


# Clouds of Aotearoa New Zealand

In Māori mythology, Ranginui (sky father) lay on Papatūānuku (Earth mother). Their children separated them to let light into the world. But brother **Tāwhirimātea** (in charge of wind, cloud and storm) disagreed and went into the sky to be with his father and plot against his siblings.

## Unstable Clouds




Cb

Cumulonimbus

(Latin: cumulus = a pile, nimbus = rain. Māori: rautupu).

Tall bubbly cloud going all the way up to the tropopause, so that the top spreads out and is sometimes anvil shaped. They can occur individually by heating over the land as shown here, or in a line caused by converging air, or in organised lines (squall lines), or embedded in fronts.

**Photo: Neil Gordon, looking north from Te Horo at 8pm Christmas Day 2012.**  
*MetSoc Competition 2013.*




Cb

Cumulonimbus

**Giving hail to Wellington**

Cumulonimbus clouds can be dangerous. They may produce downpours of rain (in Māori: ua tāta) or hail (ua whatu, ua waitara), thunder and lightning (te whatiri, te uira), icing and turbulence for aircraft, bursts of strong winds in downdrafts and squalls (pōkāka) and sometimes tornadoes (āwhiowhio).

**Photo: Peter Fisher, “Giving hail to Wellington.”**  
*MetSoc Competition 2005.*



TCu


Towering Cumulus

(Māori: kapua whakapipi).

When a cumulus cloud grows upwards so that it is taller than its base it is called a towering cumulus. When the cloud gets higher than the freezing level it can produce a shower.

The rainbow is light from the sun split into colours by refraction through a raindrop. These beams then reflect off the back of a veil of raindrops so that they appear to the viewer as a bow of colour. The sun is directly behind the viewer.

**Photo: Lynne Findlay.**  
*MetSoc Competition 2013 2nd Prize winner.*



Cu

Cumulus

(Latin: a pile, also the root for the word “accumulate”. Māori: taipua).

A low-level cloud with a flat base and bubbly top. These clouds form in thermals that rise from the heated earth during fair weather, or where the wind hits the hills.

**Photo: Bill Mariner.**  
*MetSoc Competition 2005.*

## Stable Clouds



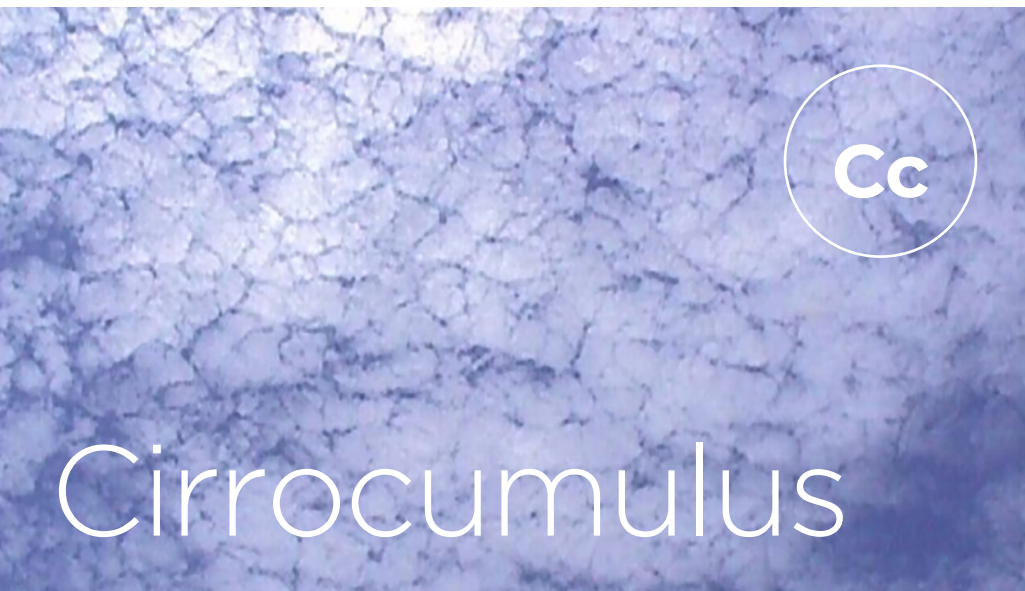
ci

Cirrus

(Latin: tuft of hair. Māori: iorangi).

Made of ice crystals. The first sign of an approaching front. Cirrus streaks are sometimes known as mares' tails.

**Photo: Emma McDonald.**  
*MetSoc Competition 2008.*



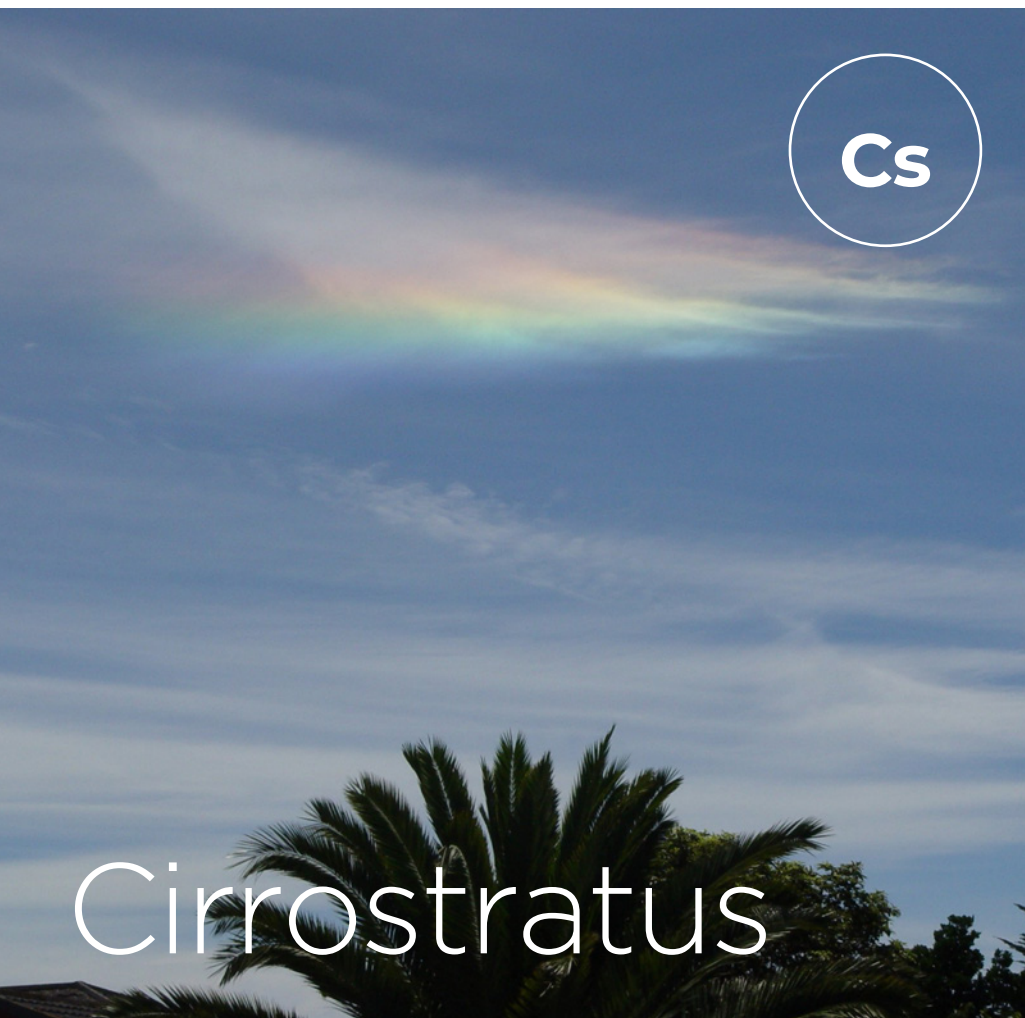
Cc

Cirrocumulus

(Latin: cirrus = a tuft of hair, cumulus = a pile).

A layer of ice-crystal cloud with a bubbly texture.

**Photo: Stephen and Bev Tate, Arthurs Pass.**  
*MetSoc Competition 2005.*



Cs

Cirrostratus

(Latin: cirrus = a tuft of hair, stratus = spreading out. Māori: Pipipi).


A veil of high cloud comprised of ice crystals.

Iridescence (irisation): When sun/moon-light shines on the edge of a cloud containing small liquid water drops or small ice crystals, the light sometimes undergoes interference through diffraction and scattering, splitting into pastel hues, as shown here.

Corona: When the sun/moon is viewed through a thin veil of cloud, iridescence/diffraction forms a bright circular disk that may be surrounded by one or more coloured rings.

Halo: When the sun/moon is viewed through a thin veil of cirrostratus cloud (ice crystals), the light is refracted by the crystals into a ring around the sun/moon covering 22 degrees of the sky. Light spots, pillars, and arches can also appear.

**Photo: Shane/Sharon Walbran, Raumati South.**  
*MetSoc Competition 2005.*



Ac

Alto cumulus


(Latin: Alto = height, cumulus = a pile. Māori: kapua waenga).

A grey/white layer of mid-level cloud with shading and texture. The sun may appear as shown here as if viewed “through a glass darkly”.

These clouds can be blown into a wavy pattern by wind over mountains. If the air is stable, the clouds downstream of mountains may become lens-shaped and these can stack like pancakes (Alto cumulus lenticularis).

Sometime looks like scales of a fish (mackerel sky) or, in Māori, māra kūmara a Ngātoro-i-rangi (rows of kūmara).

**Photo: Smith, Waterview, Auckland May 2008.**  
*MetSoc Competition 2008.*



Ac

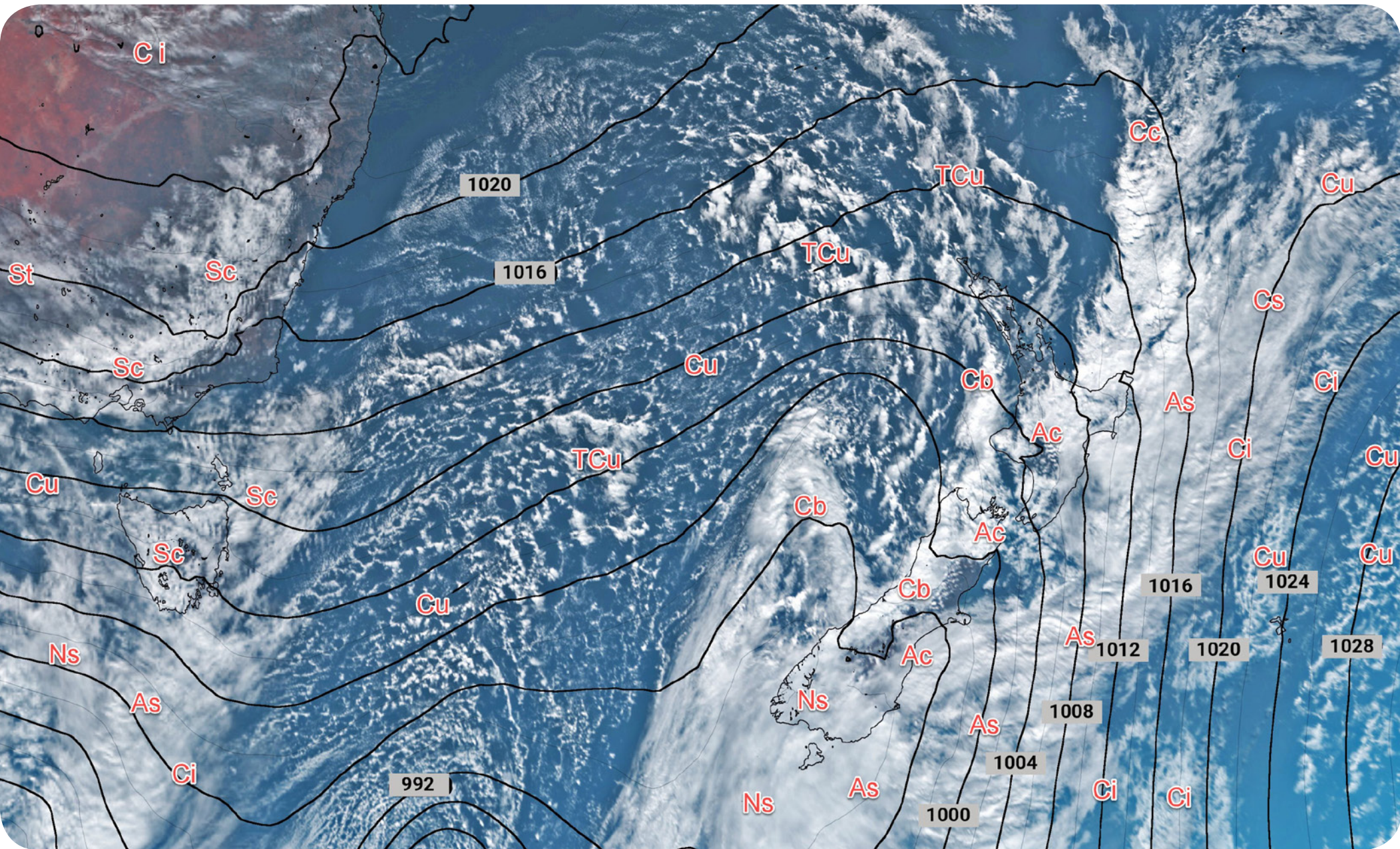
Northwest arch Alto cumulus Asperitas


(Latin: Alto = height, cumulus = a pile, asperitas = roughness).

The air downstream of an alpine range may be turbulently lifted and then may descend fast making a zone of clear air.

Turn this photo upside-down and see how the cloud underbellies mimic the surface of a choppy sea.

**Photo: Bill Slater, Hanmer Springs.**  
*MetSoc Competition 2005 winner.*





As

Altostratus

(Latin: alto = height, stratus = spreading out. Māori: waenga pūtahi)

A sheet of grey or blueish mid-level cloud without texture but possibly moulded by the landscape. It usually develops from thickening/lowering Cirrostratus.

**Photo: Darrel Goosen.**  
*Mt. Ruapehu MetSoc Photo Competition 2005.*



Ns

Nimbostratus

(Latin: nimbus for rain, stratus for spreading out. Māori: okewa).

RAIN from dark blueish-grey mid-level cloud from a passing front.

In this photo the rain is in the hills behind the lake.

**Photo: Lake Brunner.**  
*MetSoc Competition 2005.*



St

Stratus

(Latin: past participle of the verb sternere = to spread out. Māori: pūtahi).

Cloud touching the ground.

FOG/MIST (Māori: kohu) is a form of stratus over land that can occur in many different ways.

Radiation/Valley fog is formed when land or hillsides cool at night.

Post-frontal/precipitation/evaporation fog forms when air near the ground has been moistened by recent rain.

Advection fog is formed when warm moist air blows over a cooling sea.

Steaming fog occurs when cold air meets warmer water.

Upslope fog occurs when moist stable air blows onto rising terrain.

**Photo: Lisa McDonald, Dannevirke.**  
*MetSoc Competition 2015.*



Sc

Stratocumulus

(Latin: stratus = spreading out, Cumulus, a pile. Māori: pararahi taipua).

Grey/white low clouds with flat tops and a lumpy base. Can be formed by wind blowing over land/sea or by cumulus cloud spreading out when reaching a stable layer.

Usually only 300-600m (1000-2000ft) thick.

**Photo: Arjan Van Woensel.**  
*MetSoc Competition 2008.*

### Clouds from weather maps

Basically, there are three types of clouds: flat, wavy and bubbly. The determining factor is “upward motion”.

#### Flat clouds

Flat clouds are the result of gentle large scale upward motion such as when moist warm air from the tropics rises slantwise along a slope such as a frontal boundary. A front is where an invading airmass meets the surface. When thick enough, flat clouds bring RAIN (Nimbostratus).

#### Bubbly clouds

Bubbly clouds occur where the air has sufficient buoyancy to rise against gravity. This is called unstable air and occurs on a smaller scale in time and space than stable air. They produce SHOWERS.

#### Wavy clouds

Wavy clouds are produced by strong winds blowing over mountains on a stable day. Usually, there is no rain or showers.

The Latin names for clouds were introduced by Luke Howard (a chemist) in 1802.

### Isobars

Average surface atmospheric pressure is 1013.25hPa. The nearest isobar to that is 1012hPa, and indeed it is usually the straightest isobar on the weather map. Isobars with lower values are cyclonically curved and generally associated with unstable air. Isobars higher than 1012hPa are usually anticyclonically curved, with stable air.

