



Traditional Māori Weather and Climate Forecasting













Over the centuries, Māori have developed an extensive knowledge of weather and climate. The lessons learnt have been incorporated into traditional and modern practices of agriculture, sailing, fishing, and conservation.

NIWA's Māori Environmental Research Centre – Te Kūwaha o Taihoro Nukurangi – in collaboration with iwi from across Aotearoa New Zealand, initiated a pilot project in 2005 to explore Māori knowledge of weather and climate variability and change. The project documented an intimate understanding of local weather and climate conditions, including the use of a vast indigenous nomenclature for local weather and climate phenomena, the oral recording of weather- and climate-based events and trends, and the identification of environmental indicators to forecast weather and climate.

This poster shows a selection of traditional indicators used by Māori from across Aotearoa New Zealand to forecast weather and climate. While the indicators are of most use in their respective localities, many of them are shared by different iwi in other locations. Often more than one indicator is used to forecast for the day, month, or season ahead. While modern methods of weather and climate prediction have demonstrated significant skill and continue to improve, there remain opportunities to enhance our understanding of local weather and climate prediction through the application of Māori knowledge.

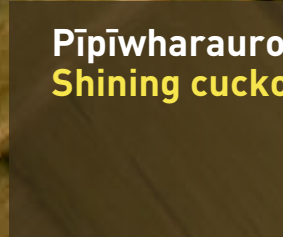

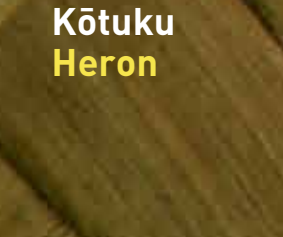
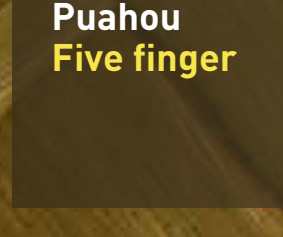

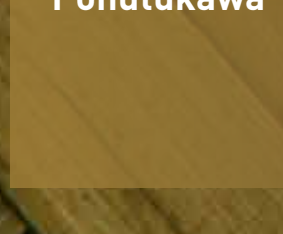



Weather

Weather is the day-to-day state of the atmosphere, varying from minute to weeks (i.e., what you see out of the window each day and over the next few days).

| Name | Indicator | Expected outcome | Iwi/Region |
|---|---|---|------------------------------------|
|  Kārearea Falcon | 1. The kārearea screams in a fine day 2. The kārearea screams on a rainy day | 1. It will rain the next day 2. It will be fine the next day | Ngāpuhi Taitokerau |
|  Pūkeko Swamp hen | Pūkeko head for higher ground | Imminent storm and flooding | Ngāti Wai Taitokerau |
|  Kākā Native parrot | Kākā begin acting up, twisting and squawking above the forest | A storm is on the way | Ngāti Pare Hauraki |
|  Ruru Morepork | The shrill cries of more than one ruru can be heard at night | Rainfall is approaching | Ngāti Pare Hauraki |
|  Ngā ngaru Waves | The sound of breaking waves up the valley | Approaching rainfall and inclement weather in expected | Te Roroa Taitokerau |
|  Pakakē Sea kelp | The furling and unfurling of hanging kelp | Rainfall or storm is expected | Ngāti Wai Taitokerau |
|  Rāwaru | Stones in the belly of the fish | Bad weather is coming | Ngāti Koata Te Taiuhi o te Waka |
|  Moehau Mt Moehau | Large cloud on top of Moehau | Heavy rainfall is imminent | Ngāti Pare Hauraki |
|  Whakaari White Island | 1. The plume lies to the left 2. The plume flattens and the end breaks off | 1. Rainfall is expected 2. Watch out, extreme weather is expected | Te Whānau-ā-Apanui Tairāwhiti |
|  Te Rā Sun | 1. A vivid halo encircles the sun 2. A pale and dim halo encircles the sun | 1. A storm is approaching 2. A storm is far away | Ngāi Tūhoe Mātaatua |
|  Kōhara Lightning | Lightning flickering above the horizon | The side on which the flashes were strongest was a sign of the direction from which the wind would come | Kāi Tahu Te Wai Pounamu |
|  Mangoroa Milky Way | 1. Mangoroa is curved 2. Mangoroa is straight | 1. Bad weather is in prospect 2. Fine weather is expected | Kāi Tahu Te Wai Pounamu |

Climate

Climate is the synthesis of weather, averaged over longer periods from months to years, and even centuries (e.g., this year it was colder than normal).

| Name | Indicator | Expected outcome | Iwi/Region |
|---|--|---|-------------------------------------|
|  Pīpīwharauroa Shining cuckoo | The return of pīpīwharauroa | The beginning of warmer weather | Ngāti Pare Hauraki |
|  Kūaka Godwit | The arrival of kūaka | The season of warming has begun | Ngāti Tūhoe Mātaatua |
|  Matuku-hūrepo Bittern | The continuing cry of the bittern as it moves around at night | A season of floods will follow | Ngāti Ruanui Taranaki |
|  Kōtuku Heron | The heron are plentiful in summer | Gales and a heavy winter will follow | Kāi Waewae Te Tai Poutini |
|  Puahou Five finger | 1. The lower branches blossom first 2. The top branches blossom first | 1. A warm, bountiful season will follow 2. A cold, unproductive season will follow | Ngāti Awa Mātaatua |
|  Pōananga Clematis | Periodic blooming | A warm season lies ahead with gentle breezes | Te Whānau-ā-Apanui Te Tairāwhiti |
|  Pōhutukawa | 1. Flowering starts on upper branches and progresses downwards 2. Flowering starts on lower branches and progresses upwards | 1. A cold winter-like season will follow 2. A warm and pleasant season lies ahead | Te Arawa Wairariki |
|  Ti kouka Cabbage tree | Early and profuse flowering | A long, hot summer follows | Kāi Tahu Te Wai Pounamu |
|  Pareārau Jupiter | The shimmer of Pareārau is light and misty | A wet month follows | Te Whānau-ā-Apanui Te Tairāwhiti |
|  Marama Moon | 1. The moon is lying on its back 2. The moon is standing upright | 1. A dry month lies ahead 2. A wet month lies ahead | Te Whānau-ā-Apanui Te Tairāwhiti |
|  Autahi Canopus | 1. The rays of Autahi shine towards the south 2. The rays of Autahi shine towards the north | 1. Rain and snow will follow 2. The season ahead will be mild and warm | Ngāi Tūhoe Mātaatua |
|  Matariki Pleiades | 1. The stars of Matariki appear wide apart 2. The stars of Matariki appear to be close together | 1. Warmer temperatures and plentiful season expected 2. Cooler temperatures and lean season expected | Ngāi Tūhoe Mātaatua |

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