

Weaving mātauranga into environmental decision-making

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Abstracts

Ko te pūtaiao me te taunaki te tūāpapa o ā Environmental Protection Authority (EPA) whakataunga. Kua whakataurangi ake a EPA ki tētahi kaupapa mahi tau tini nei e aro pū ana ki ngā huarahi kia whītki tauātia ai te mātauranga Māori taketake nei ki āna tukanga whakataunga. Mātua rā, me whai i te mārāma kehokehohanga ki ngā kaupapa o roto, me ngā hīraunga ka pā ki ngā tukanga whakataunga a EPA. Ko te whāinga ia, kia tuia te māramatanga ki te mātauranga ki ā EPA mahi o te ia rā, me te whakakaha i ngā houruatanga Māori anō hoki. Kua whātoro atu a EPA i runga i ōna ake hiahia ki Ngā Kaihautū Tikanga Taiao – koia ko te kōmiti tohutohu Māori ā-ture nei o EPA, ki Te Herenga – koia ko te whatunga kaitiaki o ngā takiwā e hāpaitia nei e EPA, ki Ngā Parirau o te Mātauranga anō hoki – koia ko te kāhui kaumātua kua kōwhiria mai i te whatunga o Te Herenga. Ko tētahi tino wāhanga ā-mahi nei o tēnei kaupapa mahi o te mātauranga ko te waihangatia o tētahi mahere hei whakamahi mā ngā kaiwhakatau, kia aromātaihia te pono o te mātauranga ka whakatakotoria ana hei taunaki. Ka kōrero tēnei pepa i tā EPA haerenga kia rite ai ki te waihanga mai i tētahi mahere mātauranga.

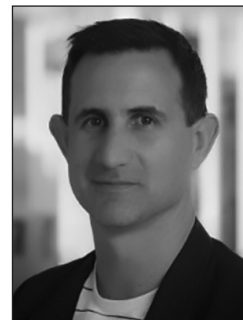
Science and evidence form the foundation of decision-making at the Environmental Protection Authority (EPA). The EPA has committed to a multi-year mātauranga work programme that focuses on ways of weaving mātauranga, indigenous knowledge, into its decision-making processes. The first step is to develop a deeper understanding of the concepts involved, and their implications for the EPA's decision-making processes. The aspiration is to weave an understanding of mātauranga into the daily work of the EPA, and to build on Māori partnerships. The EPA has engaged proactively with Ngā Kaihautū Tikanga Taiao, the EPA's statutory Māori advisory committee; Te Herenga, the EPA-supported kaitiaki network centred in the regions; and Ngā Parirau o te Mātauranga, the kaumātua group drawn from the Te Herenga network. One of the most critical strands of work of the mātauranga work programme will be to create a mātauranga framework for decision-makers to use to examine the veracity of mātauranga when presented as evidence. This paper explores the EPA's journey towards being ready to create a mātauranga framework.

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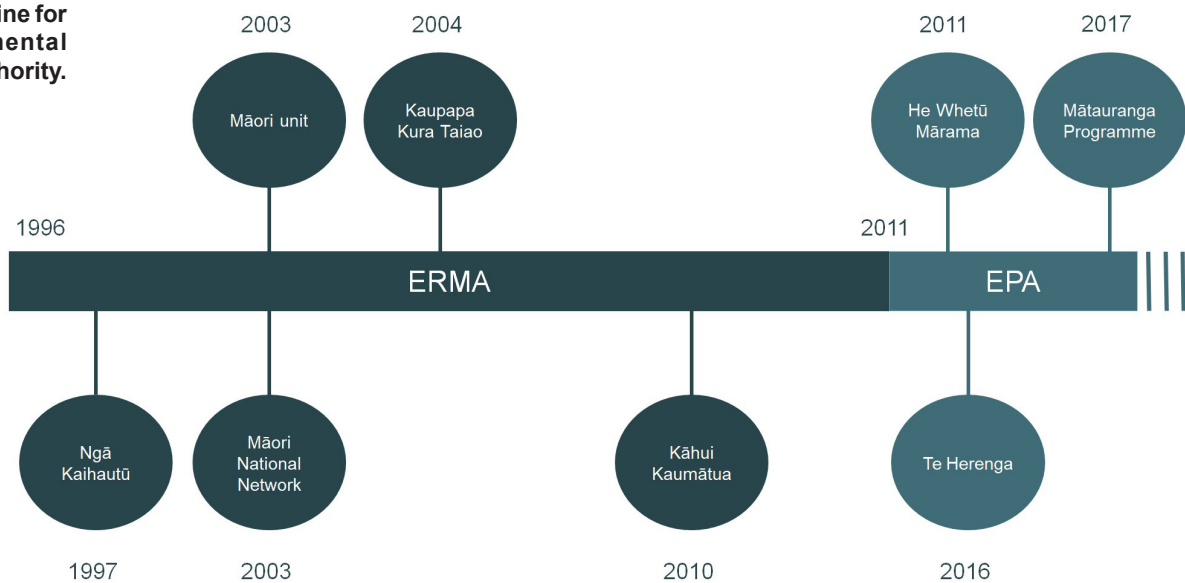
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Figure 1. Timeline for the Environmental Protection Authority.



Introduction

Mātauranga¹ is broadly defined as a body of knowledge, experience, values, and philosophy of the indigenous peoples, Māori, in Aotearoa, New Zealand.^{2,3} Mātauranga can be described as ‘the pursuit of knowledge and understanding of Te Taiao (the natural world), following a systematic methodology based on evidence, incorporating culture, values and worldview’.⁴ The development of cultural models and frameworks that incorporate indigenous knowledge and science are increasingly used to inform environmental management, policy, processes, and decision-making.^{5,6}

Te Tiriti o Waitangi, The Treaty of Waitangi, has provided a foundation for recognising the rights and interests of Māori, which is reflected in national legislation. Understanding and realising how to best give effect to Māori rights and interests has taken considerable time and resources for agencies and institutions to grasp.⁶

In the broader context, the incorporation of mātauranga into environmental decision-making has largely been driven from rights-based environmental pressure by Māori largely based around the Resource Management and Local Government Acts,⁷ a growing recognition and understanding of Māori rights and interests by institutions and agencies,⁶ and, as a means to inform sustainable environmental management, using a more holistic understanding of the relationships among Te Taiao.⁴

The Environmental Protection Authority New Zealand (EPA) has commissioned a multi-year mātauranga work programme which focuses on weaving mātauranga into its decision-making processes. The EPA is a government agency responsible for regulating activities that affect Aotearoa New Zealand’s environment, while balancing social, economic, cultural, and environmental factors.

The EPA recognises the unique relationship of Māori with the environment in Aotearoa New Zealand, their place as the people of the land, tangata whenua, and the important role they play in New Zealand’s economic, environmental, social and cultural wellbeing.⁸ The EPA also recognises that, as land managers, owners, guardians, and governors of significant natural resources, Māori contribute a range of knowledge, skills, and experience, which, through the

incorporation of mātauranga, are invaluable to robust and effective decision-making and provide for a holistic approach to environmental management.

This recognition is not new; an evolving discussion on the relationship of Māori to the environment has occurred over many years between the EPA (and its predecessor, the Environmental Risk Management Authority), Ngā Kaihautū Tikanga Taiao (‘Ngā Kaihautū’).⁹ Te Herenga, a network of Māori environmental practitioners centred in the regions and Ngā Parirau o te Mātauranga (‘Ngā Parirau’), the kaumātua (elders) group drawn from within Te Herenga.

In recent years, the EPA has taken further steps to help decision-makers and staff incorporate Māori perspectives into their work. This includes *He Whetū Mārama*, developed in collaboration with Ngā Parirau, a framework that provides EPA staff with guidance on how to meet the EPA’s statutory and other obligations towards Māori. The vision of this framework provided the foundation statement for the EPA strategy. The strategy also includes a strategic intention to *increase the trust of the nation, Māori, and business through decision-making based on science, evidence, mātauranga, and risk assessment*.¹⁰

In collaboration with Ngā Kaihautū the EPA has also developed the *Incorporating Māori Perspectives into Decision-making* protocol to help decision-makers incorporate Māori perspectives appropriately into decision-making.

The mātauranga work programme is the next step in the evolution of the EPA towards an organisation that better understands and values Māori perspectives and mātauranga. The EPA formally committed to its mātauranga work programme in 2017. The programme aims to increase the understanding of mātauranga across the EPA, enable well-informed decision-making and support the EPA to understand the issues, implications and benefits that mātauranga raises for the EPA’s decision-making processes.

This paper provides an overview of the EPA’s journey (Figure 1) in weaving mātauranga and science in environmental decision-making, using a *Waka Hourua-partnership* approach in line with the Te Tiriti o Waitangi, Treaty of Waitangi principles in the EPA’s He Whetu Mārama framework and organisational strategy. It also explores the EPA’s key findings and lessons learned to help inform others embarking on a similar journey.

Example 1. Pūrākau represent a type of codified mātauranga Māori^{12,13}

One example of mātauranga relevant to the EPA is taniwha, which can mean different things to different whānau, hapū and iwi. A common widespread understanding is that taniwha are kaitiaki, guardians. When used in that sense, as kaitiaki, taniwha serve as a warning of danger. In 2002 the Waikato expressway was being constructed. Ngāti Naho expressed concerns that a section near Meremere would encroach upon the lair of Karu-tahi, a taniwha. After consultation with Transit New Zealand the section was re-designed and the route slightly altered. Almost 14 months after construction, a flood inundated the lair of Karu-tahi, but the re-design ensured that the expressway was not threatened. In this case, it can be argued that Karu-tahi is an explanation of observed potentially dangerous flooding events, explained according to a Ngāti Naho worldview. Heeding Karu-tahi, as Transit New Zealand did, is a form of risk reduction and accordingly it acted as guardian of the expressway.

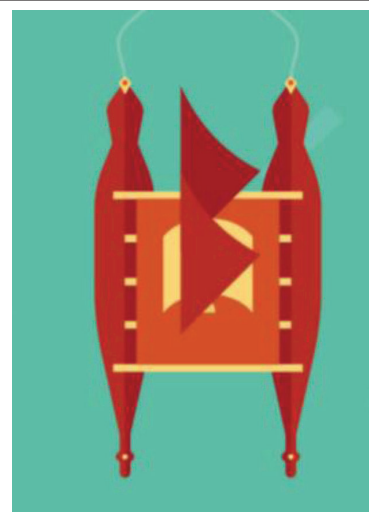
Weaving mātauranga and science

The EPA has decision-making powers under two pieces of legislation, the Hazardous Substances and New Organisms Act 1996 (HSNO), and the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (EEZ).¹¹ Decision-making powers are delegated to either individuals, or committees of decision-makers. EPA decision-makers rely on evidence, amongst other things, to help them form a view on all of the issues contributing to a decision they have to make, including both scientific and mātauranga evidence.

As an environmental decision-maker the EPA considers both mātauranga (Example 1) and science in its decisions and day-to-day work. It was noted by a kaumātua on Ngā Parirau, that decision-makers and staff are capable and confident to query, test, and assess matters pertaining to science; metaphorically, they are able to turn over the stones of familiar knowledge systems. By comparison, their ability to turn over the stones of mātauranga is limited. In order to enable a partnership approach, decision-makers and staff need to be able to turn over the stones of both mātauranga and science to make better-informed decisions.

Building on conversations with Ngā Parirau, it was identified that there was no clear pathway or framework for decision-makers to effectively assess mātauranga when it is presented as evidence, and that there could be greater understanding within the EPA of what mātauranga is and its relevance. In addition, there was limited understanding that mātauranga as a knowledge system has its own veracity and rigour – rather, any testing or probing of mātauranga tended to be from the frameworks that decision-makers were familiar with. Furthermore, at various hui over a number of years, Te Herenga members have frequently raised concerns about the potential for third parties to misuse mātauranga in ways which could compromise its integrity. While the EPA has no evidence of this happening, we acknowledge the importance of building trusting relationships between kaitiaki (guardians), regulators such as the EPA and third parties.

Figure 2: Image of a waka hourua.



Ngā Kaihautū and Ngā Parirau have discussed with the EPA to aspire to a paradigm where evidence from a mātauranga knowledge system is capable of being given equal weight to evidence from a science knowledge system, and where the veracity and rigour of mātauranga is evaluated from a mātauranga framework.

In 2016 the EPA’s Chief Executive, Dr Allan Freeth requested that Kaupapa Kura Taiao, the Māori Policy and Operations unit at the EPA, develop a work programme to increase the understanding of mātauranga across the EPA and to ensure that understanding of mātauranga becomes embedded as business-as-usual.

Complementary to this request, significant investment was made into concurrently increasing Māori capability across the organisation. The investment was matched by an enthusiasm of EPA staff to understand Māori worldviews and engage with mātauranga, including through te reo Māori and waiata. The culture change and commitment within the EPA as a result was recognised in 2018, when the EPA was a finalist in the government category for the Ngā Tohu Reo Māori awards.

The EPA has adopted a partnership approach based on the concept of a waka hourua to ensure that the mātauranga work programme draws from both knowledge systems, mātauranga and science, and is developed in a way that aligns with the mutual aspirations of Ngā Kaihautū, Te Herenga, Ngā Parirau and the EPA. We refer to this as the Waka Hourua-partnership approach to recognise that both knowledge systems are vital to understanding of what is needed to protect and foster our New Zealand way of life.

A Waka Hourua-partnership approach

The Waka Hourua, a doubled hulled canoe (Figure 2), is the symbol of the EPA’s mātauranga work programme. The two hulls represent two knowledge systems, mātauranga and science working and moving together in the same direction. The analogy of woven sails represents the information, evidence, advice, and risk assessment that inform EPA decisions. This approach will enable the weaving of mātauranga and science through the use of a mātauranga framework (potentially a series of respectful questions) that will sit alongside frameworks already familiar to decision-makers. In combination, decision-makers will be able to test, probe, and weigh evidence using the most appropriate

framework for the knowledge system. This will acknowledge the contribution both knowledge systems make towards environmental management and recognise the privilege it is to receive both.

A critical aspect of successful navigation is to have a clear image of one's destination before embarking on a journey.¹⁴ The EPA is guided by Ngā Kaihautū and Te Herenga and together provide leadership to encourage and explore the place for mātauranga within EPA decision-making processes. Te Herenga supports the EPA's moves to improve the effectiveness of Māori engagement in EPA decision-making.

In adopting the Waka Hourua–partnership approach, the EPA places a high level of importance in having the trust and confidence of Māori. The aim of the approach is to ensure that the aspirations for improved Māori participation in EPA processes and understanding of mātauranga by EPA decision-makers that have been discussed with Ngā Kaihautū and Te Herenga over a number of years are realised. A way to do this, and to maintain the integrity of the programme, is to ensure that relationships fostered over many years continue to be honoured.

Key findings

The experience of the EPA has led to the conclusion that successful development of a mātauranga work programme that weaves mātauranga and science into decision-making involves two key components working together.

First, weaving mātauranga and science into decision-making requires an alignment of aspirations, willingness, and expertise between all parties involved.

Second, the Waka Hourua-partnership approach needs to ensure that the programme maintains the alignment of the aspirations and expectations of Ngā Parirau, Ngā Kaihautū, Te Herenga, and the EPA. Both components acknowledge the critical role that everyone has in creating a well-rounded, robust, and rigorous programme which has the ability to weave two worldviews. This will be tested as the EPA moves towards implementation of its mātauranga work programme.

Alignment of aspiration, willingness and expertise were key elements to success

In order for the EPA to embark on the journey of weaving mātauranga and science into its decision-making processes, there needs to be an alignment of aspiration, willingness, and expertise between all parties involved. For the EPA, the Waka Hourua partnership approach enables aspirations of Ngā Kaihautū, Ngā Parirau, and Te Herenga to be set for mātauranga that aligns with the willingness and courage of EPA leadership to formally adopt and invest in a multi-year mātauranga work programme.

The willingness also extended to the EPA staff who were eager to learn more about Māori worldviews and perspectives, to incorporate into their own day to day work. The investment by the EPA to increase Māori capability alongside the willingness of staff, and the culture change as a result should also be acknowledged in terms of alignment. The role of Kaupapa Kura Taiao in maintaining open communication and incorporating feedback on the programme, while increasing Māori capability within the organisation is important.

A Waka Hourua–partnership approach is required to weave two knowledge systems into decision-making

The Waka Hourua partnership approach is broader than weaving together two knowledge systems in and of themselves. For this to be successful, the design of, and communication about, the mātauranga work programme needed to ensure all partners, Ngā Parirau, Te Herenga, and Ngā Kaihautū, were successfully brought on this journey. In addition, the tikanga guidance provided by these partners has been essential to enabling the EPA to embark on this journey with cultural integrity. In the development of the mātauranga work programme, Kaupapa Kura Taiao focused on maintaining open lines of communication in multiple directions: with Ngā Parirau, Te Herenga, Ngā Kaihautū, and EPA governance, leadership and staff. A deliberate balance is maintained throughout to ensure that all parties involved could see their views reflected in the programme. Similarly, Kaupapa Kura Taiao is responsible for ensuring that the programme stays on track, delivers on the aspirations of Māori for mātauranga, and has integrity from a tikanga perspective.

An effective strategy to bring EPA leadership, governance, and staff on the journey of creating a programme that weaves mātauranga and science into decision-making is to demystify mātauranga, making concepts relatable and building connections between different worldviews. Ngā Kaihautū impressed upon the EPA that mātauranga has its own unique characteristics, which are different from, but equally valid to, other forms of knowledge (e.g. conventional science). Mātauranga has been disregarded by some due to a perception that it is myth and legend. When in fact mātauranga knowledge can be generated using techniques that are consistent with a scientific approach, but explained according to a Māori worldview.

The EPA has facilitated a number of presentations and symposia to expose its staff and leadership to academics, scientists, and thought-leaders who have a depth of experience and understanding of mātauranga. For Māori scientists, there is a critical role in communicating the interface between mātauranga and science. Ngā Kaihautū also has direct engagement with the EPA Board and staff to provide advice at governance and operational levels.

Next steps

The EPA has prioritised the development of a proposed mātauranga framework to help decision-makers understand, test, and probe the veracity of mātauranga when presented as evidence. This will be the focus of the next phase of the mātauranga work programme. It will require an understanding of the EPA's current legislative requirements as a baseline of what we must do, and conversations on the appetite of the organisation to move beyond those requirements to successfully implement such a framework. Implementation of the mātauranga framework will require investigation into EPA processes which are critical to encourage the transmission of mātauranga evidence, as well as, cultural capability building of EPA decision-makers and staff to use the framework and understand the concepts being presented as evidence.

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Dismantling Cook's legacy: Science, migration, and colonialism in Aotearoa

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Abstracts

I Aotearoa nei, ko te tau 2019 tērā i tohu mai kua 250 tau i te taunga mai o Kāpene James Cook, i runga i te Endeavour, i tana haerenga ki te 'rapu mātauranga pūtaiao'. Kia whakanuia ai taua kaupapa, i tuku ngā kāwanatanga, ā-motu, ā-rohe anō hoki, i te \$23 mīriona neke atu hei whāngai i ētahi anō kaupapa, ko tētahi ko te kāhui waka i haere ai ki ngā wāhi hirahira o te motu. Hākoa te hiahia o ngā kaiwhakahaere kia maumaharatia ngā 'hononga tuku iho', otirā ko ngā tūtakihanga o mua a te Māori me te Pākehā (Manatū Taonga 2018), tino kore nei te nuinga o ngā hapori Māori i hurō i te kitenga ake o te tāruatanga o te Endeavour i te paerangi. I kaha te whakahēngia o te kaupapa whakamaumahara i tōna wairua whakatarapī, ka mutu i ngā mahi kino rawa atu a Cook nōna i konei (arā, ko te kahaki, me te kōhuru i ētahi Māori; tirohia tā Ranford 2018). Ko tō Cook noho ki Aotearoa tētahi tino wānanga mō te whakakotahitanga mai o te pūtaiao, o te nuku tangata, o te whānako whenua anō hoki i tēnei motu. Mā tēnei tuhinga, ka taki ahau i te hītori o te pūtaiao me te nuku tangata i Aotearoa (mai i te taunga mai o ō ngā Māori o nāianei tūpuna tae noa ki te taunga mai o te Pākehā, ā neke atu), ka kōrero hoki he pēhea ngā kaupapa here me te pūtaiao o nāianei, ā-nuku tangata nei, i te inenga o ngā hua ki te ōhanga i tēnā o ngā tūraru e whakapaengia nei ka puta i ngā rāwaho kua whakaiwingia, me te huna tonu i ngā hanganga kaikiri whānako whenua nei i tūāpapa ai i a Niu Tīreni, ka mutu ka tohu i ētahi huarahi hou o te rangahau ā-pūtaiao i te nuku tangata ā haere ake nei.

In Aotearoa, 2019 marked the 250th anniversary of the arrival of Captain James Cook, aboard the Endeavour, on its voyage of 'scientific discovery'. To mark the occasion, central and local governments committed over \$23 million to fund events including a flotilla that travelled to sites of significance around the country. While organisers intended to commemorate our 'dual heritage' and in particular the early 'encounters' of Māori and European peoples (Ministry of Culture and Heritage 2018), the sight of a replica Endeavour on the horizon was not a cause for celebration for many Māori communities. Strong objections to the commemorations were raised because of the imperial intentions and violent actions of Cook while here (which included abducting

and murdering Māori; see Ranford 2018). Cook's presence in Aotearoa is an interesting case study of how science, migration, and colonialism have converged in this country. In this essay, I sketch a history of science and migration in Aotearoa (from the arrival of the ancestors of modern Māori through to the advent of the European and beyond), and outline how migration policy and contemporary migration science weigh economic benefits against the presumed 'risk' posed by racialised migrants while obscuring the racist settler-colonial structures New Zealand was founded on. I suggest new pathways for the scientific study of migration to move forward.

Science and migration

In Aotearoa, the story of science is the story of migration. The ancestors of modern Māori, through science and innovation, constructed the fastest seafaring vessels in the world (Walker 1994), the waka hourua, and through their extensive knowledge of ocean environments, of swells, of weather systems and atmospheric conditions, of marine life, and of astronomy, were able to navigate the largest ocean in the world – Te Moana nui a Kiwa – and populate every major island throughout (see Howe 2003). In doing so, our ancestors created the largest 'culture sphere' in the world, spanning 25 million square kilometres, and occupying approximately one-fifth of the Earth's surface – at a time when European ships were 'still hugging the coastlines of continents for fear of the open ocean' (Davis 2009, p. 41).

On reaching Aotearoa, our ancestors encountered an environment vastly different from the tropical islands they had formerly called home. Once again, they applied scientific rigour as they migrated throughout these islands, studied the natural environment, and adapted the culture and technologies they brought with them from tropical East Polynesia to allow them to thrive in much cooler climes (see Walker 1994). Within a relatively short time, Māori had explored the length and breadth of Aotearoa, naming and categorising new species of flora and fauna as they went, and had found uses for all the raw materials that would continue to be of value for the next five hundred years (Addis 1998).

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