

# **National Science Challenges Mid-Way Review**

## **Sustainable Seas Ko ngā moana whakauka**

### **Report of the Review Panel to the Science Board**

**August 2018**

Whakataka te hau ki te uru

May the winds cease from the west

Whakataka te hau ki te tonga

May the winds cease from the south

Kia mākinakina ki uta

So that a cold breeze may blow over the land

Kia mātaratara ki tai

and a cold breeze blow over the sea

E hī ake ana te atākura

Giving rise to a red tipped dawn

He tio, he huka, he hauhunga

A piercing cold, a touch of frost, a glorious day

Ti hei Mauriora

A breath of life.

### **The panel recommends guidance for MBIE during the contract negotiation process:**

- Ensure that the research outputs of the first three themes support and integrate to the research quality of the EBM theme, for example through a research roadmap;
- Develop an appropriate mechanism to enable full exploitation of generated data. Ideally this should implement Challenge-wide principles and mechanisms to create a single entry point to view or source data (perhaps a data plan to crystallise thinking). This should include the Challenge's understanding of the implications of sovereignty of Māori data;
- There needs to be a roadmap to impact beyond the life of the Challenge; this could be based on a Theory of Change;
- A framework to evaluate success toward achieving the impact is needed and the necessary metrics should be implemented with some urgency;
- The director role may require additional time and resources consonant with the size and complexity of the effort to deliver successfully on this ambitious programme;
- There is opportunity to increase the gender balance on the ISP and Governance Group.

### **Overall Comments**

The Review Panel was impressed with the manner in which the Challenge has embarked upon achieving its ambitious programme. This has been enabled through assembling a diverse team of skilled researchers and stakeholders. The Panel is, however, of the view that there is further opportunity to complement achievements to date by establishing a broader range of international linkages.

The efforts made to embed Vision Mātauranga throughout the Challenge are apparent and its marked influence in the Challenge's systems, processes, and structure has provided the Panel with confidence that the foundations set will be of considerable value to the Challenge as it progresses.

Leadership throughout the Challenge is involved and supportive. This is evident in the role that the Host Organisation plays in providing support across a range of administrative and management responsibilities. The Panel is, however, of the view that increasing the time allocated to the Challenge by the Director is warranted.

A key success factor for the future strategy of the Challenge will be in measuring the uptake of the Ecosystem-Based Model (EBM) into policy development in New Zealand. A range of current Government initiatives can assist in advancing the benefits of EBM for the nation and the Challenge will need to ensure it is engaged with those initiatives.

The Panel is also of the view that further value will occur with the development of clear baselines and indications of how long-term impacts will be measured throughout the Challenge.

The Panel noted the consideration by the Challenge of the complexities involved with access and use of generated data and issues of sovereignty regarding data generated from Māori sources.

The Challenge has a diverse range of stakeholders, some of whom are not entirely supportive. The need to build trust through a common understanding of EBM must be a key focus for the

Challenge. The engagement with Māori/Iwi to date is applauded, but as the Challenge progresses effort should be made to expand relationships with other Māori entities, Hapū and Iwi.

The Panel also noted the opportunity to improve on the gender balance in the composition of the ISP and the Governance Group.

### **View of Past Performance**

- By definition this is a highly ambitious programme, which is making discernible progress towards meeting the objectives of the Challenge;
- A highly productive Challenge in terms of scientific outputs and metrics;
- A collegial community of researchers spanning a broad network across the social and natural sciences has emerged;
- Impressive progress has been made in bringing a diverse group of stakeholders into the Challenge;
- Patchy network of international linkages; there are limited linkages to existing international programmes in the same sphere;
- Vision Mātauranga is firmly embedded and visible in structure, system, and processes; kaitiakitanga in terms of intergenerational stewardship has been influencing how the Challenge evolved;
- The leadership throughout the Challenge is clear, effective, and cohesive but stretched thinly;
- There is an effective operational relationship between the host institution and the Challenge; acknowledging the welcome support provided by the host;
- There is a lack of clear baselines and indications of how long-term impacts will be measured;
- Capacity building is creative and impressive with a large number of Māori researchers, early-career researchers, and engagement with youth and social scientists;
- Unintended, but positive consequences of Ko ngā moana whakauka/Sustainable Seas NSC are that its network has become a resource; the Challenge has become an enabler for difficult conversations;

### **View of Future Strategy**

- EBM is an urgent imperative consistent with government direction, social expectations, and global challenges. The Panel was encouraged by the effort in developing a common understanding of EBM and encourage the team to continue to build and communicate it through co-development;
- The “moon shot” is in embedding EBM into policy in New Zealand. The Challenge should capitalise on government policy that can contribute to and give effect to outcomes (for example, the Living Standards Framework and the Future of our Fisheries);
- The Panel supports the shift from disciplinary programmes to thematically and interdisciplinary themes in Phase 2. EBM is the overarching theme to which the other three themes should contribute;

- There are opportunities for more collaboration across the natural resource NSCs, specifically, but not exclusively, Te Kōmata o Te Tonga/The Deep South;
- There needs to be prioritisation of effort associated with the scientific challenges;
- Given the diversity of stakeholder interests, trust is integral to achieving a successful implementation of the EBM model and new ways of achieving this will be necessary;
- Effort will be required in the development of tools that can be trusted by all sectors;
- Vision Mātauranga is firmly embedded and visible in the structure, system, and processes; kaitiakitanga in terms of intergenerational stewardship has been influencing how the Challenge evolved;
- The Challenge should engage with a wider section of the Māori community to achieve buy-in. Expanding relationships with other Iwi, Hapū and Māori entities is encouraged;
- Planning for legacy ought to be considered early; this will include developing a data plan;
- The director role will require additional time and resources consonant with the size and complexity of the effort to deliver successfully on this ambitious programme;

### **Comments against review criteria**

The Panel's review was guided by the following gazetted criteria only.

#### **6.1 (a) The proposal is collaborative and will respond to the most important, national-scale issues for New Zealand and the Challenge objective**

The Science Board must consider to what extent the Challenge's strategy for research, science, technology and related activities in the second funding period builds on the Challenge's activities in the first funding period to:

- provide a strategic, integrated and multidisciplinary portfolio of research, science, technology and related activities that meets the Challenge objective and outcomes (having reference to the themes), and the needs of end-users;
- build on and make best use of relevant New Zealand and international research, capabilities and user communities, including accessing funding and support from a range of sources; and
- give effect to the Vision Mātauranga policy in clause 3.1.

### **Comment**

The Future Strategy for Ko ngā moana whakauka / Sustainable Seas builds on the multi-disciplinary nature of the research carried out during Phase 1, which helped create the necessary disciplinary skill sets for implementing Phase 2 and for accomplishing the Challenge objective. The Panel noted that significant progress was made during Phase 1 in overcoming disciplinary and institutional divisions in marine science in New Zealand, creating an integrated and collaborative programme. This aspect was evident in the documents and in the Panel's discussions with the researchers, several of whom commented positively on the changed research environment.

The Panel supports the change in the structure of the Challenge from a series of disciplinary programmes in Phase 1 to several inter- and trans-disciplinary themes in

Phase 2. This change favors the interdisciplinary nature of the Challenge, but also will require continuous communication and interaction. There are plans to have individual researchers traverse the themes in order to enhance linkages within the Challenge, and the proposed appointment of post-doctoral researchers to carry out this function is supported.

The trans-disciplinary approach that has been adopted in the Challenge is impressive, involving extensive consultation with stakeholders in co-designing and co-producing the research. Vision Mātauranga, especially kaupapa Māori, is well integrated internally and supported by the principles underpinning EBM.

### **Opportunities for improvement**

The Phase 2 Strategy has good bi-lateral engagement with some international programs, including Canadian and Norwegian programmes, and it has been successful in leveraging additional funding to achieve Challenge outcomes. The Panel recommends that the international connections be developed further, with a particular emphasis on pro-actively engaging global programmes. One way to achieve this might be through strategic invitations of international speakers to the Challenge's annual conferences.

In general, there also are opportunities to improve collaboration with other NSCs on common issues (such as data management) and on overlapping information requirements (such as indicators of the status of the ecosystem and of the human dimensions of marine management, including socio-economics and the living standards framework). In particular, the Panel recommends that closer connections be fostered between Ko ngā moana whakauka/Sustainable Seas Challenge and Te Kōmata o Te Tonga/The Deep South Challenge with respect to climate change research that cuts across the two NSCs. The effects of climate change on fisheries are of critical interest to Ko ngā moana whakauka/Sustainable Seas' stakeholders.

Improving the support base of the Challenge among all stakeholders requires continuous engagement and open dialogue. With respect to Vision Mātauranga, it is important to engage with a wider section of Iwi, Hapū and Māori entities. With respect to the broad seafood sector, the Panel noted the existence of negative bias against the Challenge and a lack of understanding of the benefits of EBM. To address these issues, a range of communication strategies are required which enhance the credibility of the research for all stakeholders and strengthen their support for the Challenge.

### **6.2 (a) The research, science and technology will be excellent quality**

The Science Board must consider to what extent the Challenge's strategy for research, science, technology and related activities in the second funding period will deliver excellence, and builds on the Challenge's activities in the first funding period to:

- make best use of, and build the skills and expertise of New Zealand researchers to deliver the Challenge objective and outcomes (having reference to the themes), leveraging international researchers and research organisations, and allowing for the dynamic introduction of new capability, research and researchers;
- contribute to science quality, across a portfolio which appropriately balances high

- risk, high return research and new knowledge generation with incremental research and helping end-users to take up research (horizons balance), and appropriately balances science disciplines; and
- give effect to the Vision Mātauranga policy in clause 3.1.

## **Comment**

The Panel's findings described below are aimed at quality, productivity, diversity, and engagement of the research and researchers.

The Review Panel concurs with the view of the Independent Science Panel that the quality of the research, science, and technology to date is outstanding. Performance and productivity, as reflected in publications and interaction, are generally of the highest standard (with special recognition to the increasing number of publications in the social sciences). The early publication outputs are above average in quantity and are well placed in international journals of appropriate impact; this is a consequence of an apparent and well thought-out strategy for publication.

The breadth of research activity is also laudable. In particular, the Panel applauds the integration of social and biophysical sciences. The *transdisciplinary* engagement across these domains is especially valuable. Several of the research components are of particular note: The Tipping Points research is world leading; it is innovative and will result in effective predictive capability. Additionally, the research on model development and selection is appropriately fit for purpose.

An important aspect of the research in this Challenge is the effort toward engagement of researchers. The development of mechanisms to engage new researchers into the community is innovative. The level of participation of Māori researchers is unique and commendable.

Overall, the Panel finds that the research programme is well integrated, innovative and of high quality, invoking confidence in the quality of future efforts associated with this Challenge.

## **Opportunities for improvement**

The opportunities for improvement in Phase 2 of the Challenge deal mostly with organization and prioritization of research, expansion of the reach of the team, as well as data curation.

Recognizing the primacy of the fourth theme of the Challenge (Ecosystem Based Management, EBM), the research outputs of the first three themes (Degradation and Recovery, Blue Economy, and Risk and Uncertainty) must evidently and obviously support and integrate accordingly. The development of a research roadmap is recommended to ensure the connectivity and "flow" of research activity. Similarly, the diversity of applicable models (biophysical and socio-economic) begs the question of priority of modelling investment. A second (or perhaps, subordinate) roadmap indicating model investment priorities would be helpful.

The Panel found that while there has been some effective international engagement of a bi- or multi-lateral nature (especially with Canadian and Norwegian researchers) there are some missed opportunities for a fuller integration with global efforts. Specifically, the engagement with intergovernmental entities (such as the Intergovernmental Oceanographic Commission) is encouraged. This outreach will most likely require a proactive initiative on the part of the Challenge leadership.

Another important opportunity lies with the effective stewardship of generated data, including the challenges to understand the implications of sovereignty of Māori data, and the down-stream implications of data management for the emerging blue economy. The Challenge is encouraged to develop a set of Challenge-wide principles, policies, and mechanisms for data archive (including quality assessment and control), management, and access.

## **6.2 (b) The proposal is focused on delivering impact**

The Science Board must consider to what extent the Challenge's strategy for research, science, technology and related activities in the second funding period will deliver impact, and builds on the Challenge's activities in the first funding period to:

- realise a credible pathway to create the impacts necessary to achieve the Challenge's objectives and outcomes (having reference to the themes);
- deliver benefits and additionality to New Zealand and to New Zealand science; and
- give effect to the Vision Mātauranga policy in clause 3.1.

## **Comment**

The Challenge has undoubtedly created significant additionality in this area by virtue of research on, and the application of, EBM in New Zealand being limited with un-coordinated research prior to the Challenge. Nevertheless, an EBM approach to the sustainable management of the marine environment raises huge challenges with respect to engagement with groups across society who may be (initially) hostile to the concept and also in the unprecedented demands on biophysical and social scientists to work together to deliver the science needed. The Challenge's impact will be judged by how well these challenges are addressed.

The Panel was extremely pleased to note that the Challenge had succeeded in initiating the necessary changes in thinking amongst many stakeholders. Also, researchers from different backgrounds and agendas had brokered increased trust between groups in society and seen a new dialogue beginning to emerge around EBM. This was apparent both from the research presentations and from the engagement with representatives from the stakeholder group. The latter group provides a welcoming forum for a broad and diverse set of stakeholders with different degrees of commitment, and who are supported and resourced, if required, to ensure inclusive engagement at all levels, including community and volunteer groups. Whilst much needs to be done to extend this success to more recalcitrant elements within the stakeholder community, the Panel has

confidence that success will increase over time and that this will be greatly facilitated by Minister Nash's recent announcement of the need for an EBM approach to fisheries by 2020, which the Challenge has a timely opportunity to inform and support.

The Panel commends the Challenge's approach of co-development of research to ensure uptake as well as a focus on upskilling of researchers to effectively engage with stakeholders and communicate research to a wide variety of audiences. The integration of youth within the Challenge is an example of the inter-generational component of kaitiakitanga and is an example of how an additional part of the community, not normally engaged, is being brought on board.

### **Opportunities for improvement**

Whilst the Panel was pleased to hear about the commendable impact activities of the Challenge, there was less clarity surrounding the formal pathways in place to evaluate the effectiveness of those activities in delivering benefits and additionality to New Zealand and to New Zealand science and to give effect to the Vision Mātauranga policy. There is an urgent need for formal and rigorous structures and frameworks to be put in place that would allow the Challenge to map out the route towards the impact(s) desired (e.g. the acceptability and implementation of an EBM approach) and to devise key metrics that allow the team to evaluate in near-real time their progress. Such a roadmap would need to incorporate a realistic alignment of end-user expectations with research capability and be sufficiently adaptive and responsive to acknowledge future changes in both expectations and capability. The Panel was encouraged to hear that such plans were under early consideration by the Challenge, e.g. by adopting a Theory of Change approach, but the Panel also felt that greater priority should be given to progressing the roadmap.

For the Challenge to have impact at every level in society it is vital that its activities are well-coordinated with, and sensitive to, high-level government priorities, in particular the Minister's desire to implement an EBM approach. It was not clear to the Panel what formal contacts, structures and arrangements are in place to facilitate this.

Much of the long-lasting impact of the Challenge will lie in the biophysical and socio-economic data generated, collected and archived over the course of the Challenge. Current activity in this area seems not to be well coordinated, is of variable intensity and is dispersed across many data-base sites. The Panel urges the Challenge to develop a robust data management strategy that would allow future use of such data, for instance by the New Blue Economy and by future generations using EBM. In this respect, the Challenge needs to work with stakeholders to consider what (if anything) needs to be done to the infrastructure and workings of the traditional blue economy to implement EBM.

### **6.2 (c) Decision-making and accountability arrangements are sound and enduring**

Based on the Challenge's performance during the first funding period and any proposed changes, the Science Board must confirm that the Challenge's governance, management, and financial structures, including decision-making and accountability arrangements, are effective, appropriate and give effect to the Vision Mātauranga policy

in clause 3.1.

## **Comment**

The Panel was convinced that the governance systems for Ko ngā moana whakauka/Sustainable Seas Challenge are extensive, appropriate and effective. There were several lines of evidence that supported this. The Panel was impressed by the leadership team (Challenge Director and Programme Leaders) who presented as a highly committed, effective and cohesive group. It was clear that the Team had prepared extensively for the review, and was very graceful under questioning, providing clear answers, contributing to each other's responses and avoiding any defensive behavior.

The Panel also met several stakeholders from the stakeholder reference group. The Panel was impressed with the high caliber of the people on this group and by their clear and obvious commitment to the Challenge and to spreading the message through their networks. The Panel talked to the chair of the Independent Science Panel, and again saw a high level of engagement and commitment, with the most recent meeting of the ISP being in April and evidence of extensive discussion in between meetings. Likewise the Chief Executive of the host institution demonstrated commitment of resources to the Challenge, indicating that additional administrative and other support resources were being provided.

The Panel was particularly impressed with how Vision Mātauranga is firmly embedded and visible in the structure, system, and processes and how kaitiakitanga interpreted as intergenerational stewardship is central to the vision of the Challenge.

## **Opportunities for improvement**

The Panel had some concern that the allocation of resources to leading the Challenge may be inadequate. Further discussion with both the Challenge Director and the Host Organisation CEO revealed that the Director is already contributing at least 0.7 FTE, even though the Challenge is only resourcing 0.5 FTE. The Panel was also concerned about the single person dependency of relying so heavily on the Director. The Panel recommends that the Challenge looks carefully at the resources allocated to leadership and considers augmentation. This could be done through increasing the time allocation of the Director, or by bringing in additional leadership capability e.g. a Deputy Director, or a combination of approaches.

The Panel noted that gender balance among the Challenge leadership team was good, and in fact there appeared to be more women in leadership roles than men. However, the Panel also noted that this is not the case for the Governance Group (two women out of ten members) or the Independent Science Panel (one woman out of six members). The Panel recommends strongly that governance will be improved by having a better gender balance on these two key committees.

The Panel noted that there are some cross-dependencies between Ko ngā moana whakauka/Sustainable Seas Challenge and Te Kōmata o Te Tonga/the Deep South Challenge, particularly with respect to climate change. There could be an opportunity to

use the overlapping membership of the governance groups to increase formal coordination between research outcomes in these two Challenges.

The Panel noted some challenges with research prioritisation, and suggests that the Independent Science Panel could provide more targeted and robust advice on prioritisation and also science quality assurance to assist the Science Leadership Team in making their decisions about science project approvals and progress.