



Stephanie at a planting site. Photo courtesy: Stephanie Dijkstra

Stephanie is a Māori environmental scientist specialising in intergenerational outcomes and the interweaving of mātauranga and Western science. She wears many hats, working as a Senior Mātauranga Taiao Advisor with Storm Environmental, a Ngā Kaihautu Tikanga Taiao Member with the Environmental Protection Authority NZ, and a member of Te Puna Māori Advisory Committee with Taumata Arowai The Water Regulator. She also chairs the Ngāi Tahu Hazardous Substances and New Organisms (HSNO) Kōmiti. In conversation with NZASE Science Communicator, Sneha Pillai, Stephanie shares her journey of weaving her love for different branches of science like cellular plant biology and ecology to do what she's truly passionate about – leaving the planet in a better state than the one she found it in.

BORN

Born in 1991 in Southland

AFFILIATIONS

Ngāi Tahu me Kāti mamoe

SCHOOLS AND SUBJECTS

"I went to a few different primary schools in Nelson and then moved back to Southland for intermediate and secondary. For secondary schooling, I went to Verdon College in Invercargill and I took Biological sciences, Chemistry, Physics, Classics and Calculus."

HOW SHE GOT INTO SCIENCE

Stephanie recalls that she fell in love with science when she was in intermediate. The Magic School Bus (an animated children's TV show) was popular then and that also spurred her interest in pursuing science as a career. "My grandparents were good at fostering a sense of curiosity. My grandfather always said that if he hadn't been a farmer, he would have been a forestry scientist. And, my mother was a nurse. So, I got a lot of exposure to science at home."

TRAINING AND JOBS

"I went into university not really knowing what I wanted to do," admits Stephanie. "Initially I thought I wanted to do engineering. I did a year of that before realizing it wasn't for me. Then I pursued biochemistry and completed my undergraduate in biochemistry. For my postgraduate studies, I switched to plant cell biology/forestry."

While still pursuing her undergraduate degree, Stephanie started to work with Ngāi Tahu in the hazardous chemicals space. "I was able to apply my knowledge of hazardous chemicals, gene technology and genetically modified organisms in this job," says Stephanie.

When she completed her Master's degree in 2020, there were limited jobs owing to the COVID-19 pandemic and its impact on the economy. Stephanie reached out to Ngāi Tahu again, which opened the doors for her to work as a water scientist. Today, she helps Ngāi Tahu with their policy submissions under the Hazardous Substances and New Organisms Act 1996, apart from also working as an environmental consultant with Storm Environmental."

FIELDS OF SCIENCE

"I work in the field of contaminants," notes Stephanie. "I'm not a contaminated land specialist, but my work is in this field. Whether we're talking about hazardous substances and the policy spaces that I work in or whether we're talking about stormwater treatment, it's all about contaminants. So yes, contaminant remediation is my main passion."

Stephanie considers herself fortunate to have studied a wider area of science to be able to do what she does today. "The knowledge that I have around contaminants came from my biochemistry background, whereas my knowledge about plants and ecology came from my Master's. In addition, my one-year experience studying civil engineering enables me to identify practices to improve stormwater outcomes across the country."



Stephanie pulling up a tau koura.

RESEARCH EXAMPLES

Stephanie notes that her research mostly involves studying contaminants and the need to protect people and our biodiversity from their harmful effects. Mulling over the recent flooding events in Dunedin, she notes, "When it comes to events like these, flooding is the big, obvious issue with stormwater and the destruction it causes. But the other big issue with stormwater is something called 'Urban Stream Syndrome', where all of our urban streams are in really poor ecological health because they're continually getting urban contaminants washed into them. So, while it's certainly important that we focus on flooding and how we can mitigate flooding at a catchment scale and individual houses, we also need to keep in mind the contaminants that are entering our ecosystem through these processes."

One of the projects that Stephanie is closely involved in currently involves looking at mahinga kai (traditionally gathered food) and how safe it is from agrochemical use. "One of the concerns Ngai Tahu

has had for quite a while is the exposure of whanau to agrichemicals through harvested food. Obviously, there are certain pesticide limits to which food can be exposed. But those limits apply for food harvested on the farm," explains Stephanie.

"One of the issues that we face with traditional foods is that the ecosystems that we would gather them from have become increasingly more contaminated. If you take Canterbury for example, quite often if you want to go and get watercress or tuna or inaka, you may often be harvesting them from a farm drain because that's the only ecosystem that

supports the growth of these kai. Our concern is that when the Government is setting limits and targets for pesticide exposure, they're not necessarily taking into account the exposure that mana whenua might have when they are undertaking the traditional gathering processes. They're not going to know that the farms have just had herbicide or pesticide sprayed and may be exposed to higher doses of the chemical, which may lead to negative health outcomes for our mana whenua. Through the research, we are looking at the extent to which this is occurring."

Stephanie has also been researching for a policy project that advocates the need for an Aotearoa-specific ecological risk assessment framework. She explains, "When agrichemical companies bring new chemicals into Aotearoa, all of the ecotoxicology information is derived from studying its effect on international, mostly European, species. Partly it's because of where these huge multinational companies are based. But partly it's also because we don't want people to test nasty chemicals on taonga species such as Kiwi and Takahe."

"Instead, with Ngai Tahu, we have developed a framework that will enable the companies to bring their knowledge of the chemicals and assess that against the knowledge held by our mana whenua on our taonga species and their sensitivities. We have developed a questionnaire that will help us better

understand what effect a certain chemical may have on any Aotearoa species because their sensitivities are different from those of the European organisms that the ecotoxicology information may have been modelled on."

HOW SHE FINDS THINGS OUT

"Both for research and the general work that I do as an environmental consultant, I'm always looking for opportunities to leverage the amazing amount of knowledge that mana whenua have about this country. From a Western science perspective, the history of this country is only 150 years old. But if we go and partner with mana whenua, then through oral histories and traditions and the knowledge that they have, we gain access to a much longer time scale of knowledge about Aotearoa. Especially when it comes to implementing nature-based solutions for stormwater treatment, which is generally wetlands, that knowledge is really helpful because it allows us to understand where wetlands used to be prior to land being drained in the 1800s for farmland."

MĀTAURANGA MĀORI

"It's a really brilliant way to view the world - both through a western science lens, which by nature is quite reductionist and wants to go all the way down to the atom and then come back up. But, looking through a mātauranga lens allows you to look at things holistically, because everything is about the relationships and how everything is interconnected. Being able to look through both the Western science lens and the mātauranga lens means that I can zoom in to a particular part of the project, while keeping in mind the bigger ecosystem that that is part of. It

allows you to center yourself a lot more when you're doing research."

WHAT SHE LIKES ABOUT SCIENCE

"I think one of the coolest things about science is that it somewhat takes humans out from being at the centre of the universe. Because when you look at things as a scientist, there's so much going on in nature that we don't understand and will take

thousands of years to understand! I think the fact that nature has these processes and also has created everything is super cool. By studying it and looking into it, we're able to be better kaitiaki of this land."



Pictured above is Te Kuru wetland, a project that Stephanie worked on. It is a 109-hectare stormwater facility featuring expansive wetland areas, stormwater storage, and filtration basins. Courtesy: Stephanie Dijkstra

"Looking through a mātauranga lens allows you to look at things holistically, because everything is about the relationships and how everything is interconnected."

RELEVANT LINKS

[Stephanie Dijkstra: Representing Ngāi Tahu in governance and policy](#)

Te Kuru wetland project: [New \\$50m wetland opens in Christchurch](#)

Stephanie's [research articles on ResearchGate](#)

Ngā Kupu

Hikawai: headwaters
 Ki uta ki tai: from the headwaters to the sea/a catchment
 Parawhenuamea: the goddess of muddy waters/stormwater
 Oneone: soil
 Repo: wetland
 Rongoā: traditional māori medical practices
 tau koura: a traditional fish and koura (freshwater crayfish) trap made of aruhe (bracken fern)

Source: Stephanie Dijkstra