



Te Wai Pounamu

Weather and Climate Forecasting

The ancestors of Māori who lived across the varied land and waterscapes of Te Wai Pounamu developed an extensive knowledge of local weather and climate. This understanding was based on careful observation of daily, monthly, and seasonal conditions; as well as deeper knowledge about natural linkages in the environment which can reveal much about imminent and forthcoming weather and climate conditons. Such knowledge was critical for minimising the potential for harm in a sometimes harsh and unforgiving environment.

NIWA's Māori Environmental Research Centre – Te Kūwaha o Taihoro Nukurangi, worked with iwi from across Te Wai Pounamu to identify, revitalise and promote the use of environmental indicators to forecast local weather and climate.

This poster shows a selection of indicators used by Māori across Te Wai Pounamu to forecast weather and climate. While the indicators are of most use in their respective localities, many of them are shared by hapū and iwi in other locations. Often more than one indicator is used to forecast for the day, month, or season ahead. It is hoped this work will contribute to reconnecting youth with their environment and making the most of all available knowledge to manage the risks associated with changing weather and climate conditions.

Weather

Weather is the day to day state of the atmosphere, varying from minutes to weeks.

Name	Indicator	Expected outcome	Iwi / Region
 Bar-tailed godwit Kūaka	Paired Kūaka entering a burrow	Fine weather is expected the next day	Waitaha, Kāti Māmoe, Kāi Tahu, Te Taurapa o te waka
 Broad billed prion Parara	Parara arrive on the tītī mutton-birding islands during the night	Gales and heavy rainfall expected the next day	Waitaha, Kāti Māmoe, Kāi Tahu, Te Taurapa o te waka
 Brown tree frog Poraka	Silence of the night is broken when Poraka are heard whistling and croaking	Rainfall the next day	Kāti Huirapa, Kāi Tahu, Arowhenua
 Hector's dolphin Tūpoupou	Hector's dolphins are unusually excited in the wake of boats during summer	Storm on it's way, driven by a northerly	Kāti Mahaki, Makāwhio, Kāi Tahu, Te Tai Poutini
 Ghost moth Takata-wairua	Ghost moths observed flying near a light source	Light, misty rain expected the next day	Kāti Huirapa, Kāi Tahu, Arowhenua
 NZ sandfly Namunamu	Swarms of namunamu start biting aggressively	Rainfall is expected	Kāti Mahaki, Kāi Tahu, Makāwhio, Te Tai Poutini
 Kelp weather-glass Paoro-matapae-huarere	1. The glass is full of air and hard to the touch 2. The glass is spongy and soft to the touch	1. Fine weather ahead 2. Rain is imminent	Waitaha, Kāti Māmoe, Kāi Tahu, Te Taurapa o te waka
 White caps Karu huka	White caps appear within the Bluff Harbour	Westerly blowing. Stronger winds expected bringing rain from that quarter	Waitaha, Kāti Māmoe, Kāi Tahu, Te Taurapa o te waka
 Mt Peel Tarahaoa	A thin 'collar' like cloud surrounds Tarahaoa / Mt Peel	Rain imminent within three days	Kāti Huirapa, Kāi Tahu, Arowhenua
 North-west arch Te Māuru	A mass of dark clouds begins to form above the Southern Alps. Blue sky is seen above and below the clouds	A southerly expected next day. The strength of the southerly depends on the height of the NWA above the mountains	Kāi Tahu, Waitaha, Ōtautahi
 Southerly 'honest wind' Toka	1. Rain with no wind before a southerly 2. Rain accompanied with wind before a southerly	1. Southerly will hang around Kaikoura 2. Southerly will pass through Kaikoura quickly	Kāti Kuri, Kāi Tahu, Kaikoura
 Mares tails Cirrus clouds Ioraki	High clouds similar to horses tails observed above the Canterbury Plains	A shift in weather conditions due in 2-3 days	Ngāi Tuāhuriri, Kāi Tahu, Tuahiwi

Climate

Climate is the synthesis of weather, averaged over longer periods from months to years, and even centuries.

Name	Indicator	Expected outcome	Iwi / Region
 Paradise duck Pūtakitaki	Pūtakitaki nesting near the river	Dry summer season ahead	Kāti Huirapa, Kāi Tahu, Arowhenua
 Grey warbler Riroriro	1. The riroriro builds a nest high in the trees 2. The riroriro chooses to build a home low down among sheltering branches	1. Mild westerly winds will ensure a warm summer 2. Cold southerlies expected	Kāti Huirapa, Kāi Tahu, Arowhenua
 White heron Kōtuku	The kōtuku are plentiful in summer along the West Coast	Gales and a heavy winter will follow	Kāi Tahu, Te Tai Poutini
 NZ fuchsia Kōtukutuku	The leaves of the Kōtukutuku are seen dropping to the ground	Winter is on the way	Kāi Tahu, Te Tai Poutini
 Kōhai	1. A mixture of blooms sticking up and down 2. All blooms drooping 3. All blooms erect	1. Mixed season ahead 2. Cooler season ahead 3. Warmer season ahead	Kāi Tahu, Ōtautahi
 Cabbage tree Ti kōuka	1. Profuse early flowering 2. Late flowering	1. Long, dry summer ahead 2. Wet summer expected	Kāti Huirapa, Kāi Tahu, Arowhenua
 NZ flax Harakeke	Early flowering of the koladi stem (korari)	Long, dry summer is expected	Waitaha, Kāti Mamoe, Kāi Tahu, Te Taurapa o te waka
 Sea fog Kohu moana	1. Sea fog rolling in from the east along the Whakaraupō 2. Numerous sea fog events take place	1. Cold wintery conditions are on the way 2. Colder than normal conditions for the season can be expected	Ngāti Wheke, Kāi Tahu, Rāpaki-Whakaraupō
 New moon Marama korohiti	1. Fine weather during the new moon phase 2. Wet weather during the new moon phase	1. Fine weather expected for most of the month 2. Wet weather expected for most of the month	Kāti Huirapa, Kāi Tahu, Arowhenua
 Crescent moon Marama ohua	Crescent moon seen lying on it's back	Drier conditions expected for that month	Waitaha, Kāti Mamoe, Kāi Tahu, Te Taurapa o te waka
 Rigel Puaka	1. Puaka rises on the south side 2. Puaka rises on the north side	1. Sign of settled and cooler conditions ahead 2. Sign of settled and warmer conditions ahead	Kāi Tahu, Ōtautahi
 Canopus Autahi	Autahi is located far apart from the Milky Way during winter	A dry summer will follow	Kāi Tahu, Ōtautahi