

WIND AS MODEL, MEDIA, AND EXPERIENCE

Sound and Circumstance: Voicing the Winds

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Media art practices enable an intimate listening to and modeling of the sparring winds. We hear the wind's voice with increasing stridency as cyclonic conditions intensify across Te Moana-nui-a-Kiwa (the Southern Pacific Ocean). Sound-orientated media artworks attune and amplify our perceptions of these meteorological forces, and we focus on the winds as active exchangers with the unruly twenty-first-century weathers. We foreground two media artworks, *Koea o Tāwhirimātea – Weather Choir*, and our collaborative artwork, *MĀKŪ, te hā o Haupapa: Moisture, the breath of Haupapa* (2022–23), as generative catalysts for eco-social activism, drawing in ancient cosmologies of wind and weather. The artworks map the winds with Indigenous names and harmonic and aharmonic sounds to augment numerical datasets and images (culturally inscribed in the European tradition) and to negotiate local and global scales. Mātauranga Māori (Māori knowledge), which includes contemporary pūtaiao (Māori biophysical science), is found to resonate with and differ from non-Indigenous worldings from the environmental humanities and atmospheric science, drawing on the writing of Ngā Puhī author Reverend Māori Marsden (1924–1993) and Kāi Tahu orator Ron Bull (2023). The wind is positioned as a circumstantial mediator between bodies and technical and cultural instruments, with French philosopher Michel Serres (1930–2019), who positions human-meteorological encounters as thresholds of feeling or sensibility. Artworks situated as exchangers are argued to produce counter-mappings, creating circumstantial gatherings of the winds above glaciers or oceans, unsettling the primacy of human phenomenological experience. As art makers, we find that listening, slowing, and attuning to the winds enable a metabolization of ecological crisis spurring renewed efforts toward eco-social mediation.

To listen to the sound compositions and find the images discussed in this article please open the Data Sets/Files folder above.

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But watch! Tāwhiri of the wind and Tūmataunga of the humans are turning. They are at each other's throats, deadly. Ranginui shouts at Tāwhiri, begging his overprotective son to calm tf down. Begging his mokopuna, the humans, to quit provoking him. When the show gets serious, the atua fight. When the atua fight, the show unravels.

From up here in the gods, all can be seen. Nations pooling, clouding. Falling.

—Cassandra Barnett 2023, 29

Composition requires a tension between the local and the global, the nearby and the far-off, the story and the rule, the uniqueness of the word and the unanalysable pluralism of the senses ... Watch closely, anticipate. Suddenly at the same time, you see both miniature and panorama.

—Michel Serres 2008, 239

Introduction

Media artworks that register and retransmit the winds engage listeners at the audible threshold of approaching storms amid the multiscalar effects of the climate crisis. Two collaborative artworks featuring sound and image compositions are positioned as counter-mappings and active exchangers with the affective circumstances of winds. The first, *Koea o Tāwhirimātea – Weather Choir* (2022-2023), is a distributed choir of aeolian wind harps at eight coastal locations in Te Moana-nui-a-Kiwa, the great Southern Pacific Ocean of Kiwa. The second, *MĀKŪ, te hā o Haupapa: Moisture, the breath of Haupapa* (2023), hereafter *MĀKŪ*, is an audiovisual installation propelled by live weather data. The installation traces the changing state of Haupapa (Tasman) glacier and awa (lake) as it rapidly melts to water. *MĀKŪ* takes the wind as hā, the breath of the atua (supernatural beings), and manifests in the form of the sound of the winds, voices, underwater video, and software. The artwork weaves live hydrophone and atmospheric recordings by coauthor Rachel Shearer (Rongowhakaata, Te Aitanga a Māhaki, Pākehā) and underwater and atmospheric video images of glacial fragments by coauthor Janine Randerson (Pākehā, settler descendant).¹ *MĀKŪ* was guided and voiced by Kāi Tahu orator and project collaborator Ron Bull.² The collaboration also included glaciologist Heather Purdie (Pākehā) and creative technologist Stefan Marks (Pākehā), who designed custom software for the online artwork and physical installation. *Weather Choir* also creates a

¹ The bracketed names refer to Māori iwi (kinship groups) affiliations. The noun Pākehā refers to a settler descendant of European origin.

² Kāi Tahu, also Ngāi Tahu (in other dialects), are the principal Māori kinship group in Te Wai Pounamu, the South Island of Aotearoa New Zealand.

conditional map of feeling from the winds, signals of the changing weather. From 2022 to 2023, sound artist Phil Dadson and the Breath of Weather Collective collaborated on aeolian harps in a sonic model of the winds. The harps were installed at storm and sea-level rise affected locations around Te Moana-nui-a-Kiwa, including the coastlines of Niue, Sāmoa, Rarotonga, and Tonga, and four locations in Aotearoa New Zealand. Both artworks were commissioned by Te Tuhi, a contemporary arts organization in Tāmaki Makaurau Auckland, as creative weather reports from a weather station in the World Weather Network (WWN), an online platform to distribute works about the climate crisis to international audiences.³



Figure 1. Janine Randerson. Anemometer at Aoraki National Park, Aotearoa New Zealand. Digital photograph.

In the second part of this article, we position these artworks that vocalize and mediate the wind as circumstantial exchangers, modeling winds at local and global scales, borrowing Serresian terms—connected to spiritual and pluralist approaches to place and linked by digital currents that radiate into wider spheres of affective relations. Michel Serres (2008) proposes a global theory of exchangers and circumstances, localities and global panorama, in his sensorial media theory. His expansive ruminations on media and information theory are grounded in the senses and in cultural and embodied knowledge, offering rich parallels to the storying of place and ethos of

³ The World Weather Network (WWN) is an online artists' network, catalyzed by Artangel in London in 2021, which connects twenty-eight small public arts organizations from many different parts of the Earth. New artworks and writing are commissioned to document and express artists' and writers' experiential responses to the new weathers. *MĀKŪ* and *Koea o Tāwhirimātea – Weather Choir* featured in Te Tuhi's program for the WWN, *Huare: Weather Eye, Weather Ear*. The program included six artists' "weather reports," exhibited online and following the seasonal phases of the Maramataka, the Māori lunar calendar. The reports were launched in June 2022 and continued until July 2024. See <https://worldweathernetwork.org/about/>.

reciprocity in mātauranga Māori (Māori knowledge). Māori philosopher, tohunga (chosen expert, priest, healer), and Anglican minister Reverend Māori Marsden presents a challenge to the quantitative modeling of winds that renders mathematical mappings discrete from cosmological and experiential weather worldings. Marsden offers a genealogy of ancestor-winds from a Māori worldview; however, akin to Serres, he also draws parallels with Greek cosmologies and new physics, which considered the real world as “pure energy” and the universe as a “process” (Royal 2003, 31). With Serres and Marsden, we investigate the complex dynamics between place (the local) and the world (global information) as modeled through media artworks. Finally, the artworks are situated as exchangers that might uncolonize the winds, with reference to Māori historian Sinead Overbye (Te Whānau a Kai, Ngāti Porou).

Before we embark on this text, as artist-coauthors of *MĀKŪ*, we acknowledge the partiality of our version of the artworks that follows. We foreground the experience of artists in mediating between aesthetic and technical instruments and the winds of Te Moana-nui-a-Kiwa.⁴ As an insiders’ reflection on artistic research, we draw on artists’ public talks and interviews about *Weather Choir* and *MĀKŪ* in the *Huarere: Weather Eye, Weather Ear* (2023) and *World Weather Network* programming. We recognize the agency of winds as critical to the media artworks under discussion. Media studies scholar Yuriko Furuhashi’s recent history of climatic media in Japan and the United States resonates with our own: at once meteorological and social, geophysical and political, and “in the spirit of the atmospheric circulations of air” (Furuhashi 2022, 5–8). Furuhashi takes a transpacific approach to illuminating the elemental conditions of media that affect the atmospheric bubbles we inhabit in climate-controlled buildings, in the phones we carry with us, in the science of weather modification, and in artworks. We recognize the ecological cost of field recordings and sonified, visual, or graphic representations of sounds and images in computing environments. *Weather Choir* and *MĀKŪ* disseminate digital weathers from specific places that in turn become energy-consuming internet materials that appear in the air-conditioned rooms of galleries through sound and video devices, reaching the homes of viewers/listeners of the World Weather Network web platform and mobile app on energy-dependent devices.

With Eva Horn’s (2018) positioning of air as an elemental medium, we suggest that the winds radically elude the scales of human power at municipal and synoptic levels. Winds move both locally and transnationally across archipelagos, oceans, and continents, and the intensity of tropical cyclones is increasing (IPPC 2023). No political governing body or institution can

⁴ We could call this a postphenomenological approach. See Robert Rosenberger and Peter-Paul Verbeek, eds., *Postphenomenological Investigations: Essays on Human-Technology Relations* (Lexington Books, 2015).

ameliorate a cyclone or control its passage. The prevailing westerly winds circulating in Aotearoa New Zealand are affected by the Antarctic continent, yet “ex-tropical” cyclones also reach us. At higher tropical latitude, the prevailing trade winds singing in the *Weather Choir* are southeasterly. *MĀKŪ* and *Weather Choir* are artworks generated by the chance appearances of wind itself, featuring as medium in a cultural and biophysical exchange generated by Indigenous and Pākehā (settler descendant) collaborators. These winds can manifest as a devastating biophysical force, yet the energetic power of the winds can also be harnessed or farmed for human use. We emphasize artists’ wind-powered instruments as circumstantial exchangers between wild, spiritual, and energetic modalities (Serres 2008). Media historian Douglas Kahn has also called artists’ instruments “switching mechanisms” to be used “at the disposal of energies,” an apt phrase for the playerless nature of aeolian sound (Kahn 2013, 218).

As Horn writes, the “meteos” or weather refers to a “deterritorializing principle of planetary dynamics and forces, of unsteadiness and singularity,” unsettling stable categories (2018, 13). Artists’ research projects—such as Andrea Polli’s *Sonic Antarctica* (2008), which oscillates between natural and industrial field recordings in the McMurdo Dry Valleys, as well as sonifications and audifications of scientific data, and those of artist and writer Susan Schuppli—parallel our method. Schuppli describes how natural media manifest in her thermal imaging and aberrations of lens crystallization in *Not Planet Earth* (2021), exploring how climate change evidences itself materially (Morrison and Schuppli 2023). Such modes of art making tangibly express the mediality of the natural world itself, and where it intersects and becomes visible through scientific-artistic “quasi-instruments” (Randerson 2018). Like Polli and Schuppli, we assemble artworks that return a cultural complexity to modeling the winds and their endosomatic effects, where physical phenomena transmute into the numerical digits that drive both meteorology and digital art forms.

Koea o Tāwhirimātea – Weather Choir: Wind Harmonics

Coastal inundation and ascending cyclonic conditions suffuse the Breath of Weather Collective’s *Koea o Tāwhirimātea – Weather Choir*, for which eight aeolian harps were installed at eroding and storm-damaged coastlines around Te Moana-nui-a-Kiwa. The work was first released as part of the World Weather Network’s digital program in 2022 at Matariki, the Māori new year in June–July when the Matariki (Pleiades) star cluster becomes visible from our vantage in Aotearoa New Zealand. The Breath of Weather Collective is composed of Indigenous tangata o le Moana (Pacific peoples), including Pasha Clothier, Maina Vai, Uili Lousi, Kasimea Sika, and Ahi Cross, and Pākehā descendants of European settlers (Dadson, McCarthy, Terstappen, and Mark Cross), living on islands in Te Moana-nui-a-Kiwa.

They are each oriented toward socio-ecological justice and climate activism, while also implicitly presenting a counter-model to military, trade, and resource mapping of “the Polynesian triangle.”

The sounds of the aeolian devices vary based on wind strength and direction: they might transmit the delicate sensitivities of a light breeze or the unsettling screams created by strong winds, respectively calming us or setting us on alert. The name *Koea o Tāwhirimātea* – *Weather Choir* summons the wind atua (supernatural being) Tāwhirimātea, who broke away from his parents, Ranginui, the sky father, and Papatūānuku, the earth mother. This cosmic rupture is imagined by Māori contemporary poet Cassandra Barnett (Ngāti Huri, Raukawa) in the opening epigraph of this article. Today, we experience the fury of the atua in the intensifying storms that rage in our weatherspheres as the climate warms. Barnett poetically evokes the winds as warring and the relationship with the winds as uneasy. She positions humanity as contributing to and embroiled in this epic sparring (Barnett 2023, 12).

Aeolian sounds in the natural world are generated without a human player. Oral histories record aeolian sounds of wind blowing through natural geological formations, such as holes in rocks, in precolonial times in the islands of Te Moana-nui-a-Kiwa. Aeolian instruments are named in English after the Graeco-Roman god Aeolus, the divine keeper of winds. On his island archipelago (off the north coast of Sicily in the Tyrrhenian Sea), Aeolus attempted to bind the paths of the blustering divine winds in an oxskin bag, but they were released to wreak havoc on the world, as recounted in book 10 of Homer’s *Odyssey* (circa 675–725 BC). Kahn suggests the natural medium of the aeolian invites us to consider the nature of music, the nature of the wind, and the nature of technology, beyond human conceptions. Yet, he writes: “the Aeolian would stand as an expression exceeding human embodiment and mediation, at times blowing back to mediate the human soul” (2013, 41).⁵

On the embodied experience of living next to a harp at his home in Whakatāne, in Aotearoa New Zealand, Breath of Weather Collective member James McCarthy says: “Tamanui [the name of his harp] sat on my lawn for the past year, and she would often wake us up at night when the storms were blowing through, as she absolutely screams in strong wind. And for me that was the point these became acoustic sirens, an alarm system for what’s going on in the environment” (Dadson and McCarthy 2023). In June 2023 the work was physically installed at Te Tuhi gallery in Tāmaki Makaurau Auckland; two large harps, McCarthy’s Tamanui and Ngā-hau-e-whā by Phil Dadson, were planted on the roof of the building and the amplified voices of the wind tunneled through the speaker space at the entrance to the gallery.

⁵ Kahn applies the terms “commune technologies” and “natural media” to the sounds produced by biophysical phenomena and technologies of earth observation and sensing (2013, 257).



Figure 2. Breath of Weather Collective. *Koea o Tāwhirimātea – Weather Choir*. 2022. Audio file and image. James McCarthy in Whakatane, Aotearoa (New Zealand). Image courtesy of the artist.

The year prior, in 2022, Dadson had mailed eight DIY kits to collaborators in the newly formed Breath of Weather Collective around various islands in Te Moana-nui-a-Kiwa. The kits contained six nylon strings, each about three meters long, a wooden bridge for the strings, a large empty tin, and a set of assembly instructions, including a video. The kits were packaged in yellow polystyrene boxes that had previously contained COVID-19 vaccine. The harp's tripod legs and weights were to be assembled from local materials—stones, lumps of coral, or other detritus found at each island site. In Niue, artists Mark and Ahi Cross used the polystyrene-box packaging as a resonator, their harp perched on a clifftop location. In the Cook Islands, members of Te Ipukarea Society, an environmental NGO, used a tin as the resonator and staged the harp's installation as a community event. In Haumoana, artists Dianne Reefman and Ricks Terstappen used a weathered wooden Ceylon tea box to resonate the aeolian howls on a sharply eroded coastline of Aotearoa New Zealand. Meanwhile, in Sāmoa, journalist Maina Vai and her family installed the harp in the center of their village, using bamboo for the tripod legs and a car battery as the weight, and reported regularly on the wind conditions.



Figure 3. Mark and Ahi Cross. 2022. Image. Aeolian harp with recording instruments and coral weight, as part of *Kōea o Tāwhirimātea – Weather Choir*. Liku, Niue. Image courtesy of the artists.

The community-built harps transmitted digital sound and video recordings with smartphones or contact microphones to the World Weather Network platform in digital form, creating a lo-fi audio island eco-political network and expanding the intimate experience of listening to the aeolian harps acoustically from the ear to a global audience. Next, we turn to activist Uili Lousi's experience as part of the Breath of Weather Collective, described in an interview on Tongatapu (Randerson and Lousi 2023) in more detail.

[Listen to James McCarthy's Aeolian harp sounds, and Phil Dadson/Breath of Weather collective's recordings for *Kōea o Tāwhirimātea – Weather Choir* in the Data Sets/Files folder at the beginning of the article.]

Embodied winds on Tongatapu

Lousi placed his aeolian wind harps at several significant spiritual sites on Tongatapu—including the thirteenth-century limestone trilithon Ha'amonga 'a Maui (the Burden of Maui), 'Emeline Beach, and the sacred ancient royal tomb of Langi Namoala—and on his restored land (a former site of refuse dumping) with beehives and a banana plantation near Nuku'alofa. Lousi's organization, Ohai Tonga, is involved in reforestation projects, local plastic-collection efforts (campaigning for recycling facilities), climate-change activism, mitigation support, and artistic research.⁶ He built his harp using available materials of off-cut wood and a tin-can resonator with hand-carved

⁶ Ohai is named after the red-flowered Tongan flame tree, a signal for Lousi that the ocean and the atmosphere are on fire. See Ohai Tonga: <http://www.ohaitonga.org/>.

wooden bridges. Once the harps were set up with the help of his friend Kasimea Sika at a coastal point, he meditated and absorbed the aeolian vibrations of the wind sounds, inviting others to join him.



Figure 4. Uili Lousi. 2022. Detail of aeolian harp. *Koea o Tāwhirimātea – Weather Choir*. Tongatapu, Kingdom of Tonga. Image courtesy of the artist.

At first, Lousi set aside the Breath of Weather Collective's mission to record the sounds with technical devices (mobile phones or contact mics) for presentation on the World Weather Network's online platform. Instead, he closely listened to the singing of the strings and embodied the wind and warm atmosphere by deeply attuning with his breath. He associated the winds with a choir of voices, emanating vowel sounds where the melodic sounds combined with birdsong, dog barks, and children's voices. At the ancient site of Ha'amonga a Maui, Lousi bathed and breathed in the circulating winds as they sang through the aeolian harp. He predominantly experienced the northeastern wind, Tonga a Hahake, and felt a resonance with the deep 'O' sound in his lungs and liver. Ha'amonga a Maui is also orientated to ancient points of celestial equinoxes, so the wind installation worked at multiple scales, from the intimate and bodily to the atmospheric and cosmological. At 'Emeline Beach, Lousi described the prevailing wind as generating a bass sound, a long 'A' that vibrated the strings as it vibrated in his large intestine.⁷

⁷ During an interview on August 15, 2023, Uili Lousi took coauthor Janine Randerson to several of the sites on Tongatapu where the aeolians were installed. 'Emeline beach has small blow-holes where the atmosphere meets the waves, spouting water, mirroring the breathing spouts of the humpback whales who give birth in these waters, beyond the coastline's raised coral terrace. The wave movements and patterns are shaped by winds from sometimes thousands of kilometers away. Lousi notes that historical navigators, both Polynesian and European, have recognized that the ocean currents around Tongatapu have a strong geomagnetic signal, produced by the electrical charge that tides and waves create in saline water (Randerson and Lousi 2023).

The frequencies of the wind sounds, he felt, mirrored and amplified our bodily, physical, and psychic sensibilities, allowing us to reconnect with the natural world (Randerson and Lousi 2023).

Lousi's aesthetic experience of the aeolians, without electronic intervention initially, deviated from the original conception of Phil Dadson to record and disperse the aeolian sounds to the central web platform. Yet Lousi's interconnected interior and exterior bodily sonic mapping holds a restorative potential for healing transformation, at both a personal and a metaphysical level, through his closely related art and activist practices (Randerson and Lousi 2023). Anthropologist Tim Ingold suggests, "To feel the wind, is not to make external, tactile contact with our surroundings but to mingle with them" (Ingold 2007, S19), echoing Serres's (2008) philosophy of mingled bodies. In this mingling, we live and breathe between the ground, sea, sky, and winds through respiration, a fundamental process of life (Ingold 2007, S19). Lousi's meditative practice accords with Reverend Māori Marsden's emphasis on metaphysical reflection on time and existence beyond "formulae and dogma" (Royal 2003, 28). Marsden stresses Indigenous values, writing, "Science and technology produce 'know how', but it is nothing without 'know why'—a means to an end, a mere potentiality" (Royal 2003, 27). Lousi's "know why," or motivation for participation in the Breath of Weather Collective, was ecopolitical as well as personal.

Sonic attunement to the winds is tied to Lousi's art and activist practice of returning Tongans to values of environmental care as opposed to the short-term profit valued under late capitalism. Marsden argues that the means of transmission of value are "the instruments by which we view/interpret/experience and make sense of the world" (Royal 2003, 27–28). For Lousi, art making is one means to transmit value. In addition, Lousi was part of a team of researchers considering the post-traumatic stress on Tongan people after Cyclone Gita (2018), the most intense tropical cyclone in Tongan recordkeeping (Sattler et al. 2020, 273). Two of the sites where Lousi installed the aeolians on the eastern coast of Tongatapu are rapidly eroding as the sea level rises and storm surges become more severe as the climate warms. Plastics clump on the shores like seaweed on sand-mined beaches, spread by the winds and local dumping due to the lack of recycling plants.

Attuning to the winds

Listening to the minutiae of the wind's movement is political in the act of noticing, stopping, and slowing to hear patterns of ecological change. The aeolian instrument-exchangers transduce wind media, resulting in aleatory sonic expressions. However, back in Aotearoa New Zealand, McCarthy, a Pākehā (settler descendant) collaborator on *Weather Choir*, analyzed the mechanics of audio activation through the vortex that is behind the strings in the aeolian harps. He described the sound produced as

really unusual, there is a name for this phenomenon, “von Karman vortex”, when the wind is blowing behind and wrapping around, flowing on, becoming unstable and creating eddies. It’s those little eddies that activate the strings and actually start to vibrate the whole length of the string and make beautiful patterns. The harmonic points of that string, the harmonic series are activated through the wind series, and you get that very rich, multi-harmonic sound happening simultaneously[.] (Dadson and McCarthy 2023)

McCarthy attempted to tune a tonic from the metal resonator, but the wind’s disorderly appearances in an endless range of differential sounds foiled his efforts.

Along with McCarthy, sound-based performer Dadson embraces the quality of aeolian harps to produce aharmonic frequencies, including their propensity, in his words, “to get a bit jarry” (Dadson and McCarthy 2023). This jarring effect, most noticeable in storms, might be understood as a wind-driven call to action to recognize the part of human beings in the heating climate. Dadson resists the traditional twelve-tone equal series, saying:

a harmonic series is essentially the basis of a piece of music that has been blighted somewhat by the twelve-tone equal, we have been conditioned to expect this kind of harmonic movement, which limits the potential of harmonics; however, the beauty of natural harmonics is expressed in the DIY aeolians[.] (Dadson and McCarthy 2023)

He describes the aeolian harps as sensing bodies, responding to the variables of wind and weather; they are harmonious when calm with a laminar flow of wind, while they go wild and become dissonant when the winds are strong. The aeolian instruments mediate and model the changing circumstances of the winds, becoming bodily correlates.⁸

To work in difference to quantifying methods and harmonic scaling can also be understood as a form of decolonizing mediated nature (Smith 1999; Demos 2016) or uncolonizing (Overbye 2023) the ancestor-winds, as we discuss further on. In *Weather Choir*, the aeolian harps offer the winds the agency to create dissonances and musicality, without a conventional harmonic scale or human composer. The harps, prompted by coastal winds, create a chaotic sonic wind model. For *MĀKŪ* also, rather than a human-edited

⁸ On the relation between aeolian sound and contact microphones, Phil Dadson said, “The technology of the contact mic has its idiosyncrasies, amplifying vibrations within the resonator membrane rather than vibrations through the air.... But the contact mic will also amplify any sound made by other parts of the harp if the weights are knocking or scraping, or if a loose cable is flailing against a tripod leg. These sharp, ‘less musical’ sounds travel through the structure to the membrane and will also be captured, adding a sometimes strange but interesting juxtaposition with the voicing of the strings.” *Koea o Tāwhirimātea – Weather Choir*. Listening tour, Te Tuhi, July 22, 2023.

sequence, random appearances of live winds are routed through custom-made software to trigger the appearance of particular names, sounds, and images from Haupapa (Tasman) glacier.

MĀKŪ, te hā o Haupapa: Moisture, the breath of Haupapa
(2023)

Haupapa is an atua (a deified natural entity) and the name of both the glacier and the lake where the artwork *MĀKŪ, te hā o Haupapa: Moisture, the breath of Haupapa* was created. Haupapa lies below the preeminent ancestor of Kāi Tahu, Aoraki (Mount Cook), the tallest mountain in Aotearoa, and the center of the range in Aoraki National Park. Aoraki mountain shapes the flow of winds and the cloud formations over the massive peak. In Kāi Tahu cosmology, Haupapa glacier is understood as a long tongue from the side of Aoraki. The glacier was formed from a deep exhalation of the ancestor mauka (mountain), as he readied to speak.

The collaborative media artwork *MĀKŪ* continues Indigenous Māori sound practices in Aotearoa that geospatially map time and space (Shearer 2018). Sound and songs, especially traditional Māori waiata (songs) and mōteatea (laments), as well as the recitation of genealogy through naming, communicate geospatial, historical, social, and survival information about this lived landscape. *MĀKŪ* brings attention to a glacial landscape in crisis through image and sound recordings that react to live winds in a weather-responsive artwork. The live data (from New Zealand's National Institute of Water and Atmospheric Research, NIWA Taihoro Nukurangi) is collected by instruments in Aoraki village and the Mueller Hut in Aoraki National Park. The fluctuating, near-real-time dataset prompts also the release of specific Kāi Tahu names of the winds.

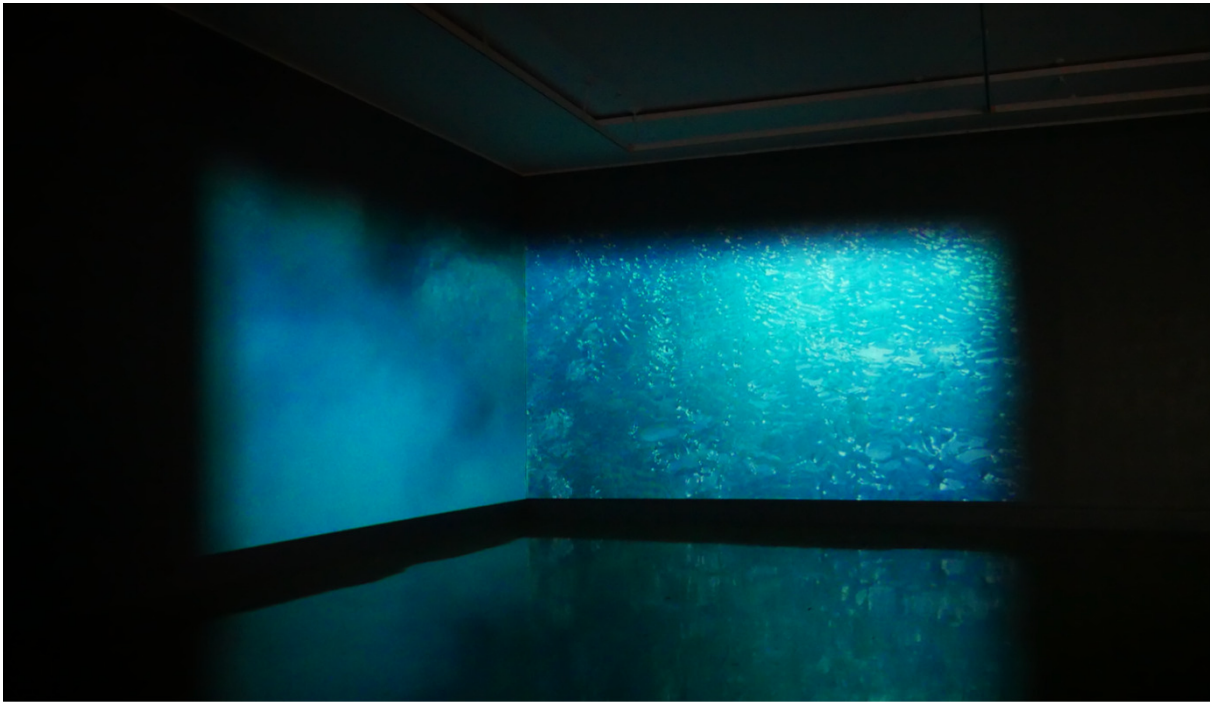


Figure 5. Ron Bull, Stefan Marks, Janine Randerson, Rachel Shearer. 2023. Installation Image. *MĀKŪ, te hā o Haupapa: Moisture, the breath of Haupapa*. Data courtesy of NIWA Freshwater and Ocean Science. Scientific advisor, Heather Purdie, University of Canterbury. Commissioned by Te Tuhi for the World Weather Network. 4 June 2023–30 July 2023. Installation view, Te Tuhi, Tāmaki Makaurau, Aotearoa New Zealand. Software, video, sound. Image courtesy of Stefan Marks. See an earlier online iteration: <https://tetuhi.art/world-weather-network/haupapa-the-chilled-breath-of-rakamaomao-artwork/>. Image courtesy of the artists.

Recording the winds

The images and sounds of winds and water in *MĀKŪ* were recorded over two years at the Haupapa (Tasman) glacier. Janine Randerson recorded video inside and around the lake, and Rachel Shearer made atmospheric sound and underwater recordings. At the edge of the glacier, we were joined by glaciologist Heather Purdie and Ron Bull, who made the space culturally and physically safe for us to record and offer the gifts of names at Haupapa. Bull spoke the names of ancestral winds over the waters, from the boat and the shore of Lake Haupapa. In his voicings, Bull gives the whakapapa (genealogy) of his ancestors descending from the ancient ancestor Rākaihautū, who named the lakes and the mauka Aoraki. He narrates:

From Aoroki came Rakamaomao, came Tāwhirimātea; when the west wind (Puwaitaha) blows, it is a challenge to the southerly (tonga); the voice of the wind. ... All the names of those various individual wind gods that come into this land, that hit Haupapa, the glacier Haupapa, that place where the wind blows onto the land. We see mākū (moisture) in its many various forms as ice, snow, and rain. It was inhabited by the atua, by the gods, by their breath, by Rakamaomao, the winds that blow through this place. That breath has been captured in the ice and the snow. And now that hā (breath) has been

released because of the footsteps of people going through this place and not respecting the legacy of the atua, the divine ancestors[.] (Bull et al. 2022)

He intended the ancient names of the ancestors, which he carefully researched prior to the field visit, to mingle with the primordial elements of *mākū*.

As well as the recording of Bull's voice made in the open atmosphere, the other feature of the sound of the installation is the hydrophone recordings made deep in the waters of Haupapa awa. The sounds inside the lake registered by the hydrophone are understood to include the *hā* (the breath of ancestors) and the stories inherent to the accumulated materials released from the ice—pollens, and ash from fires and volcanic eruptions. Shearer also used field microphones to make field recordings above the lake. *Tāwhirimātea*, one atua of the winds, is regarded as a giver of breath to older spinning instruments—*pūrerehua* (bull-roarer) and *porotiti* (Shearer 2018, 32). Brian Flintoff explains that a range of sounds made by the wind—whistling, moaning, and swishing—are acknowledged as messages from the spirit world in the same way that when *taonga pūoro* (traditional Māori wind instruments) produce unexpected wind voices, they can be perceived as spirit voices joining in with song (2004, 57).⁹

⁹ Drawing on ethnomusicologist and *taonga pūoro* maker Brian Flintoff (2004), Shearer writes, “Papa (the earth mother) is the rhythm; Rangi (the sky father) is the melody. From their children the different atua give their voices to groups of instruments” (2018, 32).



Figure 6. Rachel Shearer. Image and sound File. Hydrophone recording in Lake Haupapa. Aoraki National Park. August 2022. Image courtesy of the artists. Listen to Rachel Shearer, Ron Bull (voice), and Janine Randerson's composition "*MĀKŪ, te hā o Haupapa: Moisture, the breath of Haupapa.*" 2024. https://soundcloud.com/haupapa-230543821/maku-te-ha-o-haupapa-moisture-the-breath-of-haupapa_composition

Reactive Ancestors

According to Māori weather knowledge, *kā tohu o te taiao* (signs of nature) in immediate environmental circumstances can also be used to predict future weathers, and the weather also responds to human endeavors. Bull drew on Apanui Skipper's (2020) research into weather and climate knowledge to decide the wind ancestor names that he would speak. Skipper interviewed forty Kāi Tahu knowledge holders to gather names of rain, wind, weather conditions, and cosmologies. The appearance of certain plants, sandfly swarms, birds, and braided river paths could be used to predict the winds—knowledge that is vital to the gatherers of kai (food) (Skipper 2020, 309). Coming winds could also be predicted by the stars, as one Kāi Tahu elder explained about the star Atutahi (Canopus):

Atutahi, shining there above us, is a weatherwise star, a foreteller of the winds and storms. Sometimes he twinkles more brightly on one side than the other. You pakehas cannot see that, of course, but our ancestors did, and so can I tonight. When he twinkles or winks very sharply and clearly on one side, and the other side is dimmer, then it is going to blow hard from the side on which the star is flashing brightest. When I see Atutahi winking sharply and brightly on the south side, as he frequently does, then I know that a strong southerly wind, often a gale, is coming. This is a sign that never fails. (Skipper 2020, 312)

The ancestor winds and stars can be used for weather prediction; they watch over us, yet they can also react unpredictably to human presence.

Bull describes the atua winds as powerful spirits over the land, and he kept us attuned to local kawa (customs), in the offering of words and song to introduce ourselves to place to avoid transgression. In the Northern Hemisphere, Canadian anthropologist Julie Cruikshank (2001) describes the complex ways that Indigenous histories, previously relegated to “myth,” and contemporary scientific research overlap and differ, drawing on Tlingit and Athabascan observations about the behavior of glaciers in the Mount Saint Elias ranges where Alaska, British Columbia, and the Yukon Territory converge. She relates accounts from Indigenous women, historical observers, and contemporary field scientists that register a sentient landscape (Cruikshank 2001, 2005). For instance, Kwáashk’i Kwáan clan member K’áadasteen’s dictated account in Tlingit, recorded in 1909 by ethnographer John Swanton, features vengeful supernatural wind beings who, when his kinsmen laughed at the eulachon fish they were cooking, “excited fierce south winds that drowned one and left the others stranded for 21 days” (Cruikshank 2001, 383). While Cruikshank recorded the cautionary stories of Tlingit people that sought to avoid offense to an ancestor-being at a time of surging glaciers in periods of advance, glacial regions are just as dynamic in their rapid retreat. Sudden mass ice-calving events at Haupapa could have caused waves that might have upended our boat on the proglacial lake as we came close to the terminus of the glacier.

The melting of Haupapa, in biophysical terms, ultimately accelerates freshwater inflow to the sea, which in turn slows the ocean currents of the salt waters of Te Moana-nui-a-Kiwa, becoming a source of hydroelectric power on its way. The warming sea waters then create a feedback loop of moisture, rain, and increasing cyclonic conditions. But the glacier does more than melt from ice to water. This glacier’s body is understood culturally to be re-forming and continuing as water, retaining its life force, or mauri. The significance of the relational connections made through voicing and naming in the face of climate catastrophe is highlighted by Bull’s observation that the ancient ancestor Rākaihautū could not have named Haupapa awa (lake) at the base of the glacier because “it was not there” (Bull et al. 2022). The proglacial lake only began to form in the 1970s, as a few meltwater pools, but as the climate warmed and took hold, the Haupapa glacier began to melt rapidly. The lake is now over 240 meters deep and 11 kilometers long. Haupapa awa (Tasman Lake) is Aotearoa’s fastest-growing body of wai (water). Geographers Harlan Morehouse and Marisa Cigliano argue: “As glaciers become increasingly iconized in the Anthropocene, they become more detached from cultural and conceptual contexts. Such detachment overlooks how the fate of glaciers is not only a matter of quantifiable loss but is also implicated in everyday encounters, generational experiences, and stories spun at the nexus of ice and

culture(s)” (Morehouse and Cigliano 2021, 913). *MĀKŪ*’s making process counters a detached or objective account of glacial melting by recognizing the mauri of Haupapa as a living entity, even as it changes state.

Disseminating Haupapa’s winds

MĀKŪ has adopted various names and forms, online and in gallery spaces, between 2022 and 2024.¹⁰ The artwork first appeared online as part of the World Weather Network under the title *Haupapa: The Chilled Breath of Rakamaomao* during the volatile spring weather of 2022.¹¹ Winds from Aoraki National Park are registered by anemometers at two NIWA weather stations, where they become digital information in a server, ultimately triggering a range of voice, sound, and image files played by *MĀKŪ*’s custom software. Participants see slowly moving underwater, close-up images of the glacier altered by live weather. Near real-time changes in wind direction and strength at the glacier’s location prompt Bull’s uttering of the names of the same wind element (the names that were recorded earlier on the boat and at the edge of Haupapa lake). For instance, one of the winds is Wawa, which is the northerly land breeze, so in the artwork, audiences could hear a drone triggered by the live north wind data as well as the voicing of the wind name. By spending enough time with the artwork, listeners can hear the weather change.

Shearer’s field recordings of the interplay of the winds in the environment were digitally processed into harmonic drones using Ableton Live software. The composition is created by the weather conditions, with the presence and intensity of the wind drones generating an immersive musicality. Stefan Marks, collaborator and the program designer for *MĀKŪ*, regards his role as a form of “data-driven storytelling,” where he is interested in conveying messages embedded in data from live environments (Marks et al. 2022). Marks gives an instance of how the glacial windscape is mapped in a gallery space or online:

One example is when the live wind comes from the west, the stereo sound of Ron’s voice calling the wind direction is programmed to pan from the right speaker (the west wind)

¹⁰ There are four versions of this artwork, presented from the spring equinox 2022 to March 2024. The first iteration, *Haupapa: The Chilled Breath of Rakamaomao*, commissioned by Te Tuhi for the World Weather Network, was presented online. In 2022 this online artwork was shown at Art Sonje Center in Seoul, South Korea, and SAHA in Istanbul, Turkey, which are also art organizations in the World Weather Network. We focus on the second iteration, which was installed in a physical space: *MĀKŪ, te hā o Haupapa: Moisture, the breath of Haupapa*, at Te Tuhi, Tāmaki Makaurau Auckland, 4 June–30 July 2023. The third iteration of the artwork, *Ngā raraunga o Te Mākū: te hā o Haupapa*, was also installed in a physical space, at Blue Oyster gallery, Ōtepoti Dunedin, 14 September–28 October 2023. The fourth iteration, *Ngā raraunga o Te Mākū: The Data of Moisture*, was installed at Khōj International Artists Association, New Delhi, 31 January–3 March 2024. These two latter versions of the artwork included an additional screen and set of sounds that displayed the live data in abstract lines.

¹¹ The artwork can be viewed at <https://tetuhi.art/world-weather-network/haupapa-the-chilled-breath-of-rakamaomao-artwork/>. Participants can switch to a graphical linear charting by hovering over the right corner of the screen.

to the left (the east wind) across the installation, or across the computer screen if you have headphones for online[.] (Marks, Randerson, and Shearer 2023)

One of the challenges for Marks's custom-built software was the different intervals in which the weather data was collected by the various instruments at the NIWA server, which measured not only wind direction but also temperature, solar radiation, precipitation, cloudiness, and snowfall. Each of these parameters shaped which image was likely to be shown in the installation, the image qualities of saturation and brightness, the direction and speed of movement of the image, and the sound parameters such as volume and panning. Numerical weather datasets always contain gaps and inconsistencies in the data, even while purporting to represent the wholeness of an environment through quantifiable units. *MĀKŪ*'s mapping works with the inevitable missing information between uploads of data samples to create the sensible feeling of a glacial windscape.¹²

When the artwork was exhibited physically for the first time in June 2023, at the opening event at Te Tuhi gallery, the exhibition was blessed according to the gallery's tikanga (Māori-led protocol). As the assembled group entered the *MĀKŪ* installation space, the sound of Wawa noticeably increased in volume: the sound file assigned to the different wind-data streams was programmed to play back louder when the wind was stronger. In that moment, it seemed as if Wawa had stepped up to mihi (greet) the group with an acknowledgment of their northerly location. Kāi Tahu poet Liam Jacobsen read a poem written to Haupapa inside the dark room. In another exhibition of the work in Ōtepoti Dunedin, Bull spoke a live karakia (blessing ritual) in the gallery, mingling with the amplified and projected images, sounds, and data lines.

The sensible and circumstantial

The gathered ancestor winds in Bull's voice, surging within zeros and ones through digital data collected by NIWA anemometers, or the playing of aeolian harps can be positioned as sensible exchangers of the chaotic elements of the wind. Like Reverend Marsden's writings, Serres ranges from myth to geospatiality, embodied local knowledge and global communication, earth science and quantum physics, spirituality, technology, and language. We focus here on his subjective account of the sensible body in relationship to the elements. The sensible, according to Steven Connor (1999), indicates the

¹² The Haupapa online server polls information from the NIWA servers every ten minutes, which, in turn, receive data from the weather stations about once every hour. The sonification and visualization of the artwork interface demands real-time information to keep the audience involved in a flow of movement and sounds. Accordingly, the software interpolates between received actual datasets to achieve the feeling of continuous and dynamic real-time data (Marks, Randerson, and Shearer 2023). See <https://tetuhi.art/world-weather-network/haupapa-the-chilled-breath-of-rakamaomao-artwork/>.

changeable, “that which is capable at any moment of a change of direction.”¹³ Serres also finds potential in art for opening new relations with the biosphere rather than reducing it to resource (2008, 242). As artists, we find the sensible an appropriate concept to model the aleatory winds through the senses. Bull uses language and Indigenous ritual to speak to the wind, while at the same time, we feel the changing winds on our skin or hear them with our ears. In Serresian terms, we imagine artworks that vocalize the wind as exchangers of geographical and cultural information, connected to place and linked by digital currents that radiate the specific and local circumstances outward into the global, always capable of changing meaning. Circumstance for Serres is tied to the sensible. He writes:

the sensible is in general both the constant presence and fluctuation of changing circumstances in the crown or halo bordering our bodies, around its limits or edges, inside and outside our skin, an active cloud, an aura in which take place mixtures, sorting, bifurcations, exchanges, changes in dimension, transitions from energy to information, attachments and untying—in short it is everything that connects a location and a particular individual (or weather?) to the global laws of the world and to the manifold shifting of the mobile niche. (Serres 2008, 303)

Serres proposes that not only human bodies but also instruments or other matter can be “sensible.” He writes:

The magnetic needle can thus be said to be sensible as it vibrates or seeks equilibrium around a fragile bearing. Minute promptings coming from everywhere, in quality, dimension or intensity, on every wavelength make sensibility tremble, fluctuate and sweep and dance randomly over the spaces through which things, the world and others bombard or summon it. (Serres 2008, 304)

To apply this literally for a moment: we audio- or video-record the movements of the anemometer on the NIWA station at Aoraki as it quivers and lightly responds to the winds. A wind-direction rod in Marks’s visualization trembles. The anemometer doesn’t seek equilibrium, yet is sensible to every minute prompting of the wind, which at the same time plays on our own bodies and stimulates Bull’s elemental voicings.

13 Steven Connor, “Michel Serres’s Five Senses,” Michel Serres Symposium, Birkbeck College, conference paper, 1999, <https://www.stevenconnor.com/5senses.htm>.

The winds respond to a highly variable set of circumstances from specific ecological niches in the artworks described in this article. Serres sketches the role of circumstance by shifting from language to physics as follows:

Circumstance describes three things superlatively: the imprecise surroundings of subjects, objects or substances, even more remote than the accidental; highly unpredictable chance occurrences; a tricky history of stasis and equilibrium, disturbances and returns to the original state, deviations towards the fluctuating environment. (Serres 2008, 297)

Attentiveness to places of exchange, feedback loops in systems, deviations, and connecting points also characterize our use of data and recordings of place. Serres often turns to meteorological analogies to describe the “mobile niche” where the local shifts into the global, moving beyond the specifics of place. To extend this to *MĀKŪ* and *Weather Choir*’s dissemination, the World Weather Network is a mobile niche, an exchanger of information to be dispersed more widely than local weather conditions or physically located artwork can be.

To describe an artwork that senses weather circumstances, we also build on the more-than-human orientation of cultural geographers and anthropologists, including Tim Ingold (2010) and Derek McCormack (2017), who problematize the colonial concept of “world,” foregrounded in the global weather map, as a human-centered notion of space-time. Our dwelling in Indigenous temporal and spatial cosmologies, where the deep past is also constantly present as a cyclical indicator of the future, resonates with a postphenomenological account of weather-worlds composed of a mingling of atmosphere and human and more-than-human entities. McCormack finds that attention to circumstantial qualities attunes us to the affective force of life-worlds or weather-worlds (after Ingold 2010). Life-worlds might be felt as a kind of “circumstantial palpability” (McCormack 2017, 2). McCormack surveys discussions of circumstance in philosophy and how the circumstances impinge on the human act, from Thomas Aquinas to Levi Bryant’s onto-cartography, where circumstance opens up agential possibilities felt in forms of life (2017, 7). He focuses foremost on Serres, as we do, arguing that, critically, for Serres, circumstance is not a spatial container or surround: “Instead it is an unformed spatiotemporal envelope whose shape is open. The time or temps of circumstances is therefore meteorological: it is a cloud of conditions that can precipitate as a shape of change” (McCormack 2017, 7). Circumstance is a momentary configuration of elements, forces, and energies that are shaped by noncoincident forces. Although Ingold and Serres come from a philosophical tradition far from Māori or other Pacific cultures, there are resonances where the body is understood as a measure of meteorological experience. The affective force of anticipating future climate-multiplied threats (collapse, storms, or sea-level rise) in response to the

glacial landscape, or what McCormack calls the palpable (2017, 5), may be experienced in the artwork. Palpability might be understood as a feeling or an atmosphere so intense as to seem almost tangible, rather than physically experienced. The sensible (in relation to *MĀKŪ*) is a condition of the sensing body, instruments, and atmospheric interactions that are always subject to change.

Local, global, and spiritual

We attempt to signal the irreducible pluralism of the winds and weather through their unfixed state in open combinations with the potential to affect people differently. Like Serres, we counter the detached global weather visualization, where “The world passes from landscape to panorama, from local to universal, rambling changes into method” (2008, 305). He opposes the unitary framing of panorama with the pluralist assemblage of a landscape, stating, “A rational or abstract panorama expels the combinatory spectra of a thousand landscapes” (Serres 2008, 242). Instead, he celebrates the landscape artist who “stitches, juxtaposes, assembles and tries things out” (2008, 242). The governor, the technician, and the scientist count on obtaining a global result from a local circumstance, Serres writes, “gathering their local models into a totality that mimics the earth” and “receiving gifts from the world and inflicting damage on it in turn” (2008, 43). However, recalling the colonial period in Aotearoa and the Pacific, we note that colonial landscape artists have often been as complicit as scientists in creating representations that reduce the land and its inhabitants to spectacle to entice settlement.

Reverend Marsden, Bull, and Serres all embrace a pantheon of supernatural beings, *atua* in *te reo Māori* (the Māori language), rather than the one God as architect of the universe. Serres decries totalizing forces and many orders of homogeneity, from monotheism (the Word) and scientific law to the monocropping of corn. The industrial path or road that only passes through the land, he argues, “[p]ushes the gods of place aside, goes straight ahead” (2008, 241). His understanding of local belief systems and the disappearance of “a hundred local divinities” springs from small villages and meadows, cairns, glades and vines, sea journeys, and even glacial encounters (Chabournéou) in France (Serres 2008, 1995, 2012). In *Te Moana-nui-a-Kiwa* equally, the resource-hungry demands of multinational agribusiness, the mining of ocean minerals, and the overfishing of sea creatures continues to disregard or erase the bios and spiritual practices of Indigenous care.

While Bull positions the winds and moisture as ancestors, as part of a genealogy of origin, Serres also writes that place names reflect the “body and blood” of their empirical roots in many tongues as advent, the beginning of life. Ancient Hebrew, he writes, “speaks the ruagh, spirit, wind, breath, voice moving above the waters on the first day of Genesis, the preliminary to creation” (2008, 245). Serres never places humans at the center of his philosophy; however, there is a romanticism in his longing for the paganism

of the ancient European village in his wanderings (Johnson 2021). A disjunction between the cosmologies of Serres and of Reverend Marsden lies in the former's location of pagan polytheism in the deep past of European antiquity, myth, and fable (leaving its traces in language and land), while Māori and Tangata o le Moana (Polynesian) collaborators manifest a living, sustained spiritual presence today in Te Moana-nui-a-Kiwa. By the end of Biogea (2012), Serres asks "What lasts in the end?"—whether, ultimately, soft information will have the most impact on forming the future world—noting that he transits from software to the spiritual. He speculates that even as yet unwritten software has the potential to develop our lives in ways we cannot imagine (2012, 195).

Negotiating Western science and Indigenous knowledge

The belief system that created a mathematical, measured version of the reality of winds captured by weather instruments might appear to be an unlikely fit with Indigenous forms of weather knowledge, which once imagined a rich cosmos without Western physics in the precolonial world. *MĀKŪ* opens space for cultural stories and invisible whakapapa (genealogy), along with quantifiable data collected by NIWA instruments from Aoraki village and the Mueller Hut in Aoraki National Park, with a memorandum of understanding between the organization and the artists. A critique of mathematical operations of mapping, as noted by philosopher Hannah Arendt (1958), is the reduction of "sensually given data" to "numerical truths" through the shrinking of complex information into graphs, charts, and colorful animations. Arendt observes that the "eyes of the body" become removed from phenomena through the force of distance (1958, 267). More recently, Eva Horn describes the "panopticon of global weather data," gathered to form the global picture of climate, in a continuation of the statistical nature of modern meteorology (2018, 14). We test whether it is possible to unsettle a distancing, objectifying position of wind as dataset (the legacy of extractive colonial science) in a weather-responsive artwork.

When *MĀKŪ* was exhibited in the closest city to Haupapa glacier, Ōtepoti Dunedin, reviewer Robyn Maree Pickens (2023) teased out the seeming polarity of co-siting the Western science of weather-measurement software alongside Kāi Tahu mātauraka (the Kāi Tahu spelling of mātauranga, knowledge). In her review, Pickens recounts a phone call to Bull, who addressed her concerns about the taking of breath in the glacier-ancestor in the form of winds and representing it as data. This transmutation of biophysical substance to data substance was reciprocated, Bull responded, by karakia (blessings) and oriori (chants, lullabies) spoken in and on Haupapa lake and glacier. The engagement between entities is embodied in the phrase mana ki te mana (where mana means presence and authority that an entity

possesses).¹⁴ Engaging *mana ki te mana* (mana to mana) means ensuring that the mana of all parties is recognized and upheld, preserving balanced and reciprocal relations. In our case, we recognize the mana of Kāi Tahu mātauraka as we recognize the mana of Western science. It follows that Western science should recognize the mana of Kāi Tahu mātauraka.

Without resorting to a binary position where the sensory connection to the winds has been drowned out by quantifying scientific language, with Serres (and as Steven Connor points out), we imagine a condition of the body and atmosphere where place-based knowledge and emergent language of algorithms and information dispersal in digital form may revisit the schism between experience and cognition, art and science (Connor 2008, 13). For Marsden, the cosmic process evidenced in theories of relativity, quantum mechanics, and the uncertainty principle are unified and bound together by spirit. He writes, “The ancient Māori seers like the later modern physicists created sets of symbols to provide them with their maps/models to portray each state in this evolutionary process” (Royal 2003, 30). These models intersect but differ, and we suggest that artworks can mediate between (but not merge) oral, numerical, and instrumental information about the winds, and beyond this the cosmos (Robinson 2020). Marsden also describes a Māori approach to life as holistic, and he avoids “the disjunction between the secular and the spiritual, the compartmentalisation and isolation of one institution from another, and the piecemeal approach to problem and conflict resolution” (Royal 2003, 33).¹⁵ The reclaiming of oral language of *te reo Māori* in the form of a highly specific Indigenous naming of the winds is central to *MĀKŪ*, but we propose that this can occur in parallel with the global distribution, by using weather datasets, eccentrically customized software, and software-distributed media art forms.

Visiting field scientists often spend a long time carefully finding out things that “we know already,” Bull quips, referring to Māori embodied and longitudinal observation of the winds. Julie Cruikshank argues that Indigenous relations to glaciers, as sentient landscapes, “shift their shape” once they are engulfed by sustainability or science frameworks, and transform into “land and resources” (2001, 389). In Aotearoa New Zealand there has been a revaluation of oral histories, and much Māori knowledge formerly separated into the “cultural” realm is now embraced as science, or *pūtaiao*, a contemporary word for Māori biophysical science. *MĀKŪ* was made at a time when *pūtaiao* was debated for and against (by the conservatives) within Aotearoa’s school-curriculum delivery. We felt our way through the

¹⁴ The Māori concept of *mana* is a complex term with many layers. In this context, Māori academic and leader Mason Durie’s statement “all beings and objects are experienced as having *mana*, a form of presence and authority” (quoted in Hoskins and Jones 2017, 52) points to the respect accorded to the sacred beingness of all things.

¹⁵ Reverend Marsden wrote this in response to the Resource Management Act 1991 in Aotearoa, to encourage increased recognition of Māori knowledge in environmental legislation.

discourse around pūtaiao, asking whether the layering of social and technical-instrumental models of winds could sit with a storied approach, while resisting an assimilatory model.¹⁶

For Bull, storytelling with words, storytelling with images, or storytelling with data are different (yet similar) modes of knowledge transfer, and often we need to choose between dual perspectives. An understanding of the Haupapa glacier, lake, and the winds above as sentient beings manifests in a conversation across multiple knowledge forms, yet we signal a tension when we show images of the quivering datasets in a separate room, as a mode switch on the webpage, as a linear overlay that appears and disappears, or as a compass that sits alongside the images and sound.



Figure 7. Ron Bull, Stefan Marks, Janine Randerson, Rachel Shearer. Weather data visualization, including wind direction rod with barbs for wind strength. Third iteration of the artwork titled *Ngā raraunga o Te Mākū: te hā o Haupapa*. Blue Oyster gallery, Ōtepoti Dunedin, Aotearoa New Zealand. Software, video, sound. Image courtesy of Stefan Marks.

To conceive artworks as exchangers of circumstance suggests a negotiation of instabilities between spiritual and earthly realms, between the interior (endosomatic), bodily subject and the minutiae of our weather- and life-worlds, between instrument and player. When *Weather Choir*'s metal resonators are activated as sonorous instruments, transferring the wind's kinetic energy to sound, they manifest a performative and relational connection with the spiritual, listeners, and the wind itself. As Uili Lousi's account of the vibrations of his aeolian harp in Tongatapu signals, the individual experience is only one element in the manifold openings to elemental winds. An openness to circumstance and unpredictability courses through the wind's live coastal performance in *Weather Choir*. Winds unfurl through NIWA's datasets in dynamic uncontrol in *MĀKŪ*, in a highly changeable situation rather than a controlled and predictable one with

¹⁶ Ron Bull addresses this relation between Western and Indigenous knowledge further in an interview with Natasha Matila-Smith: "Pūtaiao (Māori science) and all Mātauraka Māori (Māori knowledge) are essentially forms of scientific knowledge, Indigenous knowledge systems (IKS). The difference between Indigenous knowledge systems and 'Western' science is the metanarrative that underpins them. Both are a form of narrative inquiry that asks the questions: What is that? Where does it come from? What has it got to do with me? ... IKS relies on the telling and retelling of stories that explain relationships and cause and effect. I feel that both, the mind and the body, are ways of ordering the world, the universe and everything into a structure that answers those three big questions" (Matila-Smith et al. 2023).

dependable outcomes. In both artworks, we also see rare states and unusual sounds, which might be the voices of atua. One might come across an image or sound confluence that is seldom seen or heard. When the wind suddenly changes direction, when anomalies are registered by the software and code, suddenly the kind of data spirit that is cleaned by scientists from a dataset—because it doesn’t correlate to general trends—becomes apparent.

The uncolonization of winds

The winds and the artworks that mediate them encompass both the spiritual and the physical; they can be harnessed for energy, and they create their own amusicality. We build on the vital work of Linda Tuhiwai Smith (1999) in developing critical decolonizing methodologies in Indigenous research and for a critique of the scientific positivism that relegates Māori knowledge to the cultural realm rather than considering it as a science in itself. Aotearoa writer and historian Sinead Overbye traces forms of “uncolonization” in artworks that move between the physical realm—homelands, histories, and lived experiences—and the spiritual realm, and between past, present, and future. She reflects on the group exhibition *Whetūrangitia/Made as Stars: Transforming Indigenous Futurism* (2023), which includes artworks such as *Ice spirit* and *Black wolf spirit* by Tcheu Siong, an artist of Hmong ethnicity from Northern Laos. Siong uses the physical art medium of textiles to represent the divine. Overbye writes that Siong’s artwork gives “form to spiritual beings and atua that are often only experienced through feeling, oral histories or dreams” (2023). Overbye continues:

many people talk about decolonisation, and how this might be achieved. The prefix “de” refers to a reversal, or a descent. *Whetūrangitia* goes further, to imagine un-colonisation, a term that insinuates a non-event or an erasure of trauma. Indigenous artists are gravitating towards Indigenous Futurisms so we can un-colonize ourselves, un-slaughter our people, and un-pollute our waters and our lands[.] (Overbye 2023)

In this sense, an uncolonizing of the wind was a vital concept that Bull brought to the *MĀKŪ* collaboration through creative processes of gifting, listening, and returning ancient names. We augment the NIWA measurements, but the winds that pass through the instruments elude capture. As geographers Sarah Wright and Matalena Tofa suggest, “The beings and becomings of weather have their own Law/s, their own knowledges, their own survivances, their own sovereignties” (Wright and Tofa 2021, 1126).

However, *MĀKŪ* is unlike the Indigenous futurisms expressed in *Whetūrangitia*, as the artwork is a collaboration between descendants of settlers (Marks, Randerson, and Purdie) and Māori creatives (Bull and Shearer). While the specificity of windscares foregrounds the Kāi Tahu

cosmologies in Bull's naming of the atua elements, which remain present in oral histories but have been overwritten by Western science, we each bring different histories to place, braiding rather than absorbing these cosmologies together in digital space. A form of uncolonizing might be to remove the European settler descendants altogether and represent, as Bull posed to us, a time when only Māori breath was captured in these glaciers' ice-pocket bubbles. Yet in Aotearoa New Zealand, in activist, creative, scholarly, and political discourse, including the environmental humanities, a partnership between colonizer and indigenous people is recognized.¹⁷ The paired terms tangata Tiriti (people of the Treaty—the European co-signatories of the Treaty of Waitangi and the many cultures that have since made Aotearoa their home) and tangata whenua (people of the land—the Indigenous Māori) express this relationship. The Māori-language version of the Treaty, Te Tiriti o Waitangi, recognized Indigenous sovereignty over Māori lands, sea, air, and winds. Hence, the ongoing struggle for tangata whenua and tangata Tiriti to join as allies to call for the government in Aotearoa New Zealand to “honor the Treaty” after a century or more of breaches.¹⁸

The Breath of Weather Collective also models how assemblages of instruments and people, both Indigenous and settler descendants, foster ethical relations as well as vigilance amid the ensuing climate catastrophe. Artist and writer Dylan Robinson (xwélmexw, Stó:lō/Skwah) articulates the dangers of “inclusionary” cross-cultural or intercultural music performance, where Indigenous performers must fit white listening and performance modalities, and at worst, assimilate cultural law into settler aesthetics (2020, 9). With a focus on Canadian art music that emerged around the time of the Truth and Reconciliation Commission, he cautions that to combine Indigenous and non-Western contemporary art forms may revert to a representational politics that does not address the structural inequities of colonization (2020, 6–7). The non-Indigenous collaborators (Randerson, Marks, and Purdie) in *MĀKŪ*, and Dadson, who initiated *Weather Choir*, position themselves as political allies to the shared honoring of the founding Treaty, yet they still descend from the dominant cultural position of a regime of settler-state governmentality that often fails to recognize Indigenous sovereignty. While Tongatapu has never been colonized, Uili Lousi relates to the prevailing winds of the South Pacific with both openness and prescience of the future inundation caused by the historical and neocolonial resource extraction (notably by America, France, Australia, Aotearoa, and China) that warms our seas and atmosphere. The artists' collaborations surveyed here test

17 The current conservative coalition government led by Prime Minister Christopher Luxon in Aotearoa New Zealand is actively destabilizing this Treaty-partnership model in the name of fiscal responsibility.

18 For a practical overview of what a non-Indigenous ally or “tangata Tiriti” can do to support Māori sovereignty, see Tina Ngata's blog post, “What's Required from Tangata Tiriti” (Ngata 2021).

ways to negotiate this asymmetry and avoid the trap of nonreciprocity, to the ancestor-winds and to the tangata whenua (the Indigenous people of the land).

By unsettling and counter-mapping the Western hold over weather data supplied from a NIWA weather station, or removing it altogether, *MĀKŪ* and *Weather Choir* point to the uncolonizing of Western science as translator-in-chief of the voice of the wind, elevating Indigenous geospatial mapping of winds. In grand narratives of climate change, Indigenous and feminist approaches to understanding eroding coastlines, glacial melting, and wind force are often marginalized, even while they work to integrate counternarratives into broader conceptions of place. To do this in art making has important implications for modeling an ethos of reciprocity and recognizing vulnerability in the face of loss of cultural and natural heritage (Carey et al. 2017, 770). Rather than creating a visualization with numerical representation, a harmonic scale, a foreground and a background used to convince, persuade, and colonize, we hope energetic transfer of the winds brings about their re-embodiment. Robinson describes Indigenous embodiment as the “the literal emplacement of the listener back among sensual experience of place” (2020, 45). *MĀKŪ* and *Weather Choir* attempt to maintain a distinction between the elemental winds, place, people, and scalar relationalities of local and global, in resistance to the conflation of difference, joined but not merged (Robinson 2020, 9; Matila-Smith et al. 2023).

Conclusion

through thin halls of glass, i'm watching Haupapa nurture every
angle of an old
world. stars of pollen and ash roused brutally from an ancient
dream.
i'm thinking of my Nana's posture softening with age, and of
her breath
slow and warm. i remember when talking about weather meant
easy.
the night thickens and Rakamaomao is carrying to my cheek, a
soft chill.

—Liam Jacobson 2023, 51

Between the contingent moment or the chance caress and the
hand given to convention, a day goes by ... A new whole is
reorganised as if from vibrations, sounds of words and heart,
movements and wind: a storm is brewing, the warm breeze
chases the clouds in the sky: the two women, like clouds, go for
a walk: A ramble.

—Michel Serres 2008, 298

The words of Michel Serres and Kāi Tahu poet Liam Jacobson are lightly responsive to the energetic vibrations of the wind and the body at once. Endosomatic reactions are ignited through our senses in a relational tumble of artists' quasi-instruments, aeolian harps, and software. Jacobson read this poem aloud inside the installation at Te Tuhi in June 2023, his Kāi Tahu familial connection voiced with the winds in the artwork. *MĀKŪ* gathers artists, glaciologists, scientists, programmers, and composers, condensed over the longitudinal rhythm of seasons, where the punctuating circumstances of weather events are transformed into intensified sonic moments, and the names of ancestors reach backward and forward in time. The Earth's warming climate intensifies cyclonic winds and multiplies flooding events, and while the ocean circulation of Te Moana-nui-a-Kiwa has historically been a powerful sink for carbon, this ocean is now warming quickly, creating an immense feedback loop with the atmosphere. Melted freshwater from polar sheet ice, amplified by the warm winds that scrape away the glaciers, slows saline oceanic movements. To attend to the affective realm of local expressions of wind creates conditions for knowing climate change more intimately, even while distributed through the World Weather Network through physical cables and intensive energetic cycles. Within given affective circumstances, the practical and processual rather than via the quantitative and representational in artwork, we might begin to reconstruct and uncolonize our subjectivities through remapping affective forces (Overbye 2023; McCormack 2017, 8).

Koea o Tāwhirimātea – Weather Choir draws together local climate activists including Maina Vai, Uili Lousi, and James McCarthy, and all the participants, to collectively hear and then retransmit the cries of our intensifying winds across the ocean of Te Moana-nui-a-Kiwa. Tangata whenua (Māori), tangata o le Moana (Pacific peoples), and tangata Tiriti (people of the Treaty) coexist on wind-tossed islands in the same vast ocean, facing the increasing strength of cyclones from differing ontological positions. As Serres suggests, exchangers proliferate in an unstable whirlpool, in bodies, winds, and instruments, creating unstable audacities and the “chance of slight buffeting of the periphery” (2008, 304). Reverend Marsden, too, looks toward the knotted relationship between world and place, the particular and the general, Indigenous ontologies and the transformation of settler institutions. Uncolonizing practices conceptually unsettle the weight of disciplining the winds, allowing the winds to be and to let go. *MĀKŪ* and *Koea o Tāwhirimātea – Weather Choir* are both in place and out of place with the weather, activating the textures of digital space through sound and voice, foregrounding harmonies and dissonances—with the sensible body.

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Author Biographies

Janine Randerson (Pākehā, of European descent) is an artist, writer, and curator. She is an Associate Professor at AUT University, Aotearoa New Zealand. Randerson often makes or facilitates creative works in collaboration with community groups and environmental scientists from urban meteorologists to glaciologists. From 2022 through 2024 she has been engaged as a curator for the World Weather Network. Randerson's book *Weather as Medium: Toward a Meteorological Art* (MIT Press, 2018) focuses on modern and contemporary art that engages with our present and future weathers.

Rachel Shearer (Rongowhakaata, Te Aitanga a Māhaki, Pākehā) is an artist and academic based in Aotearoa New Zealand. Her work explores listening to the energies of the earth through Western and Māori philosophies and technologies. Experimental music, field recordings, gallery and place-based installation, sound/spatial design, moving image, and writing are all variously engaged toward exploring this theme.

Banner image credit: Aoraki mountain and NIWA anemometer (photo: Janine Randerson, 2022).

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SUPPLEMENTARY MATERIALS

Figure 2. Breath of Weather Collective. *Koea o Tāwhirimātea – Weather Choir*. 2022. Audio file. James McCarthy in Whakatane, Aotearoa (New Zealand).

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Figure 4. Phil Dadson and Breath of Weather Collective. 2022. Audio mp3 file. Aeolian harp mix by Phil Dadson for *Kōea o Tāwhirimātea – Weather Choir*.

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Figure 6. Rachel Shearer, Ron Bull (voice), and Janine Randerson. “*MĀKŪ, te hā o Haupapa: Moisture, the breath of Haupapa*”. 2024. Sound file, audio mix.

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