



ATUA
MA
TUA

Ngā Tohutaka Taiao

He panui tautoko mō ngā
kaiako kura Māori

Ihirangi Heke

A support document for exploring, gaining approval and initiating safe discovery of Taiao Māori
using Ngā Tohutaka Taiao and the Atua Matua Well-being Framework.



Ihirangi Heke
Integrated Hauora Initiatives Limited

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CONTRIBUTORS

Integrated Hauora Initiatives Limited would like to acknowledge the following people for their valuable contributions to this report. Ngā mihi maioha ki a koutou hika ma, mā koutou tautoko manaaki ki te ara tika o tēnā o tēnā. Whaia!

GEOFF OCKWELL (MANAGER)

University of Otago School of Physical Education

ANDREW MOUNT (PROGRAMMES MANAGER)

Sir Peter Blake Marine Education and Recreation Centre

SHARON NICHOLAS (TRAINING MANAGER)

Outward Bound New Zealand

ANDREW LESLIE (CEO)

Recreation Aotearoa

MOANA TIMOKO (ACTING PRINCIPAL)

Te Kura Kaupapa Māori o Kaikohe

DARYL CRAWFORD (KAI AKO, LEAD)

Te Kura Kaupapa Māori o Mangatuna

Healthy Active Learning - Sport Gisborne

KIWI CAMPBELL (NATIONAL COACH)

Horouta Waka Hoe Club



HE TIMATANGA

Nei ra te mihi maioha ki a koutou mā ngā kaiako o te motu. Koinei he whakaaro noa iho ki ngā mate maha i takahia te ara tika o Tāne ki te taha o Hine Nui te Pō me ōna teina a Rohe rāua ko Miru. Heoi koutou katoa ngā kura Māori, nau mai piki mai ki enei kōrero tautoko taiao, aromatawai tūraru rānei mā koutou tauira, mātua o ngā taitamariki. Me ngā pōari o ia kura. Whaia!

INTRODUCTION

Presently the number of considerations for teachers wanting to lead their classes outdoors is overwhelming with some schools withdrawing from outdoor environmental programmes because of, for example; the perceived risk to boards financially culpable for injury of students and teachers, students who have been taught to be wary of the outdoors, an education sector that discourages practical experiences preferring academic pursuits and teachers who have been trained to provide 'top down' learning processes where they are expected to know every aspect of education outside the classroom without any appropriate training in how to achieve that.

This document is therefore aimed at critiquing current risk assessment procedures used in Kura, schools and education units. In addition, this document is an attempt to reinstate Māori practices of identifying environmental indicators that show 'risky' situations but use alternative pathways to arrive at the same conclusions i.e., determining potential for education outside the classroom based on what environmental signs are present and how these align to the Atua Matua framework of wellbeing.

This document is also a report / a discussion piece on how the process to reinstate a Māori world view of 'risk' can, in large part, remove the concept of risk, replacing it instead with mātauranga Māori information about atua, kaitiaki and tipua and how they provide all of the information required for education outside the classroom. In the past, taiao was a place where Māori not only flourished but led others to understand the richness that existed when an appropriate level of respect and mātauranga Māori was maintained. This document suggests Māori may have something yet to contribute to environmental sustainability and climate change through indigenous knowledge.

In conclusion, while risk is a term used widely to ensure 'safe' business, health and occupation practices, the term has been counterproductive even counter intuitive for Māori struggling to obtain self-determination. Traditional tohutaka practices allow Indigenous knowledge to be seen as a store house rather than a place to be avoided or worse, a place to be used for personal financial gain.

ATUA MATUA

WHAT IS THE ATUA MATUA WELL-BEING FRAMEWORK?

Atua Matua is a term that was created by Dr Ihirangi Heke in 2007 to describe how connections between environments can result in improved well-being for Māori communities. More simply, Atua represent environmental knowledge and Matua represent iwi-centred interpretations of environmental knowledge. Atua Matua asks people to consider various environments in terms of our connection to them i.e., tatai whakapapa and to consider that a hierarchy may exist in terms of environment first and people fast. This is a tatai whakapapa approach also known as a Systems Dynamics) that places the oldest most knowledge bound domain first and those of least recent impact last.



WHAT IS THE ATUA MATUA WELL-BEING FRAMEWORK?



Mātauranga Māori is the key, over arching principle that allows access to knowledge from different environments e.g., high alpine, sub-alpine, mountain ranges, rivers, forests, plains, coastal shores, oceans, even urban environment.



Whakapapa allows a contextual relevance between a specific environment and the people from that location. More specifically whakapapa is not just a list of names but a methodology for interpreting connections between environment to environment, environment to people and people to people. For example – if we are paddling a waka in waitai (salt water) and move into waimāori (fresh water), we paddle differently because of a change in water characteristics i.e., a change in ‘atua’ connected to that water.



Huahuatau is about what we learn because of Taiao, what experiences we gain in applying knowledge of whakapapa or kōrero in a particular environment. This is referred to as dynamic capability. Dynamic capability is achieved when capacity building is converted into applied outcomes in a wide range of areas e.g., what I learn in the ocean can teach humility in a person as the ocean is the dominant feature, hydrodynamics in terms of universal physics and time management in terms of wave speed being used to measure sprinting in preparation for sport.

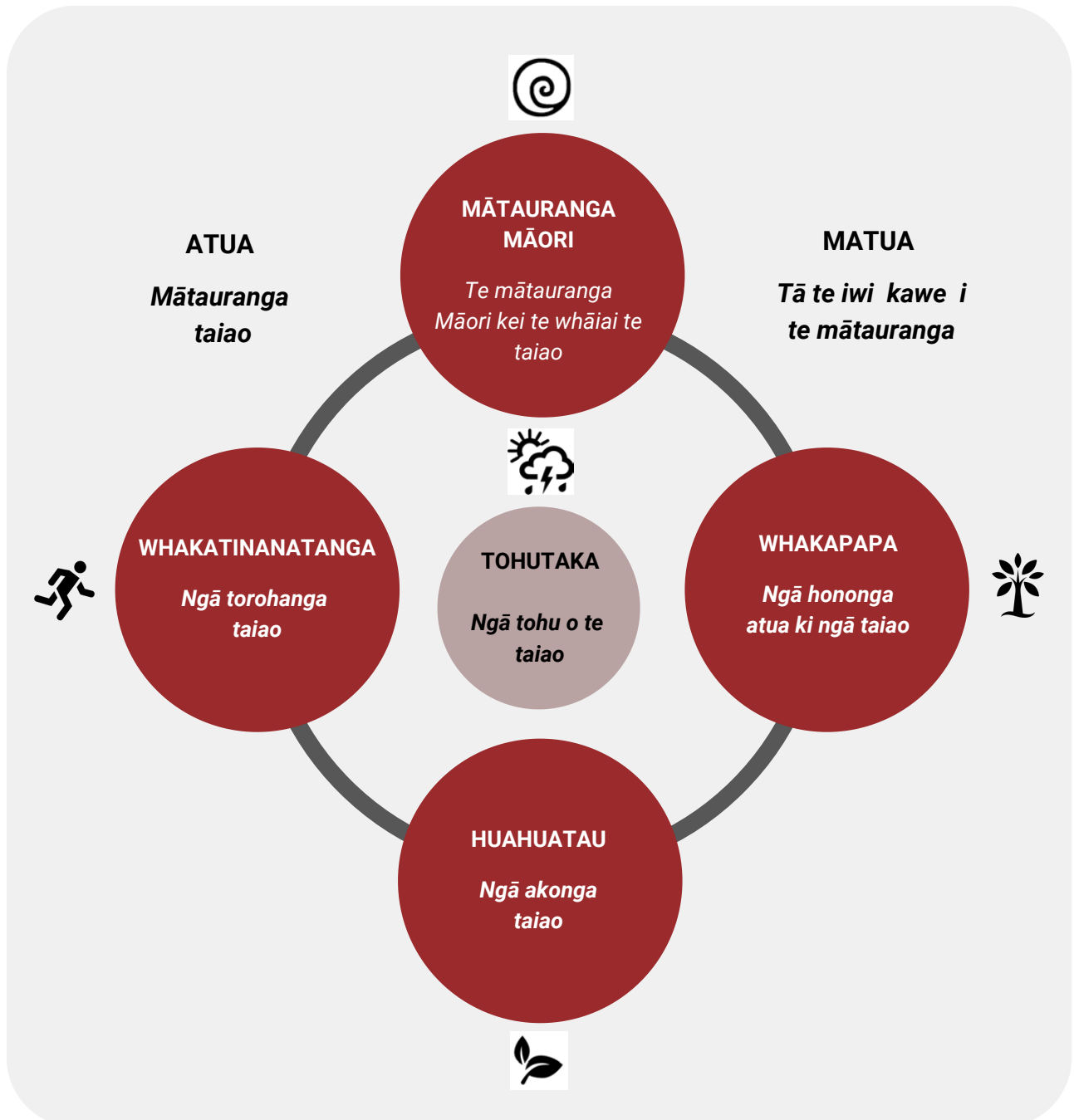


Whakatīnanatanga is the action phase. The intensity, the volume, and the medium through which an activity is carried out. In terms of mitigation of risk or more preferably, emphasis of potential, this domain is where the majority of action/interventions take place. Contrary to current well-being processes that start with interventions at a person-centered level, in an Atua Matua approach, person related interventions come much later.



Ngā Tohutaka is concerned with the timing of when the activities are conducted i.e., signs obtained from trees, fish, birds, insects and weather patterns. Out of interest this approach is being used to take groups of 8-10 individuals into different taiao over a 3-4 day period utilising waka, mountain bikes, trail running, swimming and alpine experiences to help them understand how best to engage with taiao whakapapa safely and with maximum intended outcomes.

ATUA MATUA CONCEPTUAL DIAGRAM





The Atua Matua Well-Being framework is best utilised when local environmental knowledge/ mātauranga Māori, tātai whakapapa and kōrero tawhito are engaged with over an extended period of time, i.e. across 12 months, 3 months, 1 month and 3-4 day periods. From these timeframes the potential for productive outcomes can be better determined and planned for.



NGĀ TOHUTAKA

WHAT ARE NGĀ TOHUTAKA?

Tohutaka is concerned with the timing of when activities are conducted i.e., signs obtained from trees, fish, birds, insects and weather patterns. Tohutaka, can also be obtained from star movements that can predict likely outcomes for the year to come (often taken from Pūanga and Matariki respectively). Likewise the atua Kaupeka is associated with seasonal variation expressed through flowering dates, volume and location on the tree (i.e., flowering on the whole tree, from bottom up, from top down or flowering in clumps on the tree). In addition, the timing of flowering is linked to the appearance of certain constellations, and the consequences for other animals linked to those occurrences e.g., the flowering of Ti Kouka can help determine the likelihood of a dry or wet summer whereas the appearance of Pohutukawa flowers and Kowhai flowers can be used as indicators for the state of Koura and Kina respectively.



More recent interest in maramataka has sparked a national resurgence of interest in the behaviour patterns of plants and animals as indicators for prime moments in time to improve yields of both plant and animal based foods. It is likely that maramataka will also have future contributions regarding the ideal times for academic excellence, relationship outcomes and sporting performance. This may mean that Oturu days, for example, may be the best days for personal best sporting performances whereas Whiro days may be better for injury rehabilitation and recovery. It may also mean that nutrition returns or certain food types may have better outcomes when the characteristics of food types are aligned to the ideal performance days e.g., shark consumed on high energy Rākaunui days versus octopus might result in high energy returns and especially when obtained as a seasonally-based process.

Furthermore, Ngā Tohutaka have quickly become the most readily understood and hence most easily utilised aspect of an Atua Matua approach to well-being. This is because the five areas of Tohutaka are numerous, ubiquitous, and show interconnected relationships that lend themselves to interpretation very easily. For example, tohu rākau allow a whole range of 'readable moments' including wind speed and direction based on the type or tree that will move. More precisely, a little used old Māori term for a wind that affected the Tōtara tree was Hautō. Where the term Hautō was used I could then assume that the wind direction was over 10 knots as the foliage on the Tōtara is somewhat dense and stiff requiring a strong wind to move it. I can also make assumptions on where the location being talked about might be relative to where I know certain trees prefer to locate themselves e.g., North, inland and in moderate to dry conditions. Lastly, I could also have predefined trees on set locations that could be used to tell me from where the wind is prevailing as, for example a specific Tōtara tree on school grounds that faces East.

Also, the type and colour of flower can tell me the time within a season that I could expect to see the flower arrive e.g., Matiti Kaiwai is often associated with the late flowering passage of the Rata when water might be scarce and the ground begins to crack open and consume water i.e., Kai wai. The phase of summer can also help provide additional interconnected signs through cross referencing of details from fish, insects and birds. For example, the arrival of seasonal birds and fish can align to flowering patterns that will align to dominant wind patterns that all confirm the phase within spring or summer.

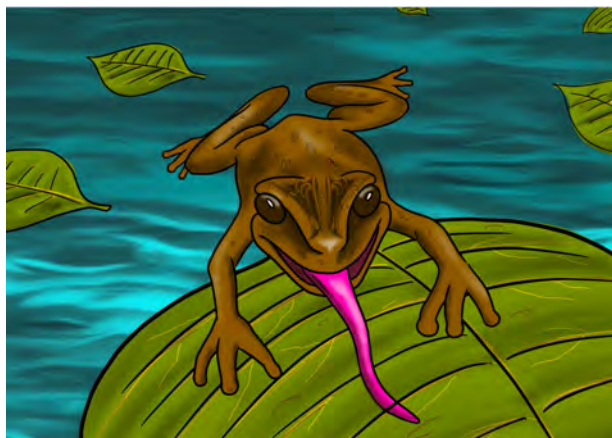


Matiti Kaiwai – Is known as the middle of summer. This is when the ground is so dry it opens up and thirsts for water

Likewise the arrival of birds in uncommon locations or at odd times can inform the observer of some type of environmental anomaly. This type of occurrence is a useful precursor to the arrival of an uncommonly strong storm pattern when sea birds head inland to avoid the tempest. Much is the same when birds are used to determine the ground cover one is likely to encounter while traveling on foot e.g., Pūkeko preference for wetlands and Kāhu preference for open hunting areas.



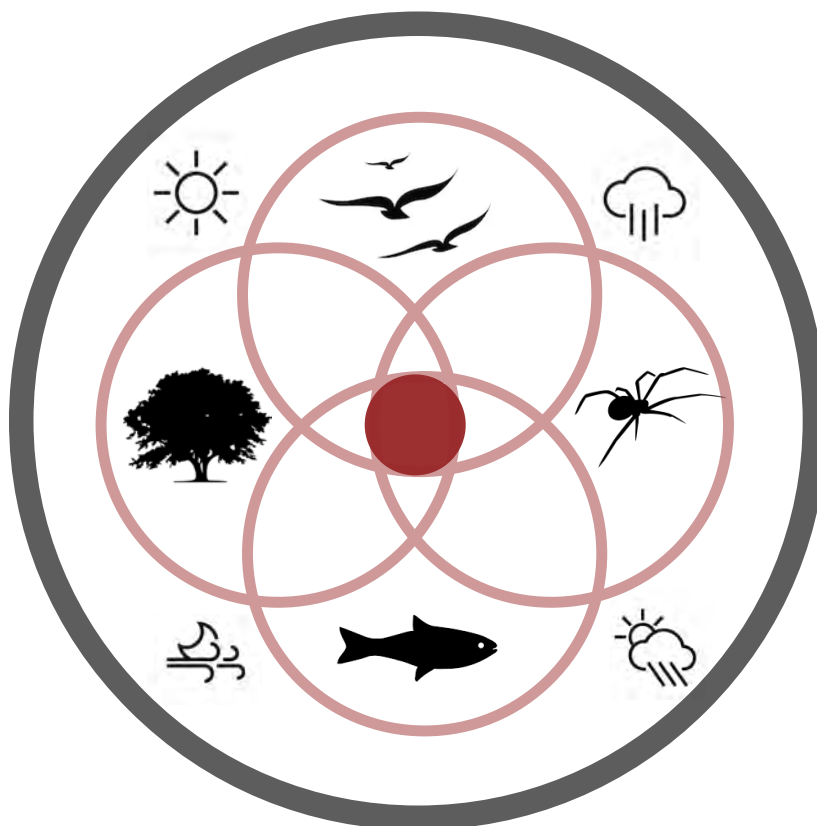
Insects provide a number of tohu when one is prepared to observe over a long period of time to determine the personality traits of the animal. Spiders in particular provide a number of tohu that can be consequently used to determine the likelihood of certain events occurring. When a weather change is likely, for example, the spider will change it's position in it's web to avoid direct impact with rain along with a positioning of it's web to avoid dominant winds and constant rebuilds from being battered by the wind. Spiders also allow timeframes for events as the rebuilding of its web can give us time frames for how long an activity has been in progress. Injury prevention through use of the spider web to slow bleeding and tracking of lost people through the presence or absence of webs in main thoroughfares is also useful. In some cases, particular webs when 'read' in the morning can show the numbers of people and the mode of transport as when the web is read from ground level it will show where the dew is held or lost as a reflection of the people how last traveled by.



Fish and weather patterns are the remaining mediums that are useful for reading environmental signs. The Moki is a fish that tells not only the phase of spring due to their arrival in Te Kaha but cultural protocols for how the fishing should be conducted e.g., the first fish returned and the fish not being gutted at sea. The weather reading skills of the early Māori were not accidental but developed over centuries of travel on the most violent ocean on the planet - the Pacific Ocean. An understanding of exactly which atua was being consulted, and more importantly, the atua interaction with other atua, allowed a highly specialised skill that allowed ocean travel and an improved ability to know when to engage with movement.

Where mainstream models of risk assessment require regular consultation with the MetService to obtain likely weather pattern changes, early Māori would explore the relationships between birds, trees, fish and insects and the consequent weather pattern without the need for internet access and the added benefit of multiple layers to confirm each other e.g., Kāroro inland suggested weather change in coastal area with high wind patterns shown through Tāwhirangi's effect on high cloud structure e.g., smooth and elongated clouds identifying high alpine risk.

NGĀ TOHUTAKA TAIAO CONCEPTUAL DIAGRAM



RISK

WHAT IS 'RISK'?

Risk is an elusive concept in that it is almost impossible to determine all the situations where risk might appear. However, the ultimate aim is to reduce risk through assessment processes that evaluate as many of the hazards present, then reduce or remove the hazard through mitigating control measures. In some instances the reduction of risk are called Risk Assessment Methods Statement (RAMS), Safety Action Plans (SAPs), Safety Management Systems (SMSs) Emergency Contingency Plans, Emergency Preparedness Plans and any number of other variations of the general theme.

RAMS, SAPs and SMSs can also be administered through Mātauranga Māori, knowledge of Ngā Tohutaka and using the Atua Matua Well-being framework. In some instances the breadth of a Mātauranga Māori approach supersedes those of a RAMS, SAPs and SMSs because examples from centuries of connection to the environment can be included through purākau that tell stories of when adverse situations have been avoided. Likewise, atuaanga tells of certain characteristics that can be expected in specific environments through atua that represent or act as guardians over particular domains (e.g., Tāwhirirangi and high altitude winds), kaitiakitanga informs Māori of the influence of animals from various environments (Pūkeko will call when darkness is about to fall), tipuatanga explains many

environmental anomalies (the rising and falling of Lake Whakatipua to match the heart rate of the tipua).

In addition there is also the consideration of the timeframes that one might expect these events to take place (e.g., Maramataka suggests some 'Tamatea' days are prone to unsettled weather). Also the timeframes for seasonal changes through Kaupeka, the atua of seasons can give predictions for what can be expected much like annual predictions are taken from readings of Matariki (see Rangi Mataamua's explanations for yearly predictions in Matariki: Te Whetu Tapu o Te Tau).

Finally, the Atua Matua Well-Being Framework provides a plan for considering the implications of the above aspects into a \ rational authentic process through that whakapapa i.e., the interconnectedness between environmental events. In summary, Atua Matua allows an ordering of effects by providing a hierarchical explanation that is a systems analysis of why an event may happen, with which environment an individual might connect, what aspects are meant to be acknowledged, mitigation processes that can be engaged to reduce or indeed to heighten the experience and lastly a comparative study of Ngā Tohutaka that suggest similar likely outcomes.



In short, a Mātauranga Māori approach to 'risk' is a comprehensive approach in that it is multi-layered i.e., why an event might happen, where it might happen, which environments will be interconnected in the event, what information can be obtained for current and future use, steps to avoid ill-advised confrontation and when the event may occur. Also, Mātauranga Māori provides a situational analysis of pūrakau, moteatea, haka and waiata to avoid deficit thinking where the environment is seen as a 'risky' location.



ADVANTAGES OF RISK ASSESSMENT

Aside from the obvious reasons for avoiding risk such as loss of life or significant injury there are a number of reasons that risk avoidance is seen as very important. Some of these include mitigation of fear on activities that are not only enjoyable but sometimes essential to your work role. In of itself, risk assessment can occasionally open up new areas for developing confidence and resilience through attempting innovative ways of engaging in high risk situations i.e., looking at alternative ways to do the same activity but with low risk processes. Likewise, significant life lessons can be obtained through risk mitigation including improved learning opportunities, experiences, rewards and the simple outcome that one's knowledge is increased for a certain activity.

DISADVANTAGES OF RISK TERMINOLOGY AND EXPOSURE

However, despite some of the advantages, there are a number of disadvantages to risk terminology that can make the process a negative experience. For Māori, risk is mitigated through knowledge of the environment (i.e., atuātanga) and negative experiences are often a reflection of a lack of knowledge of an environment that could cause injury or loss of life. Indeed, it was often seen as an obligation by pre-European Māori that the testing of one's environmental knowledge was not only critical for growth but also allowed the strengthening of one's genetic material and was an important assessment process that determined your level of knowledge of taiao. It was sometimes seen as a form of embarrassment to not know those taiao that sustained your way of life, your tribal existence and your position amongst your peers. In addition, mistakes were not only costly in terms of tribal contributions going forward but reflected badly on those who were briefed as tribal knowledge holders with roles to inform its' tribal members.

Probably more importantly is the undermining of environmental knowledge when risk terminology places people as the focal point rather than long term concerns for the degradation of environmental knowledge and consequences for inter environmental connections. More specifically, a risk analogy places people at the hierarchical peak of importance, uses deficit-based language to do so and does not recognise a tribal members ability to learn from the environment and show humility in the face of millions of years of environmental knowledge, that is, anthropocentric arrogance. In fact some of the advantages pointed out earlier could also be used to increase one's learning opportunities, experiences, rewards and knowledge for taiao as much as they could be identified as advantages for the individual. In more simple terms, it could be stated that where humans seek to dominate nature, risk inevitably arises. Where humility is shown, especially alongside recognition of tohutaka provided by taiao, risk is significantly lowered.

POLICIES

OVERVIEW OF PROFESSIONAL & EDUCATION SECTOR RISK POLICIES

Education Outside the Classroom (EOTC) enables learning to extend beyond the confines of the classroom and for children to understand the importance of knowing their natural environment. EOTC should be seen as an essential part of school life, and encouraged and supported by not only the school but also parents with children at the school. Learning and safety are paramount in EOTC. There are strict procedures that ensure all EOTC trips are thoroughly planned and run to ensure the safety of all participants whether these are being led internally or by some external professional body. For both education and professional bodies, if you want to take a group on an EOTC event then you must follow an approval process and be well trained in how to ensure student safety. Not surprisingly, as the consequences for being associated with an injury of a student increase, some schools are being convinced to ditch their EOTC programmes.

Both the education and professional sectors have significant policy requirements for any of their staff working in Education Outside the Classroom. There are some subtle differences between the two but in essence both have legal requirements to be able to be providers or lead programmes in this area. The outdoor sector generally has to ensure that the likelihood of injury is reduced or ideally, eliminated completely. This outcome is achieved by prioritising the establishment of a

Safety Management System (SMS) as the overarching feature of their outdoor programme. The SMS is regularly reviewed with the professional sector review being exceptionally rigorous and more regular at twelve to twenty four months and where injury occurs in the sector, more regularly.

However, in the education sector reviews are conducted by a Board of Trustees, who are elected community members and sometimes they do not have a connection to the outdoor education sector or lack the skill base to make effective changes. In some cases the revisions have a timeline for when they should be reviewed but this is not always undertaken on time and may take up to three to four years. Both the professional and education sectors understand the benefits of making sure they are using the most up to date version and importantly where the most up to date version is located and hence rollover practices for revision are part of a school or organisations executive assistants role to ensure they happen. Incidentally, having an updated version also means that obsolete versions must be deleted as soon as the information is out of date and all those involved have been notified of exactly which version is out of date.



The Atua Matua Well-Being Framework also recognises the importance of a safety management system but chooses to use different processes to achieve the same outcomes e.g., a Safety Management System might be labelled a Tatai Whakapapa Pūnaha i.e., a hierarchical process that shows a connection between particular environments and how people will interact with that location. Likewise, whilst tracking which version of a document is in circulation is important, an Atua Matua approach is not limited by the sector assigning timeframes determined by administration but rather by environmental indicators e.g., updates are aligned to environmental signals such as a king incoming tide which is often nutrient rich but is also a metaphor for the arrival of new information. Similarly, maramataka days identify phases where multiple activities can be undertaken e.g., Tangaroa days that could have two versions open for review simultaneously much like two tidal changes in twenty four hours. In essence, this means that reviews could be undertaken with recognition of the characteristics of Tāne te wānanga as the atua connected to knowledge transferral.

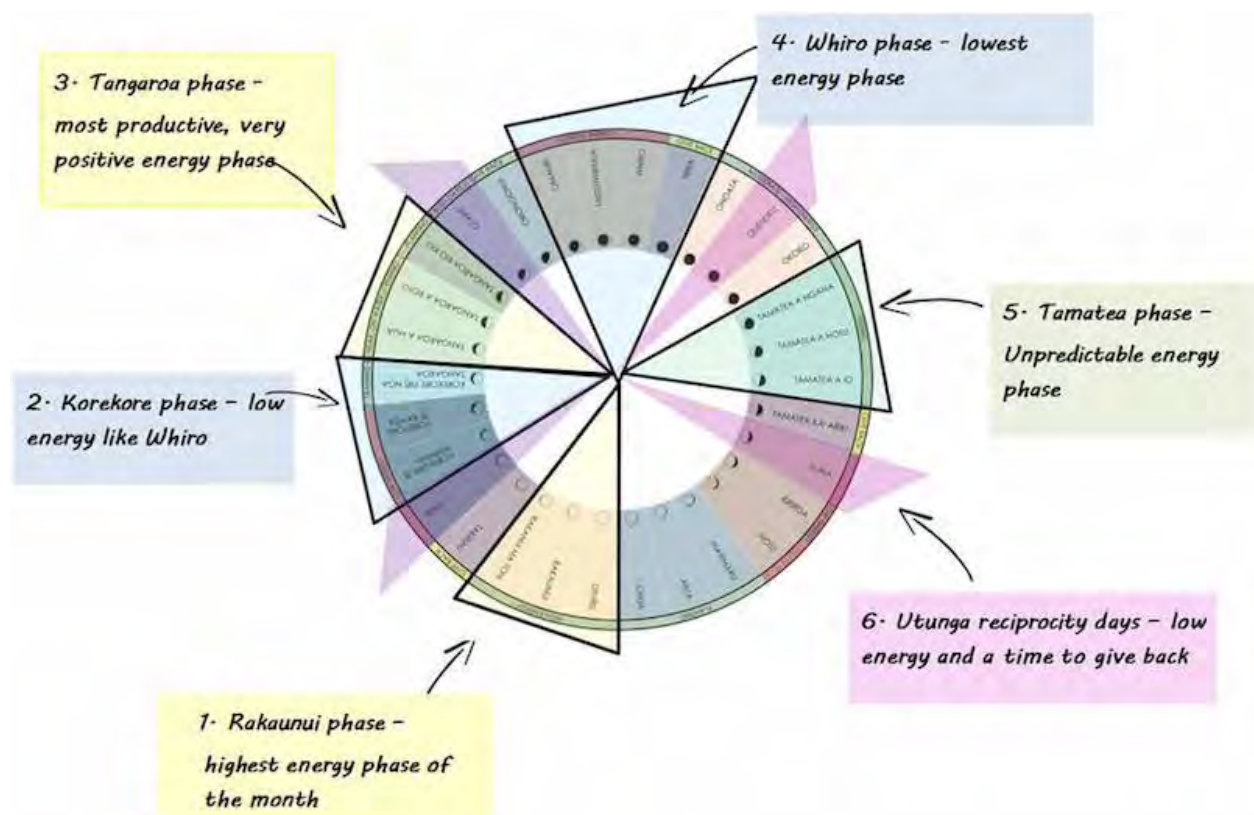


Image Source: Makiha, R. & Hoeta A. (2020) *Learning to live by the Maramataka - Haratua*. The Spinoff Atea.

STANDARD OPERATING PROCEDURES

Standard Operating Procedures (SOPs) shows what might be needed for staff every time they engage with an environment that has risk included. They may be day to day information, connected to specific events or activities e.g., water-based activities and they may include transport to and from an activity.



SAFETY FORMS AND TOOLS

Safety forms and tools are used to gather, record, and provide safety information. They can be used to assist staff preparation, training, hazard updates, minutes from meetings, Safety Action Plans / Risk Assessment and Management Strategy forms (RAMS) and incident forms. In some cases these forms can be used to assist audit processes to show safe practice and meeting of sector standards. In this space review information can be maintained also i.e., any internal or external results can be stored and used as tools for future audits or assessment for legal requirements.

IDENTITY OF THE ORGANISATION

Educational and professional bodies both insist on their documents identifying where their organisations are based, who is in which role and what their targeted work might be. If anything the professional outdoor leaders insist on this information being highlighted because of the opportunity for exposure to their facility and consequent fiscal gain. The education facilities are less interested in this component of visibility because of their education bias, however the financial impact of Equivalent Full Time (EFTs) is of much interest for tertiary facilities. Alternatively, an Atua Matua approach is more interested in the identity of atua and their role in assisting an exchange of knowledge from their (atua) environment to an individual. More succinctly, an Atua Matua approach seeks to ensure that the environment is given priority of fiscal gain.



STAFF ROLES, LINES OF REPORTING & INCIDENT MANAGEMENT

This component is of interest to both education and professional outdoor providers because there are fiscal obligations should an incident occur e.g., school principals can be personally charged for injury of a student (hence school boards are now taking insurance cover to avoid this situation). In the professional sector, lines of reporting and hierarchical positions allow improved control of a situation before media are able to report on a situation without the incident going through the appropriate channels. In some education facilities there are dual protection processes where there are departmental and whole facility incident management teams. In general terms the professional sector turns first to their chief executive officer as the lead manager followed by their board chair where required. In educational facilities it is often the dean of a school or department that replaces the chief executive officer. This is followed by a senior lecturer, administration, technical advisor and contractors last. However for the professional sector the contractors play a much larger role and sit higher in terms of the hierarchical structure of responsibility, which again, has resulted in indemnity insurance to cover each contractor i.e., functional line versus formal lines of reporting.



In terms of Atua Matua there is a very clear hierarchical structure that begins with the environment, which then moves to show who (the who can be an environment - atua) is connected to which location, followed by identifying what is learnt from a location, then how a change in outcome can be achieved and lastly when the transition should be achieved by. This does not mean that legal obligations are ignored but the effect of decisions are considered in terms of impact on the environment (atua) and especially those environments that are interconnected. Where capital gain is the primary driver.



SYSTEMS

LEGAL DOCUMENTS

- Health & Safety at Work Act (2015)
- HSE (Adventure Activities) Regulations 2011
- Health & Safety in Employment (Adventure Activities) Regulations 2011 – Guidance for operators March 2012
- Activity Safety Guidelines – none related to our adventure activities
- Conservation Act 1987
- Maritime New Zealand Rules
- Crimes Act 1961
- New Zealand Outdoor Instructors Association Qualification Syllabi, Training and Assessment guidelines
- New Zealand Mountain Guides Association Qualifications and related scope documents
- Surfing NZ Qualifications & Guidelines
- Waka ama NZ Safety Rules

SAFETY MANAGEMENT SYSTEMS

In broad terms a safety management system will consist of a number of layers that ensure educational aims are achieved but that these are also consistent with the legal requirements of the sector, adhere to the organisations safety management plan, include safe operating procedures, safety tools and forms and, most importantly, support a strong safety culture.

The specific components of a safety management plan will often address the safety policy of the organisation and include hazard management, staff competency, training and induction, incident reporting and investigation and response to emergencies. These are followed by Safety Operating Procedures (sometimes confused with standard operating procedures), safety tools and forms and, lastly, the development of a strong safety culture through compliance with the relevant standards and codes of practice. Many organisations will also seek to minimise the rate of accidents, illnesses, and injuries and prevent fatalities, disabling injuries and serious illnesses through safe practice, responsibility for their actions, and judgement for their students by providing a supportive environment for their staff, students and in the case of professional providers, for contractors.

Each organisation whether professional or educational, will usually have safety objectives specific to their sector, however these are subject to the current legislation, (as seen in the table right) the sector guidelines and importantly from data that is from incident / accident and near miss activities.



As outlined earlier, a safety management plan will also strive to identify hazards and implement a plan to reduce, avoid or remove from the activity. It is often important that all staff that are administering the plan are aware of any hazards and contribute to alleviating the associated issues. On some occasions a leader or teacher may decide that the hazards are too large to ignore and may terminate the activity. From an Atua Matua perspective, identifying hazards is directly connected to the level of environmental knowledge that a teacher or leader has in the location being engaged with. Likewise this is where Ngā Tohutaka are most effective because often there are overlaps between the indicators that help support the decision to terminate. Also, an Atua Matua approach can call on centuries of purākau, moteatea, haka and waiata that may provide insights in to similar situations e.g., ocean navigation. In addition, Atua Matua is not only hierarchical but includes a whakapapa approach, both of which closely mirror systems approaches (see Systems Comparison with Whakapapa article in appendix). Hazard identification is greatly improved when a systems approach is used, especially when multiple hazards exist that make it difficult to prioritise attention.

DEFINING NOTIFIABLE INCIDENTS

A notifiable incident includes:

- a) any of the following injuries or illnesses that require the person to have immediate treatment (other than first aid):
 - the amputation of any part of his or her body; a serious head injury; a serious eye injury;
 - a serious burn;
 - the separation of his or her skin from an underlying tissue (such as degloving or scalping);
 - a spinal injury;
 - the loss of a bodily function;
 - serious lacerations.
- b) an injury or illness that requires, or would usually require, the person to be admitted to a hospital for immediate treatment.
- c) an injury or illness that requires, or would usually require, the person to have medical treatment within 48 hours of exposure to a substance.
- d) any serious infection (including occupational zoonoses) to which the carrying out of work is a significant contributing factor, including any infection that is attributable to carrying out work:
 - with micro-organisms;
 - that involves providing treatment or care to a person;
 - that involves contact with human blood or bodily substances;
 - that involves handling or contact with animals, animal hides, animal skins, animal wool or hair, animal carcasses, or animal waste products;
 - that involves handling or contact with fish or marine mammals; any other injury or illness declared by regulations to be a notifiable injury or illness for the purposes of this section.

EQUIPMENT

This aspect is a contentious domain because it has significant implications for Māori attempting to enter the outdoor sector but feeling ill prepared due to old or non-existent outdoor equipment. Very likely, at present it is inequity in equipment that is inhibiting Māori engagement with the outdoors. Some of these stem from incorrect clothing for the particular environment e.g., whitewater / alpine through to too higher cost e.g., transceivers, mountain radios, satellite phone and personal locator beacons (some can be hired). Where equipment is accessible, regular checks, noting of damage or faults are critical to the level of enjoyment and success when educating in the outdoors. Not surprisingly, equipment will also include first aid packs and more importantly what each kit is comprised of and how it can be used for specific injuries or illness. Also, when a kit is used it much be reinstated and on occasion, training undertaken for administering restricted drugs e.g., epi pens. Lastly, regularly inspecting equipment goes hand in hand with regular review of the hazardous area i.e., new hazards can arise in previously assessed areas (such as submerged logs in rivers).

STAFF, ROLES AND RECRUITMENT

A role/job description is an important associated component to equipment so that safety responsibilities can be assigned to the correct staff member with the right skill base and knowledge. Also it is pre-existing staff who then become the trainers for new staff with the ideal outcome that poor standards are not perpetuated through longer term staff members. From this point competency can also be attained i.e, does the staff member have the competency to be conducting the role they have. Where no competency examples exist, technical advisors must be called in to give advice on how to avoid injury. Records of qualifications, training completed, medical information and staff that have been employed in the past all allow a fit for purpose analysis to be made e.g., fitness, drivers licence, illness, psychological issues and or drug and alcohol problems can all be used to determine suitability for the job on offer. The complaints process and the right to refuse work where it is believed to cause serious harm are all included in terms of staff support. Incidents, emergencies, emergency preparedness and media responsiveness should also be included in the staff training to ensure effective outcomes are achieved.



INSIGHTS

The following section provides insights and endorsements for using an Atua Matua approach to Risk Assessment/ Management.

The insights that were obtained from contributors for this report were during site visits. Often their contributions were made while groups were being led in the environment. This allowed their comments to be contextualised i.e., additional contributions from the environment via weather shifts, background burbling streams or tidal waves crashing all affected the direction of the discussion. On some occasions contributors were sufficiently motivated by Atua Matua and Tohutaka being discussed that they independently emailed unsolicited commentaries to ensure the sector understood how important these changes could become. It is also worth noting that the Outdoor Education programme at the University of Otago has been cancelled with unacceptable levels of risk being given as one of the reasons for its demise. This programme had been running for more than sixty years and was a great loss to the outdoor sector.

Sharon Nicholas - Outward Bound New Zealand

Tohutaka is dynamic and allows the environment to define what needs to be done. There are a large number of similarities between Māori and non-Māori concepts of engaging with the environment but tohutaka allows a contextual relevance through a reframing that removes people from the process. Where possible I think that Tohutaka could easily sit alongside mainstream concepts of risk. I do think that it would require putting the right words to get a conceptual understanding that could then achieve an equivalent outcome. Risk as a word instills fear whereas tohutaka is about knowledge and doesn't make people as fearful. Tohutaka may even get more Māori back in to the outdoors.

Andrew Mount - Sir Peter Blake Marine Education & Research Centre

Students in schools in Aotearoa are currently confronted with an unfortunate reality in that they are no longer presented with the opportunity to engage in meaningful outdoor experiences they may have once had. One of the reasons for this is a prohibitive health and safety culture. Much of this is rooted in traditional thinking and practice based on dated knowledge and application. An alternative approach reflecting Te Ao Māori, provides an option that gives legitimate opportunity for people to engage in sharing valuable learning opportunities in a less encumbered manner and focuses on the protection of the integrity of the things deemed important. This approach embraces the principles of Te Tiriti o Waitangi and celebrates the unique identity of our country and people.

Andrew Leslie - Recreation Aotearoa

There was a big shift in 2014 when adventure regulation came in to force. At the time there was an accident in Queenstown river surfing and one of the parents of the person who died lobbied the Minister of Tourism to make significant changes. So safety became far more costly to ensure organisations were up to standard. The sector started to realise their obligations to compliance. This was followed by an increase in risk aversion to the point that some schools couldn't afford compliance testing so EOTC was parked up. If you have good systems though then risk can be managed which gives a boost for kids that can benefit from controlled risk. Whats always struck me about Tohutaka is the opportunity for parallel understanding of the same risk but rather than looking at, for example, what Metservice are saying we can take a different route to the same outcome. Tohutaka has literally centuries of information about weather than can easily match what we might get from Metservice. Ultimately though we get a whole extra level of meaningfulness that goes way beyond ticking a box. People want to be involved because now they're engaged.



We currently utilise Maramataka to inform our planning for EOTC (Education Outside The Classroom) activities. For example, we plan for busy activities during our high energy days like Ōturu, Rākaunui and Rākaumatohi. Our expectations throughout our Korekore phase are planned around the moods/emotions of our students and kaiako - Korekore tē whiwhia, Korekore tē rawea, Korekore piri ki Tangaroa. We plan water activities throughout our Tangaroa phase - Tangaroa-ā-mua, Tangaroa-ā-roto, Tangaroa kiokio. We plan for ngāhere excursions throughout our days of Ōtane, Ōrongonui and Ōmauri. We rest or focus on theory based activities throughout the new moon phase - Mutuwhenua, Whiro, Tirea. We are extra cautious with our activities throughout our Tamatea days as our weather patterns/conditions are known to be very unpredictable - Tamatea-ā-Hotu, Tamatea-ā-Ngana, Tamatea Āio, Tamatea Kaiariki. As we explore our Maramataka we are able to apply what we know and what our tūpuna have known, to identify possible risks that we may encounter on specific days of a lunar month cycle. We are able to plan in advance based on what we know about our Maramataka. For example - If we are looking to plan a Waka Ama/Fishing activity we'd be able to specify our preferred days as we know that we'd benefit from being in or around the water around the Tangaroa phase. When the time occurs we'd then be able assess or observe our natural tohu to determine if we'd be able to proceed safely with our activities. The next natural phase of maramataka is to move in to Tohutaka to identify what insects, birds, fish, trees and weather patterns are suggesting across three day rotations.

Moana Timoko - Te Kura Kaupapa Maori o Kaikohe



**Daryl Crawford - Kaiako at Kura o Mangatuna and Sport Gisborne
Healthy Active Learning Lead**

My view on RAMs is that its a needed. Confidence of teacher to get out there and do it. Flip the learning context which means who can the curriculum fit the child via the right learning opportunity. In our Kura we sign off on a general RAMs form at the start of the year and adjust as we need. The more engaged the better the outcome for the kids. We should retain the traditional RAMs to start with and then change over to tohutaka over time. Some boards may even brave over to tohutaka completely in the future. It'll probably come down to the confidence of the teaching staff.

Kiwi Campbell - National Coach Waka Ama

I think RAMs were important for the organisation but just time consuming and monotonous. Didn't think too much about RAMs just knew we were required to do it. Tohutaka is good for me because it allows a more simplified approach and still addresses risk at the same time.

My coaching outlook on performance paddling has changed hugely even to the point of how we up skill ourselves. We're looking at other ways of engaging with heaps of different environments just to connect to different places, think more broadly about physical activity and then apply it back in to wakas. For me, Atua Matua is like a moving vehicle that takes you to different places for you to try a whole range of activities. I think it is building better leaders too. The ones that are coming to the forefront are those we identified anyway but they are advancing much more quickly and now they seem to be looking for innovative ways to lead that they never used to. Its creating a much wider number of levels of leadership of all types.

Moana Timoko - Te Kura Kaupapa Māori o Kaikohe

Planning for EOTC (Education Outside The Classroom) activities currently involves our Kura using RAMs forms for eliminating and minimising any possible risks to ensure the safety of all participants. Some of these preparations will involve checking spaces and/or environments in advance. However, maramataka and ultimately tohutaka do the same thing. As a requirement Kaiako may also record and refer to 'possible' weather conditions and/or 'possible' movement actions (eg- moving across different terrains; moving in, and around water). At times we as kaiako need to utilise our senses, ngā momo tairongo, to make instinctive decisions based on what whakapapa connections to these environments tell us is right. This is from centuries of listening to the taiao. We used to have innate instincts to think about 'who' may be triggering our senses. Nō wai, nā wai raini ngā tohu? It is good practice to plan in advance and to be prepared. It is also important to be prepared and extra observant throughout a planned haerenga. Tohutaka allows this.

Geoff Ockwell - University of Otago, School of Physical Education

Generally risk and compliance were driven by a legislative process and seldom as an educative process for students. Tohutaka seems to provide a platform for increasing the role of education. The risk aspect was built around fear of what if but also a large amount of planning to avoid the risky situations. It seemed decision-making was often based on a process of thinking about a particular environment for a number of days preceding an event. There was the ideal that a situation was manageable but it wasn't embedded or contextualised as Tohutaka, especially when it came to hazards. I would, of course, notice all of the usual weather signs but not to the level that Tohutaka goes in to. The mainstream sector certainly could do with a deeper level that you're suggesting.

APPLICATION

HOW TO APPLY NGĀ TOHUTAKA

Tohutaka is concerned with the timing of activities i.e., signs obtained from the environment that allow an assessment of a suitable time to engage with an activity. This section is aimed at introducing some of the practical ways in which tohutaka can be used to build mātauranga Māori-based Risk Assessment and Method Statements (RAMS) or Safety Action Plans (SAPs). As mentioned earlier, the concept of risk terminology is often not appropriate within a Māori concept of engaging with the environment i.e., it is often more preferable to see the environment as a potential connection to knowledge. Where risk is used as the driver for making decisions the process and outcomes are somewhat skewed toward deficit concepts of what should be avoided rather than what can be learnt to allow empowerment. This in turn is one of the intents of Mātauranga Māori i.e., empowerment.

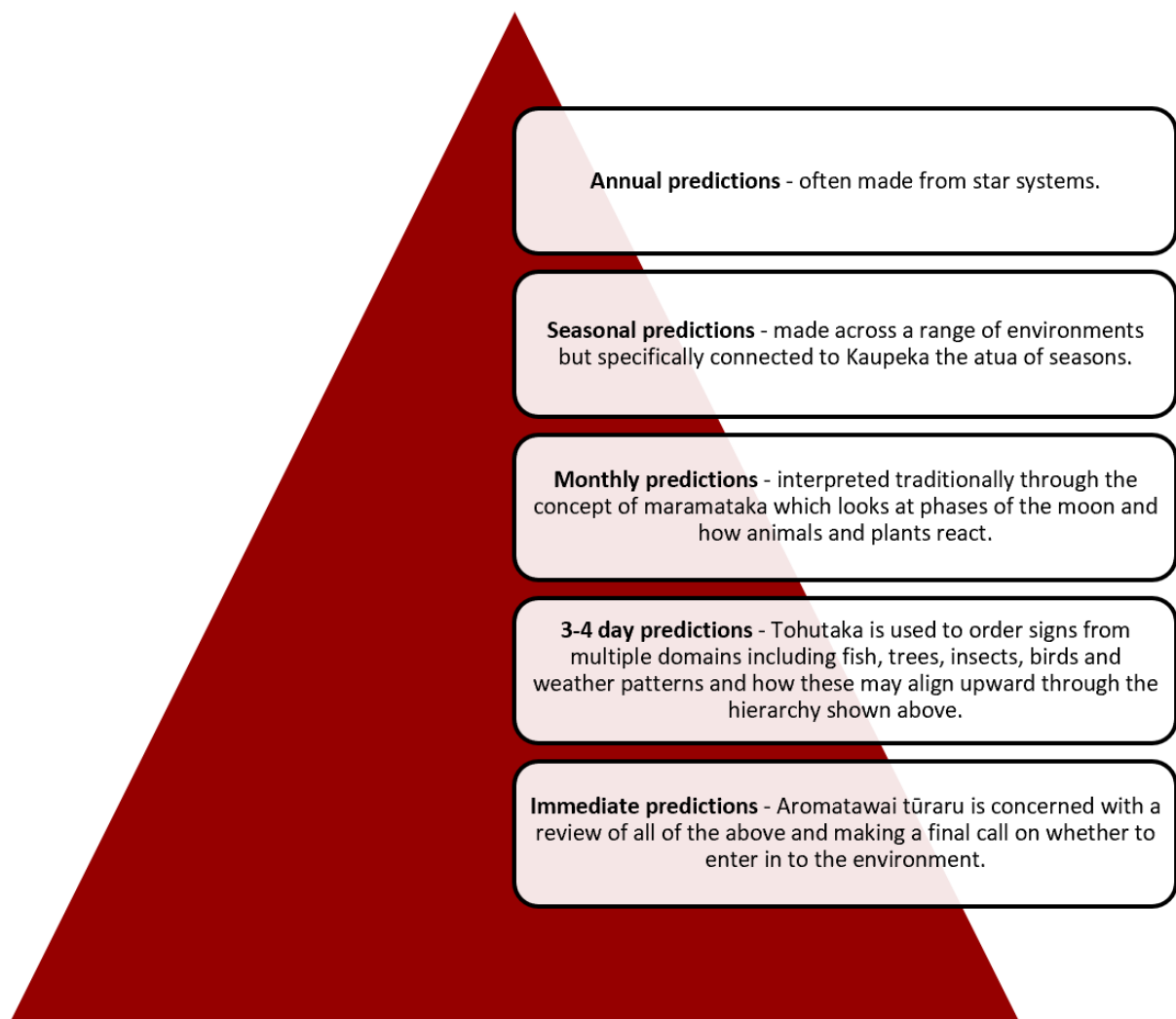
The following are some applications of tohu as alternatives to RAMS or SAPs. Often, a RAMS form will begin with general principles regarding where approval should be sought from, impact on other classes, timeframes required from applicants and a general gathering together of the appropriate forms for an application to be made. At present the author of this report is the board of trustees member overseeing the Health and Safety policy and consequently all applications for EOTC must be signed off by the author. Interestingly, the comments made by staff

within many schools is the amount of paperwork required, the amount of time it consumes and the nature of a risk averse board, all combine to make it 'just too difficult'. In some cases schools are cancelling all EOTC due to the risk to BOT members being too stressful. However, some parents are aware of the contributions that EOTC makes toward general well-being and ironically in some schools well-being of students is more important than educational outcomes.

In one Kura reviewed safety of all workers, students, visitors and contractors was a priority especially when this meant complying with the relevant health and safety legislation, regulations, standards, and approved codes of practice. Interesting too, this Kura preferred to start with acknowledging health and safety rather than risk i.e., a proactive stance rather than highlighting what should be avoided. This is also visibly reinforced where the Kura will aim to help workers who were injured or ill return to work safely. This does not mean however that risk is not mentioned but is not the leading concept. Incident training is outlined, emergency procedures are planned for and a desire for everything possible to be done in attempt to remove risk.

Within a Tohutaka approach, concepts of risk are also sidelined in preference to the pursuit of knowledge i.e., mātauranga Māori. This is not to say that risk is not acknowledged necessarily and on occasion risk is highlighted when, for example, significant errors are made in Karakia or whakawatea are followed by a number of environmental signs that suggest entrance into taiao may not be advisable. Quite often, in terms of Māori understanding of signs there is a hierarchy for how these are engaged with.

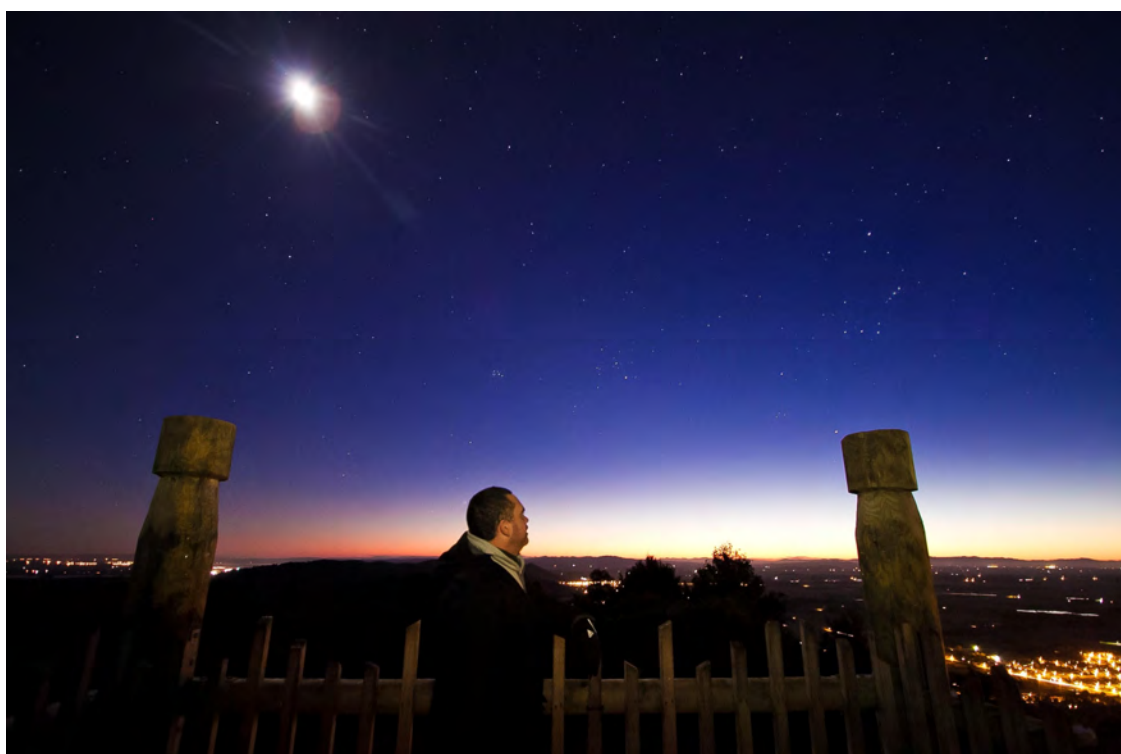
MAKING PREDICTIONS BASED ON HIERACHY OF TOHU



EXAMPLES OF ANNUAL PREDICTIONS

Annual predictions are taken from star systems due to the longitudinal benefits of an environment that is generally very stable. In the context of Aotearoa (relative to other islands within the Pacific) there are a number of predictions made from the Matariki system on the East coast and the Puanga system in the West. Some of the considerations of these star systems are; when did they become visible, which stars within the system appear to be significant relative to the other stars present, what other indicators support predictions being made e.g., which flowering plants aligned with arrival of particular stars, what have previous predictions from earlier years identified as recurring patterns. Some other predictions can also be taken from Te Ikaroa (Milky Way) and some of the guardian atua (e.g., Rongo mai taha nui), Takurua (Sirius) the winter star for determining the level of 'cold' that will occur that year.

Two atua in particular have contributed knowledge in the domain of annual predictions. Uru te Ngangana is often seen as the mataamua (first born of atua) and on occasion (correspondence - Apirana Ngata and Te Rangi Hiroa) seen as two atua i.e, Uru and Ngangana. Uru Ngangana splits the night from day as most easily explained as the atua you can see from an international flight that crosses the evening sky that is black and the red sky below that is the beginning of emerging knowledge. It is also appropriate that the first knowledge transfer from Tāne after accessing the baskets of knowledge was taught by Uru te Ngangana at Rangi Tamaku one level down from Te Hono I Wairua. Those from the Takitimu Waka also talk about Uru te Ngangana partnering with Moeāhuru and producing Ra Kura (sun) and Maramaiwhanake (half tide in) and through his second wife ngā Whetu were produced.





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EXAMPLES OF SEASONAL PREDICTIONS

Kaupeka is the atua often associated with seasonal changes i.e., Ngā peka o te tau. It was also Kaupeka who was sacrificed by his brethren, Tūmatauenga and Tumatakaka in particular, to provide the materials that were used to make the tiki Te Awhiowhiorangi and Te Whirionui that was then used to cut the arms from Ranginui so that he would desist from reaching for his wife Papatūānuku. As a consequence of this action we have the Mātauranga Māori explanation for Red in the morning shepherds warning i.e., the red in the morning is the armholes of Ranginui continuing to weep blood into the sky. The ligaments and tendons of Kaupeka were used as the lashings for the tiki and the skull to protect the union of the adze head to the handle with the handle being the thigh bone of Kaupeka.

On another level a number of environmental indicators allow a form of cross referencing that can help make more accurate predictions. Some clear examples can be obtained from the flowering of plants, the location of the flowers on the plant (e.g., bottom up flowering, top down or in clusters) and the volume committed to flowering. More specifically this can, for example, be interpreted as an indicator of drought when flowering is minimal as the plant stores energy for coming hard times (Ti Kouka and Pohutukawa are trees specifically consulted with during flowering). Likewise the time frames of when the flowers arrive during spring or summer can also be linked to other events, such as, the colour of Pohutukawa can be used as evidence of Koura being ready for harvest as much as the flowers of Kowhai being used to determine the best harvest period for Kina.

Lastly, well known Māori environmental specialist, Rereata Makiha, talks about phase within seasons that indicate the beginning and ending of a season based on the colour of the flower e.g., the white flowering of the puawānanga (clematis) through to the red flowering of the Rata indicate differing time frames. The arrival and departure of certain Manu is also one of the seasonal indicators that informed Māori of co-related effects i.e., planting and harvesting. The arrival of the Pipiwharauroa to indicate the start of spring and the departure of the Kuaka in early March indicated the arrival of Autumn and were well known to early Māori. Likewise the arrival of certain fish indicated a shift in seasons e.g., the arrival of the inanga (whitebait) in August can be used to determine spring.



EXAMPLES OF MARAMATAKA PREDICTIONS

This area of environmental predictions has been gaining significant exposure due in large part to the work of Rereata Makiha and his associates. The use of maramataka to drive Kura curriculum choices is very well explained by Te Kura Kaupapa Māori o Kaikohe.

According to **Moana Timoko (Acting Principal)**:



We currently utilise Maramataka to inform our planning for EOTC (Education Outside The Classroom) activities. For example, we plan for busy activities during our high energy days like Ōturu, Rākaunui and Rākaumatohi. Our expectations throughout our Korekore phase are planned around the moods/emotions of our students and kaiako - Korekore tē whiwhia, Korekore tē rawea, Korekore piri ki Tangaroa. We plan water activities throughout our Tangaroa phase - Tangaroa-ā-mua, Tangaroa-ā-roto, Tangaroa kiokio. We plan for ngāhere excursions throughout our days of Ōtane, Ōrongonui and Ōmauri. We rest or focus on theory based activities throughout the new moon phase - Mutuwhenua, Whiro, Tirea. We are extra cautious with our activities throughout our Tamatea days as our weather patterns/conditions are known to be very unpredictable - Tamatea-ā-Hotu, Tamatea-ā-Ngana, Tamatea Āio, Tamatea Kaiariki.

As we explore our Maramataka we are able to apply what we know and what our tūpuna have known, to identify possible risks that we may encounter on specific days of a lunar month cycle. We are able to plan in advance based on what we know about our Maramataka. For example - If we are looking to plan a Waka Ama/Fishing activity we'd be able to specify our preferred days as we know that we'd benefit from being in or around the water around the Tangaroa phase. When the time occurs we'd then be able assess or observe our natural tohu to determine if we'd be able to proceed safely with our activities. The next natural phase of maramataka is to move in to Tohutaka to identify what insects, birds, fish, trees and weather patterns are suggesting across three day rotations.



Maramataka not only lends itself well to predictions on weather, fishing and gardening but may also be critical to human performance as we see humans reacting to environmental indicators in similar ways. This concept would suggest that people may be able to produce exceptional power outputs on high energy days like Oturu but be better suited to intermittent fasting for a particular sporting event on Korekore days. As yet maramataka is an untapped storehouse of information that can provide commentary on climate change. This is because climate change is not necessarily a new concept to Māori who have been regular observers of the environment for centuries. In addition, access to food is more successful when the food source is understood in great detail, that is, when will food make itself available e.g., there are particular days when patiki (flounder) will appear during daylight hours.

EXAMPLES OF NGĀ TOHUTAKA

Although some examples of tohutaka have already been provided this section is aimed at providing a wider range of potential applications. Tohutaka is aimed at making predictions across 3-4 days by cross-referencing a whole range of environmental signs obtained from fish, trees, insects, birds and weather patterns. While there is a very clear hierarchy from annual to seasonal to monthly and ultimately to just prior to the event, tohutaka is the most commonly used form of assessing the suitability for entering the environment. Often outdoor leaders or teachers will be looking at MetService reviews of the weather at this point and trying to take in as many components of predicting power from the outdoors as possible.

In some cases teachers can use Google Earth to help with weather predictions as there is a feature that will show the last 15 years of weather on the selected day in their location and show weather changes across the day. However, an Atua Matua approach has the added benefit of showing centuries of following the environment and determining subtle changes. In fact, recently, Māori elders have been finding that maramataka schedules that have been used in their families for generations are no longer accurate due to climate change. I would suspect this would not be the first time this has been discovered with a number of environmental anomalies such as Rangitoto erupting and the little ice age of the 17th and 18th centuries all having had significant effects.

Some further tohutaka indicators that can be used for predicting 3-4 day changes can also be found in insects. For example, insect behaviour changes when weather patterns are in transition i.e., spiders will shift or retire further into their webs when severe weather is likely. Also spiders prefer to build their webs in locations that are facing away from the dominant wind patterns for the area. Manu will also tend toward building their nests in locations that avoid the strongest of wind effects. In some cases to be able to see the nest of certain birds e.g., Kukupa, suggested you were in danger due to the height that one had to be to see them. Other weather patterns were determined by the call sign of birds, for example, the Karearea will call when a change is imminent i.e., if the day is clear and the Karearea begins calling it is a signal for a change in weather for the following day.

Also interesting is the relationship between atua and the effect that one environmental representative (atua) will have on another. One case of particular interest is the change in colour of water when weather changes are imminent. In most cases the colour change can give warning in terms of hours going from light blue to green to dark blue then black just before a wind direction change happens. This is often because the various atua of wai (Kiwa, Hinemoana, Tiwhanui, Mauhi, Kaukau, Tangaroa, Parawhenuamea) are seen as the most sensitive of atua because even a breath of air from a person will cause a change in wai. Hence when Tāwhirimātea or Rakamaomao (South wind) in particular are pending we see other atua such as te Ihorangi (atua of rain), Tū Kapua (atua of clouds) respond accordingly.

Likewise, rākau are a great source of tohutaka as a record of effect of particular trees can be gathered over time to determine an effect in another area completely. More specifically, consultation trees that are in position where locals can see the effects of wind from a distance can be used to show co related effects on another coast. These are useful for when journeys are planned into other districts where rakau tohu can be used to build up information about the likelihood of another location being effected if the tree in the local district is being effected. This is also a common tohu used in the mountains by looking for wind drifts on the lee side of mountain peaks. In this situation snow will rotate on the lee ward side of a mountain peak, when sometimes there is no wind in the valley at a lower altitude.

Some birds were also used to predict the likelihood of snow especially when they were accidentally killed i.e., Riroriro. Some birds were used as time keeping strategies. For example the Pakura (Pukeko / swamp hen) are spoken of in kōrero tawhito for their calls that are made at 30 mins prior to darkness, te pou tu o te pō (middle of the night) and 30 mins prior to light. In fact many environmental tohu are used as timeframes especially when traveling to and from locations. The degradation of plants has a predictable nature that can be used to determine the last time the surrounding soil was disturbed especially when hunting pigs that root up the soil. Leaving fern leaves next to thermal areas can increase the rate of degradation where 1-3 hour timeframes are being measured. If even shorter time periods are being sought then atua of wai are useful in terms of wave speed where time periods are measured by the speed of an object moving in water or by the

sound a series of waves make as they crash e.g., from 5 to 30 second periods between breaking.

Some insects too can give an idea of seasonal change, predictions of impending weather change and even locating where people are in forest locations. Tutiniariki is often regarded as the atua of blowflies and very useful for finding where people have been by the waste they leave or if they have died then blowflies will tend to congregate. Alternatively, kikihi (cicadas) are easily recognisable as a mid summer insect that increase their sound as the weather warms. In main part it is the combination of tohu from all five areas that can confirm more accurate predictions of impending change, previous environmental effects (e.g., stands of Manuka where slips have happened suggesting locations to obtain water), timeframes available before a change will occur and likelihood of venturing out without issue.



SCHOOLS & KURA

FURTHER RISK PROCESSES USED IN SCHOOLS AND KURA

At one of the schools reviewed they cited EOTC as being in one of two categories i.e., high risk or low risk. In another school the idea of water, height and speed were identified as the areas that needed the most reviewing. As mentioned earlier these three areas are also the domains of some the most reactive atua in terms of water sensitivity, the taps state of maunga and the reaction timing of Tama te uira (atua of speed, electricity, neural transmitters and lightening). Tama te uira is also associated with Haruru maunga that maunga that are used as transmitters of the sound of thunder. Haruru maunga can also be used to determine the distance of storms based on the delay between seeing Tama te Uira (or Hine te uira / shattered lightening or Hine i te kohera / distant flashing lightening) and hearing the arrival of Rangipōpō i runga (atua wahine of thunder). If the comments of teachers who suggest that RAMS forms are overly complicated and require too much information that would seem common sense then a move toward a height, speed and water bias may be useful in both an atua sense and current modification of RAMS. The table on the following page is a schools' description of high versus low risk options.



HIGH AND LOW RISK KURA EVENTS

Type of Event	Low Risk	High Risk
Description	Events at school or in the local community that are in low risk environments that can be managed with general EOTC trip procedures.	Events that involve risk which is assessed to be greater than the average family activity. These events require specific procedures to reduce or manage the risks. This includes all <u>overnight events</u>
Guidelines	• Local or at school • Easy supervision • In school time • Close to medical assistance	• All overnight accommodation • Activities involving water, speed or height • Remote (away from phone contact) • Activities with low levels of supervision • Events at venues not previously used
Notes	• May be only sole staff member, or parent • First Aider preferred	• Must have First Aider • Should have male + Female leaders for overnights (exceptions must be noted)
Consent and medical	• Blanket Consent • Still need to inform parents • Request medical update • Printout contact and medical from Linc-Ed • Must take 1st Aid kit	• Specific event consent needed (must be returned to OJC) • Request medical update (or separate medical form) • Printout contact and medical from Linc-ed • Must take 1st Aid Kit
Safety Plans	• Follow EOTC and Transport Guidelines	• Follow EOTC and Transport Guidelines • May need specific risk assessment plan for aspects of the trip not covered by generic guidelines.
Approvals	• HOD to approve	• EOTC Coordinator must endorse risk assessment plan • Final approval from HOD of EOTC and for all overnight trips ratified by the Board of Trustees.
Example Trips	• Local Museum visit • Rainbow's End visit • Local fieldwork • Surveying trip • Festivals e.g. Polyfest • Young Enterprise • Sports day • Ultimate Frisbee games • Netball games • Basketball games • Football games • Bio field trip	• ALL overnight trips eg ▪ Rotorua ▪ Trip to Tongariro ▪ Duke of Ed tramp ▪ Skiing trip • Outdoor eg kayaking, mountain biking, snow skiing



For more information

Ihirangi Heke
Integrated Hauora Initiatives Limited

ihi.heke@xtra.co.nz