

NZASE scientist profile

Dan Hikuroa

Born where and when

Tāmaki Makaurau / Auckland, 1974; Tokikapu te marae; Owhawhe te maunga; Waitomo te awa; Ngāti Maniapoto raua ko Waikato-Tainui.

School

Target Road Primary, Wairau Intermediate, Glenfield College, all on Auckland's north shore; Biology and Physics to 7th form.

How he got into science

"Science was always in me. I was always asking questions, more interested in the rock pools at the beach, the way the waves crashed and the cliffs than swimming. Science was a way to express myself, by wanting to know and understand."

Training and jobs

BSc in Geology

Post-graduate Diploma in Science

PhD in Geology, all at University of Auckland.

Deep Field Expedition Leader, British Antarctic Survey, 1999; **Lecturer**, University of Auckland; **Senior Lecturer**, Te Whare Wānanga o Awanuiārangi, Whakatane; **Senior Lecturer**, Te Wānanga o Waipapa, University of Auckland.

Field of science

Geology, Geomorphology, Earth systems.

Research topics

"I now work mostly on community-driven and participatory projects with Māori, including using ocean resources sustainably; plans

for managing environments and natural resources; reducing the risk of disaster from natural hazards; and restoring industrial waste sites." His research asks: What can the weaving of Mātauranga and Science contribute to our understanding?

How he finds things out

"We see Papatūānuku me ona uri (and her descendants) as our teacher. I use pūrākau, maramataka and moteatea as primary sources; they provide historical evidence that's otherwise unavailable. We test that information with local Māori to ensure that what we think it has recorded is what they think. Scientists have recognised that information in those sources has been developed from constant observation, and can be precise."

"Any scientific testing we do that is inspired by pūrākau, isn't done to prove it. If we find the same answer, we have two sets of knowledge telling us the same thing. Mātauranga can tell us things that science can't, and vice versa."

He gives the example of a pūrākau about a taniwha in the form of a ngārara (lizard) living the Waitepuru stream, in the Bay of Plenty, whose tail in the Rangitaiki Plains is said to flick from side to side. The presence of a taniwha

Dan Hikuroa with an aluminium core tube at Rangitoto ki te Tonga, an island in the Marlborough Sounds.

2005 debris flows from the flooded Waitepuru stream at Matata. Photo: GNS



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suggests a danger associated with the stream, which has changed its course over the plains many times over the centuries after large floods. The taniwha was taken into account when selecting sites above the flood plain for the three marae in Matata, none of which were damaged when flood debris smashed into the town in 2005.



Dan pictured in the Hauberg Mountains on the Antarctic Peninsula.

“We tested the water scientifically with the aim of restoring the mauri, and sampled sediments for heavy metals.

We found that the anti-fouling paint on boats was poisoning the seafood and the water of Okahu Bay. Ngāti Whātua used the results in their submission to the council’s unitary plan. Removing moored boats also enabled waka ama and swimming, because there’s so much more room in the bay.”

Dan outlines the main differences between Mātauranga Maori and Science in this table:

Mātauranga Māori	Science
Participatory ‘experiencers’ of systems	Detached ‘observers’ of systems
Resources valued for themselves	Resources usually valued for their use
Knowledge as belonging	Knowledge for control
Intuition as method	Intuition rarely acknowledged
Inclusion of facts and values	Facts & values usually separated
Everything is interconnected	Everything physical is interconnected

Most valuable results

1 “Demonstrating that Mātauranga Māori can be accurate and precise.” An example is a study about the mauri (life force) of Te Awa o te Atua, the Tarawera River. Dan and the team developed a scale to measure the environmental, social, cultural, and economic indicators of mauri, as described in a wānanga organised by Te Mana o Ngāti Rangithi Trust.

Another example is a model of water allocation, Ngā Puna Aroha, based on tikanga. Puna is the deepest source of freshwater, while aroha is the love and respect that is essential for a healthy relationship between us and our ancestral bodies of water. The first allocation, Ngā Tipuna, reflects our obligation to sustain the wellbeing and mauri of these ancestral waters. The second, Ngā Mokopuna, is for the basic needs of people and animals, wild and farmed. The third, once those have been satisfied, is Ngā Koha Puna, commercial use.

2 “Proving that the anti-fouling paint on boats moored in Auckland’s Okahu Bay was poisoning the seafloor; this led to the removal of all boats from the in 2019.” The study was part of an relationship between Ngāti Whātua o Orakei and Dan and other University of Auckland scientists and students.

What he likes about science

“How it reveals things. When used correctly – its reliability, how it gives you the confidence to answer tricky questions, disprove false claims.” In his PhD fieldwork, “I was studying ridges of strata that had been squeezed by tectonic forces into huge V-shapes tens of metres across. How those strata related to each other along that ridge didn’t reveal itself until years later in the lab, as I slowly worked my way through those detailed observations.”

Links

- 2020, Dan Hikuroa, *Stuff*, [Discovering the intricacies of Matariki, mātauranga later in life](#)
- 2018, Dan Hikuroa, [Mātauranga Māori, the birth of knowledge in New Zealand](#) [2-pages]
- 2018, Dan Hikuroa, [Mātauranga Māori and Science](#) [17m video of slides & sound].
- 2018, Dan Hikuroa, [The voice of the river](#). [20m video].
- 2017 Dan Hikuroa, [Kaitiakitanga – It is our only hope](#), [short opinion article].

Ngā Kupu

Maramataka – Lunar calendars

Mātai aronuku – Geology

Moteatea – Traditional chant

Paparanga – Layer, strata

Papatūānuku – Earth, Earth mother

Pūrākau – Ancient stories

Taniwha – Dangerous water spirit

Tikanga – Correct procedure, custom

Wānanga – Conference.

From Te Aka Maori Dictionary