of project outputs: Maramataka is the framework on which the Nga Tohu project will be designed and developed. Maramataka will guide each stage of the project and will determine how each case study group engages with tribal ecological knowledge reclamation.

Evidence that project outputs are specifically tailored to supporting Māori needs, interests and aspirations: The project outputs and desired outcomes will be co-developed during wananga. We will work closely with the case study leaders to ensure the key learnings, process and outcomes are presented in a culturally appropriate way. Ultimately, we aim to ensure case study leaders are confident in presenting research findings to their wider whanau, hapu and iwi.

Meaningful Outcomes

Clear provision of appropriate delivery, dissemination and uptake of research outputs and findings to Māori audiences: Nga Tohu will work closely with Te Tahuhu Matatau (T4). Te Tahuhu Matatau aims to better understand kaupapa maori informed dissemination of research findings. T4 will support the research collective to develop a Nga Tohu digital catalogue and will support exploration of appropriate dissemination and uptake pathways.

Māori resources, people and/or knowledge has been enhanced as a result of the project and/or its outputs: Nga Tohu aims to reclaim Matauranga Maori regarding maramataka. This project, therefore, will not only enhance the repository of matauranga maori, but it will support with reclamation of locally derived tribal knowledge. The learnings from this project will serve as resources to support other maori and/or indigenous communities to reclaim traditional marine management practices and will connect kaitiaki across Aotearoa and the world.

O. ENGAGEMENT REQUIRED WITH IWI AND STAKEHOLDERS

Manaaki Te Awanui have drawn on previous experiences in conducting research with hapu by initiating early engagement and co-development of the project before commencement. This has allowed us to shape the project and identify its relevance within the case study areas of Tokomaru Bay, Te Taitokerau and Tauranga Moana. Additionally this project is kaupapa Maori led and enables the case study leaders of each area to establish and define foundational tikanga and kawa principles to guide, protect and evaluate the project. This process will also create a mechanism for the case study leaders to inform and disseminate their findings through tribal and other associated networks. To facilitate and enhance the engagement there will be up to six wananga throughout the duration of the project, with each wananga providing a scope for reaffirming relationships as well as being guided by the research group (case study leaders, advisors and researchers) to identify the appropriate pathways for introducing and disseminating findings from to project to tribal affiliations as well as local and regional organisations.

P. PROJECT COMMUNICATIONS

This project aims to set a precedence by sharing learnings through successes and challenges as well as outputs of the project by the research group (case study leaders, investigators and research leaders). This will be achieved initially by connecting the case study groups to networks within the area of marine and coastal sciences (through the challenge & with key people identified as links and dissemination of the project) as well as present at wananga and hui, set within the project and the sustainable seas challenge. It is envisaged that this will provide an opportunity for tangata whenua to speak about their whenua and taiao.

The findings from this project will also be documented on an online repository (see Te Tahuhu Matatau (T4) Tangaroa Project) Nga Tohu o Te Ao digital collection. This repository will give public (maori and non-maori audiences) access to the research progress, development and outputs. This project aims to develop a method by which maramataka can be used to develop place based tribal tohu and inform marine management. We acknowledge that tohu will differ depending on the tribal area, this project will therefore look at understanding the process of indigenous knowledge reclamation and transformation through application of maramataka practices. We envisage that methods for reclamation and reframing indigenous knowledge explored in this programme will be transferable not only to maori and indigenous communities, but we also hope that the learnings will inform marine science and management communities.

Q. RISK & MITIGATION

Kaitiaki Steering Groups
Problem: Steering groups not lasting the entire project
Risk: Medium
Remedy: Identify groups and individuals with established track records

Kaitiaki Engagement
Problem: Kaitiaki are very busy and finding the time to engage can be problematic

Risk: High Remedy: Take all opportunities to engage when kaitiaki are present for other kaupapa *Wānanga Disruptions* Problem: Tangihana and other iwi engagements can override priority of this project Risk: Low Remedy: Ensure back up venues and presenters are planned for each wānanga

R. CONSENTS & APPROVAL required to undertake research	The following project will give precedence to tikanga, kawa and kaupapa maori. Through meaningful engagement the research team will develop a set of guiding principles identified as Pou Matua. These Pou Matua will provide the research team with ethical guidelines to ensure the appropriate use of knowledge throughout the reclamation and reframing process.

S. REFERENCES

1 Clarke, L & Harris, P. (2017). Maramataka. *He Whare Hangarau Maori - Language, Culture and Technology*,129.

2 Clark D, Taiapa C, Sinner J, Taikato V, Culliford D, Battershill C, Ellis J, Hewitt J, Gower F, Borges H, Patterson M (2018). Subtidal ecological survey of Tauranga Harbour: 2017 Prepared for Oranga Taiao Oranga Tāngata

3 Cole, A. O. (me onā tūpuna), Taiapa, C. and Rameka, W. (2017). The Oranga Taiao, Oranga Tangata, Te Toi Whakatupu Mōhio report series: an introduction. The Oranga Taiao, Oranga Tangata, Te Toi Whakatupu Mōhio. Tauranga, Manaaki Te Awanui Charitable Trust: 37.

4 Ellis J, Clark D, Hewitt J, Taiapa C, Sinner J, Patterson M, Hardy D, Park S, Gardner B, Morrison A, Culliford D, Battershill C, Hancock N, Hale L, Asher R, Gower F, Brown E, McCallion A (2013). Ecological Survey of Tauranga Harbour. Prepared for Manaaki Taha Moana, Manaaki Taha Moana Research Report No. 13. Cawthron Report No. 2321. 56 p. plus appendices.

5 Fairlie, R., Rameka, W., Taiapa, C., O'Callaghan, H., Ellis, K & Fairlie, C. (2019). *Taipiri Project Report:Tahuhu Matatau Te Ao Tangaroa: Empowering the Kaitiaki of Tauranga Moana with Matauranga from Aotearoa and Beyond.* Wellington : Sustainable Seas Challenge, Tangaroa Programme.

6 Rameka, W & Taiapa, C. (2016). *Coastal Cultural Health Index Framework.* Palmerston North: Manaaki Taha Moana, Massey University.

7 Roberts, M., Weko, F. & Clarke, L. (2006). *Maramataka: Maori Moon Calendar.* Christchurch: LIncon University.

8 Taiapa, C., Hale, L., Rameka, W & Bedford-Rolleston, A. (2014). *Tauranga Moana, Tauranga Tangata: A Framework for Development of a Coastal Cultural Health Index for Te Awanui, Tauranga Harbour.* Palmerston North: Manaaki Taha Moana Research Report, Massey University .

9 Taiapa, C., Taikato, V., Lovett, P., Fairlie, R. and Rameka, W. (2017): He Mahinga Mataitai o Te Awanui, Monitoring of Te Paritaha. Results of benthic monitoring of Te Paritaha before and after a capital dredging program within the southern Tauranga Harbour, New Zealand. Prepared on behalf of the Tauranga Moana Iwi Customary Fisheries Trust (TMICFT) and the Port of Tauranga LTD.

10 Te Aho Tu Roa. (n.d.). He Kete Taiao- Ko Au Ko Koe, Ko Koe Ko Au. Mauri Tau, The Enviro Schools Foundation.