

Expressions of wai in ECE: Te Wai Pounamu

National Report to International Pilot Project 2022: Wash from
the start – Local conditions for children’s access to water

*He taura whiri kotahi mai anō te kopunga tai no i te pu au
From the source to the mouth of the sea all things are joined together as one*

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**Pedagogies
of Possibilities**

He Rārangi Take

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1. He Whakarāpopoto Whakahaere

Executive summary

This report outlines the background, context, methods and discoveries of a pilot study completed between October and November 2022, as part of a wider international project titled “Wash from the start”. The purpose of this project for Aotearoa New Zealand is best captured within the whakataukī (proverb):

‘Ko te wai te ora o ngā mea katoa
Water is the life giver of all things.’

This whakataukī describes a simple but very important truth for our country. Wai is the essence of all life, it is the toto (blood) of Papatūānuku (Mother Earth) who supports all forms of life. Māori, the Indigenous people of Aotearoa New Zealand, consider the health of their people to be associated to the wellbeing of their water bodies. Water is also central to the Early Childhood Education (ECE) bicultural curriculum - *Te Whāriki* (2017) - as this country’s bicultural identity stems from *Te Tiriti o Waitangi* (1840) (*Network Waitangi Ōtautahi*, 2018). Aotearoa New Zealand’s founding agreement between Tangata Māori (original inhabitants) and Tangata Pākehā.¹

Māori identity is linked to ngā arawai (waterways) through whakapapa (genealogical descent) from Ranginui (Sky Father) and Papatūānuku down to people and all environments. It is reflected in curriculum that calls attention to cultural and geographical landscapes (including waterways) as a central source of knowledge, sustenance, and growth. The curriculum recognises and protects “*knowledge about features of the local area, such as a river or mountain (this may include their spiritual significance)*” (p. 32). *Te Whāriki* (Ministry of Education [MoE], 2017) implies societal recognition of Māori as tangata whenua. With this, a shared obligation to protect whakapapa, te reo Māori, tikanga Māori (Māori: identity, language, and culture) is established to ensure that Māori enjoy educational success as Māori. This protection nurtures, “*for Māori...a world view that emphasises the whakapapa connection of the tamaiti to Māori creation, across Te Kore, te pō, te ao mārama, atua Māori and tīpuna*” (p. 12).

Seen in this light, wai is not merely a physical phenomenon but rather the interconnected flow between people, places, and things – with no beginning or end. Citing Matamua (2013), Mika (2019) suggests that, in this way of viewing the world, wai is pervasive throughout all forms of life and therefore an expression of whakapapa (genealogy) and identity.

Ko te mātauranga he wai nō ruawhetū
Māori knowledge flows from the cosmos/the stars
Kia mahara koe i te puna inā inu koe i te wai
When you drink the water, remember the spring
Ko wai koe?
Who are you?
Ko wai ahau?
Who am I?
Ko wai ahau
I am water
(Matamua, 2013, as cited in Mika, 2019, p. 28)

Yet, at the time of this study, sustained colonisation of the waterways, as for the land, pose significant threats to the wai. These led to a series of polarised political actions and inactions across the mōtu (country), with serious implications for local iwi and communities, kaiako (the name granted to ECE teachers via curriculum) and tamariki (children) the English translation is better to use as (the name granted to children attending ECE is mokopuna as per Te Whāriki (2017)). Despite these long-term impacts on tamariki, little is known about their perspectives on water in their lives and their learning. As such, our involvement in the pilot research meant that we ‘walked-with’ (3–4-year-old tamariki children) and kaiako in three ECE communities and their waterways in Te Wai Pounamu (South Island). Researchers photographed, observed and talked with tamariki and kaiako about their lived experiences, representations, engagements with, and understandings of, water. As such, we too are part of the flows that emanated from this exchange.

Several themes were generated concerning the presence and utility of water in curriculum. These ranged from playful embodiment, through to the life-giving properties of water as sustenance and a source of wellbeing. Presented in selected narratives and photographs, water was personified in various ways across the arts, highlighting the strong awareness of wai in the lives of tamariki, and their desire to protect water as a result. Wai was also a source of identity and a constant presence in all that took place in the ECE settings. Correspondingly, our study highlights the complex pedagogical role of kaiako in supporting and negotiating the ebbs and flows of water in the ECE setting, and into the local community - not least in the kaitiaki (custodial) role they wanted to establish for tamariki. We identify a series of tensions that arise for tamariki and kaiako as a consequence – reflecting wider social issues concerning threats to wai, and what this means for ECE curriculum, for tamariki and the water that not only orients their learning but is their lifeblood.

NB: All te reo Māori terms are explained in the Glossary at the end of this report.

¹ Tangata Pākehā: people from England who have a right to live in this country under Te Tiriti o Waitangi.

2. He Tirotiro Whānui Background to the project

The larger “Wash from the Start” initiative that underpins this report began at Western Norway University of Applied Science. It arose out of our joint desire to respond to UNESCO goals concerning global access to safe and clean water for drinking and sanitation (see *Sustainable Development Goals – Resources for educators (unesco.org)*). Children across the world, who very rarely have a say in this, are the most affected group when it comes to climate change, with devastating impacts on the waterways that they need to thrive. We share the view of many that more sustainable and ecological frameworks are needed to alter this trajectory. Moreover, we collectively consider that children have much to offer us in broadening our understandings of water as a global concept and resource. Inviting them to contribute their experiences and perspectives – as world citizens - lies at the heart of our joint endeavours and it is here where this pilot project sits. We hypothesise that children’s perspectives of water may offer fresh insights and opportunities to ‘turn the tide’ in finding our way out of the Anthropocene that does not serve them, or the waterways that surround them, well.

2.1. He Whāinga – Generic Project Aim

The aim of the international project is to understand how water is conceptualised, utilised and represented by children in diverse living conditions and these experiences are represented in ECE curriculum (and associated documentation) as/for learning. The project aligns closely to UNESCO’s sustainability goals for education (UNESCO, n.d) specifically Goals 3 – Good Health and Wellbeing; 4 - Quality Education; 6 - Clean Water and Sanitation; and 14 – Life below water.

The following countries were involved:

- Aotearoa New Zealand
- Norway
- Tanzania
- Thailand

For the pilot phase of the project each country was asked to work with 2-3 ECE services catering for tamariki between ages 3-8 years in their country. All country participants worked within the same generic framework so that it would be possible to generate comparative information about the creative and critical thinking and representations of water from children living in different parts of the world. There was some flexibility for each country to add additional layers and lines of inquiry in support of their unique contexts for investigation and the exploratory nature of this pilot study.

2.2 Ngā Pātai Rangahau – Pilot research questions

Each country set out to answer the following generic questions

1. How do tamariki represent water (e.g., artistic expressions)?
2. What do tamariki do with water (e.g., wash, drink, play)?
3. What do tamariki think/say about water (i.e., puzzle, report, discuss)?
4. How is water present in ECE curriculum and pedagogy (e.g., assessment, plans)? Is it?
5. What gets privileged and what gets overlooked? By who? And why?

As the first country to undertake the pilot, we added a few layers of our own. We also narrowed our age group to 3-4 year-olds only. In the section that follows we explain why this was necessary, in accordance with local priorities and obligations that establish the kaupapa (agenda) for our localised approach.

2.3 Ngā arawai o te Wai Pounamu – Te Wai Pounamu waterscapes

Tuatahi ko te wai, tuarua whānau mai te tamaiti ka puta ko te whenua.

When a tamaiti is born the water comes first, then the tamaiti, followed by the afterbirth, what Māori call whenua, the afterbirth that is given back to Papatūānuku the land. In this way water is integral to all life.

Aotearoa New Zealand is a small coastal country that is surrounded by water. It has a population of just over 5 million people. Many tamariki live in close proximity to waterways: he awa (rivers), he roto (lakes) he hāpua (lagoons) and Te-Moana-nui-a-Kiwa (the Pacific Ocean) or moana the sea. The specific location for this pilot study was the South Island of Aotearoa New Zealand – Te Wai Pounamu – since the research team were mostly located in or near Ōtautahi (the largest city in the South Island). Te Wai Pounamu is given its name from Indigenous Māori migration stories that refer to the bow of the canoe of Aoraki, and to translations in i) water (wai) and ii) greenstone (pounamu) – both features of the land and waterscapes that forms its base. While part of the wider Aotearoa New Zealand context, Te Wai Pounamu holds unique opportunities for expressions of wai, and its relevance in the lives of tamariki, whānau (families) and Ngāi Tahu iwi (principal tribe of this area). Ngāi Tahu whakapapa (genealogical descent) clearly shows the connections they have with the whenua (Papatūānuku), the wai (blood of Papatūānuku and Takaroa) the cleansing waiora which is the purest water falling from Ranginui the Sky Father and wai koero (melted snow) from the sky children Aoraki and his brothers). Whakapapa in this sense is local curriculum learning and how and when these were enacted. Ngāi Tahu ways of doing kaitiaki duties (custodial roles and responsibilities) which requires genuine acts that ensure the wellbeing of all Te Wai Pounamu resources and those it sustains. This practice is underpinned by the Ngāi Tahu whakatauki “mō tātou ā mō kā uri a muri ake nei – for us now and for all those generations that follow”.

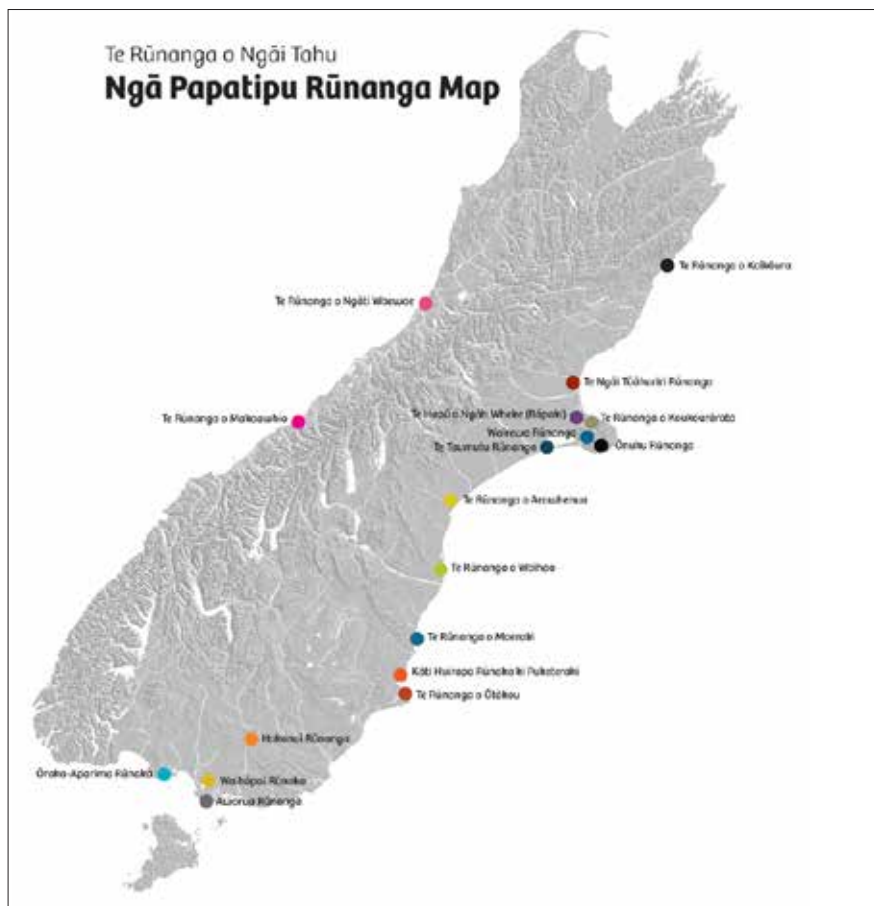
From the outset of the project we set out to represent ngā arawai (the local waterways) and their relevance for the local communities in which tamariki were located. We did so

in partnership with kaiako and community members who were deeply connected to this kaupapa. The waterscapes of Te Wai Pounamu formed the basis for selection of ECE services – such that the three sites selected are reflective of these waterways, their heritage, and their whakapapa, as well as their contemporary threats. They were correspondingly reflected in ECE curriculum and pedagogy and, for our purposes, in representations of water by tamariki.

2.3.1 Ngā Kōrero o Tangata Whenua – Voices of this Land

Ngāi Tahu iwi (tribal authority) hold the mana (authority) of 80% of Te Wai Pounamu. As outlined in the Figure 2: the dark grey area shows the landmass Ngāi Tahu hold the authority over along with where their 18 papatipu rūnanga (iwi councils) are situated throughout the Island, this is the Ngāi Tahu iwi framework. We could not undertake a project of this nature without their permission, which was sought from the outset as part of our ethical commitments.

Figure 1: Ngāi Tahu Iwi Framework



(<https://ngaitahu.iwi.nz/te-runanga-o-ngai-tahu/papatipu-runanga/>)

2.3.2 Whakapapa – Genealogical Descent

Waitaha, were the first iwi group to arrive in Te Wai Pounamu, they voyaged on the Uruao waka (canoe) and settled in Ngā Pākihi Whakatekateka o Waitaha meaning the seedbed of Waitaha or colloquially known as the Canterbury Plains. Ngāti Māmoē and then Ngāi Tahu followed. Through warfare, intermarriage and political alliances a common allegiance to Ngāi Tahu was forged. Ngāi Tahu means the ‘people of Tahu’ and connects them directly to their eponymous ancestor Tahu Pōtiki. Within the iwi there are five primary hapū being Kāti Kurī, Ngāti Irakehu, Kāti Huirapa, Ngāi Tūāhuriri and Ngāi Te Ruahikihiki.

The traditions of Waitaha, Ngāti Māmoē and Ngāi Tahu are imbued in Te Wai Pounamu whenua (land) and ngā arawai . A whakapapa expression is that Te Wai Pounamu was the waka (canoe) that carried four sons of Rakinui (Sky Father) to meet his second wife Papatūānuku (Mother Earth). The sons journeyed from the heavens and when they

sought to return, the karakia² (incantation) failed, capsizing their waka which became the South Island. The brothers climbed on top and were turned to stone with Aoraki becoming the highest mountain in the land Aoraki Mount Cook and his brothers became mountains that comprise the Southern Alps.

Ngāi Tahu – the iwi of Te Wai Pounamu - acknowledge that the captain of the Uruao waka Rākaihautū named many sites from Kaikōura to Te Ara-a-Kewa (Foveaux Strait) and carved out lakes across the South Island forming food baskets to sustain his descendants.

Another genealogical expression, according to Beattie’s sources (1920), tells of two taniwha (water spirits) in Waitaha – Te Wahine Maru Kore and Te Rangiorahina - who were brought to life by the Māori chief, Te Ake, as payment for his daughter’s death. This aparangi (or evil spirit) brought about a lot of sickness until Te Ake learnt to recite a karakia (an invocation or chant) that would invoke safety, which he passed on. Since then, Beattie was told by his sources, when fishers see the water turn to the colour of blood while out at sea, it is a sign of the taniwha under the boat - wise fishers will karakia the taniwha to ensure a safe arrival to shore.

2.3.3 Te Tāmitanga o Ngā Arawai – Colonising the Waterways

Interrelationships between these rivers, lakes and sea in Te Wai Pounamu cannot be understated. Water conceptualised as ‘wai’ is a precious ‘taonga’ (treasure) that calls for sensitive custodianship by tangata whenua and others alike. Beattie’s 1920 records of Southern waterways based on interviews with local iwi provide rich descriptions concerning the importance of wai in sustaining life for all. For example, the prior abundance of tuna (eel) and inanga (whitebait) through annual movement out of repo (swamps) to the river, and into the sea, provided a significant food

2 Williams (2022) defines karakia as being significant to Māori as these are incantations (non-Christian) and prayers (Christian) and these are used to call upon specific Atua e.g.: Tāne te atua o te ngāhere (Tāne the god of the forests) or Tangaroa/Takaroa te atua o te moana (Tangaroa/Takaroa the god of the sea) or Ruamoko te atua o ngā rū whenua (Ruamoko the god of earthquakes and volcanoes) this is dependent upon which environment you will be exploring or engaging in. Clear requests are made for spiritual guidance and protection. The purpose of karakia is to increase spiritual goodwill amongst everyone participating so that favorable outcomes can be achieved.

source for Māori (as well as various shellfish such as pāua). Māori had well-established and sophisticated ways of engaging with waterways to ensure the maintenance of an eco-system stretching far beyond the water itself. However, the introduction of new species and farming practices following the arrival of Europeans post 1840 had a dramatic impact on water. Less than one hundred years since signing *Te Tiriti o Waitangi*: “The country [Te Wai Pounamu] is drained now and the swamps are now farms and the pa-tuna or pa-mahinga-kai is a thing of the past” (1920, p. 318).

Fast forward a hundred years, and the situation has become even more dire, with over 80% of swamps dried up and waterways polluted – not least as a consequence of phosphate utilised by farmers. Coupled with the well-known effects of global warming (during this study heavy floodings in Waitaha keenly reminded us of this) with dramatic impacts on eroding shorelines, water is now widely perceived to be at great risk and with it, all forms of life. Despite this, controversies abound. At this time of this study Te Wai Pounamu was embroiled in a “Three Waters Reform” (Stuff, n.d) dispute between local and national authorities – seeking to govern drinking water, wastewater and storm water under publicly owned entities as opposed to local council authorities. *Te Tiriti o Waitangi* affords special status to Māori concerning natural resources such as freshwater – but these come into conflict with Crown assertions that water cannot be owned by anyone. At the time of writing this report these debates abound – underpinned by fundamental historical issues concerning ownership, custodianship and rights surrounding rights and access to the foreshore and seabeds of Aotearoa. The impact of these are keenly evident in the kōrero (discussions), practices and pedagogies that oriented representations of wai in the ECE sites that underpin this study.

2.3.4 Te Horanuku – The Landscape

The research team worked closely with local organisational networks within the Canterbury region to identify the three ECE services that would reflect the waterways of the area. ECE services in Aotearoa New Zealand typically cater for learners up to the age of five, hence our scope is confined to this age group for the tamariki involved in the study. Ethics commitments mean that these ECE settings cannot be named, but an identification of their broad geographical locatedness is essential in understanding the place of water in the lives of these tamariki. Table 1 outlines some of these ECE services key features and the issues they were facing at the time of the study as a result of climate change and colonisation.

Table 1: ECE sites and their waterways

ECE Sites	Waterscape features	Waterscape issues
Wāhi Tuatahi ECE Site ECE site 1: Bilingual Education and Care (birth to five year-olds, though only three to five year-olds typically engage in the outdoor 'paddock and sea' programme)	He Hāpua me te moana – Lagoon and Sea	https://www.nzonscreen.com/title/rohe-koreporepo-swamp-sacred-place-2021
Wāhi Tuarua ECE Site 2 Kindergarten (three to five year-olds)	Te Moana – Sea and Port	https://ccc.govt.nz/the-council/plans-strategies-policies-and-bylaws/plans/whaka-ora https://www.mahaanuiKurataiao.co.nz/iwi-management-plan/6-catchments/6-6-whakaraupo/
Wāhi Tuatoru ECE Site 3 Kindergarten (three years to five year-olds)	He Awa - River	https://ohrn.nz/

The land mass and coastal regions for each of our ECE sites can be seen in Figures 2 and 3 below. As far North as Whangaraupō Lyttelton harbour, over to Ngā Pahi Whakatekateka o Waitaha – the seedbed of Waitaha stretches all the way from Ōtautahi (Christchurch) down to Te Tihi o Maru (Timaru) as shown in Figure 3 below.

Figure 2: Whangaraupō - Lyttelton Harbour and Ōpāwaho directly to the rear (6.6 Whakaraupō - Mahaanui Kurataiao Ltd)



Figure 3: Kā Poupou a Rākihōiua - The 90 mile beach and Te Pātaka-a-Rākaihautū - Banks Peninsula
 Kā ara tūpuna Waitarakao to Wairewa: the ninety mile beach – Te Rūnanga o Ngāi Tahu
 (ngaitahu.iwi.nz)



Kā poupou-a-Rākihōiua is the name used to describe the Waitaha Coastline from Wairewa (Lake Forsyth) to Te Aitaraiki, this stretch of coastline is known as the 90-mile beach. It was Rākihōiua (son of the renowned Waitaha explorer Rākaihautū) and his men who travelled down the Eastern coastline of Te Wai Pounamu and constructed pā tuna (eel weirs) at the mouths of various awa along the takutai moana (coastline) by putting poupou (posts) into the ground. Hence the name ‘the eel weirs of Rākihōiua’.

The Ngāi Tahu coastal travel route between Whangaraupō and Waitarakao (Washdyke Lagoon) was the Ngāi Tahu State Highway One which connected the settlements of Te Pātaka-a-Rākaihautū (Banks Peninsula) with coastal kāinga to the South. The route extends in a continuous line of uniform shingle, unbroken by headland or bay, from the shores of Wairewa in the North to Waitarakao in the south. The apparent straight line of the beach is seen as a great arc, shaped by the even pounding of the Tangaroa (atua of the sea). This route required numerous river crossings and frequent deviations inland to avoid the pari (cliffs) repo (swamps) the weather causing waipuke (flooding) of the rivers through the waikoero (melting snow).

Ōpāwaho is the Heathcote river and it was also the name of a small settlement that sat on its banks. Ōpāwaho means Outpost and was used as such, it was a place to store food and rest as Ngāi Tahu would make the journey from Kaiapohia Pā (Kaiapoi, North Canterbury) to Te Pātaka-a-Rākaihautū following the Ngāi Tahu mahika kai practices or traditional food and natural resource planning, growing, harvesting, storing and preparing for the following year.

Ngāi Tahu philosophy of Ki uta ki tai (from the mountains Kā Tiritiri o te Moana (Southern Alps) and Kā Kohatu Whakararakara o-Tamatea-Pokai-Whenua (Port Hills) means the whole resource chain from mountain top to ocean floor. The waterways Huritini (Halswell River), Ōtākaro (Avon River), Waimakariri (river stems from the Southern alps to the Pacific Ocean), Te Waihora (Lake Ellesmere) and Ōpāwaho were all key connections to the rich food sources within the wetlands. Ngāi Tahu were hunters and gatherers who followed their seasonal trails determined by the seasons and maturation of food resources.

See <https://ngaitahu.iwi.nz/culture/mahinga-kai/> for current Ngāi Tahu mahinga kai engagements.

Be it tangata whenua or local curriculum learning the richness of each waterway and whenua is captured in pūrākau (stories), who found them and where these are located – this is how Te Tiriti-led ECE curriculum goals and learning outcomes can come to fruition in Aotearoa New Zealand curricula.

2.4 He Rārangi Tono – Project Demand

Located within these waterscapes, it is unsurprising that the project held wide appeal for the ECE communities selected for participation. The project supports and aligns to their implementation of *Te Whāriki* (MoE, 2017) by advancing mātauranga (knowledge) of the geographical and cultural features of the area. In accordance with the articles of *Te Tiriti o Waitangi*, the ECE curriculum grants special status to connections with nature made by tamariki:

- “Making sense of their worlds by generating working theories” (p. 47)
- “Making connections between people, places and things in their world” (p. 32)
- “Taking part in caring for this place” (p. 54)

Water is especially significant in the early years where encounters can develop life-long attitudes and values towards water as an essential resource for present and future generations. Alongside OMEP’s global commitment, which forms the basis of the overall investigation [see *Education for Sustainable Development (ESD) – OMEP* (omepworld.org)], ECE curriculum in Aotearoa NZ shares these aspirations for pedagogies and practice (Kelly & White, 2013; Mackey, 2012). Ritchie et al (2010) foregrounds the following considerations in approaching sustainability research in Aotearoa New Zealand ECE:

1. The possibility for early childhood pedagogies to generate counter-narratives that are respectful of indigenous views regarding nature; narratives incorporating a fundamental and central recognition of our inter-connectedness and inter-dependence with our environment.
2. The need for a paradigm shift away from western positivistic secularity and individualistic endorsement of egocentrism.
3. The belief that counter-narratives can redefine our sense of wellbeing to involve not only caring for ourselves, but also for others and our environment.

Such considerations advance more localised and culturally relevant pedagogies for ECE that observe and explore what tamariki say and do within meaningful contexts. Acknowledging the rights of tamariki - firstly to gain knowledge of the Earth and their interconnectedness with it; and secondly to use their agency in making decisions, tamariki can learn to take appropriate action in a collaborative, supportive environment (Mackey, 2012). Such practices are now widely reinforced across wider Australasian ECE communities based on local and Indigenous priorities (Early Childhood Outdoor Learning Network, 2022; Grogan & Hughes, 2020;

3. Ngā Mātāpono me ngā Tukunga Methodology and Procedures

Hindmarch & Boyd, 2021; Hughes, 2019; Hughes et al., 2021; Kelly & White, 2013; Kids in Nature Network, 2018; New South Wales Early Years Nature Connections, 2020; Truscott, 2014; Truscott, 2020; Williams-Siegefredson, 2011). Together they establish a solid agenda for the promotion of sustainable practices concerning water, and indeed all other properties in nature, in curriculum for very young children. Alongside well-established movements such as “Enviroschools” <https://enviroschools.org.nz/about-us/>, that support and incentivise sustainable pedagogies in ECE and schooling communities, the care, protection, and maintenance of waterways is very much a part of the living ECE curriculum and, as such, sets the scene for the project that follows.

2.5 Ngā Hunga Rangahau – The Research Team

The diverse research team in this project reflects the intersecting interests and expertise across Mātauranga Māori knowledge, sustainable futures, pedagogical knowledge, artistic representation, and visual methodologies with tamariki. All were essential in bringing together this research team to undertake this pilot project.

Professor Jayne White; Dr Ngaroma Williams; Dr Kaitlyn Martin; Glynne Mackie; Anna Niles (all of University of Canterbury); Professor Andrew Gibbons; Assoc Professor Andrew Denton (both of Auckland University of Technology).

Table 2: ECE site researchers and timing

ECE site	On-site researchers	Field work
Wāhi Tuatahi – Site 1	Ngaroma Williams & Jayne White	12–16 Sept 2022
Wāhi Tuarua – Site 2	Kaitlyn Martin & Jayne White	27–30 Oct 2022
Wāhi Tuatoru – Site 3	Glynne Mackey, Andrew Gibbons & Andrew Denton	27–29 Oct 2022

NB: During this time of year in Te Wai Pounamu – Spring – average temperatures were around 13–15 degrees Celsius, with mostly cloudy skies.

Inspired by this local milieu and its relationship to ECE curriculum, the Aotearoa New Zealand research team were informed by the notion of ‘walking with’ tamariki through ethnographic engagement in the field over several days. The walking-as-method approach to this research was inspired by the Common Worlds research (see for instance Taylor & Pacini-Ketchabaw, 2018) and the immersion of the researchers in the complex ecology of the life of their ECE communities. Importantly, walking as method intentionally guides the research in recognition of the ways in which place has particular agency (see for instance Hamm, 2015; Nelson, et al., 2022, Wintoneak, & Jobb, 2022).

In ‘walking with’ the three ECE communities, we sought to engage with the ‘intra-actions (Pacini-Ketchabaw, 2012) and dialogic encounters (White, 2020) of and with tamariki and water. For this reason, the research team deliberately did not enter the fieldwork with pre-determined orientations concerning what tamariki engagements or representations of water would look like, or mean, for that matter. However, we also recognised the futility of any claim that we could observe with an impartial eye, irrespective of the technologies at our disposal (White, 2020). The dynamic composition of the team meant that each researcher saw through their unique lens, and, correspondingly, engaged differently with tamariki, capturing different representations and expressions of water as a consequence. The following lenses oriented our gaze:

1. Bicultural, localised understandings in water
2. Aesthetic engagement with water
3. Water as/in curriculum and pedagogy
4. Sustainability goals for Aotearoa New Zealand
5. Philosophical thoughts surrounding waterways and their ebbs and flows
6. Socio-political contexts for understanding

‘Walking with’ tamariki also meant that researchers established relationships with learners very quickly. Tamariki were excited to share their discoveries and keen to show their understandings. Spending several days in each centre meant that trust was established – affording intimate engagements and privileged access to information. Researchers were often asked by tamariki, to play with them, or “come and look” at an aspect of interest. At other times, researchers

sat back from engagement to observe, or to catch a quiet moment with a tamaiti who seemed to be doing something interesting. Conversations with whānau, kaiako, and centre support staff also played an important role in granting access to perspectives of tamariki and experiences beyond the immediate ECE context. For example, explanations by kaiako concerning the recent death of a sibling made sense of a 3-year-old’s interest in the stars [Wāhi Tuatahi], and a discussion with a dad about swimming lessons shed light on the significance of a chalk drawing by a 3-year-old [Wāhi Tuarua]. Kaiako introduced researchers and their kaupapa to tamariki during early group times, and tamariki were invited to sign their own consent – giving researchers access to their representations and dialogues about them.

Given the emergent, co-constructed, nature of curriculum in Aotearoa New Zealand ECE contexts the researchers did not ask kaiako to do anything special or different with the tamariki during the study from what they would normally do. However, kaiako were strong allies in the research process – pointing out features of water in curriculum, asking researchers to pay attention to certain activities or resources, and reminding tamariki of the learning journeys they had been on. Some kaiako were apologetic about their pedagogical efforts, while others saw the research as an opportunity to reflect on existing practices, with a view to learning more. We saw that their contributions to the project far exceeded the role of ‘participant’ and that these illuminate the value of collaborative inquiry between insiders and outsiders in ECE research seeking perspectives. We perceive these relationships as ongoing and reciprocal – seeking opportunities for ways to support their efforts that far exceed this pilot project.

During our time with the centres, researchers also had opportunities to speak with community members and whānau. At Site 1 we were invited to hui with a local kaitiaki (working with Aoraki Environmental Consultancies and Trustee of Hekeao: Hinds Water Enhancement Project), who was also a parent at the centre. He provided us with rich contextual information about the role of water and its centrality to all forms of life in the Waitaha area:

“The state of the takiwā (region) is a matrix to rate the health of the area – so it’s not just a question of the health of the water, but the health of the plants and a way of life that was sustained for Māori - now seriously eroded by farming. This is where the three waters come in. They come from the Ōpihi river (spring forth), Ōpuha river is a tributary of the Ōpihi river, and Te Ana a Wai (which means waters from the caves). These waters are at serious risk from local farming in several ways - Lime from irrigation is killing the rock art, colonial draining of swamps to create fertile farming land has led local iwi almost to the point of destruction, whitebait (as īnaka) need certain grasses to lay their eggs, but the grass has been affected too. Yet, it also shows how resilient these native species are – panako a grey herring, pipiki a fish similar to smelt, (Paraki) - cucumber fish – that act as a health indicator – without them all things dry up. In other parts of Waitaha it is already too late. Waimate, Pareora and Hinds cannot drink water any more due to the nitrogen levels brought about by intensified farming and manganese from silage pits being placed too close to the awa (streams). Ashburton Lakes are pretty much dead due to farming and McKenzie country is close behind. Destroying plants eliminates the possibility of retrieving kai as our ancestors did. Mahinga Kai³ was

3 Mahinga Kai literally means to work the food, so it is about the value placed on the local natural resources that sustain life, including the life of people. For Ngāi Tahu managing these resources to allow their people to gather kai (food) in the way their tipuna (ancestors) did remains a foundation of Ngāi Tahu values today that include rāhui (sustainable practices) manaakitanga (the ability to welcome and host visitors to the area by providing the local bountiful produce) these are all essential practices of that are reflective of carrying out practices of kaitiakitanga or managing the environment and resources based on Māori world views. Ngāi Tahu are actively working with local Government agencies across Te Wai Pounamu to ensure that their people have access now to resources and for the generations to come, refer to Ngāi Tahu Settlements Claim Act 1998: Part 12 Mahinga Kai: <https://www.legislation.govt.nz/act/public/1998/0097/latest/DLM429090.html>

an extremely important method by Ngāi Tahu for gathering kai, but it has been taken away. Getting our land back is getting our whakapapa back – it is a matter of life and death – the whenua is part of the language and wai is central to that”
[Wāhi tuatahi Day 3: Hui with Mike]



Local Kaitiaki – Mike – on ECE site

It was this kōrero (discussion) that provoked an additional research question to our pilot study: “to what extent can/do/should/could tamariki play a role in advocating for our waterways?”. Our approach to the field was greatly influenced by this provocation as we set out to understand the significance of wai in the lives of these tamariki, and the curriculum that framed their understandings.

3.1 He Ara Whānui – Approach to the field

Researchers spent 3-5 days across each of the three sites over the period September to October 2022 (see Table 2). No more than three researchers at a time entered each site and the team was evenly spread across sites. A one hour briefing session took place at each site prior to field work when researchers introduced the project and invited teachers to provide a repository (i.e., box) for family/whānau ethical consent forms in the weeks prior to the study commencing. Researchers asked teachers and invited community members who attended each briefing a series of questions about the protocols of the setting, any background information we needed to know concerning direct and indirect relationships tamariki had with water in, and beyond, the curriculum.

On the first morning of field work researchers checked all signed consents and then, for those families who had consented, sought additional informed consent from the tamariki using tamaiti-friendly forms. Researchers then generated data in the following ways:

- observed tamariki experiences with and about water,
- engaged in conversations with tamariki about their experiences and representations (some of which they recorded) in play and art,
- collected representations of water that were provided or on display in the setting by photographing these.
- explored assessment and planning documentation to look for further representations of tamariki engagements with water and talk with tamariki about their perspectives.
- took photographs of water landscapes or scenes in or surrounding the ECE setting and
- gathered information about how water was represented in the curriculum and by tamariki.
- collected information that was displayed on the walls, in recent newsletters or in assessment records, where water was evident in some way.

Researchers wrote down conversations, verbatim comments, anecdotes and commentaries with or by tamariki where they were applicable to water. In each case they checked with tamariki verbally that they were happy for the researchers to photograph or record their work and/or play. Each photograph and/or written text was de-identified before it was included in the data set.

Throughout this week the researchers were guided by approved University ethical agreements, local protocols as well as centre practices (see Appendices A & B). All researchers were authorised to visit ECE sites and gave assurances that they would be as unobtrusive as possible during their stay. Researchers remained vigilant to the comfort levels of tamariki, and did not impose themselves on tamariki when they show signs of assent (e.g., withdrawing, placing hands over artwork, showing reluctance to engage in dialogue). Researchers asked teachers to tell them if they saw any signs of discomfort also. No signs of assent were evident throughout any of the weeks spent in ECE settings – conversely, tamariki seemed excited and proud to share their insights with the research team and did so readily.

3.2 He Tātaritanga – Analysis

Working across geographical spaces, each site team of researchers recorded their discoveries, notes, photographs, drawings, narratives – in a shared TEAMS folder. Once complete all researchers met to discuss their insights and identify key areas of focus. They then coded the combined data in the following ways, sharing examples from each site:

1. **Modes of representation** observed in 'official' curriculum: Identifying the different ways water was manifest in ECE contexts and curriculum, and what meanings are ascribed to it accordingly
2. **Tamariki representations and expressions of water** shared alongside descriptions of their significance in-situ
3. **Pedagogies about water** evidenced in the intentional practices teachers used to bring water into curriculum in-situ, including assessment activity.

Given the cultural and geographical context of our study, we were not constrained by discrete one-off representations of water. Neither did we limit ourselves to traditional conceptions of 'curriculum' - given that *Te Whāriki* represents learning as "taking it to include all experiences" (MoE, 2017, p. 7)" we tried to take all water events – big or small, loud or quiet, overt or hidden - into account. Paying attention to the ways that ways water 'flowed' between and within the everyday moments of tamariki engagements within the setting led us to become curious about what was produced, connected or, conversely, left out.



4. Ngā Hua – Findings

A series of common themes were generated concerning the significance of water across ECE sites. These form the basis of the sections that follow and are supplemented by selected narratives and images that bring them to life. We discern subtle differences in representations between sites and their waterways, emphasising the significance of localised curriculum in and for tamariki in ECE experiences in, around and about their waterways.

4.1 Ngā tau tānui o te marau - Modes of representation

Not surprisingly, representations of water persistently featured in ECE curriculum across all sites. We identified a series of curriculum modes of expression that were clearly discernible across all sites, and which had been purposefully included in the settings by kaiako (forming the basis of their pedagogies), and which feature in the narratives that will follow:

Table 2: Evidence of wai enacted in curriculum contexts by ECE site

He Mahi Marau Curriculum Activities	Wāhi Tuatahi – Site 1	Wāhi Tuarua – Site 2	Wāhi Tuatoru – Site 3
Mahi Toi: Art	Clay, water painting, playdough, felt pens, stickers (stars), star template.	Chalk on concrete Paint at easels Carpentry – glue, wire, glass	Six colours of dye, crayon, charcoal and large sheets of blank paper taped to a table outside
Whakaari: Drama	Atua, Maramataka, pipes as eels, tuna catching, lava monsters	Pūrākau, concerning Aoraki, fishing off the dinghy, puppet show, animated video (of previous centre performances)	Fishing in the sandpit lake using a net and small plastic fish. Mermaid play.
Ngā Pukapuka: Books	“Māori picture dictionary” in which water is explained and connected to matariki. “I can be Māui” depicting the Māori atua who fishes up the South Island of Aotearoa New Zealand in pūrākau. “Kei hea te Taniwha?” a playful engagement asking “Where is the Taniwha?”	Taniwha (local pūrākau) - further explained in section 4.3.6 “He Karere”. A dictionary explaining weather patterns, and a range of non-fiction books in baskets outside about sea life. Books containing photographs and stories of previous centre projects.	<i>Daddy’s Little Bear</i> by G. Cary in which little bear interacts with the river. ‘ <i>You can’t catch me</i> ’ by J. Prater in which a tamaiti is running from their bath time. On sustainable fishing, <i>The Three Fishing Brothers</i> Gruff by B. Galbraith
He Hīkoi: Community walks	“Waewae Kai Kapua” - an outdoor programme that includes a daily paddock setting (at the rear of the centre where only natural resources are permitted – no plastic) and walks to beach – rockpools and sandhills.	Not observed but ‘rubbish walks’ featured in assessment records and were practiced regularly during walks in the community and down to the Port.	The river is a member of the teaching team, a central metaphor for the philosophy and design of the centre, and ubiquitous curriculum focus. There are regular walks to the river.
Ngā taputapu wai: Hoses, troughs, buckets	Funnels, bowls, troughs, pipes, buckets, troughs, teapots, plastic fish, shells.	Water containers recycled from ships at the port. Articulated pipes for recycling rainwater	Hand pumping collected rainwater into the sandpit through an assortment of pipes and hoses
Te Ao Tūroa: Use of naturally occurring water events	Not observed but flooding and its effects on erosion featured in assessment records and tamariki verbalised memories	Hāuaua - Rainy Umbrellas and jackets	Puddle jumping and splashing during a light afternoon rain
Waiata: Song and Dance	Matariki He Tainui Ko moko tara e te moana Te Maki Moana Tuna fish handplay	Playful chants about the rain by kaiako Taniwha song (in te reo Māori)	The audio book including story and action songs: <i>Tuna</i> by Tanya Batt
Wā Whāriki: Mat time	Ngā Atua Māori Matariki Reminders about caring for the wai Daffodils and seeds	Taniwha song and stories repeated Reminders about washing	Sharing observations of a jar of three tīnaka from the river
Handwashing, hygiene	Tamariki were invited to wash hands prior to eating kai and were provided with a cloth and mirror for after kai.	Handwashing was largely independent on the part of tamariki, although they were encouraged to do so prior to eating, signalled by a bell	During routine times tamariki use of the bathroom was carefully monitored and supported
Drinking	Jug and glasses provided on a trolley, drink bottles are also brought from home.	Water machine with a foot pedal, recycled glass jars on a trolley, drink bottles from home	Each tamaiti has their own drink bottle. During mealtimes kaiako encourage drinking with ‘water bottles unite’
Other artefacts used for specific purposes	Sticks to check for water depth, explore for texture (and occasional gun or tuna imaginary play). Funnels, containers and tubes. Sandpit with water brought out by kaiako in buckets.	Wire and boats/fishing. The dinghy in the outdoor area activated a lot of imaginary fishing experiences. Port vessels for buckets, articulation systems, shells and other containment vessels. Sandpit with water from reticulator taps	Water quality measurement paraphernalia Sandpit and bridge building with water from hose.

4.2 Ngā Whakaahuahanga o te wai - Tamariki representations and expressions of wai

It is one thing to observe features of water that were evident in our observations of the environment. However, our quest was to understand how these are represented, expressed and enacted *by tamariki themselves, and from their perspectives*. Through this analytical lens we identified seven central themes concerning the ways tamariki represented, depicted, talked, experimented, explored and played with and represented water across each site.

- Ko Au te Wai - Water is me
- He Wai Whakatinana - Water personified
- He Wai Tākarokaro - Water as playful encounter
- Ngā Hononga i te wai - Water connections
- He Waiora te Wai Māori - Water as sustenance
- He Wai Whakatikatika - Water as maintenance
- Kaitiakitanga - Guardianship of water

Each are presented through narratives and images in the sections that follows

4.2.1 Ko Au te Wai – Water is me

Tamariki across sites were not merely playing 'with' water but were persistently seeking to get *in* water during their play. This persistence appeared to us as a deeply affective and embodied relationship. The joy and excitement was evident as gumboots and shoes were ripped off, and trouser legs pulled up, for the tamariki to immerse themselves – jumping and diving figuratively and literally into available sources of water in the sandpits and rockpools of their communities. Language to describe the effect of water included: "It's so much fun in the water, it's really cool, it's slimy". Or was evidenced through bodily encounters rather than verbal language.

Several tamariki were observed pouring water over their bodies, or allowing other tamariki to pour water over their head and shoulders. For example, at wāhi tuatoru a tamaiti, in the middle of the trench at the river, calf-deep in water, was heard to exclaim: 'We want to get in the water'. These interactions produced laughing, smiling and joking as well as observations of how the water felt, preferences for different water temperatures or silent encounters that we will never fully understand due to their private engagement (and nor would we want to). In each of these encounters, time seemed to stand still for tamariki as they literally embodied the wai, and the following narrative portrays:

Ka tirikohu ki roto i ngā Āria - Plunging in to the rock pools!

As soon as we arrive at the rock pools, several tamariki launch themselves joyfully into the pools, while others are content to splash in their gumboots, finding sticks or shells or stones to put into the water. The centre policy is for tamariki to test the depth of the pools with sticks first, which many did, but one tamaiti literally threw himself into the pools – immersing his entire body and moving along the rock pools like a tuna. It seemed as if he was completely captivated by the wai and all its properties – feeling his way along and occasionally stopping for a joyful splash!

An older 4-year-old shouts excitedly that she has found fish in the rockpool and kaiako race over to see. There are also crabs to be found under the rocks – though none of the tamariki are keen to touch them! Other tamariki take the opportunity to test out their balancing skills in walking along the stony shoreline. Time seems to disappear as each tamariki pursues their own interests in and through the water. Each are quietly supported by kaiako who walk or sit alongside them – sharing their joy in the splashes and discoveries that ensue with seemingly endless changes of clothes always at the ready. [Wāhi tuatahi field notes: Day 2]



These joyful encounters expressed a sense of belonging to the water and facilitated relational encounters with waterways that were readily accessible to tamariki across sites, and particularly during regular trips to their waterways. It was clear that tamariki felt powerful in these open-ended spaces for exploration, which enabled them to express themselves in multiple sensorial ways. While much of these existential engagements with water were intensely social, we also observed moments of satisfied solitude:

He rangi kōuaua - a sprinkling of rain

It's been 'spitting' rain at the river for about twenty minutes and puddles are beginning to form. Many of the tamariki are continuing with their work in the sandpit. There's one very new and young tamaiti wandering around outside in the rain. This tamaiti is finding the newly forming puddles and halting in each one for a brief splash, before moving to another. She then puts her hands on her head and I can hear her talking to herself, I think saying 'it's raining' but I do not want to get closer to find out. I notice her dad has just arrived and is watching her and me watching her. He shakes my hand and I share that I've been learning about playing in puddles. He says she loves puddles. [Wāhi tuatoru field notes: Day 2]

In these expressions of water, time seemed to take on different meaning as sustained encounter, thus enacting Mika's (2019) assertion of the wai concerning the embodied, interconnecting flows that exist between people, places, and things.

4.2.2 He Wai Whakatinana - Water Personified

Tamariki were deeply familiar with the pūrākau that surrounded their ECE sites, and frequently utilised the atua (guardians) that featured in their various expressions of water. They spoke effortlessly with kaiako about Tangaroa as the sea, Papatūānuku as mother earth, and the relationships between each of the atua they referenced. We observed kaiako supporting tamariki to make important connections to the whakapapa that oriented their approaches to water, for example, ensuring that water was cared for as one such Māori oral tradition is that it represented the tears of Ranginui (Sky Father), the relationships between sky and waterways through the maramataka – Māori lunar time cycle that starts from welcoming Matariki - the Māori new year (see Appendix C) - or the lessons learnt from the pūrākau of Aoraki [see 2.3.2]:

He Wai me ngā atua – water and guardians

The mural on the wall – developed by tamariki during Matariki celebrations in June this year - provides a great source for discussion with one tamaiti pointing to it – this cue was responded to by kaiako who asks “Ko wai tēnei atua?”. A group of tamariki call out “Papatūānuku!” and “Ranginui!” to which the kaiako replies “Auē! Who separated them?” There is no response, so she points to the atua (gods) depicted on the mural and names them, one by one, Ko Tawhirimātea tēnei... and so on until all are named. A tamaiti points to the star (Rehua) and says “he is not there now. He is there at nighttime.” Here kaiako picks up that he is speaking about his tuakana (older brother to a male) who passed away and whispers gently “yes, that's right”. The tamaiti says “Whaea came to my house” and she

replies “that's right, I did, when you were little”. She then asks “Kei hea a Ranginui?” (looking at the mural). The tamaiti points Ranginui out on the mural. “Āe, his tears are pouring down. He was crying”. Tamaiti replies “Sky was raining”. The kaiako says “Āe, he was crying. That's why we always have to remember to be careful with water. In the bathroom we turn the tap off after we have washed our hands so that we can look after it”. [Wāhi tuatahi field notes: Day 2]



Tō Mātou Aoraki - Our Aoraki

A pūrākau of how Aoraki, the tallest mountain in the South Island, was formed pervades the play, dramatic retellings, and art of tamariki at Wahi Tuarua. A tama asks me to take a look at “Aoraki”. He tells me “Aoraki lives in a boat. He hunts for fish, salmon and, I think, trout”. He points out features of his painting “That's the waka and that's their faces, but you can't see them”. He has now pushed the brush too hard into the paper in an effort to draw their faces but develops a strategy to painstakingly repair the paper using cellotape. “They have a big stick, to catch fish. There is a big hook there too”. His kaiako later tells me it is called a tao or spear. As he carefully experiments with the paints to produce the right colour for sand to his image, he explains how the waves in the sea are pushing the waka along. I ask him how he thinks the waka moves along the water and he tells me there are paddles. While adding his finishing touches, he launches confidently and without prompting into a familiar waiata about the waka. [Wāhi Tuarua field notes: Day 1]

Over the course of two days at the Wāhi Tuarua, this tamaiti brought the researchers back multiple times to tell the story of the Taniwha which had been central to a learning theme previously at the centre. He spent over an hour both days independently collecting the materials from around the centre and creating the 'staging' to tell this local pūrākau. Without being guided along, he tells the story on his own:

He karere - Story Telling with a Message

“A long time ago there was a taniwha who lived on land (uses green taniwha to illustrate hopping around). He ate berries and all these things (uses taniwha to pretend to eat wooden kiwi, kererū, and other birds). But then people came on land and started eating all his food. So, he went into the water. (Now uses blue taniwha with legs). He ate lots of fish and seals (shows Taniwha eating wooden figurines) and lived in the sea cave. But then the people came in the water and ate all his food again! (puts people in the waka) They caught all the fish (puts all the wooden figurines in the waka). So, the taniwha didn't have any food, and he got really angry. So he ate all the people. (Taniwha jumps into waka and 'eats' all the people). When asked what the moral of the story was, he added, “Not to take too much food from the land, not to take too much food from the ocean, just what you need. The taniwha had to eat the people because they ate all the food.” [Wāhi Tuarua field notes: Day 2 and 3]



The tama returns to his setup multiple times over two days, with a few new materials each time to retell the story. During one of these retellings, the tama asks if he can take his own photos for the researchers as he tells the story. Obliging to his request, he is given the camera and quickly starts narrating and recording this retelling, taking full control of his representation of the pūrākau.



Pūrākau such as these resurfaced in different guises and across contexts in various retellings throughout each day of our visits - through dramatic performances, retellings, waiata, karakia, a puppet show, a wall mural, watching an animated video (which the tamariki watch through several times daily, entirely entranced), as well as in everyday conversations or reminders concerning care for the wai. As Williams (2022) points out, these are important representations for tamariki to make as part of their learning, giving them “a sense of kaitiakitanga by providing children with regular opportunities to connect with the wider natural environment and with materials drawn from nature” (cited in MoE, 2017, p. 50). The living nature of pūrākau and the lessons it can offer to less visible forms of engagement with wai as told by the tamaiti when collecting kai (food) just take what you need. The use of traditional storytelling. Young children often identify with the natural environment through seeing the human-like qualities of the natural world. This approach encourages conversations about more-than-human rights; the bio-centric rights and eco-centric rights of water. Davis (2014) discussed how these experiences show us all how we are interconnected with the systems and cycles of the planet.

4.2.3 He Wai Tākarokaro - Water as playful encounter

Expressions of water through playful encounters were witnessed in two fundamental ways:

- Firstly, in experimentation with the properties of water (and its limits), utilising sand, containments (e.g., water troughs and flows through a range of pipes and vessels).
- Secondly, water was playfully explored in dramatic play – where water became a source of imagination and led to sophisticated narratives and co-operative activity.

Across each site play with water occurred in the sandpit, which was a standard feature of every ECE context. However, what this ‘looked like’ differed across sites, and was influenced by the surrounding waterways. For example, in Site 3 the building of bridges sustained the work in the sandpit by the tamariki. Tamariki were observed testing out wooden planks and then graduating to the use of metal shovels. Tamariki queued to take a turn in walking, running, hopping across, as well as balancing on, the bridges – predicting, planning, and expanding on their play in creative ways.

We observed, and indeed experienced first-hand, similar levels of playful experimentation and exploration with water troughs, pipes, and containers readily available at each site. Irrespective of the vessels in which the water was held, tamariki found ways to transport and pour it in multiple experimental ways:



Ka tāhoro te wai – Pouring the water

Transporting the water over to the funnels from the trough in bowls and cups, S tells me his water “went backwards” - having tried to pour it into one of the slots. M demonstrates to him the right place to pour – further down the ramp – which he does with success and repeats many times over before he is joined by enthusiastic peers. [Wāhi tuatahi field notes: Day 4]

He wā whakaataata – Just pretending

The black pipes are also used to blow bubbles into the bucket. Kaiako tells them not to drink the water because it is paru (dirty), but they seem unconcerned (or is it convinced?). Relenting, she asks them what it tastes like, and M says, “like toothpaste!”. We all laugh (since clearly it does not!). TM cannot resist tipping water on himself and those around him. This includes me! When I bend over to talk to another tama, TM pours a bowl full of water down my jeans! He beams as I squeal (well, it’s cold!). He then attempts to climb right into the water-trough amidst shouts of his peers “NO!” he is eventually dissuaded by kaiako who helps him climb out, saying “Let’s get some dry clothes on”. (I note that this is the third change of clothes that has been needed today!). The remaining tamariki bring the oldest tama a cup of dirty water to where he is sitting. TM immediately swoops in, grabs the cup and gulps in down, while the older boy looks at me, sighs and says very seriously - “It’s for pretend drinking” - he shakes his head disapprovingly. [Wāhi tuatahi field Notes Day 4]



Aspects of water were also keenly evident in the many dramatic play episodes we observed amongst tamariki. In these representations water provided a means of experimenting with ideas and of generating extended social narratives amongst peers. We noted that many of these playful encounters were sustained and highly sophisticated – integrating a range of interconnected ideas over time (what White, 2022 describes as utterance chains), opportunities for language extension, leadership, creativity and co-operative activity based on the provocations of water in the lives of tamariki:

He wai whakangaio me he taniwha - Pretend water and the lava monster

Earlier in the week tamariki are introduced to the concept of lava in the sandpit and there is great excitement as they watch its flow. Two days later, a near five-year-old tama explains to me when I arrive at the paddock that volcanoes need lava, and that the lava is about to flow “Evacuate! Evacuate! Lava quick!” he calls to me and the other tamariki “You have to climb onto the truck. Come on!”. They run away pulling a wagon and wheelbarrow shouting “honk honk”. They collapse dramatically under a tree at the back of the paddock and start to spread out some blue mats. Tama calls to me “Sit here or you will get burnt by the lava”, to which I dutifully respond. “Yay! We did it. We evacuated!” he shouts with a big grin on his face. At that moment another younger tamaiti announces that he is now a lava monster with outstretched arms and a growly voice. However, he is quickly told by his tuakana (older peer) that there are no lava monsters on the blue mat, so he relinquishes this role and sits with his friends obediently. Clearly he is the boss of this game! [Wāhi tuatahi field notes: Day 3]



Hī ika - Fishing with wire

Ngā tama (four year-old boys O & Q) have discovered some wire on the outdoor carpentry table. Immediately they rush over to the centre dinghy outdoors and start to paint the wire with glue. O: That’s bait for the fish. We are putting bait on ours. Q: We have to go out on the boat. Tie this to the sail”. O starts to painstakingly wind some of the wire he has now cut around the stick (aka fishing rod). He is starting to get frustrated: “I keep winding it round and the glue comes off.” He persists “Look, I wound it round lots of times and now we can fish off the boat. Q – hurry!” ... He strategically brings the leaf ‘fish’ into the boat and pulls it off the stick ‘rod’. “That’s poisonous fish food. That’s poisonous fish food. Wind it tighter!”. Q: “I need to find a way to put this wire on (He goes indoors to get a chair which he places beside the boat) I’m putting the flare on the sail. I need to put it on the top O”. O: I’m just re-weaving some of this sail. Q pokes the metal in, climbs down and cuts some more while O cuts a piece for himself. O: I need to put some on (O is shorter than Q so when he tries to reach the top of the sail he cannot) Q – can you put this chair in the boat?” Q obliges and a second piece is added – with a few wobbly moments as the chair is now precariously arranged in the boat. Q: “There. O – you need to cut some more wire.” He weaves the wire into the side of the sail, holds the harakeke and asks O to pass him the scissors ... passes O the scissors and he folds the harakeke in half, then passes the scissors back to O. Now O runs back to the carpentry table to get a hammer and nail. He climbs onto the chair and attempts to hammer a nail into the very top of the sail. He explains to me: “We are repairing the sail. There was a big storm and now we are fixing it. I’m hammering the flaxes on so they make our boat go fast.” He persists for over an hour until it is done. Later, on my way home, I recognise the vast amounts of wire used at the local Port and ponder its significance in their sustained play. [Wāhi tuarua field notes: Day 2]



4.2.4 Ngā Hononga i te Wai - Water connections

We discovered that tamariki representations of water were often based on personal experiences in places far beyond the ECE site itself, and which held personal meaning for them.

- Firstly, tamariki were constantly making connections to local sources of water related to features of each place e.g. bridges at Wāhi Tuatoru near the river, toy shipping containers and barges at Wāhi Tuarua near the port; maps of the sea at a centre near the lagoon at Wāhi Tuatahi.
- Secondly, tamariki made numerous connections through the provocations of materials at the ECE setting, to their recall of other places far beyond the ECE curriculum itself. For example, the artwork of one tamaiti at Wāhi Tuatoru depicted her family’s participation in winter sports. She drew a series of isosceles triangles, each with a blue ‘peak’ representing snow. When asked, she identified the name of each mountain and where they travelled for snowboarding. Another tamaiti showed a researcher his picture of the sea. He tells him that it is “evening”. Another tamaiti at Wāhi Tuatahi formed playdough planets in his depictions of the solar system – an interest he shared with his mother via the internet.
- Thirdly, we observed tamariki utilising water as a means of connecting themselves with place, through mapping representations and journeys of significance.

Together these connections with, through and in recollections of waterways highlight the idea that representations of water were connected to valued place-based memories and experiences of tamariki in and beyond the waterways themselves – invoking memories of valued experiences from elsewhere:

Kaiteriteri Blue

A kōtiro (girl) is patiently drawing with chalk along the wooden decking outside. She uses blue, pink and white in sections and sings quietly as she goes. She is joined by three others who, seemingly inspired by her efforts, join in. One says she loves the blue of the chalk. I ask her “what does this colour make you think about?” Immediately she replies “Kaiteriteri⁴ - the sea is blue, blue, BLUE there. I go there for holidays. Aunty Jo and Gran are there too, but not my Grandmama – she stays at home”. I ask her what she does with Aunty Jo and Gran, and she replies “There is a beach there and you can make sandcastles and you go in the sea and there’s a tent there and my friend Quinn lives in a camper there too. There was a bunk bed and Florence was on the top. But I sometimes sleep on the other bed-thing”. I ask if it was a lilo (a floating bed that gets pumped up for camping). She looks at me quizzically. Her kaiako, picking up on the conversation says she likes the bridge and the river there. The bell rings for mat time and everyone runs to get their gear and sit on the mat inside. [Wāhi tuarua field notes: Day 1]

As we saw in the previous section, fishing had a particular connection with some tamariki, who readily shared their experiences and knowledge of fishing as a familiar activity in their lives – one that featured in curriculum across multiple contexts for learning:

Hī Ika – Fishing

During a mat time a tamaiti shares that he is about to move to another region with his family - where there are “lots and lots of fish. He is asked a series of questions by the kaiako about sustainable fishing practices (not catching undersized fish, and not catching over the quota) and this includes conversations about fishing licenses. Later in the week a mat time story about brothers who had unsustainable fishing practices is shared during mat time (The Three Fishing Brothers Gruff by Ben Galbraith). Back on the river by the centre, tamariki regularly encounter people fishing for inaka. Stories of encounters with the people fishing are shared, including a story of a tamaiti throwing a catch from the bucket back into the river. There’s laughter about this memory. The kaiako shares her knowledge of white baiting, the different (ethical) ways and places, and questions whether it would be good to eat whitebait from the local river. They joke about how they avoided that ‘white baiter’ for a while. [Wāhi tuatoru field notes: Day 1].

Tamariki also represented their connections with waterways through mappings. These provided a means of narrating stories of significance and for tamariki to locate themselves in the wider waterscapes, as markers between places:

Whakamahere ngā arawai - Mapping waterways

Back in the paddock, maps are drawn by T and his friends with felt pens and paper. Tamariki point to the waterways they have drawn on their maps and show me the paths to where they live in relation to this. Painstakingly a tama draws the road from the centre, around the bay, past the sheep, showing me the route he takes to the beach. He stops at the sheep hill because he says he doesn’t know how to draw sheep. His older peer has been listening and steps in with his orange felt pen to accommodate. The picture evolves from there – with crabs and grass, and more pathways drawn by the two tama together. Another joins in – explaining to his peers that he has been to the North Island in an aeroplane to see his grandma – both tama listen intently. One says he has not been on an aeroplane and ponders this for a while. [Wāhi tuatahi field notes: Day 3]



Portrayed on a fifth birthday hat by a tamaiti who is leaving the centre for school the following week, a felt pen mapping is carefully narrated to me: “This is a boat and here is me... this is the sea and here is the fire. Oh no, its broken, its broken” she draws a hole in the boat “The water got in there”. She repairs the hole by drawing an extra line and then adds a square shape to the end “It’s an engine, so it can go far”. She draws water splashing off the back of the boat to illustrate this speed. Kaiako then arrives with much coveted sparkly star stickers (reserved only for 5 year olds of course!) and peers look on with admiration (coveting this esteemed prize) as she places them onto the hat – occasionally managing to retrieve an abandoned sticker for themselves to add to the effect. B places the stars along the top and says “The stars show the boat where to go at night”. Kaiako staples the hat around her head and the tamaiti wears it with pride and a sense of anticipation before the special birthday song is sung at mat time later that morning “Ra whānau ki a koe”. She is bursting with pride and everyone joins in the celebrations. [Wāhi tuatahi field notes: Day 5]

4.2.5 He Waiora te Wai Māori - Water as sustenance

Water was readily available as sustenance for tamariki, and plants alike. Each site had specific rituals around how water might be accessed, when, by whom and how. Tamariki were very familiar with these processes and drank as they needed to, throughout the day. Pitstops to drink often acted as a transition marker across the day, and largely accompanied the rituals of eating kai (food). Clean or dirty, water was seldom discrete from bodies:

He inu māku - Pouring a drink for myself

Around 0930 the bell chimes again, this time signaling morning tea. The tamariki all head to the bathroom and form a line to wash their hands in the sink. They then retrieve their water bottles or one of the recycled glass jars that is provided from a nearby trolley, which they fill with water and sit down at a table where the kaiako has placed their lunchboxes. Kaiako asks a 4-year-old kōtiro to show me how she gets her water and I dutifully follow her over to a most ingenious water cooler which is operated by pressing a pedal with one foot. She carefully holds her jar under the tap and ‘voila!’ Kaiako explains to me that this was gifted to the centre by whānau who won it in a raffle – it has proved to be very successful and especially so during covid as no hands are required to touch taps or levers. I note that every tamaiti who uses it does so with great skill and care – this is a very purposeful activity with no room for frivolity or waste! It is ‘on tap’ at all times of the day. [Wāhi tuarua field notes: Day 1]



⁴ Kaiteriteri is a town and seaside resort in the Tasman Region at Te Tahu Ihu o te Waka the top of the South Island.

Ngā Tōhihi - Puddles of water

One tamaiti releases her drink bottle which falls over as she's playing with her lunch box lid. She does not do anything about the bottle, which is dripping, so the kaiako picks it up. There is a small puddle of water on the table. The tamaiti takes a drink from the bottle, closes the lid, opens the lid and takes another drink, wipes her mouth with her hand, then tells the tamaiti sitting next to her that she put her drink bottle on her lunch box. Towards the end of lunch there's more bottles falling over on and off the tables as there's more movement with tamariki finishing up their lunches and becoming interested in other interactions. There's one big puddle of water by one of the tables and one of the researchers points it out to the all the Kaiako [Wāhi tuatoru field notes: Day 2]

The topic of drinking comes up during the observation of the Īnaka. The tamariki answer questions about healthy water for drinking. The Kaiako Matua shares that the Īnaka cannot survive in tap water and explains the tap water is not good for Īnaka because it has chlorine and fluoride in it. She asks whether the tamariki should drink tap or river water. They respond that they drink tap water. When other tamariki arrive at the table, the kaiako invites the tamariki to pass on this knowledge.

He wai rerekē - Different waters

The Kaiako Matua asks one tamaiti(C) what he thinks about how to keep the Īnaka alive. He answers, "we could fill the jar with tap water". His peer replies "the tap water has chlorine in it". C: It does not. Maybe we could use water from our drink bottles. HT: where do we get water for our drink bottles from C? C and J seem very committed to helping the Īnaka to stay alive and suggest that the tap water will be fine. HT: let's compare some tap water with the river water [goes to get some tap water in a jar]. HT: Have a wee look and see what's the difference. C: ummm, there's a little bit of seaweed in it [looking at the river water]. J: and a little bit of green stuff. HT: what else can you see? What are some words you can use? Who is the river water good for? C: For the Īnaka. HT: and can we drink the river water? C: No. [Wāhi tuatoru field notes Day 2]



4.2.6 He Wai Whakatikatika - Water as maintenance

Water played a significant maintenance role for tamariki and was clearly represented in face, body and handwashing. In each centre stickers were posted at children's eye level to remind them to wash their hands and we witnessed many occasions of tamariki taking personal responsibility for themselves and others in the ECE environment.

Handwashing routines varied across the centres and took place in formal as well as informal ways throughout the day. There were often very well established practices for handwashing surrounding eating protocols, as the following narratives suggest. But these also provided opportunities for rich discussions about how, when and for what purposes water should, or should not, be utilised:

Horoi ringaringa - Handwashing

Karakia and waiata occur on the mat at group time every day. On this day the kaiako says "We are going to let the babies go to horoi ringaringa first". They are taken into the bathroom while older tamariki stay with kaiako and look at the mural on the wall together. Nō hea te wai? T: Ummm the ocean (a tentative response) K: Yes, it's there, but where does it come from? T: Papatūānukū! (2 tamariki shout), K: ngā roimata a Ranginui. The rain. T: I forgot. K, That's OK. Sometimes we forget. Those are tears from Ranginui. Where does the water come down from? T: The rain and into the garden (V is very matter of fact in his reply). K: That's right. T: Taps bring water to our house K: That's right. They come in pipes, like the pipes we see near the beach. When you went down to the beach the other day did you find any para (rubbish)? B says "yes" but several others say "no". K: B did. We have to wash our hands to wash off the paruparu (dirt) don't we? Remember to roll up your sleeves and be respectful when we are saying karakia for kai. Everyone now goes to wash their hands and eat morning tea. as the babies look on. There is a line-up as tamariki wash their hands – lathering them with soap. As everyone waits, kaiako reads the taniwha story. A 4-year-old tama asks me to sit with him at the kai table and whispers to me that he has a secret about fish. He uses his hands to demonstrate the difference between how what he calls "normal" fish, tuna and a shark swimming. He has very distinctive features for each. He invites me to his house and tells me about the thunder. "I don't like it, it makes noise like this" he says, covering his ears with his hands. "When Ruaumoko is angry you go like this" and he demonstrates the earthquake 'turtle' stance. We all eat rhubarb muffins tamariki have just baked that morning – they are very good! Then – one by one – tamariki access a cloth on a nearby trolley to wipe their hands and face – and are invited to check their faces in a mirror that is positioned close by. All clean before the doors open for outdoor play! [Wāhi tuatahi field notes: Day 3]

Waiata were used at every handwashing and/or eating protocol with water. Like karakia (see footnote 3), waiata encompass the spiritual teachings of Māori. A closer examination of the word waiata shows it is made up two key words – wai and ata. It is important to understand that these words wai and ata are used within different contexts and have clear vernacular meanings. Williams (2022, p. 29) asserts waiata is "a reflection of yourself and that there are many possibilities and opportunities that one needs to consider when learning and singing waiata. Of these, the first requires locating yourself with the waiata (why do you want to sing this waiata?); the second on determining the significance of its meaning. Consequently, when explaining the word waiata from a philosophical lens, wai is affixed to many very important te reo Māori phrases and/or words. For example, "Ko wai koe?" | "Who are you?" presents a literal meaning of wai. An authentic translation, however, is "From whose waters do you come?". By utilising waiata during these daily water rituals in the ECE context centres are invoking important whakapapa links, with wai [being] a representation of this once again bringing water to the centre of curriculum for these tamariki.

4.2.7 Kaitiakitanga – Guardianship of Water

Tamariki across all sites showed a deep care for taking care of the water, the creatures that live within and around it as well as its importance for their personal lives. In the sandpit, for instance, the importance of play with water was balanced with the importance of conservation of water – tamariki were keenly aware of this and, for the four-year-olds especially, we saw many examples of their concern for not wasting water. Here, tamariki were involved in recognising and talking about the processes for conserving rainwater for having water to play with in the sandpit, led by the tamariki interest. With available rainwater in a hold tank, tamariki were involved in leading the pumping of water. Elaborate construction for shifting water from the hand pump or reticulated taps to the sandpit, and elsewhere, were produced each day of the research, in a variety of intentional ways.

He uaua maha te wai - Reticulating water “It starts here”

A 4-year-old tama tries to explain his understanding of what happens to water in the pipes around the kindergarten but struggles to articulate the right words. In frustration, he takes my pen and notebook from me and draws a very detailed picture about how it is connected. With prompting from his kaiako he describes in detail the flow of water through pipes and draws what his kaiako translates to be a fire hydrant. The following day in discussion with Martin, the centre Caretaker/arborist/firefighter, I discover that the word this tama had been looking for was not ‘hydrant’ but in fact a ‘statoscope key and bar’ that was connected to a reticulator on site. This was part of the wider reticulation project at the kindergarten led by Martin who shares a deep concern for the restoration of waterways and visits the kindergarten daily – his arrival is eagerly awaited by the tamariki who had been watching and talking about this project with great interest. Taps have been added to assist tamariki in playing with water sustainably. Martin explains his ambition to develop sustainable practices with these tamariki - “It starts here” he says. [Wāhi tuarua field notes: Days 1-2]



Water restrictions during field work at Wāhi Tuatahi saw increased opportunities to remind tamariki of their obligations in protecting water. Many times we observed the struggles of tamariki as they balanced their desire to play or immerse themselves in water while at the same time caring for their environment

TE wai: He nui he iti rānei? - Too much water or not enough?

Blue slime and water buckets have been brought outdoors. The water is very popular but, tamariki are told on several occasions by kaiako, also scarce. Tamaiti tips the second bucket of water out into the tyre rim. “Oh no” chorus the other tamariki who continue to make the best of what is left – utilising teapots that are then



transported to the garden to water the plants. Some take the water through any means (teapots, spades, troughs) to the sandpit where they tell me they are making pancakes – they experiment with consistencies and quantities, shouting out “too much” or “more” as they work together to achieve their goals. [Wāhi tuatahi field notes: Day 3]

Drains Rain Only



At Wāhi Tuarua, drains were marked with blue “Drains Rain Only” fish labels, which were one of the first centre features shown to the researchers by very proud tamariki. When asked why the drain had a fish label, one tama replied, “Because we can’t put rubbish in it, or soapy water, or else the fish will get sick.” While the tamariki knew that the drain went to the ocean, they were unsure where soapy water should go instead of the drain. Here we see the emergence of guardianship, which appears to focus more on their protection of other creatures but not necessarily to protect the water in its own right. [Wāhi tuarua field notes: Day 2]

Ngā kaitiaki pai - What great guardians

During a mat time, the tamariki, sitting in a circle, were given the glass jar with ĭnaka and river water. These had been collected on the river walk earlier in the day. The tamariki carefully passed the jar around the circle. The Kaiako Matua invites the tamariki to talk about the ĭnaka as they pass the jar around. The adults watched on with visible but controlled concern/tension/care for the ĭnaka as the full jar of water passed from hand to hand. There were certainly some moments where it seemed like the jar must spill, but no, barely a drop of water spilled from the jar. The tamariki observed their care and concern for the ĭnaka, saying: They’re really special...Hello...



They’re so cute...I love it...I love it and it’s the only 1... They look invisible. Being great kaitiaki began at the river’s edge when C shared with a researcher that he’s quite concerned that the river is ‘murky’. Later, sitting at a table observing the ĭnaka the conversations with teachers explored the importance of river water for the ĭnaka.

Perhaps it is also important to recognise poignant ethic of care evident as the teachers worried for the tīnaka as they were passed from hand to hand. The tamariki and teachers are great kaitiaki (guardians) together. [Wāhi tuatoru field notes: Day 2]

At Wāhi Tuatahi and Wāhi Tuatoru we were also able to keenly observe practices of kaitiakitanga (caretakers) by tamariki during their visits to waterways. Here opportunities abounded to discuss and practice custodianship through observations of others, the presence of rubbish, dirty water, erosion and the fostering of deep respect (perhaps even love) for the waterways near the ECE sites.

Ka Haere mātou Ki te moana - To the sea!

Once over the stile everyone takes off at great pace! There is a wide green paddock for tamariki to run down to the next gate. They know they cannot go over the stile without being told to (see policy doc). As they wait for the white baiters to cross the stile the men exchange words about how much they will catch that day (whitebait season has been shortened this year) The process is seamless as everyone crosses the second stile – they know they are free now! Everyone runs and shouts ‘Hurry up’ to their peers.

As we walk along, and others run ahead, a kaiako points out the plantings that had been done by the centre tamariki 3-4 years ago, and which they tell me about. The tussock provides a safe landing place and a space to hide, while the harakeke (flax bushes planted to ameliorate erosion) provide markers along the way. There is great glee as the cliff comes into view along the path. Tamariki take the steepest route up the cliff with two kaiako who sit with them at the top where they have the most amazing view of the sea. Kaiako invites them to “kōrero with Tangaroa” (talk with). They wave their arms in the air together and sing “Whānau is my waka... (Six-sixty pepeha waiata which they all know well): *SIX60 - Pepeha (Lyric Video) - YouTube*. Tamariki are encouraged to help one another to achieve their goals as they climb, and the tussock grass provides a natural slide for them to come down. Some jump into the bushes and others sit or stand on the edge of the cliff to look across the bay and listen to the waves crashing. There is a sense of great powerfulness here as tamariki push themselves to their limits physically. I sat halfway up the cliff and offered a helping hand when asked – there was a great deal of cooperation and companionship amongst everyone it seemed. There are high levels of risk-taking here – with a sheer cliff on one side that two of the older tamas perched upon as they looked out to sea. [Wāhi tuatahi field notes: Day 2]



Manaaki i a Papatūānuku - Picking up rubbish and other things

Several tamariki have brought sticks back with them and are comparing the patterns and shapes on them. I held hands with a four-year-old after he shared his ‘duck’ shaped stick with me. He chats enthusiastically – telling me all about his Nana (who I had met the previous day), explaining that he thought she was going to die one day. We talked about the fish in the sea and speculated on what it means to die because you are old. He seemed worried about his Nana. He then spots some rubbish in the paddock and tries to pick it up with his stick (I later discovered from his Nana that the school visit he had been on had introduced him to the idea of using sticks to pick up rubbish – this was not a centre practice). After some struggles, even tears, in manipulating the stick for this purpose I pick it up for him and give him my assurances that it will go into the rubbish as soon as we got back to the centre (he does check up on this when we return!).

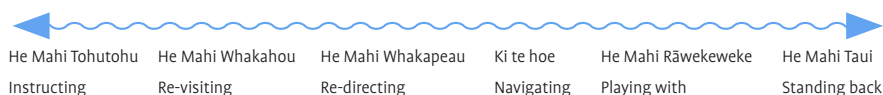
During our walk to the beach that day another four-year-old notices that the sheep had now gone from their perch on the hilltop overlooking the sea. No one asked where they had gone although I did whisper to Ngaroma that I could guess. The stench of animal carcasses is pungent through the air as we cross the second stile, passing the abattoir, on our way back to the centre. I discovered today that the freezing works caters for sheep, deer and pigs – but it is normalized here amidst the landscape. Later, a kaiako tells me that you can sometimes hear the pigs screaming as they are slaughtered. She said it sounds like a tamaiti but explains that the noise at the centre drowns it out nowadays. But nobody talks of it, despite its omnipresence in the smells and sounds surrounding the ECE site [Wāhi tuatahi field notes: Day 2]



4.3 He Ariā Whakaako i te Wai – Pedagogies of water

Each of these representations were underpinned by a series of pedagogical orientations by kaiako. These ranged from standing back right through to explicit instructional teaching – depending on the intention for learning as discerned by kaiako. Consistent with much of the existing literature on ECE pedagogies in Aotearoa New Zealand ECE, kaiako moved effortlessly between these pedagogies – utilising each according to the context and their priorities for tamariki. At no time would we suggest that these were not intentional acts, since kaiako played multiple roles as enablers, facilitators and advocates for water and its accessibility to tamariki – as a primary source of learning. The continuum below emphasises the range of pedagogical strategies involving water that we observed during fieldwork – many occurred simultaneously, and artfully, within a singular curriculum experience or encounter with water:

Figure 1: Continuum of pedagogies concerning water



In the section that follows we provide short excerpts of practice to illustrate some of the intentional pedagogies used by kaiako in their application of water as learning in curriculum. While they are presented discretely, we do not suggest that they are isolated from one another, depending on the curriculum context in which they are located.

4.3.1 He Mahi Tohutohu - Instructing ‘about’ water

Across ECE sites, many of our first encounters were through explicit teaching and activities related to water. Knowing that we were interested in water, many kaiako and tamariki were keen to show us direct activities which focused on this theme. As a pedagogical approach, this exemplifies purposeful planning and interactions with water by kaiako for tamariki, and where the kaiako is very much steering the learning. We witnessed pedagogies of this nature taking place at group times through demonstration, hypothesising, theory-building and questioning, as well as in spontaneous events of coaching and demonstrating, as the following narratives illuminate:

He mahi pūtaiao - Water: science learning

At group time a kaiako tells tamariki to close their eyes as she has a surprise. A tray of daffodils and beans is ceremoniously carried to the mat as tamariki move in close. The kaiako asks them to hypothesise what has happened to the daffodils that had been put in dye and the beans they have previously placed in damp tissue (two days earlier). She shows tamariki the stems of each and explains how the dyes were sucked up by the daffodils. “I wonder why there is more colour on these?” she asks – pointing to the dark blue dye. Tamariki are clearly puzzling but one says “its darker” “that’s right” she says “let’s see what will happen if we swap them around” which she does, and then puts them on the shelf for the next day.



Next, she shows them the beans and the roots that are now protruding: “can anyone remember what we put in the beans?”

“Coffee!” calls out one tamaiti. “Just water” responds Kaiako “Wai. See how some have split apart. We need them to grow into beans but where do they go next?” Another tamariki answers “Garden!”, “yes, mara. Today we will put the beans into the garden with lots of dirt”. [Wāhi tuatahi field notes day 3]

Hopihopi nga ringaringa - Lathering up hands

A very young tamaiti seems to be enjoying the warm water on his hands, others are becoming impatient behind her. The kaiako comes over and has to coach him through the process: You made bubbles with the soap! The soap gets the germs off, see the bubbles? Make bubbles, rub, rub rub, mirimiri with the soap, then rinse off. [Wahi tuarua field notes: Day 2].



4.3.2 He Mahi Whakahou - Revisiting ‘with’ water

At Wāhi Tuatahi, kaiako revisit prior engagement with Matariki (see Appendix C) three months earlier to reinforce tamariki understandings of what each star represents in Te Ao Māori. Tamariki understanding of this event and its relationship to the maramataka plays a key role in pedagogy here. Placement of the stars is viewed as an important aspect of learning about the wai – especially for this site as they are situated where Waitī meets Waitā – as in the cluster in the evening sky you will always find Waitī above Waitā as fresh water always runs into salt water here in Aotearoa. Here we see kaiako actively encouraging tamariki to revisit experiences through prior art work and recall. Of note here is the joyful and repetitive manner in which this is achieved, promoting recurrences of valued learning:

During group time a tamaiti points to the photographs on the wall. “He wāhi tino pai! That’s a cool place” responds Kaiako. “Do you remember what you were looking at? Did you go to look at ngā whetū o matariki? Whose eyes are these? Ko wai au karu?” she points to the picture. Tamaiti replies “Tawhirimātea”. Kaiako asks “what did he do with the stars?” Tamaiti replies “Up in stars”. “yes” she answers, “he threw them”. Two tamariki now jump gleefully in the air and shout “up high, up high!”. One puts his arms up to Kaiako who picks him up and says “and he threw them into the sky!” they all laugh as she points to the whetū (stars) on the ceiling and then throws the tamaiti up in the air. “Which one will you catch?” she asks “That one” replies tamaiti and points to one of the stars. Whaea counts them “Tahi, rua, toru, whā...”. Tamaiti shouts “higher, higher” and this game is repeated – each time whaea asking “did you get it?” and as they come down, they count on their fingers backwards “Kāore e rima” (not 5) says kaiako. Two older tama ran past with fans they had adapted from the plastic blocks. They call out “Ranginui!”. After several rounds of this repetitive action Kaiako lies down on the cushions “I’m going to lie down and look at them now. Ka rongo ki tōku manawa – feel my heart!” - they laugh together. [Wāhi tuatahi field notes: Day 3]

Kaiako see themselves here as key to enacting whanaungatanga or the intergenerational transmission of mātauranga (knowledge) to tamariki about the whakapapa connections to the whenua, to ngā arawai, to ngā Atua Māori (Māori gods) and to ngā tīpuna (ancestors) (MoE, 2017). We observed many

examples of these revisiting connections being orchestrated by kaiako both in formal learning contexts such as group time, with one example as follows:

Whakapapa and Water

At 9:30 all tamariki are asked to sit on the outdoor mat, removing gumboots as they do so. In the centre of the mat is a statue circle of friends with a special stone placed in the middle. Following karakia: “Ko Ranginui kei runga, ko Papatūānuku kei raro, e manaaki e tiaki i a tātou katoa Amines and then followed by the supporting waiata where the tamariki and kaiako sing *Te Aroha*.

Each tamaiti is passed the stone and encouraged to say their pepeha. Some do and some don't, but all are encouraged warmly and cheered if they do so. When all tamariki and kaiako have had their turn N asks “Ko wai te atua o te rū whenua?” And then translates into English “Who is the god that makes the earth shake?” “Papatūānuku” calls one tamaiti. To which kaiako replies “inside Papatūānuku”. And then says, “We need to listen and pay respect to our atua”, before chanting a karakia: “Nau mai e ngā hua, o te wao, o te ngākinga, o te wai Māori, nā Tāne, nā Rongo, nā Maru, ko Ranginui e tū iho nei, ko Papatūānuku e takoto nei, tuturu whakamauia kia tina, TINA! Hāumi e! Hui e! TĀIKI EI! On cue the tamariki are then able to leave which they quickly do! [Wāhi Tuatahi field notes: Day 1]

As mentioned, kaiako regularly used this pedagogy during daily rituals with water to revisit, or reinforce, desirable drinking behaviors, hygiene practices with water or recall of experiences. Kaiako sat with the tamariki around the table during lunch time and intermittently reminded tamariki to drink or wash and facilitated (at times triggered) discussions based on recall.

5 A translation for the karakia tīmatanga or whakamutnga so this incantation can be used to start or finish a day, a session a gathering within Wāhi Tuatahi this was their karakia to start the day off. With Ranginui (Sky Father) above and Papatūānuku (Mother Earth) below we will all take care of and we will all be cared for Amen.

Te Aroha waiata translation: Te Aroha = Love; Te Whakapono = Faith; Te Rangimarie = Peace; Tātou tātou e – for us all.

6 Translation for Karakia mō te kai – said before going to eat: I welcome the gifts of food from the sacred forests, from the cultivated gardens, from wild plants, from the sea and the fresh waters. I acknowledge Ranginui (sky father) who is above me and Papatānuku (earth mother) who lies beneath me. Let this be my commitment to them all

4.3.3 He Mahi Whakapeau – Re-directing

At times kaiako also needed to re-direct learning as they, too, navigated the tensions between care for the appropriate use of water as exploration. Kaiako at Wāhi Tuatahi actively dissuaded the many games that ensued in the paddock using pipes as guns by suggesting that they might become eels. Across all sites we saw a series of pedagogical protocols concerning when, how and to what extent water might be utilised. Tipping water out or not using it in the ‘right’ way (e.g., gardening as opposed to watching water get soaked into soil or concrete on a hot day) formed the basis of many re-directing manoeuvres on the part of kaiako across all sites – with varying degrees of success! Often kaiako would gently utilise ‘cause-and-effect’ explanatory dialogues to settle such matters with tamariki:

He Māra Kai - Planting in the food garden

A kaiako invites tamariki to help her plant the beans. As they till the soil with spades Whaea invites them to check for roots as they discover old strawberry plants. “What do you think will happen if we don't water our plant?” she asks. “It will dry up” says one tamaiti. “yes, it will dry up because te rā [the sun] is shining” says Kaiako. Each tamariki seems to have a different way of engaging with the soil in the same way they did at the beach – some are digging with the much-coveted spaces while others are taking roots out to put into the dump truck (toy). There is a great deal of cooperative play taking place. The kaiako then brings bamboo sticks and invites tamariki to push them into the soil “They are a fence for our beans to grow up” she explains. Next, troughs are provided and tamariki invited to “make a tunnel for our seeds”. Carefully each tamariki places the beans and pats down the soil around them “Great job” says Kaiako “well done”. The task that follows is to try to explain to all the tamariki (including toddlers) that the garden cannot be climbed on while the beans are growing. A series of re-directions took place over the next hour as kaiako explained over and over again, removed tamaiti from the garden, or invited older tamariki to play an active custodial role. I am amazed by the patience of this kaiako who persists in her care for the plants. “This is a mara kai (food garden) now and you cannot walk in it – only around the edge” becomes a persistent refrain. [Wāhi tuatahi field Notes: Day 3]

Again, group times provided additional opportunities for re-directing the use of water through reminders:

He whakamārama - Explaining about water for washing

As everyone is settling onto the mat the kaiako reminds the tamariki – there has been a lot of discussion about water today, but, the kaiako asks “did they remember that they also use water to wash?”. Another kaiako comes in with a dirty sock she has found outside – trying to find its owner. “Lucky we've got a

washing machine to wash it in”. One of the tamariki says “You could take it home?” to which Kaiako replies “I do sometimes take things home from kindergarten to wash. Everyone takes turns”. Another tamaiti says “I do, I take it home”. “And bring them back all clean and fresh” says the kaiako. On the other side of the mat an older tama is wiping his mouth vigorously with his sleeve Kaiako asks if everything is OK. He says “Something is in my mouth. It's not snot”. Kaiako replies “It's not snot? Maybe it's saliva. Maybe you could get a tissue instead of wiping it on your sleeve” she suggests. Tamaiti retrieves a tissue, and all is well. Everyone gradually leaves for home before 3 pm. [Wāhi tuarua field notes: Day 1]

Or in creating transition markers between play and routines:

Ka whakapeau ki te kai - Redirecting to kai time

Kaiako says it is kai time. Q: Not hungry (he says this three times with decreasing resistance). O: Not thirsty either! K (in sailor voice) Calling all sailors. It's time for kai. This time the tamas reluctantly walk inside. K: good choice. You'll need something to eat – you've been SO busy! [Wāhi tuarua field notes: Day 2]

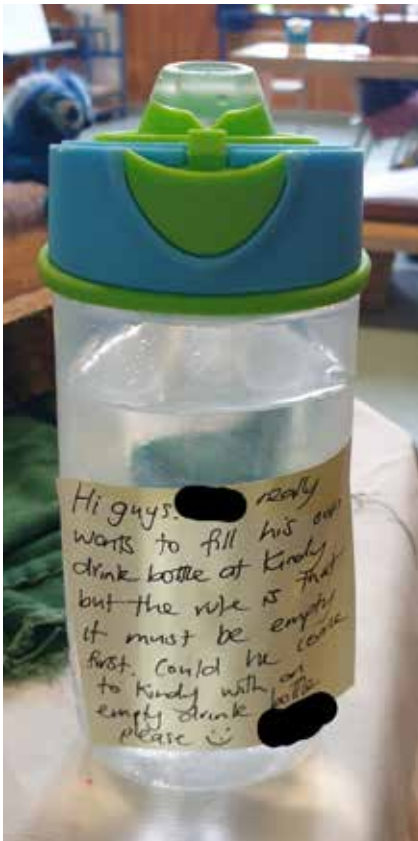
He tikanga whakahaere - Supervising the flow

Kaiako invite the tamariki to leave the mat one by one and queue by the bathroom where there is a sink with two taps. Another kaiako helps with the flow of tamariki as they move from the queue to the basin and then to dry their hands and leave for their snack or lunch. In this centre, the teachers have described the bathroom as ‘gross’ and are looking forward to planned renovation of the bathroom. [Wāhi tuatoru field notes: Day 3]

Kaiako at Wāhi Tuarua were also observed using re-direction as a way to teach tamariki and their wider whānau about the water rules at their centre.

The Water Bottle

Seeing a friend get to fill his water bottle using the fun water fountain, a tama takes the lid off his own (full) bottle and gets up as if to go fill it. The kaiako notices and tells him, “We only fill our water bottles when they are empty, that is the rule.” This makes the tamaiti visibly upset, and the kaiako indicates this isn’t the first time he has been disappointed for this reason. She decides to write a note home to put on his water bottle while describing to him why he can’t fill it right now, re-directing this tamaiti with his current frustration and re-directing future behaviour as well. [Wāhi tuarua field notes: Day 3]



4.3.4 Ki te hoe - Navigating ‘around’

Kaiako utilised every experience of water – across play and even through the weather patterns or events – as much as to extend tamariki thinking by navigating for potential learning. These pedagogical strategies were not pre-planned but relied on kaiako responding ‘in-each-moment’ to the opportunities offered in the environment and by tamariki themselves. They often re-routed engagement with water and/or provoked new ways of thinking about its relevance for learning.

He karere - Radio transmission at sea to Santa Claus

Kaiako walks by two tama who are fishing off the dinghy (see 4.2) and asks, “How is your fishing going?”. Q: “Good” and carries on with his mahi. Kaiako leaves and returns with a radio transmitter. “Maybe you could radio in to ask if any other boats have seen any more fish.” Q calls up on the transmitter and reports to his friend O in a pretend voice “Tides have taken the fish. Oh no! I pushed the wrong button, and I woke up Santa Claus. I woke him up on the phone!” Q and O laugh with the kaiako before they return to their serious fishing business.

[Wāhi tuarua field notes: Day 2]

He kōrerorero pai – An interesting discussion

Kaiako has brought blue glass to the carpentry table that she collected from her weekend walks along the beach. The glass has been worn down from the sea and feels delightfully smooth. Holding it up to the light, the colours are magnificent – pale blues, ochre, green – and it is hard to believe they are a product of chance rather than design. It evokes rich discussion with tamariki about where the glass came from, how it got to the sea, how it landed on the beach and the work of the waves in sanding it down to what it has become. There was also discussion about glass being rubbish and why it was important to pick it up. The kaiako has brought wire in to make a special harness for the shells and there is much dialogue about how it might be shaped. Each of the tama want to use glue and seem determined to apply it to the glass and turn it into a hook to catch fish.

Kaiako: Glue is not good for fish. It could stick to their bottom. O: But fish don’t have bottoms Kaiako: Then how do they poo and wee? O and A laugh raucously – then pause to point out a fish that is pictured on the table in front of them. Q: It’s a pencil fish! K: Do you think those fish have tentacles? Q: Yes, they do – see (points to the tentacles) K: That’s right! What about a wheke – how many tentacles does an octopus have? O: Eight! K: That’s right – Octo means eight. Q: We gonna catch fish. K: How many? Q: We gonna catch 20. O: No, a hundred! K: Remember we need to leave some fish for the other people. I think you are allowed 50 mussels a day. O: A hundred mussels! K: If you take too many, the fisheries people will say you’ve exceeded

your quota. A: Too many fish. K: If we take too many, what do you think might happen to the fish? Q: None left. K: That’s right, they become extinct. O: Poisonous fish food. K: What would happen if we ate poisonous fish? O: We would get sick. [Wāhi tuarua field notes: Day 2]



This kind of pedagogical navigating was also seen in the importance placed on taking tamariki to the water. At Wāhi Tuatahi their outdoors nature programme “Waewae Kai Kapua” had been approved by the Aotearoa New Zealand Ministry of Education and enabled kaiako to take small groups of tamariki to the beach – weather permitting – each week, sometimes each day. Kaiako worked hard to juggle their tamaiti-teacher ratios to ensure this would occur (and at the time of this study were seeking new staff to ensure it was possible). They had a carefully planned Excursion Policy that was shared with tamariki who all knew the rules of being safe around waterways.

Ngā Tikanga – Rules around visiting Tangaroa

One tamaiti asked “We go beach today?” to which kaiako answered “I’m not sure, Tangaroa might be feeling hōhā today. If Tangaroa is on the rocks we are not allowed on them are we?” “No” replies tamaiti. [Wāhi tuatahi field notes: Day 1]

The image below illustrates one of the well-established strategies for checking out the depth of waterways by utilising sticks:



As a consequence, the route to the beach was well known by tamariki and was facilitated by regular reminders and, until they were safely off roadways, in the act of rope sharing seen pictured here. Cold weather did not prohibit these outings, as kaiako provided waterproof coats and trousers for all who needed them. Kaiako described, in detail, their commitment to these encounters with wai, which were also widely featured in assessment documentation:



Kaiako also put a lot of specific effort into developing stories and activities, and encouraging both planned and unplanned learning about water. One teacher has set up a table outside with blue trays containing samples of river water. She has set up pipettes and jars and there are lists of animals you can find in the water, particularly insects and larvae. The teacher has also brought along a water clarity instrument and shows the tamariki and me how you use it to check water clarity. The teacher explains she was up early in her waders getting the samples. She is a member of the local river trust.

At the river, after the excursion, a teacher sat with the sample jars and discussed how to keep the *īnaka* alive. Discussion ranged from water quality to water temperature and explored the difference in needs for humans and *īnaka* when it comes to water and wellbeing. The tamariki were very concerned for the wellbeing of the *īnaka* and quickly showed an understanding that despite their urge to get their hands in the water, that this would be unhealthy for the *īnaka*, and they began sharing this knowledge with other tamariki as they arrived at the table to explore the samples.

He mahi tika – Why we do what we do

During group time a tamariki points to the driftwood mobile with rubbish and says, “we go to beach”. Kaiako replies “yes when we go to the beach we always pick up the rubbish and put it in our kete. If animals swallow that rubbish, they might get sick. They might think its food”. [Wāhi tuatahi field notes: Day 3]



4.3.5. He Mahi Rāwekeweke - Playing with

Though less evident in our observations at each site, kaiako occasionally played with tamariki and their engagements with water. Playfulness as a pedagogical strategy took the form of valued rituals around drinking or related activities, and in tuning in to the opportunities that were provided by water, such as during a rainstorm. Kaiako remained ever vigilant to the opportunities water offered them to do so, and engaged in wordplays, jokes, and observations accordingly. Interestingly, we did not observe kaiako readily playing with or in water themselves during our time in these ECE sites, despite the obvious joy tamariki derived from their own immersions. We are left pondering as to why this was the case and suspect that kaiako are constrained by issues concerning safety, ratios and regulations – all of which lurk behind the scenes of these pedagogies.

He inu wai - Drinking processes

During snack time, we ask the teachers if they use any strategies to support drinking. They share that they raise their own bottle and say ‘water bottles unite’ along with the tamariki and this gets all the tamariki drinking. It’s essentially a ‘cheers’ and some of the tamariki can be heard saying cheers as they raise and tap their water bottles. Kaiako Matua: we always have a drink of water with them. Teacher: These tamariki come from good water drinking families. One tamariki, K, who has been quite quiet today, and later sits on the couch for a nap, takes a sip of her water and then breathes out ‘aaaaah’. [Wāhi tuatoru field notes: Day 3]

Whakarongo ki te ua - Listening to rain under the umbrella

It starts to rain softly and the kaiako sings: “If all the raindrops were lemon drops and dew drops - Oh what a rain that would be. Standing outside with my mouth open wide” (opens mouth and makes sounds in tune with tongue out – demonstrating how to catch the rain). Kaiako asks: “Did you catch any on your tongue?” “No, on my head” replies a tamariki. “Oh, you missed your mouth!” smiles kaiako who then asks, “where do you think the rain comes from?”. Tamariki answers matter-of-factly “Clouds. Lots and lots of drips of water”. “Hmmm” says Kaiako “Why do you think we

get more rain from some clouds?”. Tamariki answers “Some clouds have rain, and some have sun.” The rain starts to get heavier and tamariki asks if they can wear the centre jackets. Others follow suit and the kaiako brings a lot of red jackets outside, then helps tamariki put them on if they want to. As they are waiting one says “Jayne sounds like rain” pointing at me. We laugh and sing “Jayning in the raining”. Tama are back in the boat with jackets and the kaiako asks “Is the boat filling with rain?” O: “No, it’s dry in here.” After assisting tamariki with jackets the kaiako exclaims “Oh no, I left my jacket at home! I know! I’ll get an umbrella”. The umbrella proves to be very popular, and everyone tries to get under it. The kaiako invites tamariki to take turns. They all huddle together under the umbrella as she invites them to listen to



the pitter patter of the drops to discern how hard the rain is. They walk together up the stairs and there is a bit of congestion because so many tamariki want to join in. Kaiako makes a suggestion “we could shelter in the trees too and watch the drips. I think the garden needs some rain.” Everyone quickly retreats to the trees up the hill where hide and seek and other games are played out amidst the drips, as the rain gets harder and harder [Wāhi tuarua field notes: Day 2]

4.3.6 He Mahi Tai - Standing back

Conversely, across many learning encounters with water, kaiako made decisions to stand back in order let the learners explore on their own. After the encounter described in 4.2.9 *Kaitiakitanga: Guardianship of Water* with the rain-only drains, the kaiako had asked a tamaiti to share about what he knew about where the water goes once in the drain and prompts him with a photo they drew as a class of the water treatment plant. The tamaiti appeared very shy and avoided answering her questions or talking to the researchers about his knowledge. The kaiako decided to leave it, and he went off to play with a friend, and the researcher stepped into another room where the tamariki could still be viewed through a window. We were able to observe the tama playing with his friend in a water-trough with some soapy water, sponges, and containers.

He wai paihana – Contaminated water

Tama: Collecting bubbles with small cup and putting them into larger container, I'm putting all the wastewater here! Oh no! (Soapy water has gone to the ocean!) We need to get the soap out!

Friend: All this wastewater can't go to the ocean!

Tama: Pouring bubbles again into larger container. (Into the waste soap container!) [Wāhi Tuarua field notes: Day 2]



Watching their creative independent play, it was evident to kaiako that tamariki knowledge of water treatment and the water treatment facility was being explored thoroughly through their creative independent play. By standing back in this situation, kaiako were able to observe how these tamariki were making their learning real and relevant within their play, which may not have been evident through direct instruction or play with kaiako. This level of pedagogical trust oriented much of kaiako engagement, and disengagement with water, and led to specific kaiako roles concerning the provision of water, and interventions only to re-orient its (inappropriate) use.

He wai whakatōngā me ngā maringi - Water restraints amid tippings

No sooner is the planting finished than Whaea emerges from indoors with a bucket of pre-prepared blue slime, plastic sea animals and shells. These are placed in a trough near the sandpit. “Yay” shout the tamariki. As Whaea pours the slime in she asks, “what does it smell like?” to which one tamaiti answers “Like strawberries”. Several tamariki plunge their hands in as one calls out “don't waste it!”. Tamariki lift their hands high in the air to make bubbles and toddler E has a taste. Whaea N points out “Look - the shells are the same beautiful blue colour as the slime”. “it's ice” calls out one tamaiti “Turned into ice: shouts another. They use the shells to scoop and cover the animals with slime. Whaea has also brought out a second bucket of soapy water that one of the toddlers tips out – watching the water run in streams through the mud. “Oh dear, I better get some more” says Whaea.[Wāhi tuatahi field notes: Day 3]



All three of these examples highlight the key responsibilities of kaiako in *Te Whāriki* (MoE, 2017), intentional teaching, and the strategies that kaiako put in place and the knowledges they utilise to structure learning for tamariki.

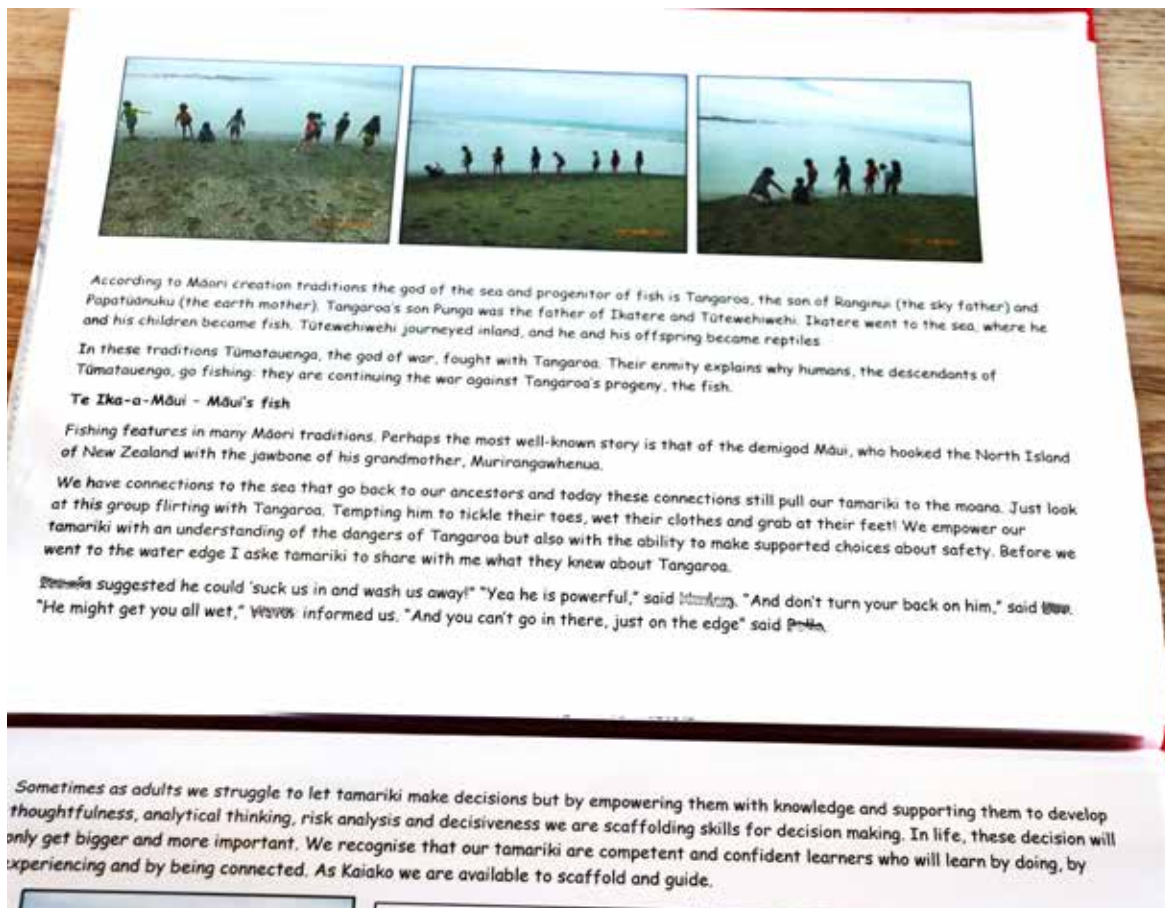
4.4 He Aromatawai - Assessment for learning about/with water

In Aotearoa ECE curriculum, assessment plays a fundamental role in noticing, recognising, responding, and revisiting learning. It is integral to pedagogies for learning (as opposed to assessment of learning). *Kei Tua o te Pae* (MoE, 2004) and *Te Whatu Pōkeka* (MoE, 2009) offer Māori assessment frameworks which can be used to assess all tamariki through learning stories. Learning stories reveal kaiako understandings of the significant learning that is happening within learning experiences and highlight the strengths, interests, abilities, learning dispositions and working theories of the tamariki that are evident therein. Given their centrality to ECE curriculum in Aotearoa New Zealand, it is unsurprising to discover that learning stories were utilised across all three sites (as is typical for Aotearoa New Zealand ECE practice) to portray aspects of learning with water too. Given their status and orientation in ECE curriculum these stories provide important clues as to the learning that is valued in each context, revealing the priorities that are given to water by kaiako (who write these stories) in each ECE site. Our analysis of these during fieldwork – in past records at our disposal – show that water is indeed ‘pervasive’ in kaiako depictions of learning in curriculum. Throughout these narratives kaiako were persistent in their belief that water provided sensory, cognitive and metaphysical meanings as a result of its whakapapa layering in the lives of tamariki.

It is beyond the scope of this report to share the fullest expression of these narratives. However, the following examples across sites are representative of many stories that were shared with whānau in tamariki portfolios - as a primary source of evidence for learning. Seen in light of what we observed in practice, they reinforce our claim that water was not simply a material engagement or a source of sustenance, but also a point of connection, a form of identity and a opportunity learn about people, places and things surrounding and embedded within the waterways around each ECE site.

The first of these, from Wāhi Tuatahi situates tamariki walks to the beach as a means of connected to whakapapa through the sea. Through the personification of Tangaroa (the Atua of the sea) we learn about tamariki explorations of tidal flows, aspects of safety, fishing and whakapapa. We see a very deliberate positioning of tamariki as i) capable and confident learners in their own right (and as peers who are able to puzzle over meanings) and ii) connected to all things through the water and its connections to their lives. The pedagogical role of kaiako is articulated here as scaffold and guide, in keeping with the sociocultural orientation of *Kei Tua o te Pae* (MoE, 2009) itself.

He Aromatawai – Assessment: Learning Story



According to Māori creation traditions the god of the sea and progenitor of fish is Tangaroa, the son of Ranginui (the sky father) and Papatūānuku (the earth mother). Tangaroa's son Punga was the father of Ikatere and Tūtewhiwhi. Ikatere went to the sea, where he and his children became fish. Tūtewhiwhi journeyed inland, and he and his offspring became reptiles.

In these traditions Tūmataunga, the god of war, fought with Tangaroa. Their enmity explains why humans, the descendants of Tūmataunga, go fishing: they are continuing the war against Tangaroa's progeny, the fish.

Te Ika-a-Māui - Māui's fish

Fishing features in many Māori traditions. Perhaps the most well-known story is that of the demigod Māui, who hooked the North Island of New Zealand with the jawbone of his grandmother, Murirangahenua.

We have connections to the sea that go back to our ancestors and today these connections still pull our tamariki to the moana. Just look at this group flirting with Tangaroa. Tempting him to tickle their toes, wet their clothes and grab at their feet! We empower our tamariki with an understanding of the dangers of Tangaroa but also with the ability to make supported choices about safety. Before we went to the water edge I asked tamariki to share with me what they knew about Tangaroa.

Pōkeka suggested he could 'suck us in and wash us away!' "Yea he is powerful," said *Pōkeka*. "And don't turn your back on him," said *Pōkeka*. "He might get you all wet," *Pōkeka* informed us. "And you can't go in there, just on the edge" said *Pōkeka*.

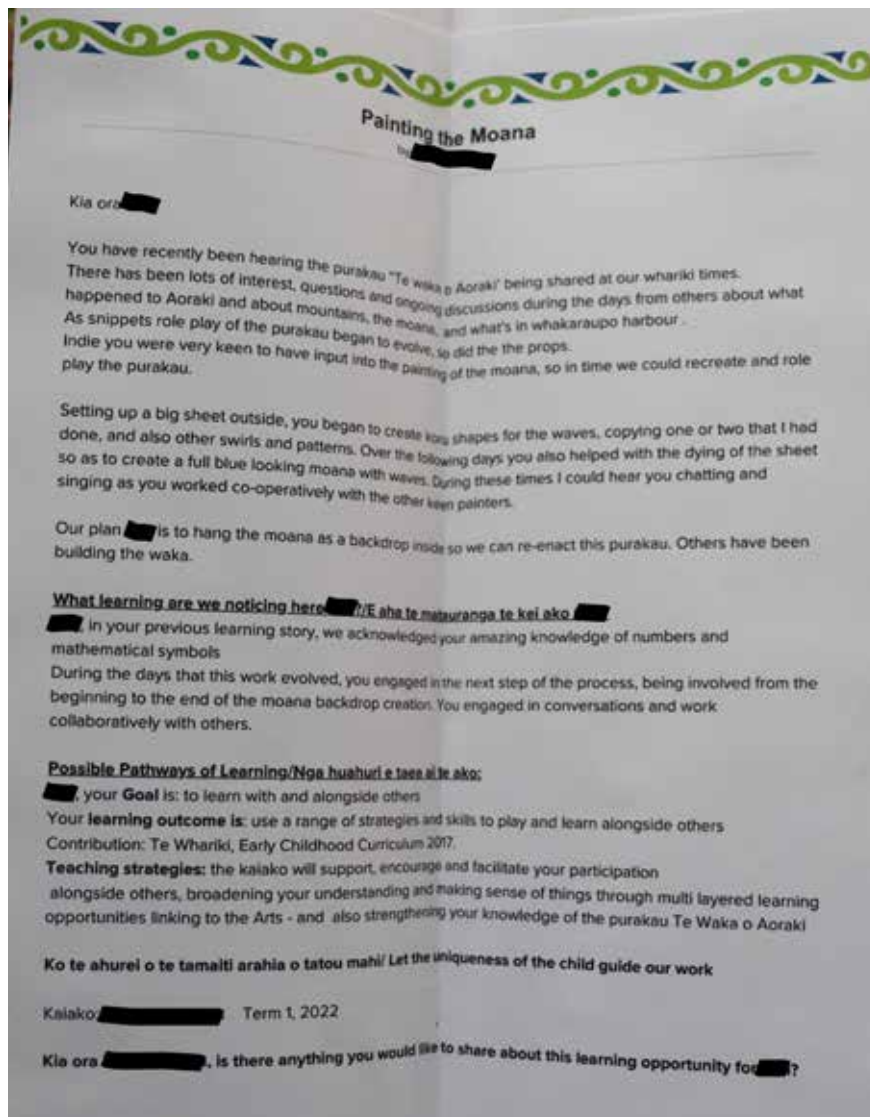
Sometimes as adults we struggle to let tamariki make decisions but by empowering them with knowledge and supporting them to develop thoughtfulness, analytical thinking, risk analysis and decisiveness we are scaffolding skills for decision making. In life, these decision will only get bigger and more important. We recognise that our tamariki are competent and confident learners who will learn by doing, by experiencing and by being connected. As Kaiako we are available to scaffold and guide.

7 *Kei Tua o te Pae* booklet three provides three key kaupapa Māori principles: whanaungatanga: relationships with people, with environments and with resources; manaakitanga: providing mana enhancing teaching and learning engagements and kotahitanga: kaiako and tamariki work collaboratively together and kaiako know when to engage and support tamariki and when to allow tamariki to explore independently.

8 *Te Whatu Pōkeka* framework asserts three key factors: Ngā Hononga ki te Tauparapara which links to the whakapapa of each tamaiti from the beginning of time. *Te Ahuatanga o te Tamaiti* focuses on what each tamaiti bring to the ECE context with them and *Tikanga Whakaako* explores the ways the ECE programme can support each and every tamaiti within their contexts.

At Wāhi Tuarua several learning stories focused on learning that was evident around the pūrākau of Aoraki, a dramatic retelling that was the focus of much learning amongst the centre. The re-enactment involved tamariki singing waiata, creating props and stage sets, and learning to tell the pūrākau of Aoraki. Within a learning story from one tamaiti, we learn how the centre's Aoraki theme allowed her to explore and develop in multiple areas. This tamaiti helped to paint the moana backdrop for the pūrākau re-enactment, and while doing so developed her local knowledge, worked collaboratively, and held conversations with others while helping with the production of the ocean backdrop for the re-enactment. Many of these artefacts remain in the centre and were used throughout the study by tamariki to tell the researchers about their wai knowledge and experiences.

A whakapapa story is provided by the iwi kaitiaki Te Rūnanga o Arowhenua exploring this pūrākau of Aoraki: *Aoraki - Ancestral Mountain – Te Rūnanga o Arowhenua – Arowhenua Marae*



At Wāhi Tuatoru kaiako made special mention of a tamaiti who has a particular interest in water and recommended that we could look at his portfolio. His portfolio included many explicit and intentional connections to the river. Other connections to the river across stories were more subtle and perhaps more powerful as a consequence. For instance, one learning story discusses the courage of a tama as he gains independence in the centre by connecting this courage back to the wai in the following whakataukī:

Kia maia te āwhā tū maiangitia he ua – brave the storm and dance in the rain.

Whakataukī (proverbs) are used as a reference point in speeches and also as spoken or written guidelines to others day by day. It is a poetic form of the Māori language often merging historical events, or holistic perspectives (Williams, 2012) with underlying messages which are extremely influential to kaupapa Māori assessment practices. Kaiako need to recognise the diversity and the multifaceted nature of contemporary Māori ways of knowing and being. "In effect Kaupapa Māori assessment fore-fronts Māori perspectives of knowledge, knowing and knowers which are fundamentally different to non-Māori" (Rameka, 2012, p.327). It is clear that kaiako are working purposefully to acknowledge these differences through their inclusion in assessment.

Taken together, these assessment records reinforce our observations across curriculum modes of representation, portrayals of tamariki and pedagogies enacted. They suggest certain orientations of water that far exceed its material properties or purposes towards important life-giving principles and priorities concerning whakapapa and identity. The following section synthesises these and sets in place a plan for the wider project going forward.

5. Ngā Kōrero Whakakapi – Concluding messages and implications for the wider project

Throughout this report we have provided many themes and examples of water in and around curriculum – as represented in the ECE site curriculum contexts, in tamariki representations and through kaiako pedagogies (and assessments). Across each and all of these it is clear that water plays a significant role in the learning experiences of these tamariki, and that kaiako are pedagogically attentive to the myriad of possibilities for expanding learning.

Returning to our original research questions we can now respond as follows:

1. That tamariki do indeed represent water in and through their ECE experiences. They do so in multiple ways and for multiple purposes – these include joyful engagement, playful exploration and discovery, connection with waterways and their memories, and in response to the flows of water across time and space. The sustained levels of engagement witnessed here – and the variety of responses to the wai as each tamaiti negotiated various aspects of their properties and movements – all at their own pace and in their own ways.
2. That tamariki are constantly engaging with water in play, for sustenance and hygiene purposes and as kaitiaki who protect and care for the wai. At times we saw tensions in this regard, as tikanga (or rules) of encounter with water were established, and sometimes dis-established by tamariki. Kaiako navigate these in a variety of ways through their pedagogies.
3. That tamariki think and talk about water a great deal. Their puzzles are discernible through play and engagement more than as a result of interrogation. As Mika and White (2019, p 67) suggest “The drive to ... ‘teach’ young tamariki is governed by this unification with mystery which itself never quite disappears and limits our ability to see the tamaiti of *Te Whāriki* in more abstract, metaphysical, ways. This in spite of his or her presence in and beyond”. Indeed, our findings suggest that when tamariki are left to engage with water without prescribed outcomes, and kaiako are prepared to respond to their priorities concerning their engagements with learning as a consequence, the greatest insights appear to be found.
4. We saw evidence of the fact that tamariki are worried about the effects of the climate on water and see that they have a kaitiaki role to play. Moreover, they have developed sophisticated strategies and working theories to fulfil their desires to be ‘in’ water while also understanding its broader role in the environment. In this regard we identify further tensions concerning the extent to which water can be utilised as a plaything, as opposed to a living entity. The depiction of water through waiata, karakia and pūrākau ameliorates this issue, to some extent, as tamariki can personify wai beyond its materiality – as Atua who hold special status accordingly. Water is actively presented in ECE curriculum and pedagogy. Kaiako use diverse pedagogical strategies to support tamariki to recall, reflect, revisit and advance their understandings of water. These kaiako make full use of the waterways around them to bring a living curriculum to tamariki that is place-based and oriented to the preservation, protection and maintenance of water, while supporting learners to engage in multiple and dynamic ways. Engaging in the bicultural curriculum of *Te Whāriki* provides unique opportunities for kaiako to work with local communities, local narratives and national priorities, to ensure that water is portrayed as interconnected to whakapapa and whakapapa are the blueprint that guide and shape the present ways of being and of knowing that explain the future ways of doing. As Williams (2022) explains, these whakapapa stories of Ranginui and Papatūānuku (generic to North Island iwi) and Rakinui and his sky tamariki Aoraki and his brothers are starting points to weave local curriculum into the daily teaching and learning programmes for all tamariki. They are tightly bound to water as with all things. The holistic nature of water across all aspects of centre life and beyond is how Williams (2012) described how whanaungatanga is implemented, being relationally connected having that continuity between home and centre – the repertoire of play contexts and so on. Tamariki know a great deal based on their experiences and what and who they bring to the centre with them.
5. Aspects of water that appear to be privileged are those that invite discovery and inquiry. Kaiako work hard to ensure that tamariki have access to authentic engagements with waterways in their local communities, and that water is not merely an item for play, but a partner in sustainable futures. Responding to the additional question posed to us by Mike (see section 3) “to what extent can/do/should/could tamariki play a role in advocating for our waterways?” we identified a strong pedagogical orientation towards tamariki playing a significant role as advocates for waterways through kaitiakitanga practices. These were underpinned by the active establishment of a deep respect for water and its multiple purposes. The importance of people like Mike and Martin and their lack of expectation for young tamariki and what they might be able to learn about in terms of what is happening to the water around them – or is this a burden seen as too heavy for these young learners?
6. The centrality (nay omnipresence) of water – as wai – in the lives of tamariki. It is often more subtle than we realize as it is embedded in a great deal of intentional practice and routine (repetition of experience and storying, flows in and out of play). Kaiako work with water and all its bounty across all aspects of curriculum and reinforce its importance through whakataukī and related strategies at their disposal.
7. The profound sense of care for water and nature in general has been evident across all three sites. Kaiako, tamariki, wider whānau members and the hapori (community) play pivotal roles towards implementing sustainable practices. Williams (2022) advocates that when applying a kaupapa Māori lens towards managing our kaitiakitanga roles as kaiako the whakataukī of “kia whakatōmuri te haere whakamua | I walk backwards into the future with my eyes fixed on my past.” It is our past (ways of knowing) that guides our present (ways of doing) for the future (ways of being). For tamariki they may “express their respect for the natural world in terms of respect for Papatūānuku, Ranginui and atua Māori. Kaitiakitanga is integral to this” (MoE, 2017, p. 46). It is to these that pedagogies in Aotearoa New Zealand ECE contexts seek to align through wai.

5.1 Te Whakamātau - Methodological insights

This pilot project was informed by the walking-as-method approach to research, inspired by the Common Worlds research (see for instance Taylor & Pacini-Ketchabaw, 2018) and the immersion of the researchers in the complex ecology of the life of te hapori o te whare kōhungahunga - the early childhood centre community. As such this design begins with attention to place. The recognition of place contributed to the viscosity of rich descriptions of water in each centre community – each moment of handwashing, drinking, playing, artmaking, and so on, was vibrant with connection to each centre's sense of its relationships in place with water. Each conversation was layered upon relationships between tamariki and adult, past and present, and future.

If we were to have washed over the recognition of place, each observation would be detached, generalised, thin and disconnected – elements which we argue are symptomatic of a colonising, exploitative, capitalistic sense of water. In other words, to be aligned to the purpose of this global commitment, our commitment was to three centres, and to hāpua, moana and awa. We have tried to find ways of representing our discoveries without assuming or ascribing meanings in the absence of those voices we seek to convey – worrying that we have done justice to the complex narratives that underscore each and every observation.

Our design -walking-as-method - was critically dependent on the relationships that have been formed over many years and to which we are committed in the days to come. Immersion in the stories of each place additionally contributed to a navigation of the challenge of researcher intervention in moments of play in each community. We were quickly welcomed as researchers who sensed the depth of each community's commitments to water. As a consequence of our intense engagements in the field, we struggled to leave each site after our one week and felt the pull from tamariki and kaiako also. For this reason, and because we maintain our commitment to the kaupapa of this research, we intend to return as soon as possible to find our way forward as long-term collaborators rather than short-term visitors to these ECE sites.

5.2 Kia Haere Whakamua - Way forward

As this project is currently a pilot, we are open to the many lessons we have learnt so far. If we were to gather data in other communities around Aotearoa, we wonder what new narratives would emerge that provide an aligned sense of the contribution of place that is so evident in these first chosen communities. What waterways might we need to traverse as a consequence? For instance, in Tamaki Makaurau, the isthmus, between two Oceans, what stories are told, what relationships are formed, and in what ways are they formed? Moreover, if we were to conduct this research at the end of a dry summer season, how would the data compare and contrast? What alterations might need to be made to our methods as a consequence? These and other questions remain under answered but will form the basis of our thinking over the months that follow.

Dissemination and synthesis of pilot findings in 2023 by the Aotearoa New Zealand research team (unless otherwise noted):

- Early Childhood Australia Conference
- Artful Inquiry Research Group Symposium
- Association for Visual Pedagogies Conference
- Reconceptualising Early Childhood Education Conference
- Pedagogies of Possibilities UC Public Lecture
- New Zealand Association for Research in Education Conference

The Aotearoa New Zealand team will prepare scholarly papers/articles and a news media article (target: The Conversation) for publication, given the timeliness of this pilot in relation to the sociopolitical climate.

The international team in Norway will also prepare a synthesised report, drawing on reports from each of the four participating countries, a collaborative scholarly article, and application for funding the larger study. We will also co-present our discoveries at the World Organisation for Early Childhood Education World Forum in late 2023 (International research team).

Larger study 2024-25:

Based on the lessons learnt throughout these pilot investigations, the proposed international study, hosted by Western Norway University of Applied Sciences, will invite 66 member countries of OMEP to participate following design adjustments to the project. The Aotearoa New Zealand team will invite ECE colleagues from OMEP Aotearoa New Zealand to join them in the larger study, and across the mōtu. KINDknow research centre will work with research teams across countries to co-produce a film documentary for wide dissemination globally. Advocacy for our existing Te Wai Pounamu ECE sites will be ongoing within and between these research teams as we develop the project further in the years ahead with our colleagues in OMEP Aotearoa and internationally. All are keen to continue their involvement based on our pilot investigation and its potential to bring wai to the fore in and beyond curriculum for young learners.

6. Ngā Mihi - Acknowledgements

This project would not have been possible without the tremendous support of local communities, iwi, ECE services, kaiako, tamariki and whānau who generously allowed the researchers to ‘walk with’ them in/as wai. We acknowledge Mike for taking the time to hui with us about the state of the wai. The support of Te Kaupeka Ako, Faculty of Education and Pedagogies of Possibilities Research group cannot be understated. Thanks also to AUT for ‘loaning’ us the Andrews for a while. Printing by UC Print and design by UC Design



7. Ngā Rārangi Pukapuka

Key references

- Andersen, J. C. (1942). *Māori place-names: Also personal names and names of colours, weapons, and natural objects*. Polynesian Society of New Zealand.
- Beattie, H. (2009). *Traditional lifeways of the Southern Māori: The Otago University museum ethnological project, 1920*. (A. Anderson, Ed.) Otago University Press (with Otago Museum).
- Davis, J. (2014). Examining early childhood education through the lens of education for sustainability: Revisioning rights. In J. Davis & S. Elliott (Eds.), *Research in early childhood education for sustainability. International perspectives and provocations*. Routledge.
- Early Childhood Outdoor Learning Network. (2022, December 20). *Home page*. <https://early-childhoodoutdoorlearning.weebly.com/>
- Grogan, L., & Hughes, F. (2020). Pedagogies for ECEFS in bush kinder contexts. In S. Elliott, E. Årlemalm-Hagsér & J. Davis (Eds.), *Researching early childhood education for sustainability: Challenging assumptions and orthodoxies* (pp. 138-149). Routledge.
- Hamm, C. (2015). Walking with place: Storying reconciliation pedagogies in early childhood education. *Canadian Children*, 40(2), 57-67.
- Hindmarch, T. & Boyd, D. (2021). *A path made in the walking: Forest School in Norway and in England* (Eds.). SchemaPlay Publications. <http://www.omep.org.uk/wp-content/uploads/2021/08/A5-Forest-School.pdf>
- Hughes, F. (2019). Researching pedagogies for sustainability in Australian bush kinder: A reflective analysis on a framework and methodologies. *New Zealand International Research in Early Childhood Education*, 22(1), 1-14. <https://doi.org/10.3316/informit.608838040678271>
- Hughes, F., Elliott, S., Anderson, K. & Chancellor, B. (2021). *Early years learning in Australian natural environments*. Oxford University Press.
- Taiaroa, H.K.. (n.d.). [English translation of two original notebooks in te reo Māori of place names related to mahinga kai compiled by H.K. Taiaroa in 1880 from information provided by Ngai Tahu informants]. Ngāi Tahu Archive. (Collection 140. Item D301, Box 102, D. Wai-27-Doc-R30-Book "Ngai Tahu 1880."). Macmillan Brown Library Archives Collection. P208:34.
- Kelly, J., & White, E. J. (2012). Pedagogy beyond the gate : The Ngahere project. *Early Childhood Folio*, 16(2), 5-11. <https://doi.org/10.18296/ecf.0136>
- Kelly, J., & White, J. (2013). *The Ngahere project: Teaching and learning possibilities in nature settings*. Wilf Malcolm Institute of Educational Research.
- Kids in Nature Network (2018). *State of nature play report*. <https://www.kidsinnaturenetwork.org.au/state-of-nature-play-report>
- Mackey, G. (2012). To know, to decide, to act: The young child's right to participate in action for the environment. *Environmental Education Research*, 18(4), 473-484.
- Ministry of Education—Te Tāhuhu o te Mātauranga. (2004). *Kei tua o te pae: Assessment for learning: Early childhood exemplars*.
- Ministry of Education—Te Tāhuhu o te Mātauranga. (2009). *Te whatu pōkeka: Kaupapa Māori assessment for learning: Early childhood exemplars*.
- Ministry of Education—Te Tāhuhu o te Mātauranga. (2017). *Te whāriki: He whāriki mātauranga mō ngā mokopuna o Aotearoa: Early childhood curriculum*.
- Mika, C. (2019). When 'water' meets its limits: A Māori speculation on the term wai. *Dutkarsearvi Dieđalaš Aigečála*, 3(2), 20-32. <http://dutkarsearvi.fi/wp-content/uploads/2020/02/Dutkarsearvi-Vol3Issue2-Carl-Mika.pdf>
- Mika, C. & White, E.J. (2019). Ngā mokopuna kei te hāereere: Becoming in Aotearoa Curriculum – The First 1000 Days. In M, Gradovski, E. E. Ødegaard, N. Rutanen, J. Sumsion, C. Mika, & E. J. White (Eds.). *The First 1000 Days of Early Childhood. Policy and Pedagogy with Under-three Year Olds: Cross-disciplinary Insights and Innovations*. (pp. 55-72). Springer. https://doi.org/10.1007/978-981-32-9656-5_4
- Nelson, N., Yazbeck, S., Hodgins, B.D., GoForth, A., & Simpson, A. (2022). Learning to land: cultivating a sense of 'the commons' with early childhood urban park and cosmos relations on Chekonein family territory. *Reconceptualizing Early childhood Education Conference*, Vancouver, 23-26 June. <https://receinternational.org/wp-content/uploads/2022/06/rece-2022-conference-program-presentation-abstracts-june-21.pdf>
- Network Waitangi Ōtautahi (2018). *Treaty of Waitangi questions and answers*. <https://nwo.org.nz/wp-content/uploads/2018/06/QandA.pdf>
- New South Wales Early Years Nature Connections (2020 December 20). *Home page*. <https://www.nsweync.org>
- Pacini-Ketchabaw, V. (2012). Acting with the clock: Clocking practices in early childhood. *Contemporary Issues in Early childhood*, 13(2), 154-160.
- Rāmeke, L. K. (2012). *Te Whatu kākahu: assessment in kaupapa Māori early childhood practice*. [Unpublished doctoral thesis]. University of Waikato.
- Ritchie, J., Duhn, I., Rau, C., Craw, J. (2010). *Titiro whakamuri, hoki whakamua: We are the future, the present and the past : Caring for self, others and the environment in early years' teaching and learning : A summary*. Teaching & Learning Research Initiative Nāu i Whatu Te Kākahu, He Tāniko Taku.
- Taylor, A., & Pacini-Ketchabaw, V. (2018). *The common worlds of children and animals: Relational ethics for entangled lives*. Routledge.
- Truscott, J. (2014). An exploration of nature-based play at Australian pre-schools. MEd Thesis, Southern Cross University, Lismore, NSW.
- Truscott, K. (2020). Toward a pedagogy for nature-based play in early childhood educational settings. In A. Cutter-Mackenzie-Knowles, K. Malone & E. Barratt-Hacking (Eds.), *Research handbook on childhood nature: Assemblages of childhood and nature research* (pp. 1522- 1545). Springer.
- White, E. J. (Ed.). (2020). *Seeing the world through children's eyes: Visual methodologies and approaches to research in the early years*. Brill|Sense. <https://doi.org/10.1163/9789004433328>
- White, E. J. (2022). Utterance chains: A dialogic route to speculative thinking-with toddlers in the Chthulucene. *Global Studies of Childhood*, 12(3), 249–262. <https://doi.org/10.1177/20436106221117573>
- Williams, M. N. (2022). *Ki te hoe: Journeying toward indigenising the early childhood curriculum in Aotearoa New Zealand*. [Unpublished doctoral thesis]. University of Canterbury.
- Williams, M.N. & Te Rongopatahi, K.M. (2023 in press) *He Maramataka Māori - A lunar time cycle*. Ako Aotearoa.
- Williams, M.N. (with Broadley, M.E.). (2012). *Resource kit for student teachers*. Ako Aotearoa. <https://ako.ac.nz/assets/Knowledge-centre/NPF-09-009-Bicultural-competence-in-ECE/Tool-Resource-kit-for-student-teachers.pdf>
- Williams-Sieghfredson, J. (2011). *Understanding the Danish forest school approach: Early years education in practice* (2nd ed.). Routledge
- Wintoneak, V., & Jobb, C. (2022). Walking laboratories: experimentations with climate and waste pedagogies. *Children's Geographies*, 1-15. <https://doi.org/10.1080/14733285.2022.2071599>
- UNESCO. (n.d.). *Sustainable development goals*. <https://en.unesco.org/themes/education/sdgs/material>

7.1 Key Uniform Resource Locators (URLs)

Christchurch City Council. (n.d.). Whaka-ora healthy harbour plan. <https://ccc.govt.nz/the-council/plans-strategies-policies-and-bylaws/plans/whaka-ora>

Gallagher, K. (Co-Director), & Goodwin, K. (Co-Director). (2021) *Rohe Kōreporepo: The swamp, the sacred place*. [Film trailer]. NZOnScreen Iwi Whitiāhua. <https://www.nzonscreen.com/title/rohe-koreporepo-swamp-sacred-place-2021>

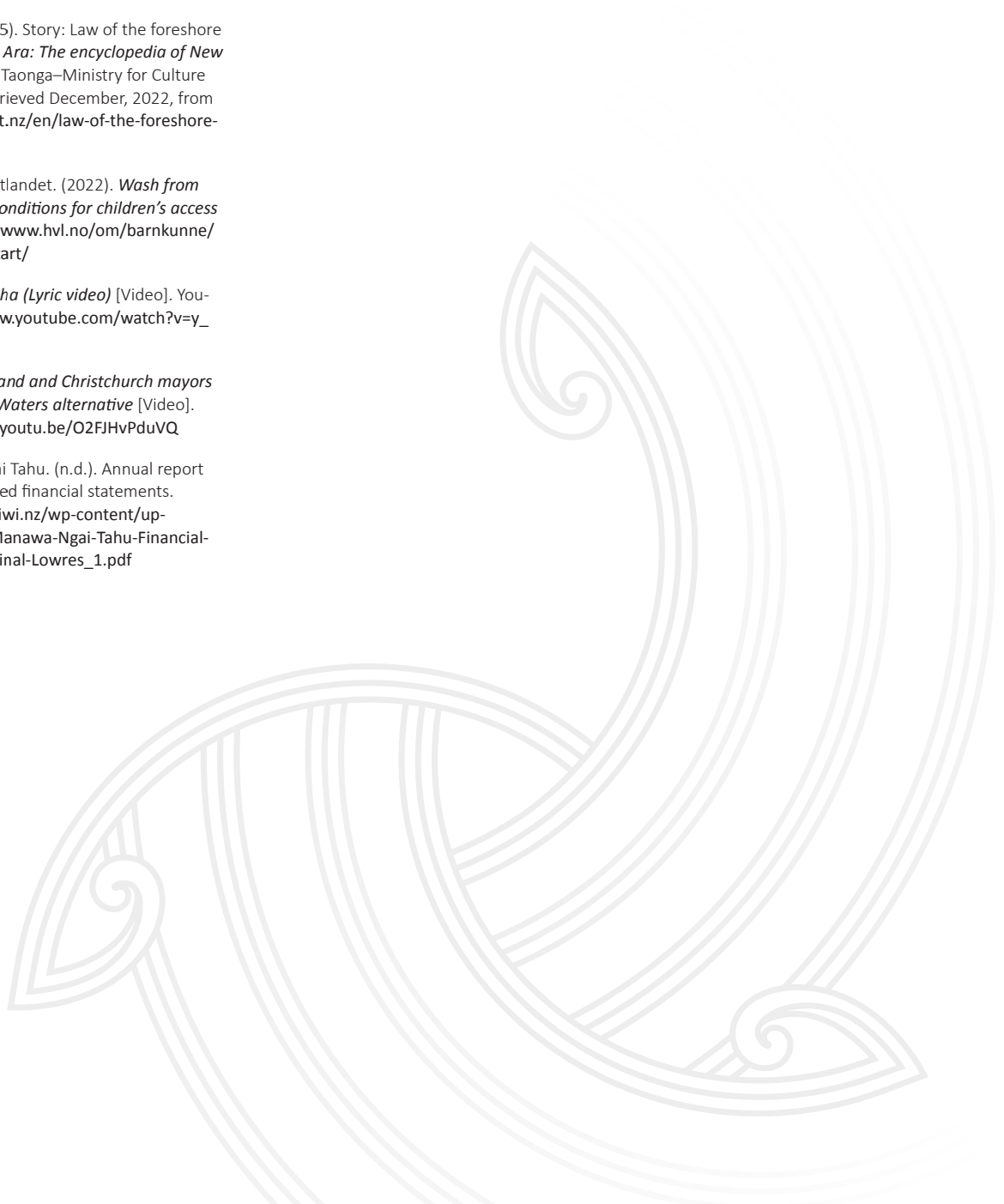
Hickford, M. (2015). Story: Law of the foreshore and seabed. In *Te Ara: The encyclopedia of New Zealand*. Manatū Taonga–Ministry for Culture and Heritage. Retrieved December, 2022, from <https://teara.govt.nz/en/law-of-the-foreshore-and-seabed>

Høgskulen på Vestlandet. (2022). *Wash from the start - Local conditions for children's access to water*. <https://www.hvl.no/om/barnkunne/wash-from-the-start/>

SIX60. (n.d). *Pepeha (Lyric video)* [Video]. YouTube. https://www.youtube.com/watch?v=y_CJFEKNvX8

Stuff. (n.d.) *Auckland and Christchurch mayors front over Three Waters alternative* [Video]. YouTube. <https://youtu.be/O2FJHvPduVQ>

Te Runanga o Ngāi Tahu. (n.d.). Annual report 2017 – Summarised financial statements. https://ngaitahu.iwi.nz/wp-content/uploads/2017/11/Manawa-Ngai-Tahu-Financial-Summary-2017-Final-Lowres_1.pdf



8. Papakupu – Glossary

Aotearoa	The land of the long white cloud, name by Hine te aparangi who was the wife of Kupe the well renown Māori explorer who discovered this land. This was name given to the North Island, but the narrative today suggests that Aotearoa is the Māori name for New Zealand.	manaakitanga	To care, to host, highest acts of hospitality.
Aoraki	Aoraki Mount Cook – with a height of 3,754 metres is in Aotearoa New Zealand's highest mountain..	Māori	The name given for the indigenous peoples of Aotearoa New Zealand
aparangi	evil spirit	matariki	Māori new year, cluster of 9x stars .
arawai	waterway	mirimiri	To rub together
awa	river	Moeraki	Small fishing village on the East Coast of Te Wai Pounamu.
atua	God, guardian	ngā	When this word is used it plurals the following word e.g.: awa by itself means river however ngā awa now means rivers.
harakeke	flax	ngā arawai	Waterways
hāpua	lagoon	Ngāi Tahu	Main iwi of the southern South Island area.
he	A particle determiner which can be used as: a – singular, an or some – plural. e.g. He awa – a lake or lakes.	Opihi	A natural and cultural river that has whakapapa associations to Te Rūnanga o Arowhenua people of Te Muka.
Hekeao	Māori name for the Hinds River just South of Hakatere/Ashburton in mid caterbury.	Opuha	Is a river and a tributary of the Opihi River in South Canterbury.
He wāhi tino pai	A very good place	Ōtautahi	Christchurch
hōhā	Bored, annoyed, tiresome exasperating	panako	Shore spleenwort
horoi ringaringa	Wash hands	Papatūānuku	Mother Earth.
īnanga/īnaka	whitebait - īnaka uses the Ngāi Tahu dialect which substitutes the northern iwi ng for a k.	para	rubbish
iwi	The main tribe Māori belong to.	Paraki	Smelt (fish)
Kaiako	Teacher	Pareora	Small rural town 10 kilometres south of Timaru
Kaiako Matua	Head Teacher	pari	cliffs
Kaikōkura	Small seaside town on East Coast of Te Wai Pounamu.	paru	Dirt or dirty.
kaitiaki	Being a guardian, a protector, a custodian, a caretaker for a specific action. e.g.: Guardainship and protection: a way of managing the environment based on Māori worldviews	pāua	abalone
Kaitiakitanga	The suffix of tanga turns the key word kaitiaki (verb) to a noun:	pā tuna	eel weirs
karakia	incantations, prayers, invocations, chant.	pā mahinga kai	temporary camp sites
kaupapa	purpose, agenda, topic.	pipiki	A fish similar to the smelt.
kereru	Aotearoa New Zealand Native Wood Pigeon	poupou	posts
kete	Woven basket or kit	pūrākau	Ancestral stories
kiwi	Aotearoa New Zealand Native Bird	Rāhui	A prohibition put on a particular area or activity, these are placed temporarily usually to protect a resource or a mishap has happened and the area is not safe to engage in or with.
ko wai āu karu?	Who's eyes are these?	Ranginui or Rakinui	Sky Father. Rakinui uses the Ngāi Tahu dialect which substitutes the northern iwi ng for a k.
kōrero	To talk, speak, have a discussion	rima	five
kōtiro	girl	repo	swamp
Mātauranga Māori	Māori knowledges, philosophies, ways of knowing,being and doing.	roimata a Ranginui	Tear drops of Ranginui the Sky Father.
mahinga kai	Literally means 'to work the food' and relates to the traditional value of food resources and their ecosystems, as well as the practices involved in producing, procuring, and protecting these resources.	roto	lake
mahika kai		Rua	two
		Ruaumoko	Atua o ngā rū whenua – the guardian of earthquakes and volcanoes said to be the unborn child of Ranginui and Papatūānuku.
		pūrākau	Referred to as stories but pūrākau are a form of transmitting ideas and creating shared understandings.

tahi	one	tīpuna/tūpuna	ancestors – dialectal difference some iwi use i and some the u.
Takiwā	Specific region or area.	toru	three
takutai moana	coastline	tuna	eel
tama	tama	Waewae Kai Kapua	Name provided to a curriculum activity at Wāhi Tuatahi literally meaning when going out on excursions is to walk with their heads in the clouds.
tamaiti	tamaiti	wai	water
tamariki	tamariki	waiata	Song or to sing or it is made up of two words: wai is water and ata is reflection .
taniwha	Water spirit	Wai koero	melting snow
tao	A spear	Waimate	A rural town 45 kilometres south-west of Timaru, the full name of this town is Te Waimatamate meaning the stagnant waters.
taonga	gift, treasure.	waipuke	flooding
Tangaroa or Takaroa	God of the sea, Ngāi Tahu variation substitute ng for a k thus Takaroa.	Waitā	Name of one of the stars within the Matariki cluster, it is connected to all food harvested from the sea.
tangata whenua	Original inhabitants of Aotearoa New Zealand – or a specific part of Aotearoa New Zealand e.g.: Ngāi Tahu are the iwi of 80% of the South Island or Te Wai Pounamu, whereas the other 20% area is under the eight iwi who reside at the top of the South Island or Te Tau Ihu o te Waka or the Prow of Aoraki’s canoe. The eight iwi at the top of the South Island are: Ngāti Toa Rangatira, Ngāti Rarua, Rangitāne, Ngāti Apa, Ngāti Tama, Te Atiawa, Ngāi Koata and Ngāti Kuia.	Waitaha	A shorten version of Ngā Pākihi Whakatekateka o Waitaha known as the seedbed of Waitaha which stretches from Christchurch to Timaru in the South.
taniwha	Water spirit	Waitī	Name of one of the stars within the Matariki cluster , it is connected to fresh water and the creatures that live in rivers, streams and lakes.
Tawhirimātea	Te Atua o ngā hau – Guardian of the winds, the blind guardina who gave his eyes to adorn his father at night.	waka	canoe
te	the	whā	four
Te Aitarakīhi	The land just south of where the 90 mile beach ends at Waitarakao or Washdyke Lagoon.	whaea	Mother, Aunty, or is used to acknowledge female teachers
Te Ana a Wai		whakapapa	Lineage, genealogical descent, family tree.
Te ao mārama	Phase of the beginning of time: The daily cycle of light.	whakataukī	Proverbs that are reflective of Māori cultural contexts and time.
Te Kore	Phase of the beginning of time: The void or nothingness cycle of time.	whānau	The extended family consisting of four to five living generations.
Te Moana-nui-a-Kiwa	The great sea of Kiwa = The Pacific Ocean	whanaungatanga	Relationally connected to people places and objects.
Te Pātaka-a-Rākaihautū	Banks Peninsula	Whangaraupō	Lyttelton Harbour
Te Pō	Phase of the beginning of time: The darkness or night cycle.	whenua	land
Te Tihi o Maru	Timaru city 180 kilometres south of Christchurch.	whetū	star
Te Tiriti o Waitangi	The Treaty of Waitangi is Aotearoa New Zealand’s founding consitutional arrangement made between tangata Māori and tangata Pākehā. Pākehā denotes a ‘white person’ opposed to being a Māori person.		
Te Wai Pounamu	The greenstone waters – a Māori name for the South Island of Aotearoa New Zealand.		
Te Whāriki	Translates to the mat however this is the early tamaitihood curriculum document that has and extended name Te Whāriki. He Whāriki Mātauranga mō ngā Mokopuna o Aotearoa. Early tamaitihood curriculum. Colloquial referred as Te Whāriki.		

9. He Āpitianga - Appendices

Appendix A: Information sheet for Kaiako in ECE centres

APPENDIX A: Information sheet for Kaiako in ECE centres

Faculty of Education

Email: jayne.white@canterbury.ac.nz

1 August 2022

HREC Ref: [Provided by HREC when study approved]

Information Sheet for families/whanau of participating children/tamariki

“He wairere – Wash from the start: Local conditions for children’s access to water: A pilot study”

Kia ora

You are invited to give consent for your ECE setting to participate in a research study that sets out to explore children’s perspectives, experiences and representations of water. This study is being conducted by Professor E. Jayne White, Ngaroma Williams, Kaitlyn Martin and Glynne Mackey from the University of Canterbury Te Whare Wānanga o Waitaha and Professor Andrew Gibbons and Dr Andrew Denton from Auckland University of Technology. The study is part of an international pilot project being completed by Western Norway University of Applied Sciences and OMEP (an international child advocacy group with affiliations to UNESCO).

What is the purpose of this research?

This research aims to explore children’s understandings of local water supplies, their experiences of sensing the water that is available for them and what this means for them. We are particularly interested in finding out how water appears in children’s practices of representation as part of their engagement with localised curriculum. The information from this pilot study will add to the international data generated across other kindergartens around the world. It will help to inform a larger international study proposed for 2023 which sets out to contribute to a much greater understanding of children’s responses to serious issues facing our planet, specifically with regard to water.

Why have you received this invitation?

You are invited to give consent for your ECE setting to participate in this research because it is located near to waterways and we understand you share an interest in the topic of water. Your participation in this project is voluntary (your choice). If you decide that you do not wish your ECE setting to participate, there are no consequences. Your decision will not affect your relationship with your employer, any member of the research team, or the University of Canterbury.

What is involved in participating?

Your involvement will require attendance at a one hour briefing session with some of the researchers when they will explain the project and ask you to provide a repository for family/whanau consent forms in the weeks prior to the study commencing. Researchers will ask you questions about the context, and seek your support in informing families about the project to enable them to make informed choices about their children’s involvement. Please note that not all of the researchers will attend your setting throughout the week – we will be working in teams across three different ECE sites over this time.

These researchers will then spend one week in your ECE setting when they will be observing, interacting and collecting representations of water that are provided or on display in the setting. Researchers will also explore documentation to look for further representations of children’s engagement with water and talk with children about their perspectives. We will take photos of water landscapes or scenes in or surrounding the ECE setting and gather information about how water features in the curriculum. These will not include identifiable people but the content of these may make it possible for others to identify the location of the setting geographically. Throughout this week we will be guided by centre protocols and practices, and may ask you questions accordingly. All researchers are authorised to visit ECE sites, and give assurances that they will be as unobtrusive as possible during their visit.

Are there any potential benefits from taking part in this research?

The information gathered will contribute to further understandings of children’s perspectives and representations of water – with potential to influence curriculum and policy concerning the impacts of water on their learning and experience.

Are there any potential risks involved in this research?

There are no risks to you or your ECE setting. All data will be de-identified although it may be possible that your ECE setting can be identified due to its geographical location and specific features that are represented. In such cases researchers will discuss these with you and you can choose to withdraw such data from the project.

What if you change your mind during or after the study?

You are free to withdraw your ECE setting from the project at any time up until the pilot study is published in October this year. You can do so by contacting researchers to ask for all contributions from your site to be removed from the data set.

What will happen to the information you provide?

All data will be confidential. All data will be stored on the University of Canterbury’s computer network in password-protected files. All data will be destroyed ten years after completion of the study/publication of study findings.

Will the results of the study be published?

Results will be published in peer-reviewed, academic journals and reports. Results will also be presented during conferences or seminars to wider professional and academic communities. Your child will not be identifiable in any publication.

We will send a summary of the research to you at the end of the study, if you request this.

Who can I contact if I have any questions or concerns?

If you have any questions about the research, please contact: Professor Jayne White (jayne.white@canterbury.ac.nz) or Ngaroma Williams (ngaroma.williams@canterbury.ac.nz)

This study has been reviewed and approved by the University of Canterbury Human Research Ethics Committee (HREC). If you have concerns or complaints about this research, please contact the Chair of the HREC at human-ethics@canterbury.ac.nz .

What happens next?

Please complete the following consent statement and email it to us directly. If you choose to participate in the study we will work with you to find a suitable time for to visit for a one hour briefing by some of the researchers.

We thank you for your consideration.

Ngā mihi nui, many thanks

Professor E. Jayne White
Ngaroma Williams
Kaitlyn Martin
Glynne Mackey
Andrew Gibbons
Andrew Denton

Statement of consent

I have read the study information and understand what is involved in participating in this trial. In particular, I understand that:

- I understand that the information from this pilot research will contribute to an international study.
- I understand that I do not have to give consent for my ECE setting to participate and that there are no implications for me or ECE setting if I choose not to.
- I understand that, by giving consent, I am allowing researchers to spend one week in the ECE setting when they will observe, speak with tamariki about their perspectives, and collate information about their understandings and representations of water (e.g. art work etc), and in curriculum.
- I understand that all data collected will be de-anonymised by the researchers before it is analysed or shared in any public forum.
- I understand that photographs taken by the researchers of the surrounding environment and/or the nature of content represented may identify the ECE setting.
- I understand that I can withdraw the ECE setting from the study at any time up until analysis has begun.
- I understand that I can receive a summary of the results by emailing any of the researchers.
- I understand that the data will be kept on a password protected computer at UC for 10 years after the study.
- I understand that the results of the study will be reported in academic scholarly journals, reports and conferences.

Name of ECE service

Name of Kaiako (on behalf of the ECE setting)

Signature

Date

Appendix B: Information sheet for families /whānau of children

APPENDIX B: Information sheet for Families/Whānau of Children

Faculty of Education

Email: jayne.white@canterbury.ac.nz

1 August 2022

HREC Ref: [Provided by HREC when study approved]

Information Sheet for families/whānau of participating children/tamariki

“He wairere – Wash from the start: Local conditions for children’s access to water: A pilot study”

Kia ora

You are invited to give consent for your child/tamaiti to participate in a research study that sets out to explore children’s perspectives, experiences and representations of water. This study is being conducted by Professor E. Jayne White, Ngaroma Williams, Kaitlyn Martin and Glynne Mackey from the University of Canterbury – Te Whare Wānanga o Waitaha and Professor Andrew Gibbons and Dr Andrew Denton from Auckland University of Technology. The study is part of an international pilot project being completed by Western Norway University of Applied Sciences and OMEP (an international child advocacy group with affiliations to UNESCO).

What is the purpose of this research?

This research aims to explore children’s understandings of local water supplies, their experiences of sensing the water that is available for them and what this means for them. We are particularly interested in finding out how water appears in children’s practices of representation as part of their engagement with localised curriculum. The information from this pilot study will add to the international data generated across other kindergartens around the world. It will help to inform a larger international study proposed for 2023 which sets out to contribute to a much greater understanding of children’s responses to serious issues facing our planet, specifically with regard to water.

Why have you received this invitation?

You are invited to give consent for your child to participate in this research because they attend one of the ECE services that have consented to be part of the study. Your child’s participation is voluntary (your choice). If you decide that you do not wish your child to participate, there are no consequences. Your decision will not affect your relationship with the ECE service, any member of the research team, or the University of Canterbury.

What is involved in participating?

Your child’s involvement will require no additional time on your or their part. Researchers will spend up to one week in the kindergarten observing, interacting and collecting representations of water that are provided or on display in the setting. Researchers will also explore documentation to look for further representations of children’s engagement with water and talk with children about their perspectives. We will take photos of water landscapes or scenes in or surrounding the ECE setting. These will not include identifiable people but the content of these may make it possible for others to identify the location of the setting geographically.

Are there any potential benefits from taking part in this research?

We do not expect any direct benefits to you personally. However, the information gathered will contribute to further understandings of children’s perspectives and representations of water – with potential to influence curriculum and policy concerning the impacts of water on their learning and experience.

Are there any potential risks involved in this research?

There are no risks to you or your child.

What if you change your mind during or after the study?

You or your child are free to withdraw at any time up until the pilot study is published in October this year. You can do so by contacting researchers to ask for their contributions to be removed from the data set.

What will happen to the information you provide?

All data will be confidential. All data will be stored on the University of Canterbury’s computer network in password-protected files. All data will be destroyed ten years after completion of the study/publication of study findings.

Will the results of the study be published?

Results will be published in peer-reviewed, academic journals and reports. Results will also be presented during conferences or seminars to wider professional and academic communities. Your child will not be identifiable in any publication.

We will send a summary of the research to you at the end of the study, if you request this. If you provide an email address for this purpose, it will not be linked with your survey responses.

Who can I contact if I have any questions or concerns?

If you have any questions about the research, please contact: Professor Jayne White (jayne.white@canterbury.ac.nz) or Ngaroma Williams (ngaroma.williams@canterbury.ac.nz)

This study has been reviewed and approved by the University of Canterbury Human Research Ethics Committee (HREC). If you have concerns or complaints about this research, please contact the Chair of the HREC at human-ethics@canterbury.ac.nz .

What happens next?

Please complete the following consent statement and then place it in the box provided - by the enrolment forms - at your ECE service, by 30 August 2022.

We thank you for your consideration.

Ngā mihi nui, many thanks

Professor E. Jayne White
Ngaroma Williams
Kaitlyn Martin
Glynne Mackey
Andrew Gibbons
Andrew Denton

Statement of consent

I have read the study information and understand what is involved in participating in this trial. In particular, I understand that:

- I understand that the information from this pilot research will contribute to an international study
- I understand that I do not have to give consent for my child to participate and that there are no implications for me or my child if I choose not to
- I understand that, by giving consent, I am allowing researchers to observe my child, speak with them about their perspectives, and collate information about their understandings and representations of water (e.g. art work etc).
- I understand that all data collected will be de-anonymised by the researchers before it is analysed or shared in any public forum
- I understand that photographs taken by the researchers of the surrounding environment and/or the nature of content represented may identify the kindergarten.
- I understand that I can withdraw my child from the study at any time up until analysis has begun.
- I understand that I can receive a summary of the results by emailing any of the researchers
- I understand that the data will be kept on a password protected computer at UC for 10 years after the study
- I understand that the results of the study will be reported in academic scholarly journals, reports and conferences

Name of ECE service

Name of tamaiti/tamariki

Name of parent/caregiver.....

Signature.....

Date

Appendix C: The Stars of Matariki – Stars of the Māori New Year

Ngā Whetū The Stars	Tohu o ēnei whetū/ Roles of the stars of the Māori New Year Matariki
Matariki	Matariki is the star that signifies reflection and hope. This is our connection to the environment and the gathering of people. This star is connected to the health and wellbeing of people.
Tupu-ā-nuku	Food is plentiful when this star shines brightly everything from within Papatūānuku.
Tupu-ā-rangi	Thriving is the forest, lush is the forest, bountiful is the crown of the forest upon which the tamariki of Tāne settled. Food is plentiful when this star shines brightly – all foods up in the sky: fruit, birds, berries, flowers.
Waitī	All fresh water bodies and the food sources that are sustained by these waters.
Waitā	The great expanse of Kiwa that gleams green and blue beneath Waitā. This star is associated with the ocean and all food sources within it.
Waipuna-ā-rangi	Te Ua – welcome to the misty rain! Welcome the drizzle! Welcome the showers! Welcome the heavy drenching rain – falling from the spring of the sacred sky, give drink on Waipuna-ā-rangi, the land grows and the people flourish.
Ururangi	Te Hau – pacify the unseeing god, lest the wind blows violently, blasting and fierce. But instead let it be a breeze, a gentle caressing wind so I may be revitalised and refreshed.
Hiwa o te rangi	Hiwa is the wish of the desiring heart, Associated with granting our wishes and realising our aspirations for the coming year.
Pohutukawa	This star is most sacred of all it is a reminder for our treasured ones that have gone. May each and everyone of you shine as stars in the night, sparkle within the repository of memories forever.

(Williams & Te Rongopatahi, 2023, in press)

