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Meteorological Society Of New Zealand (Inc.)



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Autumn 2016



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**Our President, Dan Kingston, is pleased to announce
that our 2016 AGM
is to be held in WELLINGTON
on the afternoon of 16 November
at MetService
along with some short papers for presentation:**

Although this won't be a formal call for interest/abstracts, Dan would like to propose that we go with a general theme of "Challenges in observing and forecasting in Earth system sciences". Members who would like to present something along these lines are invited to let Dan know at daniel.kingston@geography.otago.ac.nz

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UPCOMING CONFERENCE

**MSNZ (Meteorological Society of New Zealand)
AMOS (Australian Meteorological and Oceanographic Society)
And ANZCF (The Australia-New Zealand Climate Forum)
Are planning a combined conference 7-10 February 2017
at Australian National University, Canberra**

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AROUND THE REGIONS

DUNEDIN

4 Feb :

Dr Anne Thompson, NASA/GSFC, Strategic Ozonesonde networks: insights into ozone structure from SHADOZ (1988) and the campaign IONS series.



The Edward Kidson Medal: call for nominations (Deadline: May 31, 2016)

The Meteorological Society of New Zealand (Inc) is now calling for nominations for the Edward Kidson Medal. The award is made every two years and was first awarded in 2003.

The award is named in honour of Edward Kidson, Director of the New Zealand Meteorological Service from 1927 to 1939. Kidson was instrumental in placing New Zealand meteorology on a sound scientific footing and is regarded as a key figure in the development of meteorology and climatology in this country. His own scientific work in meteorology covered a wide field and he had an international reputation for his papers on Southern Hemisphere atmospheric circulation. His papers on New Zealand's climate remained standard works for many years.

The Edward Kidson Medal will be awarded to the author of an outstanding scientific paper published in a refereed scientific journal, which:

advances the science of meteorology and/or climatology, or

advances understanding of the influence of meteorology and/or climatology or other meteorological factors in other fields of scientific or human endeavour, or conversely, the influence of other sciences or endeavours on meteorology and/or climatology, or

reports on significant and novel scientific, educational, social or economic application of meteorology and/or climatology.

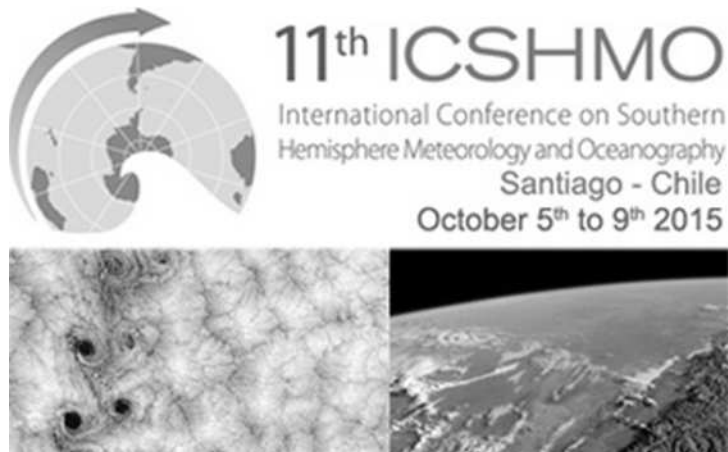
Nominees for the Edward Kidson medal should normally be New Zealand residents, but others who have a significant connection with New Zealand, particularly in the field of the atmospheric sciences will be considered. All nominations must either be by a current member of the Meteorological Society of New Zealand or include a written endorsement by a current member. Full details of the rules for consideration and awarding of the Edward Kidson medal can be found at the following

URL: <http://www.metsoc.org.nz/awards/edward-kidson-medal>.

Nominations, with supporting statements and including copies of the relevant paper, should be sent to info@metsoc.org.nz

The deadline for nominations is May 31, 2016

The winner will be announced in November 2016



In the first week of October 2015, I had the fantastic opportunity to spend a week in Santiago, Chile to attend the 11th International Conference on Southern Hemisphere Meteorology and Oceanography (ICSHMO). Held once every three years, this event is the pre-eminent gathering for scientists from around the world who specialise in all things to do with Southern Hemisphere oceanic and atmospheric sciences.

Hosted by the Universidad de Chile, I made sure to give myself plenty of extra time to arrive for the start of the first morning – turns out this was a wise decision, as there was a surprising absence of street signs along the 2km walk from the metro station to the conference venue! The end result meant I enjoyed the scenic route through some of the lesser-seen, but nevertheless pleasant parts of suburban Santiago before the first presentations of the day.

The sessions presented over the five days of the conference were as varied as they were enthralling. Particular highlights for me included keynote presentations by Michael McPhadden, describing what we were likely to expect from the (at that point) impending ‘Godzilla’ El Niño of 2015/16. Elizabeth Barnes also gave a fascinating explanation of the physical mechanisms which govern the Baroclinic Annular Mode (BAM) – that fact I could follow the presentation despite the complexity of the topic was just a testament to the quality of the speaker, and I took away many tips about how to communicate complex ideas in a simple manner for future conference presentations.

I also presented a poster on some of my work, looking at how synoptic bands of extreme moisture from the tropics (commonly called ‘atmospheric rivers’) influence precipitation extremes, particularly over extratropical and mid-latitude regions. Previous research has focussed almost exclusively on Northern Hemisphere locations, such as Western USA or Western Europe, so my work, proposing a new metric which enabled an assessment of the link between extreme rainfall events and these types of tropical moisture outflows for anywhere in the world, tied in well with the Southern Hemisphere aspect of the conference. I have no doubt that the opportunity to gauge feedback from experts at the conference will have flow-on effects to greatly improve the remainder of my PhD research.

The other real highlight of the week was a (genuinely treacherous) 2-hour bus ride into the foothills of the Andes for an evening BBQ. Ignoring the fact we were in a regular commuter bus navigating dirt trails that were more suited to a four-wheel drive, the pilgrimage was a worthwhile one, as I have never enjoyed a barbeque so much as one which included locally-sourced Chilean steak cooked to perfection. A great way to round out what was an incredibly worthwhile conference.

I’d like to pass on my sincere thanks to the MetSoc committee for establishing the annual Student Travel grant scheme, without which, I would not have been able to enjoy such an enriching experience at ICSHMO11.

Many thanks, Luke Harrington, Victoria University of Wellington



Summer 2015-16 (NIWA)

The warm air from the tropics contributed to the 2015-2016 summer being warmer than average for most of New Zealand.

Across most of the country, above average (+0.51°C to +1.20°C of the summer average) or well above average (> +1.20°C of the summer average) temperatures were experienced.

Temperatures

The North Island was particularly warm. The only locations in New Zealand where near average (-0.51°C to +0.50°C of the summer average) temperatures were recorded were in parts of coastal Canterbury. In particular, February was a notably warm month, with the second-highest national mean monthly temperature on record using NIWA's seven-station temperature series. For the season as a whole, the nation-wide average temperature in summer 2015-16 was 17.5°C (0.9°C above the 1981-2010 summer average, using NIWA's seven-station temperature series which begins in 1909).

Rainfall

The moist, humid tropical air masses affecting the country (including the remnants of four tropical cyclones) also caused numerous rain events throughout the summer. With its predominant south-westerly flow and high pressure over the country, December was a very dry month for many parts of New Zealand. But with the change to more northerly-quarter winds than usual for January and February which brought more rain, fears of El Niño-associated drought were alleviated in many parts of the country. For summer as a whole, near normal rainfall (80-119% of the summer normal) was observed for most of the upper half of the North Island, as well as Gisborne and northern Hawke's Bay. Above normal rainfall (120-149% of the summer normal) was also recorded at certain sites in Northland and Coromandel. However, it was still a dry summer for some, with below normal rainfall (50-79% of the summer normal) for most of the lower half of the North Island. For the South Island, near normal rainfall was experienced in most places with pockets of above normal rainfall in West Coast, Tasman and Christchurch, and pockets of below normal rainfall (50-79% of the summer normal) in Marlborough, Queenstown-Lakes, and Central Otago.

Soil moisture

Due to the heavy rainfall events that occurred in January and February, the patterns of soil moisture changed drastically throughout summer. At the end of December, soil moisture levels were below normal for the time of year for almost the entire country. However this changed overnight with heavy rain and flooding on New Year's Day in northern parts of the country. As such, by the end of January soil moisture levels had increased somewhat over most of the country, particularly in areas such as Northland and Coromandel which were affected by rainfall over the New Year period. As of 1 March 2016, soil moisture levels were above normal for the time of year for eastern Northland and Auckland, Coromandel, the Bay of Plenty, northern Tasman, Nelson and parts of eastern Waikato and Southland. Drier than normal soils were evident in the remainder of the North Island as well as eastern parts of Canterbury and Otago.

Sunshine

Summer sunshine was relatively evenly distributed between above normal (110-125% of the summer normal) and near normal (90-109% of the summer normal) for different sites around the country (no distinct patterns observed), except for the Bay of Plenty which had below normal sunshine (75-89%). In fact, Tauranga had its cloudiest summer on record, with 77% of normal summer sunshine. The only location with well above normal sunshine (>125% of the summer normal) was Dunedin.

Further highlights

Further Highlights include:

The highest temperature was 36.4°C, observed at Leeston on 21 December.

The lowest temperature was -1.2°C, observed at Manapouri on 4 January.

The highest 1-day rainfall was 331 mm, recorded at North Egmont 17 February.

The highest wind gust was 183km/hr, observed at Cape Turnagain on 10 January.

Of the six main centres in summer 2015-16, Auckland was the warmest, Dunedin coolest, Wellington driest and sunniest, and Tauranga was the wettest and cloudiest.

Contact

**For further information, please contact: Mr Chris Brandolino
NIWA Forecaster – NIWA National Climate Centre Mobile (027) 866 0014**



NOTABLE WEATHER IN NZ: SUMMER 2015/16

Despite it being an El Nino summer, which traditionally results in more westerly quarter flow over NZ, the weather this season was much more varied. December did see more southwesterly flows, but several low pressure systems affected the country during January, bringing more rain than expected. February was notable for northerly and northwesterly flow bringing unusually warm conditions to most areas.

DECEMBER

1st - Heavy rain in Buller, e.g. 80mm in Westport.

2nd - Very warm in east and south of South Island; several Canterbury stations reach over 30C (34C in Leeston), and 29C maximums in Lumsden and Tiwai Point are new December records. Heavy rain in Fiordland, e.g. 161mm at Milford Sound.

3rd - Temperatures again very warm in east of South Island (up to around 30C in places after overnight minimums in high teens), but cool southerly change sees them quickly dropping by about 10-15C.

4th - A few afternoon thunderstorms in Northland.

8th - Westerlies reach gale in parts of Central Otago. Tree falls onto road near Wanaka.

7th - Scattered afternoon thunder and hail in mid and South Canterbury.

10th - Very warm in some eastern areas, with temperatures reaching around 30C in parts of Canterbury.

12th - Northwesterly gales about Cook Strait, e.g. 132 km/hr gust recorded at Mt Kaukau.

13th - Thunderstorms, hail, and tornadoes in Canterbury. (see details below) Scattered hail elsewhere in South Island.

14th - Light frosts in some inland parts of Canterbury in wake of cold southwesterly change the day before, e.g. 0C minimum in Cheviot. However, temperatures rise to the 20s by afternoon, as a westerly flow develops.

15th - Cold south to southwest changes spreads over South Island, with some scattered thunder and hail.

16th - Hailstorms in Nelson region (see details below), and scattered thunder and hail elsewhere. Funnel cloud seen south of Methven about 7pm. Rather cold southerly flow over southern and central NZ, with fresh snow on South Island ranges.

17th - Low pressure over and to east of North Island, maintains southerly flow over northern and central NZ, with below normal temperatures. (e.g. only 16C maximum at Port Taharoa)

18th - Unstable southerly continues over North Island, with afternoon thunderstorms in Waikato and western Bay of Plenty.

21st - Exceptionally warm day in east of South Island, thanks to a foehn northwesterly flow originating from central Australia. Temperatures rise into the mid-30s in several places, with several new December records broken, e.g. 36C at Christchurch Airport, and 34C in Timaru and Dunedin. Northwesterlies rise to gale in far south, e.g. 176 km/hr gust recorded at Southwest Cape, Stewart Island. (a new December record)

22nd - Unusually warm in north of North Island, e.g. 31C maximum in Whakatane and 30C at Leigh (a new December record) Cheviot has its highest recorded December overnight minimum (21C), but a much colder southerly flow spreads over the South Island overnight and in the morning, with daytime temperatures some 20-25C colder than the day before.

24th - Heavy downpours cause flooding in northern parts of Auckland district, with some homes flooded at Omaha. 59mm recorded at Whangaparaoa.

26th-28th - Warm in many areas, especially inland and in the far north. Some high temperatures recorded include 33C in Cromwell (28th), 30C in Reefton (28th), and 28C in Kaikohe. (27th)

28th - Afternoon thunderstorms in Rotorua/Taupo areas.

29th - Evening thunderstorm in Lewis Pass area.

31st - Unusually warm 27C maximum in New Plymouth, thanks to foehn east to northeast flow.

JANUARY

1st-3rd - Deep low brings heavy rain and gales to northern areas. (see details below)

4th/5th - Unseasonably cold nights in many areas, as ridge covers southern and central NZ in wake of southerly of the 3rd. 0C minimums, all new record lows for January, are recorded in Lumsden and Queenstown on 4th, and Turangi on 5th.

8th - Occluded front brings a period of heavy rain and gales to north and west of North Island.



Widespread flooding in Auckland, with several properties flooded in west of city.

8th/9th - Cold in the far south, with snow on the ranges. 5C minimum in Greymouth.

10th - Brief period of westerly gales in southeastern North Island, e.g. 183 km/hr gust at Cape Turn Again.

11th - Chilly start to the day in inland South Island, with light frosts in places, e.g. -1C minimum at Tekapo and 0C at Manapouri.

13th - Chilly in some eastern areas, under a southerly flow, e.g. only 11C maximum at Le Bons Bay, and 13C in Cheviot.

15th - Northwesterly gales for a time in Kaikoura and Canterbury, including Christchurch. (where some trees were felled)

17th - Sea fog in Wellington causes disruption at airport. Afternoon thunderstorms in central North Island; downpour causes considerable damage to Tongariro Track.

18th - Heavy rain in north and west of the North Island. Thunderstorms about central NZ - 28 lightning strikes recorded around Wellington.

19th - Heavy rain causes flooding in South Canterbury, with widespread surface flooding. Timaru records 81mm, a new daily record for January. Thunderstorms in inland areas of upper South Island.

22nd-25th - A period of heavy rain in Fiordland and South Westland, e.g. 195mm at Milford Sound and 168mm at Secretary Island, both on 23rd.

24th - Very warm in north and east of North Island under a north to northwest flow, e.g. 34C maximum in Gisborne, 31C at Castlepoint and 29C in Mangere, Auckland.

26th - Sunshine and a light northerly flow pushes Masterton to 34C, its highest recorded for January. In the central North Island, high temperatures cause a goods train to derail due to buckled lines

27th - Thunderstorms in central and upper North Island. Downpour causes surface flooding in South Auckland, with many fire service call-outs. Unusually warm, e.g. 21C overnight minimum in Whakatane and 18C at Motu, both new January records.

27th/28th - Heavy rain in east of North Island, with some flooding about Gisborne and Hawkes Bay, including in Napier. Wairoa (101mm) and Mahia (63mm) record January high totals on 28th.

29th-31st - More thunderstorms in northern and central areas of North Island, which lie under a warm and unstable airmass. Kaitia records a 29C maximum on 30th.

FEBRUARY

3rd - Unusually warm in many inland areas of both islands, and the south of the South Island. High maximums include 35C in Clyde, 34C in Cromwell, 32C in Gore, 31C in Invercargill, and 30C in Levin. Puysegur Point's 26C maximum is a new February record.

4th - After a very warm day, the night of 3rd/4th is also unusually warm in the lower South Island. Wanaka and Cromwell only drop as low as 20C, while new record high minimums are recorded at Milford Sound (18C), Secretary Island (18C), and Puysegur Point. (19C)

5th/6th - Heavy rain in north of North Island.

6th - Foehn easterly flow results in high temperatures and southwest of North Island and Buller regions, e.g. 30C maximum in Paraparaumu (new February record) and 32C in Reefton.

10th - Unseasonably chilly start to the day in the far south, due to clear skies following an injection of cool air the previous day. -2C minimum at Manapouri. By contrast, warm 31C maximums are recorded in Blenheim and Whakatane under sunny skies.

13th - Afternoon thunderstorms in central North Island.

16th-19th - Heavy rain and gales in many areas. (see details below)

23rd - 31C maximum in Napier, under sunshine and a light northwesterly flow.

25th - Thunderstorms in Fiordland, with a woman being struck by lightning. (though only receiving minor injuries)

23rd-28th - Very warm spell in many areas, due to predominance of northwesterly flow over South Island, and light northerlies over the North Island. Both maximum and minimum temperatures are unusually high in northern and eastern areas. New February record maximum of 34C in Masterton on 26th, while new records for monthly high minimums are broken in Kerikeri (22nd on 28th) and Cheviot (21C on 27th)

27th - Heavy rain about Auckland due to disturbance in the warm, humid northerly flow. Falls heaviest in northern parts of the district, with the rain resulting in power disruptions.

29th - Warmth continues over North Island, with very high overnight minimums, new February records achieved in Whitianga (22C), Whangaparaoa (20C), and Masterton. (20C) By contrast, a cold southerly change spreads over South Island, with much lower temperatures, especially in the



east. (some 15-20C lower than recent days) Le Bons Bay reaches only 11C, Waipara West 23C, and Southwest Cape, Stewart Island just 10C.

MAJOR EVENTS

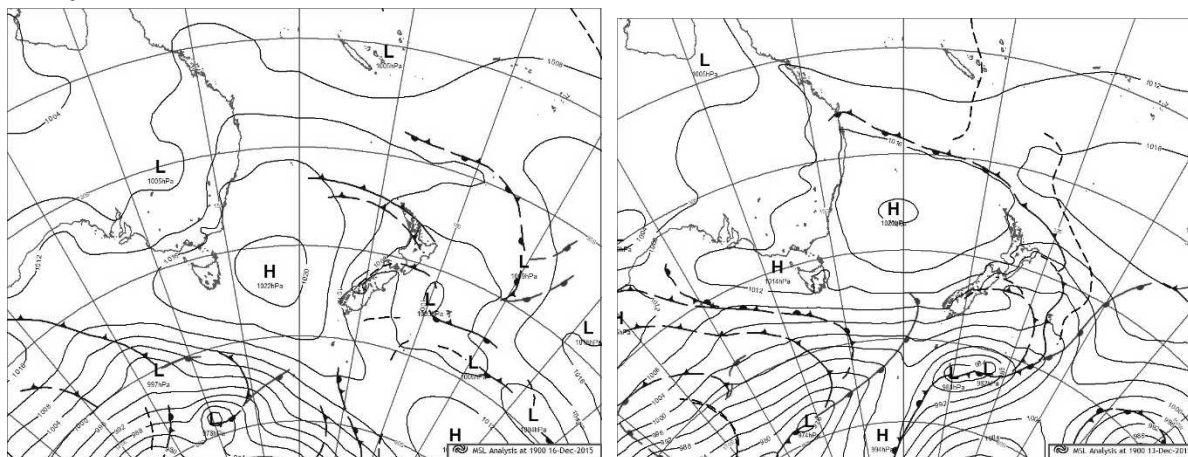
13th December - Thunderstorms, hail, and tornadoes in Canterbury/ 16th December - Hailstorms in Nelson region

Thunderstorms brought heavy hail to Canterbury on the 13th and the Nelson region on the 16th, with damage resulting from both these storms.

Canterbury storm

A disturbed west to southwest flow covered NZ on the 13th, in the wake of a cold front. In Canterbury, the sunshine allowed the ground to warm up in the morning. A disturbance moved across the South Island during the day, reaching mid Canterbury around midday, and bringing a change to colder southwesterlies. The instability of the airmass made these conditions ideal for the formation of severe thunderstorms

The biggest cell swept through the area around midday and early afternoon. Heavy hail fell (reportedly up to 3cm in diameter) leaving a white blanket in many areas, including Christchurch city. This resulted in several insurance claims regarding damage to properties and crops. Some small tornadoes were seen on the Mid-Canterbury Plains, causing some minor damage on farms. Another storm cell swept through the area later in the afternoon with more thunder and hail, though not nearly as severe as the earlier one.

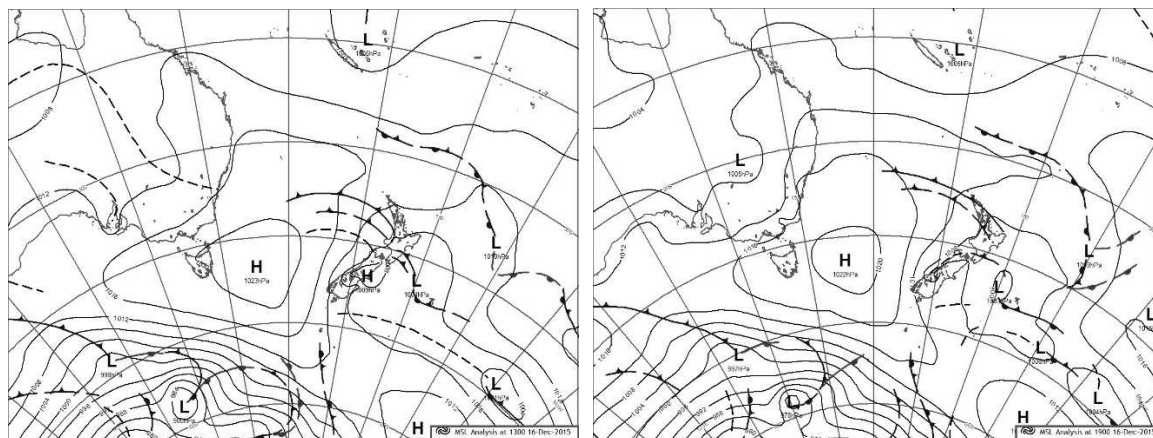


Mean sea-level analyses for 1am NZDT 13th December and 7pm NZDT 13th December are shown here.

Tasman storm 16 December

With a complex low pressure system to the east of NZ, a rather cold, disturbed southerly flow spread over most of the country on the 16th. The Tasman district was initially sheltered from the cloud and precipitation contained in the flow, and sunshine allowed the ground to warm up during the day. But as a disturbance in the flow crossed the region late in the day, the increased instability combining with the sun-warmed ground led to thunderstorms in the area.

These storms contained large hail (some stones as big as 50c pieces) which damaged many orchards around Motueka, the Waimea Plains, and the foothills. Damage was variable, but some growers reported 40-50% of their crops being significantly damaged.



Mean sea-level analyses for 1am NZDT 16th December and 7pm NZDT 16th December are shown here.

1st-3rd January - Deep low brings heavy rain and gales to northern areas

2016 began with a period of stormy weather in the north of the North Island, with heavy rain and gales causing significant disruption in this area.

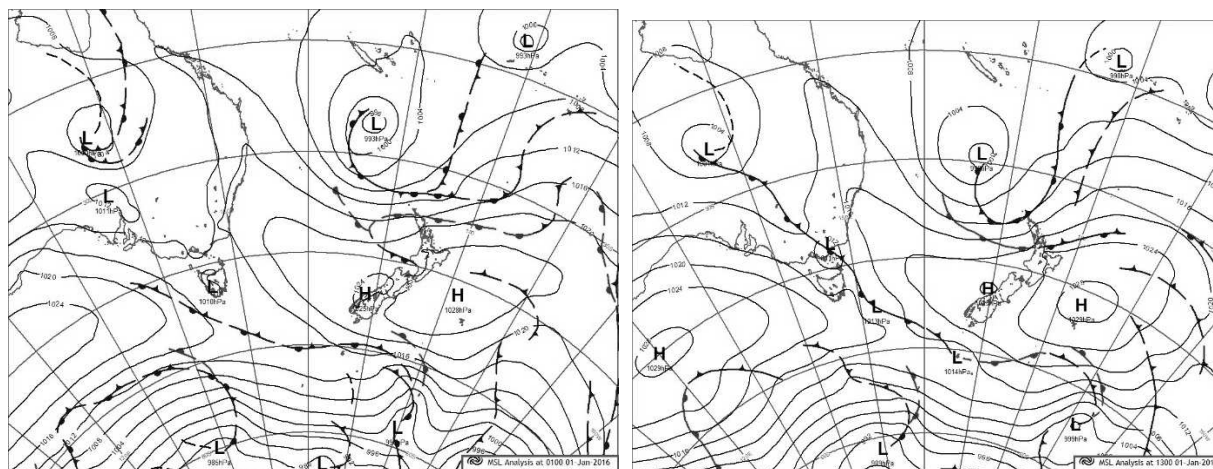
A deep low of subtropical origin slowly pushed south into the North Tasman Sea on the 1st, but was held back by a ridge extending westward from a high to the east of NZ. This situation persisted into the 2nd.

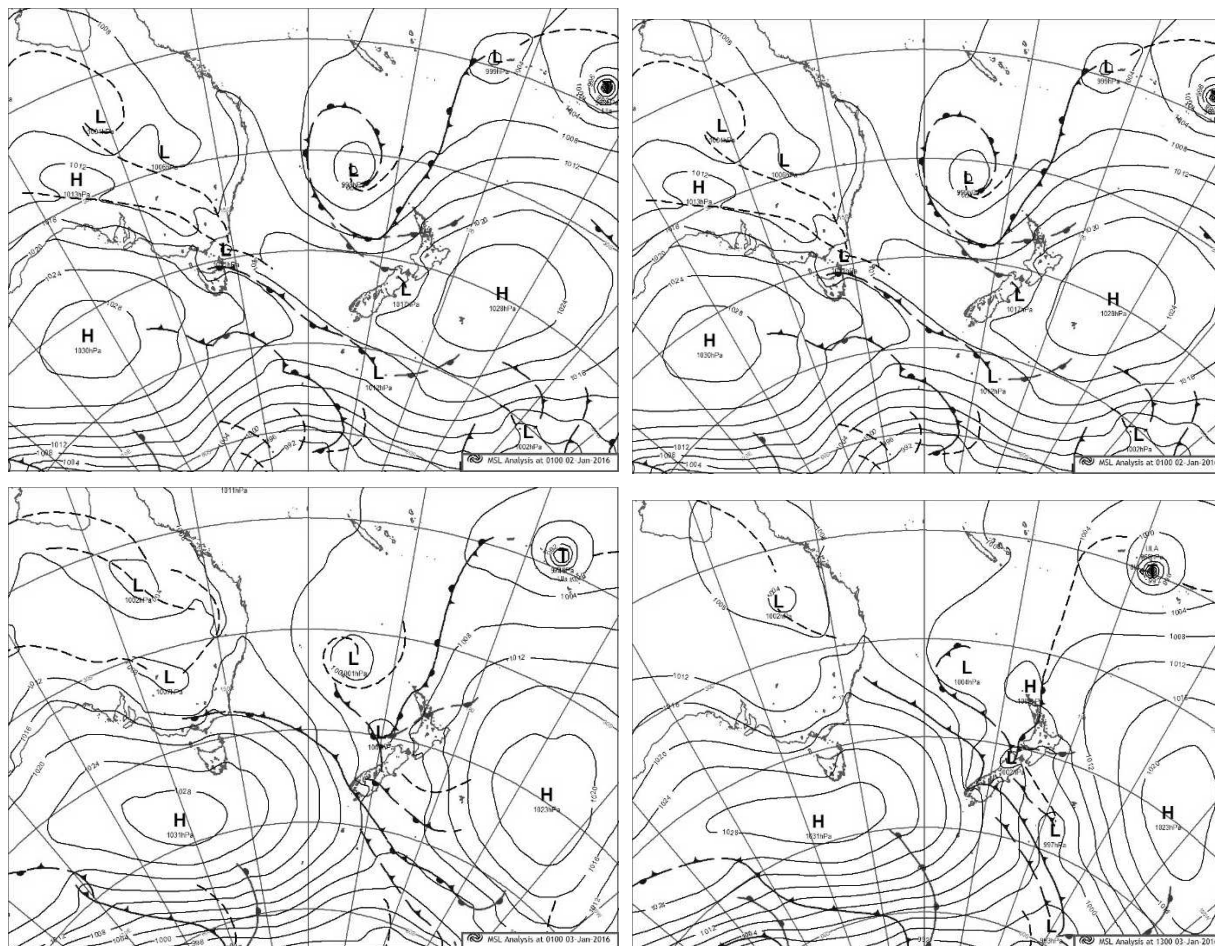
This resulted in a strong east to northeast flow over the north of the North Island. Disturbances in this flow brought heavy rain to this area, with many stations recording the equivalent of their January monthly average over the two days. (eg 119mm in Whitianga) Flooding affected many areas, including several campsites.

The unpleasantness of the weather was compounded by gale force winds which lashed exposed northern areas (gusts reached 122 km/hr at Cape Reinga on 2nd) There were some localised power cuts as a result of trees falling on power-lines.

Not surprisingly, with all this wind and rain, many holiday campers decided to head home early.

Later on the 2nd, the high to the east moved further away, allowing the low to move further away. A trough and fronts in the South Tasman Sea moved onto the South Island, collapsing the ridge. As this new system crossed the island overnight 2nd/3rd, it was soon followed by a colder southerly change over the island, with some rain in eastern areas and snow on the mountains. Parts of drought stricken North Canterbury received their first significant rain for many months, with 30-40mm recorded in some stations.





Mean sea-level analyses for 1am NZDT 1st January to 1pm NZDT 3rd January in 12 hour steps are shown here.

16th-19th February - Heavy rain and gales in many areas

An active trough with several fronts, preceded by a strong, moist northerly flow, slowly crossed NZ during this period with heavy rain in northern and western areas. This was worst in the Westland and Nelson areas, with extensive flooding.

A moist northerly flow already covered NZ on the 16th, with an anticyclone well to the east. A trough in the South Tasman Sea moved onto the lower South Island by the end of the day, and slowly crossed the rest of the island the next day with a secondary low forming in the South Tasman. Heavy rain fell in the north and west of the island, with the Nelson region particularly hard hit - the 126mm recorded at Appleby on the 17th being the highest daily total for any month, while a rain gauge in the hills behind Takaka recorded a massive 48 hour total of 528mm over the 16th and 17th. Not surprisingly, there was extensive flooding throughout the region. Hokitika was also badly flooded on the 16th, with 186mm recorded.

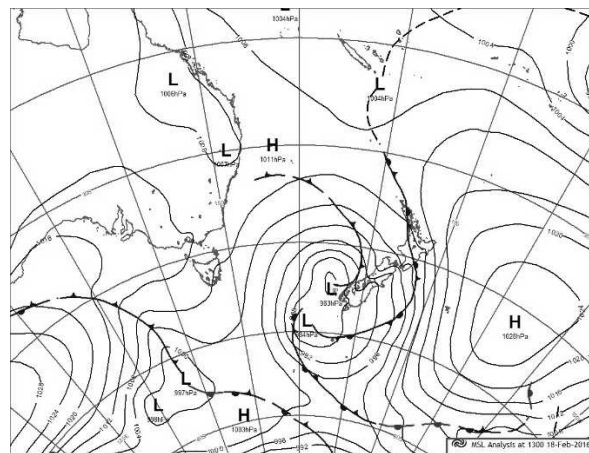
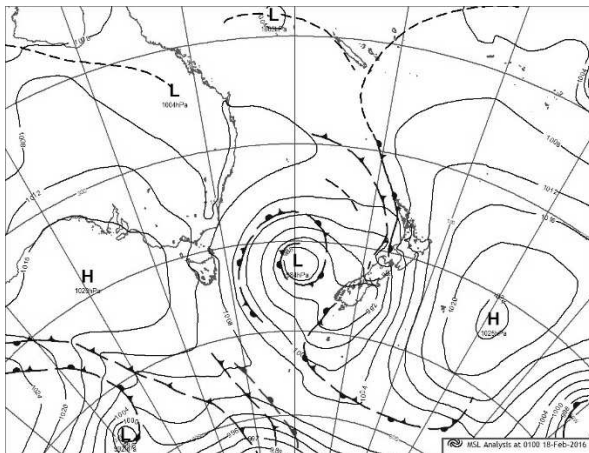
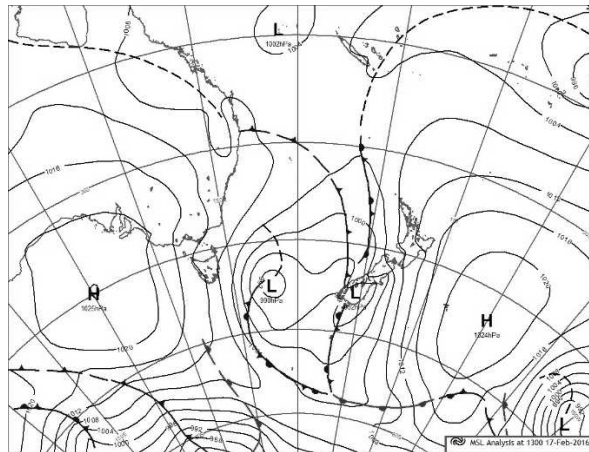
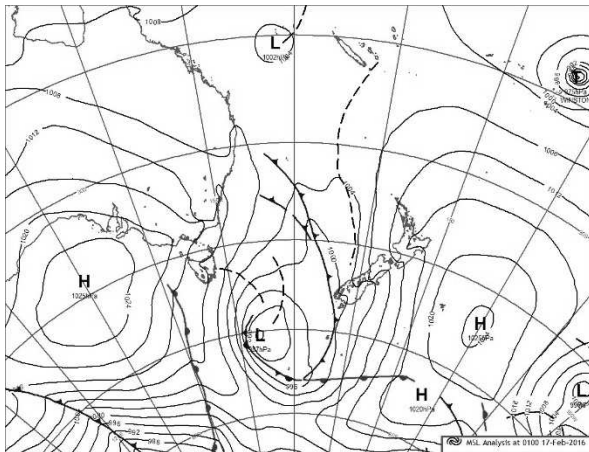
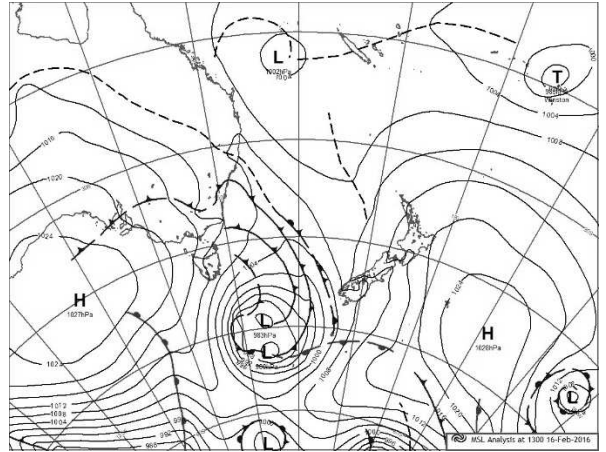
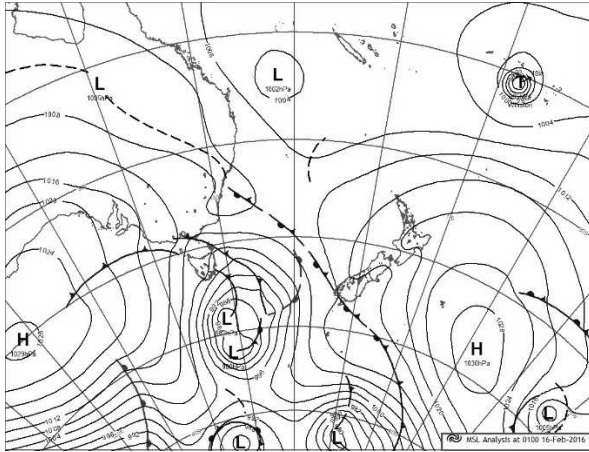
Very strong winds accompanied the rain in exposed areas, with Nelson's 95 km/hr being its highest recorded gust for the month of February. In Kaikoura, severe gusts damaged several buildings and caused power cuts.

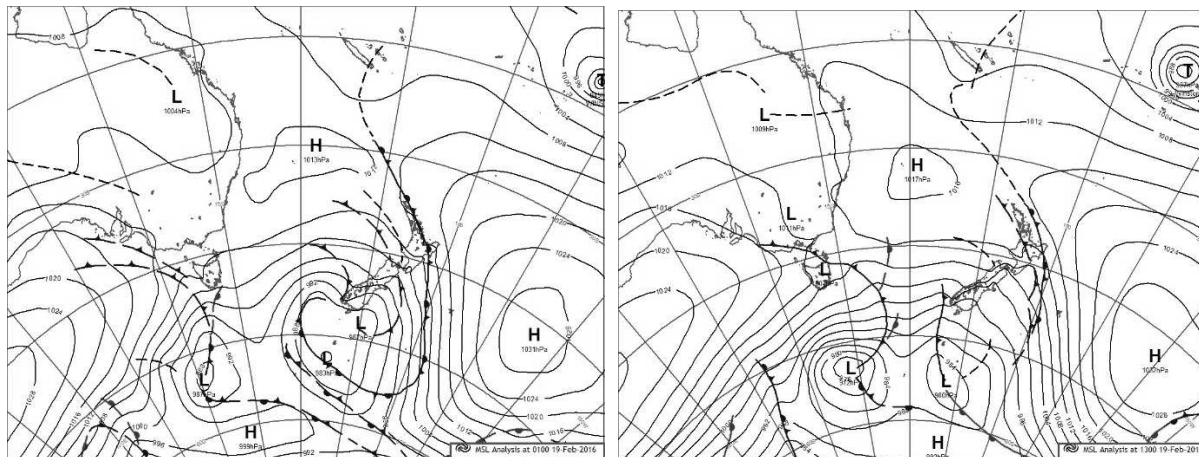
During the 17th and 18th, the fronts (now occluded) crossed the North Island, with heavy rain and strong winds in areas exposed to the north and west. Motu's 127mm on the 18th was a new February record, while Whangaparaoa recorded 104mm on the same day. A massive 500mm was recorded over the two days at Dawson falls, Mt Taranaki. Winds reached 91 km/hr in Hawera, a new February record. The stormy weather caused flooding and hazardous road conditions, with flooding trapping two people in their house near Galatea in the eastern Bay of Plenty.



Meanwhile, in the wake of the first trough and fronts, a disturbed west to northwest flow covered the South Island with thunderstorms about and west of the Southern Alps. Some of these crossed over into Central Otago, with lightning striking some houses in Cromwell (one resident even reported ball lightning in their home)

On the 19th, the remaining front decayed over the northeast of the North Island, with rain easing there. A disturbed westerly flow covered southern and central NZ with showers in the west and south, but no more severe weather.





Mean sea-level analyses for 1am NZDT 16th February to 1pm NZDT 19th February in 12 hour steps are shown here.

MONTHLY WEATHER NOTES FOR CHRISTCHURCH: SUMMER 2015/16

DECEMBER

Disturbed westerly and southwesterly flows were predominant this month. It was changeable with a wide variety of weather, including extremes of temperatures. Some very warm days occurred in northwesterly flows, most notably the 21st in which a record December maximum of 36C was recorded at the airport. By contrast, southerly and southwesterly changes brought cooler conditions at other times. The most noteworthy weather was on the 13th, when afternoon thunder and hailstorms affected Christchurch and many other parts of Canterbury. Large hail hit the city in the early afternoon, along with lightning strikes which caused some fires.

JANUARY

Despite predictions of continuing drier than normal weather courtesy of El Nino, this month ended up much cloudier and wetter than normal, thanks to low pressure systems at the beginning and then the second half of the month. The 3rd was a wet day due to a cold southerly flow, which brought fresh snow to the Alps. Low pressure systems from the 16th-19th and 25th-28th delivered rain and drizzle to the city, the most significant rain falling overnight 17th/18th and afternoon/evening of the 27th. In between these damp periods, a predominance of onshore airflows meant several days were cloudy, and temperatures were cooler than normal.

FEBRUARY

Weather patterns changed again this month, resulting in it being much warmer, sunnier, and drier than normal. High pressure to the east resulted in predominant northerly and northeasterly flows during the first half of the month, while the second half saw more northwesterly flows with some very warm days. The only measurable rain fell overnight 17th/18th. The month did end on a chilly note, with a southerly flow on the 29th dropping temperatures significantly from previous days (though without any precipitation)



Media Clips for Summer 2015/2016

El Nino's big dry prompts fears for New Zealand economy

Tue, 1 Dec

<https://www.tvnz.co.nz/one-news/new-zealand/a-concern-el-ninos-big-dry-prompts-fears-for-new-zealand-economy.html>



The Government is warning that there is a risk of economic slowdown if there is an El Nino-caused drought this summer.

Scientists say this summer is likely to bring an extreme El Nino weather pattern, which could bring disaster for already struggling farmers.

The latest forecast from the National Institute of Water and Atmospheric Research (NIWA) suggests a growing

likelihood of dry conditions, brought on by El Nino's hot and dry westerly winds. This summer is tipped to be particularly severe.

"It's right up there with the strongest in the last 100 years, it matches the 97-98 and 82-83 El Nino's," NIWA scientist Dr Brett Mullan says.

Both those events had farmers on the East Coast struggling due to severe drought, while fires are also an increased danger. Farmers are already taking precautions.

The last big dry cost the country over \$1 billion in lost income.

A similar El Nino drought could cost similar, but would be added to an already tough situation due to low dairy prices. (Abridged)

Temperatures hint at summer of extremes

02 Wednesday Dec, 2015

<http://www.sunlive.co.nz/news/114440-temperatures-hint-at-summer-of-extremes.html>



Summer warmth? Some South Island spots are expected to hit 30 degrees today. Photo: MetService, via Twitter.

The current extremes on the MetService website show Timaru sitting at 27.2 degrees, while Rotorua is registering 14.6.

MetService meteorologist Tom Adams says a warm and moist tropical air mass is moving across the country from the north-west.

"The east coast [of the South Island] quite often at this time of year gets those north-west

winds, which will raise temperatures," says Tom. (Abridged)



Dry and getting drier in the east

3 December 2015 MICHAEL DALY

<http://www.stuff.co.nz/business/farming/74681630/dry-and-getting-drier-in-the-east>

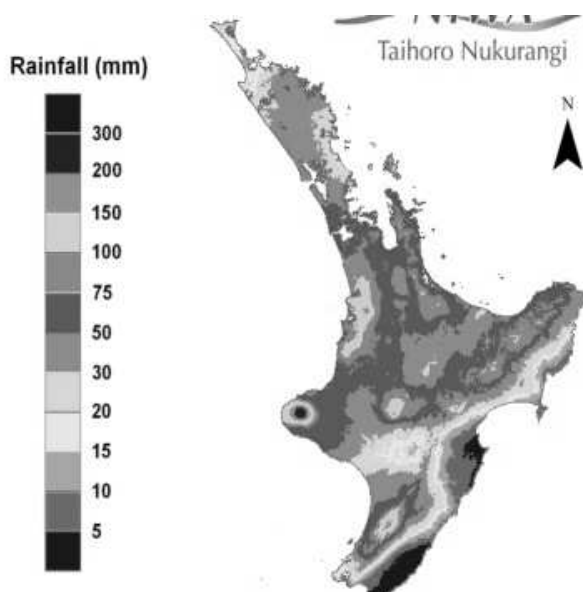


Dry eastern areas, such as the Canterbury plains, are being given little chance of decent rain for at least the next month. Dean Kozanic

Parched eastern areas have little chance of any relief for at least the next month, as a strong El Nino pattern continues to dominate the weather.

Blenheim had its driest November on record with just 4.8mm of rain. Christchurch recorded just 16mm, with

none in the past fortnight, while Timaru had just 21mm, compared to the average of 51mm. Rainfall figures were also particularly low along those eastern areas of the South Island during October.



While Napier's November rainfall was above average at 67mm, most of that - 40mm - fell on one day early in the month.

NIWA

Rainfall data for the past 15 days clearly shows how eastern areas are drying out.

I

n its rural monthly outlook, MetService said December rainfall was expected to be below normal in the north and east of both islands.

The forecast December rainfall pattern was fairly typical of El Nino summers, MetService said. El Nino typically, but not always, means stronger and more frequent westerly winds over



summer, with drier conditions in northern and eastern parts of both islands. "Over the last few months, the 2015 El Nino has been comparable to the 1997/98 and the 1982/83 events, but may well be approaching its peak, MetService said. (Abridged)

Marine app numbers soar

Friday 04 Dec, 2015

<https://www.sunlive.co.nz/news/114613-marine-app-numbers-soar.html>



The *MetService Marine* smartphone app is now being used on average 235,513 times a month – more than double last year's rate of 112,852.

In addition, more than 100,000 boaties are using Coastguard Nowcasting via its app, VHF marine radio and text services. The app was launched just 18 months ago.

More and more people are using the marine smartphone app. Photo; Supplied.

Land and general forecasts do not take into account wind speed over water (which is double that over land) or the

waves or swell. If a land forecast does give wind speed, it is in km/hr and that is an indicator that you are listening to the wrong forecast.

MetService general manager corporate affairs, Jacqui Bridges, says the beauty of *MetService Marine* is its simplicity.

"It is a great way to bring the marine forecast to life in an easy to use way," she says.

MetService Marine opens with today's recreational marine forecast for the default location of your choice, and includes forecasts for all New Zealand coastal and recreational marine areas, severe weather, tide, a rain radar and other information. It works hand-in-hand with Maritime NZ's *Marine Mate* app.

Looking forward through the El Nino

5 Dec 2015 by Roger Handford

<http://gisborneherald.co.nz/localnews/2044027-135/looking-forward-through-the-el-nino>

We're waiting until June next year before 'neutral' conditions return.

NEW Zealand's climate agency Niwa agrees with international climate experts that this EL Niño will peak over summer, and could last into early winter.

Niwa forecaster Chris Brandolino says international guidance indicates that El Niño will continue (100% probability) over the next three months. Models have the event continuing through the following season, March to May, and the majority predict a rapid return to neutral conditions in June-August 2016. By some measures, Niwa says the current event is on par with the 1997/98 El Niño (the strongest since 1950).

Niwa says that while severe droughts occurred in some eastern parts in the El Niño events of 1972/73, 1982/83 and 1997/98, east coast drought is not a certainty during every El Niño.

Meteorologist Georgina Griffiths says the month has started on a very warm note, especially in eastern regions, but advises the weather is about to turn unusually cold for the time of year. Ms Griffiths says the second half of the month should return to near average for the North Island. (Abridged)

Snowfall warning for some parts of NZ



5 Saturday Dec 2015

http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11556471

Snow flurries are expected at Porters Pass in Canterbury tomorrow morning after a period of rain tonight. Less than 1cm may accumulate at the summit of the road between 4am and 7am on Sunday morning, MetService said. A cold change is coming and even though it will be short-lived, it will come as a shock to the system to some areas, especially those seeing highs towards 30C this week. Areas of the South Island including Canterbury, Dunedin and Invercargill will see temperatures dip to the mid-teens tomorrow until the middle of the week. (Abridged)

- NZ Herald

Southland shivers, but not quite coldest December day - MetService

8 December 2015 BEN MACK

<http://www.stuff.co.nz/southland-times/news/74851048/Southland-shivers-but-not-quite-coldest-December-day-MetService>



BEN MACK/FAIRFAX NZ: Sweatshirts and scarves were the fashion items of choice in Invercargill on Tuesday, as the city experienced temperatures far below the December average of 18 degrees Celsius.

It may have felt downright Antarctic on Tuesday morning on Southland, but it was far from the coldest December day, the MetService says.

MetService meteorologist Emma Blades said temperatures in Invercargill dipped to 9 degrees Celsius overnight between

Monday and Tuesday - not quite as cold as the all-time December low of 1.4C set in 1996. She said the wind chill was the main culprit for causing residents to fling their wardrobes open in search of warm things to wear. "It's a cold southerly flow from the Southern Ocean," she said. Tuesday's cold weather came just six days after Southland recorded its hottest December temperatures in more than half a century. Temperatures on December 2 reached 28.5C as the Invercargill Airport, making it the balmiest December day since 1962. (Abridged)

Severe thunderstorm brings tornados to South Island

13 December 2015 TINA LAW AND ASHLEIGH STEWART

<http://www.stuff.co.nz/the-press/news/75045770/severe-thunderstorm-brings-hail-to-south-island>



Maree Reveley A tornado forms near Geraldine.

Tornados have been seen on the Canterbury Plains as a severe storm lashes the South Island. A number of twisters were seen, though it was not clear if any damage had been caused.

A cold snap caused temperatures to plunge in the south on Sunday, with Christchurch dropping by more than 10 degrees to sit at 6.5C by 2pm.

Nick Hoogeveen saw the tornado damage farm machinery on



his neighbour's property in Carew, near Ashburton.

"Nuts, "I could see it picking stuff up, it threw their silage wagon onto the tractor."

MetService has a severe thunderstorm watch in place in Christchurch, the Canterbury Plains and high country and North Otago.

Peter Chamberlain, who farms at Norwood just north of Christchurch, said his crops, including 38 hectares of peas just one week away from harvest, were hit by hail, but he was not yet sure the extent of the damage.



ASHLEIGH STEWART/FAIRFAX NZ: *A wall of cloud signals the arrival of the storm.*

"The rain has been great. It's the most rain we've had for 12 months."

Earlier this afternoon the streets of Christchurch were painted white with hail.

Christchurch residents were running for cover as the skies opened at about 1.30pm, while many others were likely desperately sheltering

their summer vegetable gardens. Another thunder storm hit the city around 5pm, but was not as severe.

Further south, the test match between New Zealand and Sri Lanka in Dunedin was delayed because of rain and hail. Hail of the size forecasters were predicting - up to 3cm across - could cause significant damage to crops, orchards, vines, glasshouses and vehicles as well as make driving conditions hazardous, MetService forecaster Gerard Barrow said.

The storms were caused by cooling upper level temperatures combining with the daytime heat, he said.

Philip Duncan, head weather analyst at WeatherWatch.co.nz, said the storm was part of the extended "spring pattern" that New Zealand is having this year, fuelled by El Nino. "It encourages more changeable weather - mixing of cool air with afternoon hot air," he said. "The showers really explode into life over Canterbury in particular." (Abridged)

The best strategies for surviving a drought

14 December 2015 NADENE HALL

<http://www.stuff.co.nz/business/farming/nz-lifestyle-block/75067714/the-best-strategies-for-surviving-a-drought>



Phil Walte: *Sheep are pictured in the dry conditions at Ambury Farm in Auckland. NIWA's climate experts say this year's El Nino is tracking close to the last big one of 1997-98.*

There are dry summers, but droughts are a more serious problem which can be costly, or very costly depending on how you deal with it.

The climate pattern that brings us hot and dry, drought-stricken summers is called El Nino. It's Spanish for 'the child' and originally referred to specific warm winds off the coast of Peru and

Ecuador, but it has taken on a wider meaning in climate terms.



In NZ, it tends to bring stronger or more frequent westerly summer winds, typically leading to drought in east coast areas and more rain in the west; in winter the winds tend to be chillier southerlies, in spring and autumn, southwesterly winds are more common.

NIWA's climate experts say this year's El Nino is tracking close to the last big one of 1997-98 which triggered widespread drought and was the strongest since 1950. It's expected to ramp up over summer, staying with us until at least March 2016.

The 1997-98 El Nino event cost NZ more than \$1 billion in farming losses.

The most successful strategies for surviving a drought is that the earlier you make a decision, the less your loss will be.

Storm-tide red-alert days 2016

<https://www.niwa.co.nz/natural-hazards/physical-hazards-affecting-coastal-margins-and-the-continental-shelf/storm-tide-red-alert-days-2016>

15 Dec 2015

Storm-tide "red-alert" dates are "king-tide" days that Emergency Managers and Coastal Hazard Managers should write in their diaries and keep an eye on adverse weather (low barometric pressure, onshore winds), river levels and sea conditions (waves and swell). The dates below are averaged across New Zealand. The following table shows the dates of the highest high tides ("red alert" dates) and the lowest high tides ("carefree" dates).

2016	2016
Red-alert Dates (highest high tides)	Carefree Dates (lowest high tides)
[actual lunar perigee date]	[actual lunar apogee date]
	3-6 January [3 Jan]
13-15 January [15 Jan]	1-4 February [30 Jan]
9-15 February [11 Feb]	1-4 March [27 Feb]
9-15 March [10 Mar]	31 March-1 April [26 Mar]
6-12 April [8 Apr]	
5-10 May [6 May]	
4-8 June [3 Jun]	
3-6 July [1 Jul]	11-13 August [10 Aug]
19-22 August [22 Aug]	9-12 September [7 Sept]
17-22 September [19 Sep]	7-11 October [4 Oct]
16-22 October [17 Oct]	7-9 November [1 Nov]
14-20 November [14 Nov]*	
13-18 December [13 Dec]	23 December [25 Dec]

High perigean-spring tides, colloquially known as "king tides", peak 1-2 days after New or Full Moon when Moon is in its perigee (i.e., when it is closest to the Earth during its 27½ day elliptical circuit around the Earth), but dates of highest tides vary around New Zealand.

In 2016, the Moon's closest perigee occurs on 14 November and coincides exactly with a Full Moon, with next closest on 7 April. The year's highest high tides will occur in February to May and September to December.

For the year 2016, "red alert" dates cluster around very high tides (perigean-spring tides) that peak 1-2 days after New or Full Moon when Moon is in its perigee and "carefree" dates cluster around lower high tides after First or Third Quarter when Moon is close to its apogee. (Abridged)

NZ Prime Minister John Key answers questions from WeatherWatch

16/12/2015 -



<http://www.weatherwatch.co.nz/content/exclusive-prime-minister-john-key-answers-questions-weatherwatchconz>

Exclusive -- Earlier this year we had a rare opportunity to download the free Weather-Watch.co.nz weather app directly on to the New Zealand Prime Minister's iPhone. We were unsure if the Prime Minister would actually use it, so we decided to follow it up a few months later and ask him - which kicked off asking him several other questions too, while we had the chance.

We also wanted to get the Prime Minister to comment on a couple of specific questions we have relating to NIWA and MetService - his replies (and in some instances, non-replies) are helping us work positively with various MPs this year and in 2016, to try and change government policy in NZ for the better. We appreciate Mr Key's responses..

Prime Minister John Key

1) Where did you grow up and what's your strongest memory of the weather / climate back then?

I grew up in Christchurch and have fond memories of frosty mornings cycling to school, as well as the hot nor' westers.

2) You holiday in Hawaii from time to time - what's something you love about their weather compared to, say, Auckland where you live?

We are fortunate that the place where we stay on Maui is protected by a volcanic mountain, so it hardly ever rains. It's a great spot.

3) We had a brief chance to chat earlier this year at Wellington airport - and we personally downloaded our free WeatherWatch.co.nz app on to your phone - be honest, do you use it - and are we accurate enough for you to play golf from our forecasts ...or do we have more work to do to improve?!

Yes, I do use it as it's very accurate.

Thank you for the enhancement of my sporting passion.

4) How come, with you as Prime Minister, New Zealand has become the only nation in the western world to not only have two Government owned weather forecasters competing against each other, but also they charge the most in the western world for basic data. Are you committed to fixing this unique problem we have in NZ with access to open weather data (weather data taxpayers already own and are then charged astronomical fees to use it).

Through its contract with the Minister of Transport, MetService provides core weather services to support safety of life and property in New Zealand and the wider South Pacific region.

As part of this contract, MetService makes a range of weather observation data available at no charge and with no restrictions on use.

It also provides additional information, free of charge for personal use, via its public website. Other data that may be needed to meet more specialised requirements is provided at rates appropriate to the market for weather services.

5) NIWA is a Crown Research Institute but are so commercial they won't work with private forecasters unless we pay them - do you believe in your heart this is appropriate for the Crown owned climate and atmospheric research agency 100% owned by the NZ public to be putting profits ahead of public services, especially when they make such significant profits already?

NIWA is subject to the Crown Research Institutes Act 1992, where the principles of operation require it to operate in a financially responsible manner so that it maintains its financial viability.

As a Crown Research Institute, NIWA is expected to make publicly funded data freely available to other New Zealand users except where there are substantial costs associated with the provision of such information. A range of companies contract NIWA on a fully commercial basis to undertake research on their behalf and that work cross-subsidises the less commercial public good scientific work that NIWA does.



6) Ok, let's lighten it up again -- When you get a break and play golf do you play through the rain or showers - or do you need it totally dry? Or put another way - how fussy are you with the weather?

It's more fun to play golf when it's dry, but a little rain never hurts anyone so I always box on through if the clouds open up when I'm on the course.

7) You get to travel a great deal - from active war zones to snowy business summits - what are a couple of places you've been to globally with extreme weather that was very different to NZ? *Saudi Arabia was extremely hot and dry, which is quite a contrast to when I went to Antarctica which was very windy and cold.*

8) You fly back and forth a lot from Auckland to Wellington - how many really windy landings have you had? And do you find that being Prime Minister means you have to always "look cool" even if you're nervous?

It's generally always windy flying into Wellington but cross winds mean things can get a bit problematic. I think it's important to stay cool, and I fly a lot so nothing really phases me when it comes to turbulence.

9) You're the most powerful person in New Zealand - but the weather can make all of us feel small and humbled. Have you ever been in a serious weather event and been seriously concerned about your own safety, or the safety of your family?

My family and I flew into Sao Paulo in Brazil once in an extreme thunder and lightning storm. That was the only time I've been a bit scared because of the weather. - Prime Minister, John Key.

More thunder, rain forecast

17 December, 2015

<http://gisborneherald.co.nz/localnews/2059499-135/more-thunder-rain-forecast>



There was a bit of everything in the short sharp weather bomb that hit Gisborne late yesterday afternoon including what was thought to be a mini tornado in Nelson Road.

MORE thundery unsettled weather is forecast today as daytime heating clashes with an incoming cold mass of air from the south.

Yesterday afternoon's thunderstorm delivered some very heavy short, sharp downpours over the Gisborne region, along with thunder and lightning and a small tornado was reported in Nelson Road.

Pakarae Station recorded 16.5mm in one hour late in the afternoon. The Wakaroa Trig recorded 11mm and the gauge at Te Arai recorded 13mm as the fast-moving front went over. Gisborne airport recorded 9mm. (Abridged)

South Island temperatures soar as Christchurch, Dunedin smash records

Monday Dec 21, 2015

http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11564168

The heat in Christchurch reached a sweltering 36.1C, breaking the previous record of 35.4C measured in December 1975 at the airport.

It was also the hottest temperature of the day nationwide.

Dunedin reached 34.6C, breaking the city's record of 32.2C, and Timaru, further north, hit 34.1C. Ashburton hit a scorching 35.3C this afternoon, almost reaching the town's December record of 36.3C set in 1971.



Temperature gauge on a Mobil Gas Station sign reads 33.4 degrees centigrade in Dunedin. Photo / Otago Daily Times

MetService meteorologist Claire Flynn said the heat would soon begin tapering off because of a cold front set to hit the South Island this evening. (Abridged)

Heatwave heads north

Tuesday, 22 December 2015

http://m.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11564680

<http://www.stuff.co.nz/nelson-mail/news/75353458/hottest-day-of-the-year-a-scorcher-in-nelson>



A mini heatwave in the South Island is moving up the North Island By Lynley Bilby

MetService figures show the temperature reached 28.2 degrees Celsius at Nelson the airport sometime between midday and 1pm on Monday. It didn't quite beat the record for December, which peaked at 29.9C on 8 December 1994. (Abridged)

Heat not necessarily climate change related – expert

22 Dec 2015

<http://www.odt.co.nz/news/dunedin/367725/heat-not-necessarily-climate-change-related-expert>

Yesterday's hot weather may have been record-breaking, but it was not necessarily extraordinary.

"It's summer - it gets hot. Yes, it is hot," Niwa forecaster Chris Brandolino said yesterday. "Tomorrow, it'll be cooler."

Mr Brandolino said temperatures definitely were rising across the globe, and that rise was definitely due to climate change.

However, the highs yesterday, more than 2degC above the 50-year record, could not be directly attributed to that temperature rise, Mr Brandolino said. (Abridged)

Houses flooded in Omaha, north of Auckland

24 December 2015

<http://www.stuff.co.nz/auckland/75447414/houses-flooded-in-omaha-north-of-auckland>

Torrential rain caused flooding to several houses in Omaha, north of Auckland, on Christmas Eve.

MetService meteorologist Lisa Murray said parts of north Auckland including Omaha and Kaipara suffered the heaviest rain. Omaha had received 10mm of rain per hour, while Kaipara had 15mm.

In Omaha, Meiklejohn Way resident William Freeth said he'd watched fire trucks whizzing up



and down the street. He had a gauge which measured the rain.

"We were reading about 17mm and then something like two and a half hours later it was 155mm," he said. "The joke is that some people filled up their tanks yesterday with water. That costs like \$170." (Abridged)

Some of New Zealand's berries are missing

JOHN EDENS

24 December 2015, JOHN EDENS

<http://www.stuff.co.nz/business/farming/cropping/75443537/some-of-new-zealands-berries-are-missing>

It's been a tough pre-Christmas season for some berry growers in New Zealand.

Depending on where you live, berries may be in short supply, particularly strawberries and raspberries, after late-season frosts, heavy rain and hail.



MARION VAN DIJK/NZ: Boysenberries damaged by hail at Tasman Bay Berries.

Boysenberries were badly hit by a December hailstorm in Nelson, home to the largest orchard in the country. Central Otago produces the bulk of New Zealand cherries and this market has not been hit as badly as the "soft berry" market.

Summerfruit New Zealand's industry overview says the cold snap in mid-

December has led to a moderate supply for the traditional Christmas sales but volumes should stabilise soon.

Hawkes Bay cherries and plums are in good supply.

Blenheim was hit by the cold snap but escaped the hail, which ripped across the Nelson district. In Central Otago, snow fell in places during December, delaying maturity. (Abridged)

Floods, fires and tornadoes: New Zealand's year of wild weather

25 Friday Dec 2015

http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11566078



June Flood damage, Whangaehu River Valley near Whanganui. Photo/Mark Mitchell

Floods, fires, thunderstorms and tornadoes all wreaked havoc this year as New Zealand shivered and sweltered through another 12 months of climatic extremes.

Here are some of 2015's most notable weather events, as

compiled by NIWA.



January



The dry weather kept firefighters busy in January. Photo / Gordon Wyeth

High: 36.4C at Timaru, Jan 16

Low: 0.4C at Lumsden, Jan 21

Most rain in one day: 146mm at Milford Sound, Jan 11

Strongest wind gust: 148km/h at South West Cape, Stewart Island, Jan 4

A hot and dry start to the year was good news for holidaymakers, but it kept ru-

ral firefighters busy as patches of scrub burned in the upper South Island, including a 500ha fire at Arthur's Pass.

The dry weather was punctuated by thunderstorms that brought hail, lightning and surface flooding to North Otago, Hawkes Bay and Wairarapa. Queenstown smashed its daily rainfall average with 55.4mm in 24 hours, while Wellington basked in a four-day warm spell of highs greater than 25C.

February



A dash cam caught the meteor racing across the skies. Photo / Supplied

High: 33.5C at Waiau, North Canterbury, Feb 1

Low: 1.5C at Ranfurly, Feb 26

Most rain in one day: 194mm at North Egmont, Feb 1

Strongest wind gust: 150km/h at South West Cape, Feb 4

The second month of the year got off to a dramatic start with more thunderstorms, destructive winds and a

meteor strike.

An Air New Zealand flight was struck by lightning near Dunedin, while hail hit Central Otago on February 1. Three days later, Canterbury was lashed with strong winds that brought down trees and power lines, whipped up dust storms and fanned scrub fires, forcing the evacuation of residents and schools.

A sonic boom was heard and a blinding flash lit up the sky over much of New Zealand as a meteor entered the atmosphere about 10pm on February 11.

March



High tide at Haumoana near Hastings as ex-cyclone Pam hit. Photo / Paul Taylor

High: 32.1C at Hanmer Forest, March 5

Low: -2.4°C at Pukaki, March 19

Most rain in one day: 111mm at Westport, March 5

Strongest wind gust: 145km/h at Hicks Bay, near Gisborne, March 16

Heavy rain on the South Island's



West Coast caused slips, blocked roads and forced the evacuation of 17 homes on March 5. The next day, strong winds lashed the country, tossing shipping containers into Wellington Harbour and forcing a plane landing in Christchurch to slide off the runway.

There was more to come as ex-Cyclone Pam passed the country, cutting power in Auckland on March 16. The next day, all schools in the Gisborne region were closed and more than 100 people were evacuated on the East Cape. The ex-cyclone brought slips, road closures, fallen trees, power cuts and waves of more than 9m to some eastern parts of the North Island.

April



Several yachts were destroyed around Auckland's Okahu Bay. Photo / Nick Reed

High: 30.4C at Cheviot, North Canterbury, April 7

Low: -4.8C at Hanmer Forest, April 15

Most rain in one day: 206mm at North Egmont, April 8

Strongest wind gust: 170km/h at South West Cape, April 7

An unseasonable cold snap

from April 13 brought snow to very low elevations, forcing flight cancellations or diversions at Queenstown, bus service suspensions in Dunedin, and road closures in Canterbury and Fiordland.

Later in the month, the North Island was battered with strong winds. Auckland was among the hardest hit, with boats torn from their moorings and pushed up against rocks along Tamaki Drive.

May



The Otaihangā Domain, between Waikanae and Paraparaumu. Photo/ Mark Mitchell

High: 27C at Waiau, Canterbury, May 6

Low: -9C at Hanmer Forest, May 28

Most rain in one day: 90mm at North Egmont, May 6

Strongest wind gust: 178km/h at Cape Turnagain, May 13

The last month of autumn

brought torrential rain and tornadoes, starting with flooding and slips on the West Coast. A four-day onslaught of downpours in Wellington from May 12 caused widespread flooding in Kapiti, Porirua and Lower Hutt, as the Hutt and Waikanae rivers burst their banks.

A man swept under a bridge at Paraparaumu was rescued by bystanders, but tragedy struck when the body of Dr Paul Hill, 80, was found near his submerged car in Petone.

Thousands of commuters were trapped in the capital as the road and rail links between the Kapiti Coast and Wellington were cut off. At least 20 homes were evacuated at Raumati Beach and schools were closed. The same day, a tornado ripped through Mt Maunganui, lifting the roofs of about 20 homes and severely damaging part of the grandstand at Baypark Stadium.



June



Flood-damaged home at Wangaehu near Whanganui. Photo / Mark Mitchell

High: 21.7C at Cheviot, June 1

Low: -21.0C at Tara Hills, June 24

Most rain in one day: 454mm at North Egmont, June 19

Strongest wind gust: 189km/h at Cape Turnagain, 29 June

The start of winter brought major floods that caused more than \$50 million in weather damage, according to the Insurance Council.

Dunedin was hit first, with a near record-breaking bout of prolonged rain causing significant flooding and numerous slips from June 3. The bad weather returned by mid-month. Wellington was battered with massive waves and high winds, while flooding in Hokitika forced the evacuation of 20 retirement home residents.

The heavy rain then moved up the lower North Island to Whanganui, where it caused the worst flooding on record. A state of emergency was declared and more than 100 households were evacuated on June 20.

The Whanganui River breached its banks around midnight, spilling floodwaters into the CBD. The next day, Whanganui was cut off by road and states of emergency were also declared in Rangitikei and Taranaki. Record low temperatures followed over several days from June 23.

July



Flooding at Auckland Airport's domestic terminal. Photo / Twitter

High: 21.2C at Christchurch, July 26

Low: -10.2C at Hanmer Forest, July 12

Most rain in one day: 91mm at Franz Josef, July 14

Strongest wind gust: 152km/h at Cape Turnagain, July 5

Auckland fared worst in July, with thunderstorms on July 7 and torrential rain a week later. Auckland Airport was pounded with 51mm of rain in just two hours, causing leaks in both terminals and flooding the road to the domestic terminal. Firefighters were called to dozens of incidents and had to pump water from more than 50 flooded homes in West Auckland.

On July 18, Auckland was hammered by strong winds that tore off roofs, brought down trees, flipped two light planes at Ardmore Airport, smashed boats into sea walls and cut power to 9000 customers. In Mt Maunganui there were water spouts and mini-tornadoes.



August

The Chateau Tongariro covered in snow. Photo / mtruapehu.com



High: 23.8C at Christchurch, Aug 3
Low: -11.5°C at Lake Tekapo, Aug 11
Most rain in one day: 134mm at North Egmont, Aug 5
Strongest wind gust: 141km/h at Cape Turnagain, Aug 19
Winter's last month began with record -high minimum temperatures from August 3. But there was still plenty of winter's icy grip left as heavy rain, strong winds and a small tornado

struck the Bay of Plenty and Waikato.

Further south, snowfall closed roads in Fiordland and the Southern Alps, while in the central North Island, snow closed the Desert Road and brought the largest dusting of snow to Tongariro in eight years.

The big chill brought the first snow in living memory to Wairoa, while Auckland residents saw soft hail known as graupel - which resembles snow - and an impressive lightning display, accompanied by booming thunder.

September

Wild weather closed Tamaki Drive. Photo / Brett Phibbs



High: 25.7C at Christchurch, Sept 16
Low: -7C at Hanmer Forest, Sept 8
Most rain in one day: 135.4mm at Tuti-
ra, Hawkes Bay, Sept 20
Strongest wind gust: 167 km/h at Cape
Turnagain, Sept 4
Spring started with heavy downpours
throughout the North Island and up-
per South Island, causing Auckland
traffic to back up for 5km as Tamaki
Drive was closed due to high rainfall

and a king tide.

There were big snow dumps around Queenstown, with an unexpected 15cm knocking out power and felling trees in Makarora. It was good news for skiers, however, as Coronet Peak got record snow levels.

Heavy rain in Gisborne and the East Cape caused surface flooding, cutting off the town of Te Karaka on both sides. Schools were closed, while two adults and two children were stranded in their car at Wairoa for 18 hours. Strong winds lashed northern Taranaki.



October

Wind waves at St Clair Beach in Dunedin. Photo/ Otago Daily Times



High: 31.8C at Kaikoura, Oct 7

Low: -3.7C at Pukaki, Oct 26

Most rain in one day: 291mm at Milford Sound, Oct 16

Strongest wind gust: 172km/h at Cape Turnagain, Oct 5, and at South West Cape, Oct 7

The month began much warmer than usual, but very strong winds hit throughout the South Island, knocking out power to 2200 homes in Canterbury and Otago, and smothering Twizel in a dust storm.

Rain and thunder followed as a caravan was blown off the road near Tekapo and flights at Invercargill were cancelled due to winds up to 130km/h. Strong winds and fires followed in the South Island.

November



Bush fires on the Richmond Range, Marlborough. Photo/ Peter Burg

High: 31.7C at Hastings, Nov 26

Low: -5.6C at Snowdon, Canterbury, Nov 5

Most rain in one day: 166mm at Mount Cook Village, Nov 26

Strongest wind gust: 170km/h at Puysegur Point, Fiordland, Nov 27

The last month of spring was plagued by frosty conditions in Marlborough, which was bad news for winemakers.

Strong gales tore the grandstand off the racecourse in Riverton and fanned large forest fires in Marlborough and Wairarapa. The winds also closed roads and cut power across parts of the Southern Lakes and Central Otago.

At the end of the month, a number of areas had record or near-record highs or minimum temperatures.

December



Tornado touch down in Mid Canterbury near Mayfield. Photo / Simon Baker

High*: 36.4C at Leeston, Canterbury, Dec 21

Low*:-0.7C at Hanmer Forest, Dec 7

Most rain in one day*:160.5mm at Milford Sound, Dec 2

Strongest wind gust*:176km/h at South

West Cape, Dec 21

*** All December records as of December 24.**

The beginning of summer felt more like spring, with El Nino bringing more changeable, chaotic weather.

Wellington was lashed with strong winds and heavy rain on December 12, which forced Aus-



tralian rockers AC/DC off the stage for 40 minutes due to power issues. Canterbury bore the brunt of the extreme weather the next day, as wind brought down power lines, lightning strikes caused fires, and thunderstorms brought tornadoes, heavy rain, hail storms and flooding. A week later, Canterbury sweltered through a heat wave of record-breaking temperatures.

- [NZ Herald](#)

Unusually cold, dry weather precedes high pneumonia, flu mortality

29 December 29, 2015

<http://www.healio.com/infectious-disease/respiratory-infections/news/online/%7B95eaa998-68db-4794-a8a9-645eb4d2ec1%7D/unusually-cold-dry-weather-precedes-high-pneumonia-flu-mortality>

Respiratory infections are more severe during periods of unusual cold or low humidity, even in a subtropical location with typically high humidity, according to a study published in *Influenza and Other Respiratory Viruses*.

"Reasons for the seasonal pattern in influenza mortality remain unclear," Robert E. Davis, PhD, professor at the University of Virginia's department of environmental sciences, and colleagues wrote. "Recent research suggests a connection to weather, particularly cold and/or dry (low humidity) air. Possible explanations for this relationship include factors related to virus characteristics, drying of nasal mucous membranes, enhanced airborne transmission, and human behavioral factors." by Jason Laday (*Abridged*)

Beaches kept busy with holidaymakers

29 Dec 29, 2015 By Mike Dinsdale, Northern Advocate

http://www.nzherald.co.nz/northern-advocate/news/article.cfm?c_id=1503450&objectid=11567069



Making sand-castles at Waipu Cove yesterday. Photo / Tania Whyte

MetService meteorologist Tom Adams said there had been some great temperatures in Northland over the past few days, but the weather pattern that brought them was getting squeezed from both sides.

"Northland looks like it's going to be one of the wettest places in the country moving into the New Year."

January 2016

Rain dampens summer holiday plans

2 January 2016

<http://www.radionz.co.nz/news/national/293353/rain-dampens-summer-holiday-plans>

MetService said further rain was likely to continue from Northland to the Western Bay of Plenty, with 30 to 50 millimetres expected overnight before easing in the late morning.

Trees were blown over and roofs lifted as strong winds and heavy rain battered the upper North Island on Friday night and Saturday morning.

Camp sites around Northland said wild winds and heavy rain have forced most holidaymakers to head back home.



About 200 homes are still without power north of Auckland due to gusts and heavy rain, which brought trees down and caused campers to head home.

The Department of Conservation site at Uretiti said about 60 percent of campers had left, and few if any were arriving. Jodie Rogers of the Taupo Bay Holiday Park, near Mangonui, said only long-term and experienced campers were staying put. (Abridged)

Heavy Rain, gales in North, as storm bears down on holiday hotspots

2 January 2016 MICHAEL DALY, KELLY DENNETT AND REBEKAH PARSONS-KING/Stuff.co.nz

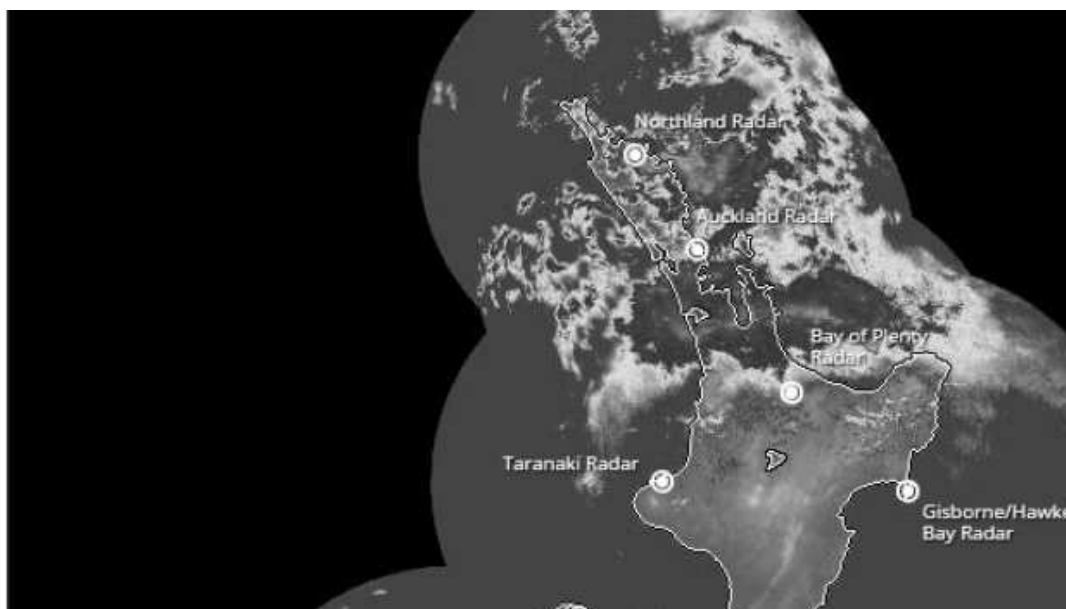
<http://www.stuff.co.nz/national/75571110/heavy-rain-gales-in-northland-as-storm-bears-down-on-northern-areas>

Bad weather has ushered in the New Year with rain battering the far North and western parts of the country on Friday - and it's expected to last most of the weekend.

MetService Meteorologist Derek Holland said the bad weather is due to a rain band coming down from the tropics, which will hang around until Sunday.

Both Whangarei and Kerikeri have received over 60mm of rain already, while Warkworth has been drenched with a whopping 125mm.

Civil Defence is also warning the worst is yet to come as campers flee heavy rain and gales in the northern half of the North Island.



MetService radar showing where the rain was falling around 1pm

MetService is warning up to 200mm of rain could fall about the eastern hills of Northland through to late Saturday. Up to 180mm could fall in Auckland mainly north of the bridge and in the Hunua Ranges by midnight Saturday, with 180mm also possible

on the Coromandel Peninsula from noon Friday to 6am Sunday.

Managers at Tokerau Beach Motor Camp on the east coast near Kaitaia said about half of their campground had emptied out over the past day. The grounds was at capacity on New Year's Eve with about 550 campers, but that had dwindled to about 200 on New Year's morning as the rain set in. (Abridged)



Marlborough water restrictions delayed after rainy spell

3 January 3 2016 JENNIFER EDER

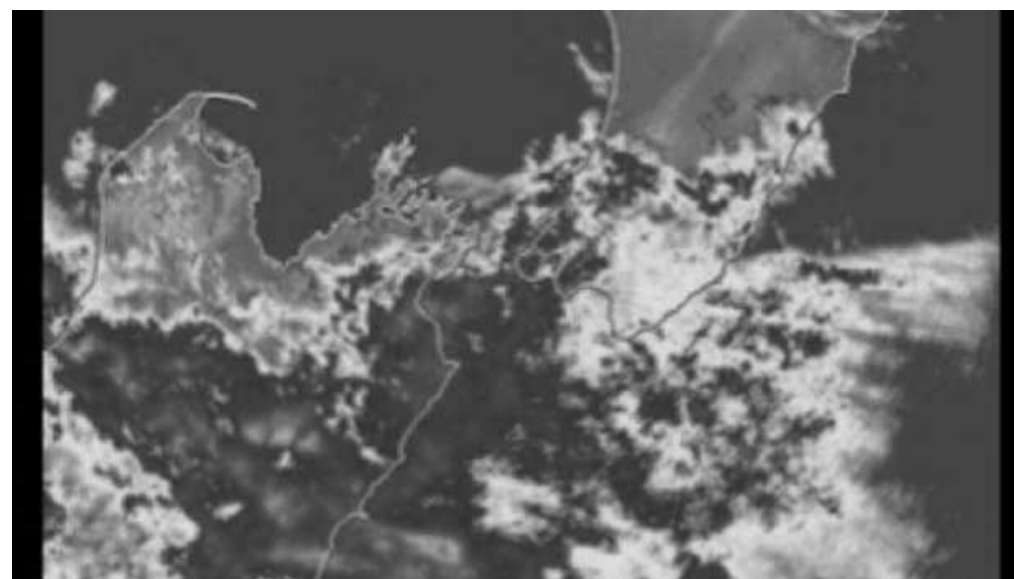
<http://www.stuff.co.nz/marlborough-express/news/75584900/rain-in-marlborough-a-welcome-sight>



*Derek Flynn/ Fairfax NZ
Braving the rain at Spring
Creek Holiday Park, near Blenheim.*

throughout Sunday, pushing out looming water restrictions for residents in Renwick and for users of the Southern Valleys Irrigation Scheme, which fed water from the Wairau River to about 4500 hectares of mostly vineyards south of Renwick.

A Marlborough District Council spokeswoman said that imminent water restrictions would likely be delayed for seven to 10 days.



*SUPPLIED A rain radar
image shows heavy rain en-
gulfing Marlborough.*

"Gardeners in Renwick would be dancing around their garden," she said. Marlborough has just come off its driest year since records began in 1930, with only 381.6mm of rainfall recorded in Blenheim 2015, well below the long-term average between 1930 and 2014 of 643.3mm. In December just 17.4mm of rain fell. (Abridged)

Kaitaia is warmer than this, says weather buff

7 Jan 2016 Northland Age

http://www.nzherald.co.nz/northland-age/news/article.cfm?c_id=1503402&objectid=11570314

Kaitaia man Bruce Buckby, who has been providing climatological data to NIWA and the MetService for more than 30 years, believes that Kaitaia is considerably warmer than portrayed by the maximum daily temperatures reported by TV1 and TV3 every evening.

He claimed that the reported maximums bore little resemblance to actual temperatures in Kaitaia, and were certainly far cooler than those recorded at the former meteorological observatory in Okahu Road, on a ridge significantly higher than the town.

"I believe (suspect) that the temperature is recorded at the MetService's automatic weather station (AWS) on top of Kaitaia Hospital, many metres above the ground and certainly not an officially certified climate site, as are the Kaitaia observatory and NIWA's electronic weather station (EWS) at Kaitaia airport," Mr Buckby said.



"Kaitaia Borough is below all these recording sites, and is usually reported on TV news as one of the coolest towns in New Zealand. This is simply not the case. During the Christmas period TVNZ reported maximum Kaitaia temperatures that were at least three degrees below the observatory maximum, and it would certainly have been much warmer in Kaitaia township.

"The temperature data must originate from and be provided to TVNZ by the MetService," he added. "Surely some solution or compromise can be found. There are significant implications for the Far North's ostensibly sub-tropical climate, and certainly for tourism, in being misrepresented in this way."

Temperature data could be certified by more than 70 years of records from Kaitaia airport and 30 years from the Okahu Road observatory.

Mr Bucky said he had queried the town's reported temperatures with the MetService in the past but had not received a response. The MetService said it could find no record of earlier queries.

El Nino abating but still intense

7 Jan, 2016. By Jonathan Underhill

http://www.nzherald.co.nz/wairarapa-times-age/business/news/article.cfm?c_id=1503410&objectid=11570460



El Nino is expected to abate, but given its intensity there is still a risk of drought.

The El Nino weather pattern, among the three strongest since 1950, is expected to abate through summer and autumn, but given its intensity New Zealand farmers are still at risk of drought, says the National Institute of

Water and Atmospheric Research (Niwa).

The El Nino weather pattern, among the three strongest since 1950, is expected to abate through summer and autumn, but given its intensity New Zealand farmers are still at risk of drought, says the National Institute of Water and Atmospheric Research (Niwa).

Niwa is due to release its first Hotspot Watch report for 2016 and monthly climate report tomorrow. The last hotspot report on December 24 showed drier-than-normal soil moisture across much of the North Island and in the northern and east of the South Island but the situation has been complicated by heavy rains over the New Year. "We're expecting El Nino to weaken for the rest of the summer and by the end of the second quarter to return to more neutral conditions," said Niwa forecaster Chris Brandolino. (Abridged)

Three more dry months of El Nino

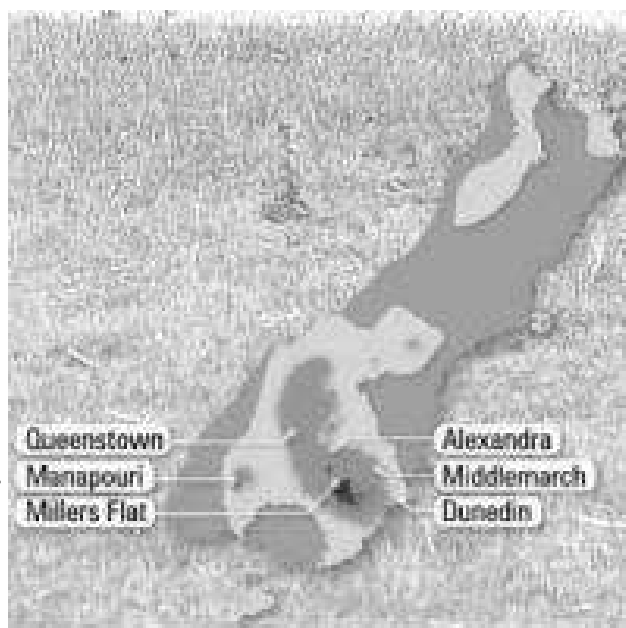
8 Jan 2016, By Rhys Chamberlain

<http://www.odt.co.nz/news/dunedin/369148/three-more-dry-months-el-nino>

There looks to be no respite from extremely dry conditions in some parts of Otago, as El Nino is a "100% certainty" to continue for the next three months.

Niwa National Climate Centre principal scientist Chris Brandolino said it was normal in some areas of Otago to be dry, but not this dry.

"You don't want really heavy rainfall rates because that is more likely to run off. That's why we [Niwa]





often say we need a sustained rainfall over days or weeks to return to normal conditions.

Any rainfall was drying off quickly, as summer evapotranspiration rates were about 3mm a day, depending on the type of soil, Mr Brandolino said. That meant significant rain was needed in central and eastern Otago regions to make an impact.

"If Mother Nature gives you 10mm of rain, some is going to run off [because of how hard the ground is] and some is going to evaporate ..."

Niwa's Alexandra [11mm] and Wanaka [14mm] stations recorded their fourth-lowest rainfall totals ever for December.

Dunedin Rain Effects hydrologist David Stewart said 25mm of rain was needed over 24 hours to ease the extreme dry. It would be enough to get grass back to normal out on the Taieri but it would still be tough for farmers in the regions, Mr Stewart said.

Most irrigated areas were losing far more than 3mm of moisture per day to evaporation but some non-irrigated areas were not, simply because there was no moisture there to evaporate, Mr Stewart said. (Abridged)

New Plymouth breaking sunshine records but still not sunniest

8 January 2016, DAVID BURROUGHS, Taranaki Daily News

<http://www.stuff.co.nz/taranaki-daily-news/news/75727758/new-plymouth-breaking-sunshine-records-but-still-not-sunniest>



CHARLOTTE CURD/Fairfax
NZ New Plymouth may be clocking up the sunshine, but it's also getting a fair share of rain.

New Plymouth has once again missed out on the title of sunniest town in New Zealand and doesn't even feature in the top four sunniest spots of 2015.

Blenheim has wrestled the sunniest town crown from arch rival Whakatane, which takes out second and is followed closely by Lake Tekapo in the Mackenzie Basin and Appleby in the Tas-

man district.

New Plymouth was once near the top of the list, taking out second place in 2013 and 2014, behind Whakatane. But that was after the sunshine hours jumped from 2025 in 2011 to 2433 in 2012 when NIWA switched from manually recording to an electronic recording device. NIWA sent the recorder away for testing and dumped the measurements taken from it, unceremoniously dropping New Plymouth's status of second place. (Abridged)

Biker killed as wild weather sweeps NZ

Friday, 08 January 2016 By Lynley Bilby

http://m.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11570826

The northern half of the North Island is being told to brace for more thunderstorms this evening, with forecasters warning we're not clear of the atrocious weather yet.

As wet roads prove hazardous, police warned people to stay home before adding to an already alarming weather-related crash toll which claimed the life of a motorcyclist in Taranaki today.

In Auckland and Wellington ferries were cancelled and flights in and out of the capital were disrupted as the stormy weather whipped up fierce winds.

MetService meteorologist Lisa Murray said thunderstorms would continue to hammer vast swathes of the North Island until tomorrow morning when the system finally cleared Bay of Plenty.

While the heaviest downpours had hit Auckland earlier in the afternoon a severe thunderstorm risk remained in place until nightfall for northern regions. Late this afternoon thunderstorms were hammering parts of Northland, Coromandel and northern Waikato.

"Thunderstorms can bubble up anywhere so the risk is still there so there's still a chance Auckland could get another good thunderstorm before this event is finished," said Miss Murray.

Ms Murray said Wellington was still being pummelled by gale force winds with the strongest gusts of



131km/h recorded at Kelburn.

*Aucklanders didn't let the Friday lunchtime rain stop them.
Photo / Greg Bowker*

The plans of hundreds of air passengers were disrupted, with flights in and out of the capital cancelled or delayed. Police warned trucks and motorcyclists travelling over the Rimutaka Hill Road to take extra care.

In Auckland buses replaced ferries to Gulf Harbour after stormy conditions forced the cancellation of all services. In Te Aroha a tarpaulin was need to be secured after it started lifting off the roof of a church. (Abridged)

Overnight storm brings welcome rain ahead of fine weekend for Nelson

8 January 2016 BILL MOORE. Nelson Mail MARION VAN DIJK/Stuff.co.nz

<http://www.stuff.co.nz/nelson-mail/news/75714470/Overnight-storm-brings-welcome-rain-ahead-of-fine-weekend-for-Nelson>

MARION VAN DIJK/FAIRFAXNZ *Woo hoo! looking out at the high seas on Rocks Road, Atawhai.*



The waves were caused by a low that has affected much of New Zealand. MetService meteorologist Lisa Murray said it had arrived "according to plan", with a moist flow ahead of it.

Overnight Nelson's western ranges got 90-130 millimetres of rainfall, with about 65mm at Takaka in the 12 hours to 9am. "That should be good for your catchment areas and hopefully give you a bit of water for your reserves,"

Murray

said. (Abridged)

Part of roof at Sunnynook supermarket collapses

8 Jan, 2016 NZ Herald

[http://www.nzherald.co.nz/nz/news/article.cfm?](http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11571112)

[c_id=1&objectid=11571112](http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11571112)

Photo / Daniel Hines

Shocked supermarket shoppers had to leave without their groceries when the front facade of the Countdown in Sunnynook collapsed this evening. (Abridged)





Weather: Thunder and heavy rain warnings for North Island and Upper South Island

8 January 2016

<http://www.stuff.co.nz/national/75708071/weather-rough-day-ahead-thunder-and-heavy-rain-warnings-for-north-island-upper-south-island>

High winds and heavy rain have caused problems across New Zealand.

A motorcyclist is dead and a major route into Taranaki closed after an accident caused by storms that are hitting much of the North Island.

Severe thunderstorms, heavy rain, and fierce winds gusting to 140kmh are bearing down on large areas of the country, causing chaos from coast to coast.



ZANETTA ZANETTA/FACEBOOK Flying trampoline, Wainuiomata

A "mini tornado" hit near Picton, seeing holidaymakers pack up their tents and head home early.

Areas likely to have the heaviest rain are north Westland, Buller, the ranges of northwest Nelson and Nelson Lakes, the Tararua Range, and the ranges of eastern Bay of Plenty.

In Wellington, high winds forced the cancellation of numerous flights.

Planes of all sizes were struggling in the strong, driving winds, and the delays and cancellations were expected to continue

for the rest of the day, Wellington Airport spokeswoman Briarley Kirk said.

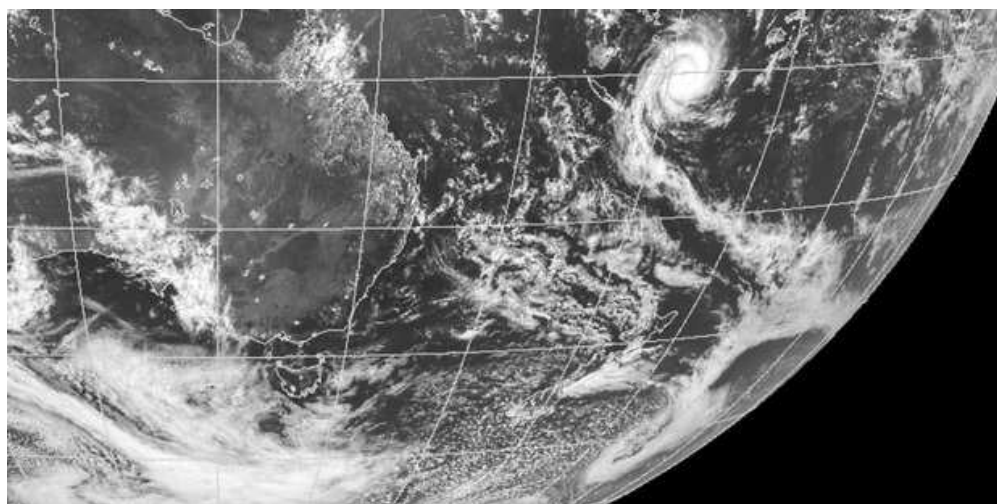
"The winds are driving and then dropping off, which is causing problems to all planes across the network."

Winds are expected to be strongest in Marlborough, Wellington, Wairarapa, with other areas at risk including inland north Canterbury, Kapiti Coast, Hawke's Bay, and coastal Southland and Clutha. (Abridged)

Cyclone ULA may strike New Zealand this week

10 Sunday Jan 10, 2016

http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11571656



This image taken by the geostationary MTSAT satellite shows Cyclone Ula in the Pacific Ocean heading towards New Zealand. Photo / Supplied

Tropical Cyclone Ula may strike New Zealand this week, possibly bringing heavy rain to the top of the North Island.

The category 3 storm is today halfway between Fiji and New Caledonia, but may come within

reach of New Zealand as early as Tuesday, weather forecasters say.

The slow moving storm is tracking west-southwest, MetService said, and the remnants of the cyclone may move to within the northeast of the North Island by Tuesday, bringing with it bands of heavy rain to the Far North. It is unlikely Cyclone Ula would bring warning levels of rain with it to New Zealand, both MetService and WeatherWatch said, as it will gradually weaken as it leaves the tropics and moves south. (Abridged)



NIWA annual climate summary reveals 2015 dominated by warm, dry days

11 January 2016, RACHEL THOMAS

<http://www.stuff.co.nz/national/75770945/Niwa-annual-climate-summary-reveals-2015-dominated-by-warm-dry-days>



Low soil moisture levels dominated many places at both ends of 2015, says Niwa.

Soil bled dry by the warm sun was the flavour of the country's weather in 2015, with a raging El Nino to boot.

Below normal soil moisture levels dominated most of the country through January and February 2015. By the end of July, soil moisture levels had returned to near normal levels for much of the country. Soil moisture levels around the country, particularly in the Waikato, began to drop again in October, but as of January 1, 2016, had returned

to near-normal for Auckland and the Coromandel.

An El Nino event was officially declared in June, and continued to strengthen throughout the second half of the year becoming a key climate driver for New Zealand. By many measures this El Nino developed into one of the strongest since 1950, said Niwa forecaster Chris Brandolino. (Abridged)

The year the South Island broke weather records

12 January 2016 CHARLIE MITCHELL

<http://www.stuff.co.nz/the-press/news/75815342/the-year-the-south-island-broke-weather-records>



MYTCHALL BRANSGRÖVE Timaruvians hit the beach on a 36.4 degree day last January, which would turn out to be the hottest temperature recorded in New Zealand all year.

Last year it was sunnier in Greymouth than in Auckland, Hanmer Springs had its driest year in more than a century, and more rain fell in a single day in Milford Sound than all year in Cheviot.

Some of the most extreme weather conditions ever recorded in the South Island happened last year, in what turned out to be a strange 12 months of weather extremes.

NIWA's just-released annual climate summary for 2015 showed turbulent weather throughout the South Island, spurred by harsh El Nino conditions.



JOHN BISSETT Sunny... Greymouth? The West Coast town had a record year for sunshine hours in 2015, making it sunnier than Auckland.

Records at opposite ends of the weather spectrum fell, some more than a century old.

For many, the North Canterbury drought defined the year's weather: Niwa's data revealed it was even more severe than some thought. Its data showed Hanmer



Springs endured its driest year since records began 110 years ago, receiving just 56 per cent of its usual rainfall. Kaikoura had its second driest year in 117 years, with 55 per cent of usual rainfall.



SYLVIA THOMPSON-KRIEK *Hanmer Springs had its driest year since records began 110 years ago.*

Both Rangiora and Cheviot were in the top five driest locations nationwide, recording similar rainfalls to famously parched areas such as Clyde and Alexandra in Otago.

Cheviot — the heart of drought-country — recorded its highest temperature ever last month, with 36.1 degrees, and received more

sunshine hours than ever before.

Dunedin, Lake Tekapo, and Greymouth were also among the South Island locations which registered more sunshine hours than previously recorded.



SUPPLIED *Flooding caused chaos in Dunedin in June. It was the second-highest amount of rainfall in a 24-hour period for the city in nearly a century.*

Unusually dry weather in the north east was typical for an El Nino pattern, said Niwa principal forecaster Chris Brandolino. He said extreme dryness in areas such as Hanmer Springs and Kaikoura was particularly noteworthy.

"There was the dry, early start. In January and February the

drought began, then we had El Nino kick in and we didn't have much rainfall thereafter.

"It's not just a single month or a season, it's the whole stinking year. Records go back to 1905, so I think that's significant."

The South Island also proved to be the destination for extreme temperatures, at both ends of the scale.

On January 23, many Timaruvians flocked to the beach in the 36.4 degree heat, which was the highest temperature recorded nation-wide. It was matched by Leeston last month, on a day of searing temperatures throughout Canterbury.

Just 100 kilometres from Timaru, the Tara Hills near Omarama hit the fourth lowest temperature ever recorded in New Zealand: -21 degrees. The next day, it reached -19.7 degrees, the eight-lowest temperature ever recorded.

"The fact we had the fourth lowest temperature ever recorded in the country raises your eyebrows. There was a bit of an El Nino influence there," Brandolino said.

"We tend to find elevated rainfall on the west coast of each island, particularly the South Island, and a propensity for reduced rainfall in the northern and eastern parts of both islands."

He said the current El Nino pattern was "particularly strong", which accounted for some of the extremes.

While North Canterbury suffered a record drought, other parts of the South Island endured record rainfall. The three wettest areas nationwide were on the West Coast: the wettest, the Cropp River near Hokitika, experienced around 11.5 metres of rainfall, almost 40 times the amount of rain which fell in Rangiora.



On April 25, 420mm of rain fell in Milford Sound, more than the total rainfall in Cheviot all year. Extreme flooding in Dunedin on June 3 resulted in chaos, closing roads and evacuating homes: records show it was the second highest rainfall experienced in Dunedin in a 24-hour period since 1918.

Dry year for Stratford despite El Nino enhanced wet winter.

12 January 12 2016

<http://www.stuff.co.nz/taranaki-daily-news/news/75810960/Taranaki-December-rainfall-one-quarter-of-normal>



CHARLOTTE CURD/Fairfax
NZ Stratford was certainly dry on the day of its Christmas Parade.

Stratford has had a rough year - recording its driest December since rainfall records began in 1960 as well as its driest October ever.

According to Niwa's monthly climate summary, 38 millimetres of rain was recorded at the Stratford collection station - 24 per cent of what the site would usually expect in December.

However, there is a small discrepancy between Niwa's re-

sults and the Taranaki Regional Council's (TRC) records.



Taranaki Regional Council's monthly rainfall report highlights an unusually dry December.

Taranaki Regional Council recorded 34 per cent of normal rainfall for December at Stratford, or 58mm of rain, slightly more than Niwa's results.

Niwa climate scientist Nava Fedaeff said the variance could stem from the period in which the two agencies collect their statistics and difference in collection station placement.

"We record from 9am on the first of the month to 9am on the first of the next of the month," she said. "So any rain that occurs between midnight and 9am would be missed by our collection station."

Data Analyst for hydrometric services at TRC, Fiona Jansma, said Niwa and the council measure rainfall from different sites roughly one kilometre apart. "Any rainfall statistic is merely a snapshot relating to the particular location of the rain gauge," she said. "The amount of rain even a few metres away from the gauge may be quite different."

Niwa's report also highlighted a disappointing result for New Plymouth's sunshine hours, falling

in at seventh place behind Blenheim, Whakatane, Lake Tekapo, Appleby, Waipara and Nelson. (Abridged)



Have NZ Farmers escaped El Nino?

17 Jan 2016 NZ Herald

http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=11575334



Calves waiting to be fed on a dairy farm near Cambridge. Photo / Getty Images

The El Nino has yet to make its presence felt on New Zealand dairy production, although the event still has some months to run.

Latest data from the Dairy Companies Association of NZ showed national milk production was down 2.1 per cent in November compared with the same month a year ago, and was down by 3.1 per cent in the season

to date.

Analysts said it was difficult to gauge the exact impact on production that El Nino would have throughout the remainder of the dairy season, but that rain since the New Year would have been useful for many farmers. (Abridged)

Short, sharp thunderstorm blasts away fog threatening Wellington Airport

18 January 18 2016

<http://www.stuff.co.nz/travel/travel-troubles/75972964/thunderstorm-to-blast-away-any-fog-returning-to-wellington-airport>



Heavy rain, accompanied by thunder, has passed through Wellington and heavy falls are expected to continue in the region overnight.

The short-lived thunderstorm hit the capital from about 5.30pm on Monday, just a day after thick fog disrupted more than 40 flights.

CIARA WOODSIDE

Dramatic shot of the thunderstorm approaching Paekakariki beach, north of Wellington.

JS McELHINEY/ *approaching storm mingles with fog over Wellington Airport, Monday afternoon.*



Flights are up and running again, and MetService forecaster Nicole Ranger said the dramatic storm, which began around Whanganui about



3pm and tracked south had blown itself out.

It had also swept away sea fog that was threatening to engulf Wellington Airport again on Monday afternoon.



DANIEL BAILEY Meteorologist Ross Marsden watches the storm roll in from the rooftop at MetService in Wellington's Botanic Gardens.

A severe thunderstorm warning was issued for the greater Wellington region, with very heavy rain and damaging wind gusts forecast as it moved rapidly south.

Wet January makes up from dry December

20 January 2016 NICHOLAS MCBRIDE AND JILL GALLOWAY



<http://www.stuff.co.nz/manawatu-standard/news/76027780/wet-january-makes-up-for-dry-december>

Grant Matthew / FAIRFAX NZ The Oroua River in Awahuri, Manawatu is a popular summer spot

Hot and sticky weather in Manawatu looks set to continue as people reach for both raincoats and sunblock.

January has seen temperatures hitting nearly 30 degrees Celsius, but also a higher proportion of rain.

The region's farmers are welcoming the rainfall, on the back of a

drier than usual December.

Records from Niwa show Palmerston North had 46 millimetres of rain last month, about 51 per cent of what would normally be expected. January quickly made up for that, with 47mm already recorded by the 17th. That was 86 per cent of the entire month's average expected rainfall. Farmers say



the rain this week has been gold.

The temperatures have slowly been getting higher too. MetService recorded 29.8C on Sunday. (Abridged)

Risk of El Nino drought eases after the rain

25 Jan, 2016 NZ Herald

http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=11579307



ANZ said the rain could bring with it an unwelcome increase in dairy production at a time when the world is still suffering from oversupply.

Recent rains have helped to improve pasture conditions across the country and reduce the risks from El Nino substantially - in fact apart from a couple of regions, it's turned into something of a non-event. The exception

was from coastal Gisborne to Hawke's Bay where soil moisture levels have decreased slightly. Soil moisture levels are below normal across much of Southland, and southern and interior Otago but near or above normal along the West Coast, Niwa said. (Abridged)

South Korea and Hong Kong shiver as snow disrupts flights

24 January 2016 BBC Asia

<http://www.bbc.com/news/world-asia-35395780>



Image copyright Reuters : Flights have been cancelled for a second day at Jeju airport

The South Korean island of Jeju has seen its biggest snowfall in three decades, causing hundreds of flights to be cancelled.

In Hong Kong, residents shivered in three degrees Celsius, the lowest temperature there in nearly 60 years.

The state-run People's Daily said on its Weibo social media account that the city

of Guangzhou had recorded its first snowfall since 1929.

In Japan, the Kyodo news agency said it had snowed in Amami Island, a subtropical island 380km (235 miles) south-west of Kagoshima City, for the first time in 115 years.

The Cold hard facts

26 Jan Kenneth Lau, Yupina Ng and Mary Ann Benitez

<http://www.thestandard.com.hk/section-news.php?id=165599>

The forecasting accuracy of the Hong Kong Observatory was called into question a day after Hong Kong shivered through the coldest day in 59 years.

The observatory's original forecast for Sunday's low was six degrees Celsius but the actual temperature recorded was three degrees. Subzero temperatures were recorded at the highest point of Tai Mo Shan and other peaks.

A New Zealand weather website, which adopted the European Severe Weather Database, had fore-



cast that Hong Kong's temperature would drop to four degrees on Sunday and it would have one centimetre of snow.

Chan said the observatory has always taken computer models from the United States, Japan and the Europe and it tried to find a balance. "Taking the most extreme one is not a smart option, although it might be eye-catching for the public," he added.

However, the observatory was quoted as saying "we know best" when telling the public not to worry and not to believe other weather websites that forecast there would be snow in Hong Kong.

Hot weather derails Kiwirail train

Tue, Jan 26

<https://www.google.com/url?rct=j&sa=t&url=https://www.tvnz.co.nz/one-news/new-zealand/hot-weather-derails-kiwirail-train>

Hot weather has caused a freight train carrying frozen meat to derail in the central North Island.



*Train derailed at National Park (Iain Stables)
Source: Supplied*

Six carriages have derailed in National Park, according to police. A Kiwirail spokesperson says the train derailment was caused by the hot weather, as high temperatures caused the steel tracks to buckle

and bend out of shape.

There are no injuries and no dangerous goods or gases involved. (Abridged)

Auckland Heat wave

Thu, Jan 28

<https://www.google.com/url?rct=j&sa=t&url=https://www.tvnz.co.nz/one-news/new-zealand/been-cranking-the-fan-aucklanders-power-use-surged-as-heatwave-hit>

Aucklanders' power use surged during this week's heatwave as they cranked up air conditioners and fans to keep cool.

Data from Transpower shows that as the mercury nudged 30 degrees in many parts of the city on Monday, Auckland residents used an average of 1,041 Megawatts (MW) between 9am and 5pm. That's 7.7 per cent higher than the 966 MW average of the previous two Mondays.

Mr Sargent says Aucklanders should plan for higher power costs this month if the hot and muggy weather continues. He says New Zealanders are used to low power bills in the summer.

Cyclone VICTOR brings more chaos as it sweeps past the country

28 Jan, 2016

<https://mail.google.com/mail/u/0/#label/WeatherWatch/15281ec2279dbc2e>

The North Island is in for another stormy day with heavy rain and thunderstorms as former tropical cyclone Victor sweeps past the country.

MetService has issued a severe weather warning for Gisborne to east of Wairoa with up to 150mm predicted to fall in some areas over a 12-hour period.

The forecaster says Northland and northern parts of Auckland will be affected by unsettled showery southwesterlies with a low risk of one or two thunderstorms.

Those living on the east coast were being warned to watch out for quickly-rising streams and rivers, and to be aware of possible flash flooding and hazardous driving conditions.

The combination of humid subtropical air and wind convergences were also expected to trigger



heavy showers over the upper half of the North Island, including Waitomo, Waikato, Taupo and Bay of Plenty.

Flash flooding hit parts of South Auckland last night as a slow-moving rainstorm passed over the area. Rangitoto Rd resident Freda King said "two lakes" built up outside her Papatoetoe property.



WeatherWatch analyst Philip Duncan said his company received a photo of water being pumped out of a house in Clevedon.

"The downpours are as a result of humidity brought down by ex-Cyclone Victor combining with afternoon heat over land," he said.

*Wyllie Road in Papatoetoe.
Photo / Supplied*



Kirby Road in Glendene last night. Photo / Supplied

"The light easterly wind in Auckland and Waikato today helped shift most of the risk into rural areas in the south-west of each region."

At the moment [7pm last night], we've still got a fair few thunderstorms around, they've moved sort of west of Taupo and west of Auckland and

Northland, but those should be easing," MetService meteorologist Claire Flynn said.

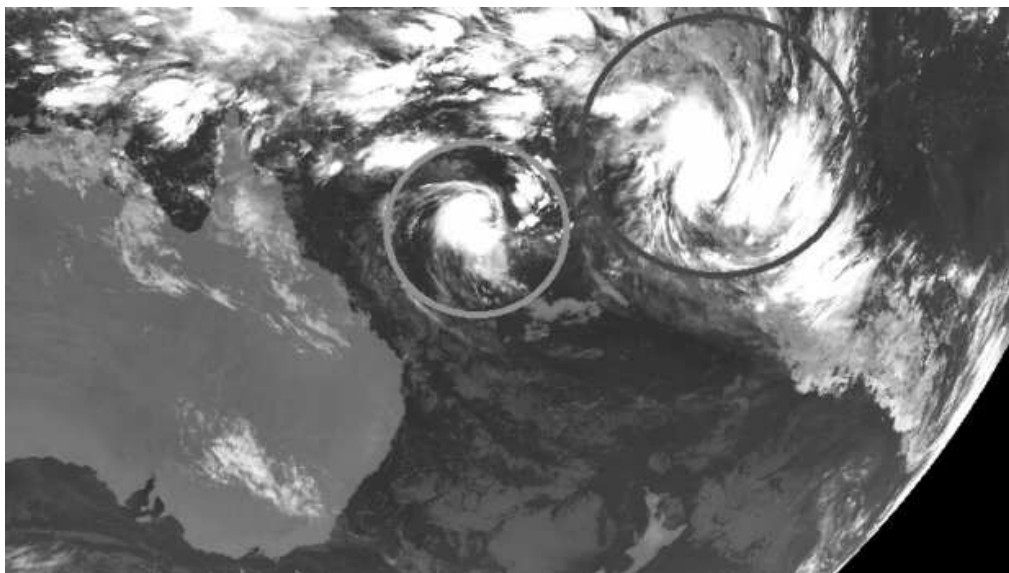
MetService reported more than 1000 lightning strikes across the island in the afternoon, and National Park received 66mm of rainfall in the 12 hours to 7pm. (Abridged)

Weather: Cyclones churn up tropics but weekend looking OK across New Zealand

MICHAEL DALY 12 February 2016

<http://www.stuff.co.nz/national/76814597/Weather-Cyclones-churn-up-tropics-but-weekend-looking-ok-across-New-Zealand>

Forecasters are keeping a close eye on twin cyclones set to batter the Pacific and then head south toward New Zealand.



Japan Meteorological Association The twin cyclones straddling Vanuatu.

The cyclones are on either side of Vanuatu, with Tatiana in the central Coral Sea and Winston between Vanuatu and Fiji. Reports overnight Thursday said Tatiana was a category one cyclone and Winston category two.

MetService meteorologist Matthew Ford said both



of the cyclones were expected to start heading south out of the tropics, but there was a large ridge of high pressure over New Zealand moving slowly east.

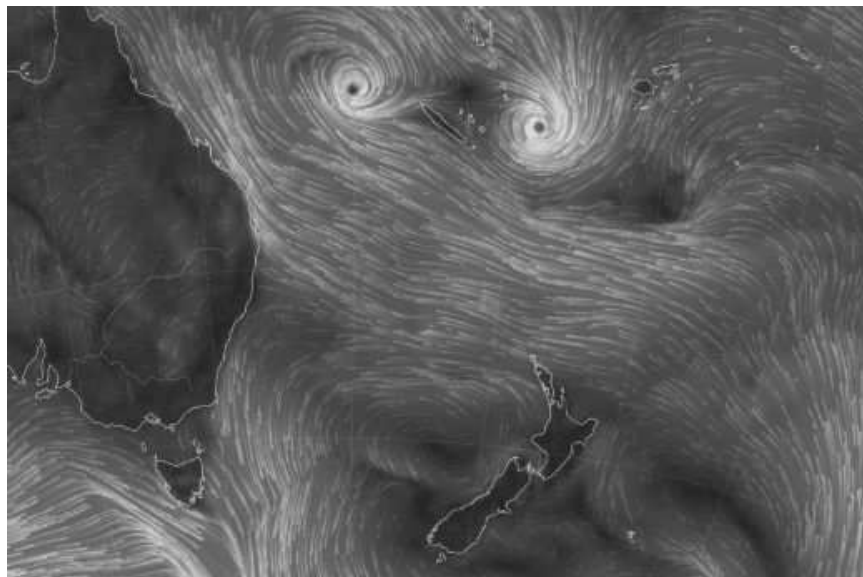
"Even though the cyclones head southwards, it seems like they may bounce off the ridge," Ford said. "The main worry is for Vanuatu and Fiji. For us at this stage, it doesn't look especially major but it will be closely monitored," Ford said. (Abridged)

Twin cyclones

13 Saturday Feb, 2016

<http://www.sunlive.co.nz/news/119455-twin-cyclones-approaching.html>

Tropical cyclones Tatiana and Winston are not expected to remain cyclones long enough to be any major threat to New Zealand, but they will definitely be noticed.



Tropical cyclones Tatiana and Winston today. Picture: Earthwind.

Philip Duncan at Weatherwatch.co.nz says the smart money is on both the cyclones breaking up as the encounter the strong easterly winds currently crossing north of New Zealand.

Winston is at this stage expected to be bounced back into the open Pacific north and east of New Zealand. While Winston may strengthen to a category three storm today, it's expected to weaken to a category two by Monday. (Abridged)

Niwa forecasts climate change effects in central North Island

16 February 2016 NICHOLAS MCBRIDE Manawatu Standard

<http://www.stuff.co.nz/manawatu-standard/news/76942609/niwa-forecasts-climate-change-effects-in-central-north-island>



David Unwin/Fairfax NZ. Niwa warns more hot days if climate change is not accounted for.

Niwa has offered a glimpse into the day after tomorrow with future weather forecasts as a result of climate change.

The environmental science institute made a presentation to the Horizons Regional Council.

Niwa chief science advisor Clive Howard-Williams said the data offered an average climate for the

region. "If you want to talk about [climate] change, you have to understand what the average is right now to measure against."

The council was also given a preview of research of future projections, based on previous research. Climate scientist Petra Pearce's presentation stated that carbon dioxide levels had increased 40 per cent since pre industrial times, with human influence extremely likely to be the main cause. The temperature in New Zealand had risen 0.09degC per decade since 1909.



The Intergovernmental Panel on Climate Change had outlined various future scenarios, depending on how much work was done to arrest change. Applied to the Manawatu-Whanganui region, lower scenarios saw temperature increases of 1degC by 2040, while by 2090 that could increase by 1.75degC in some areas

Horowhenua councillor Lindsay Burnell questioned how accurate the modelling was.

"MetService have trouble forecasting a week ahead."

Pearce responded that weather was day-to-day and climate was over a longer time scale.

"Generally, it is a bit easier to forecast climate." (Abridged)

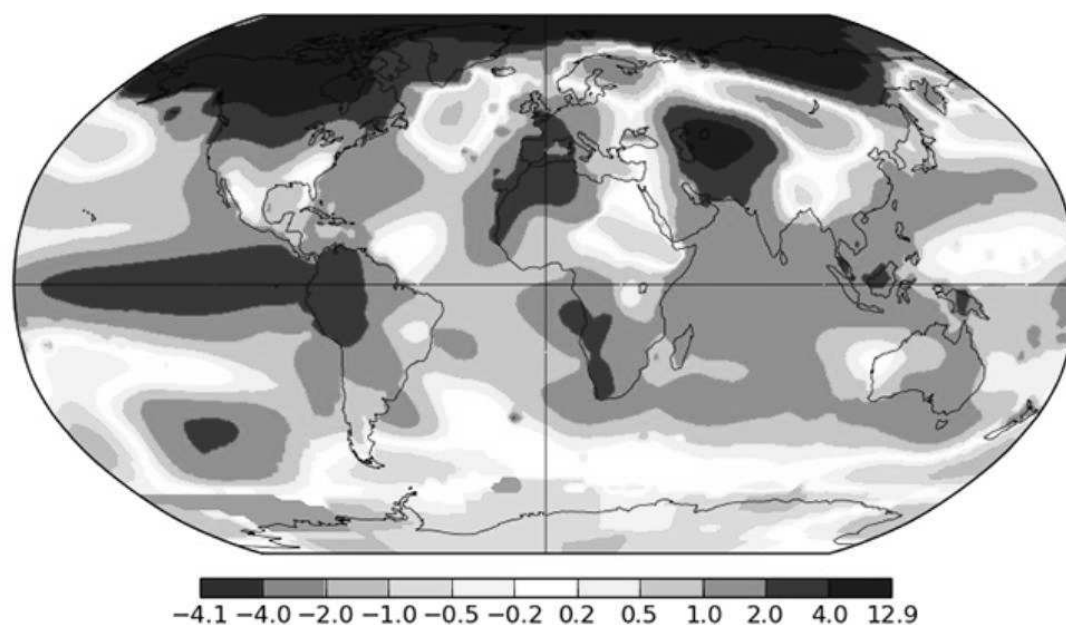
January 2016 Was the Most Abnormally Warm Month Ever Recorded, NASA Says

17 Feb 17 2016 By Jon Erdman

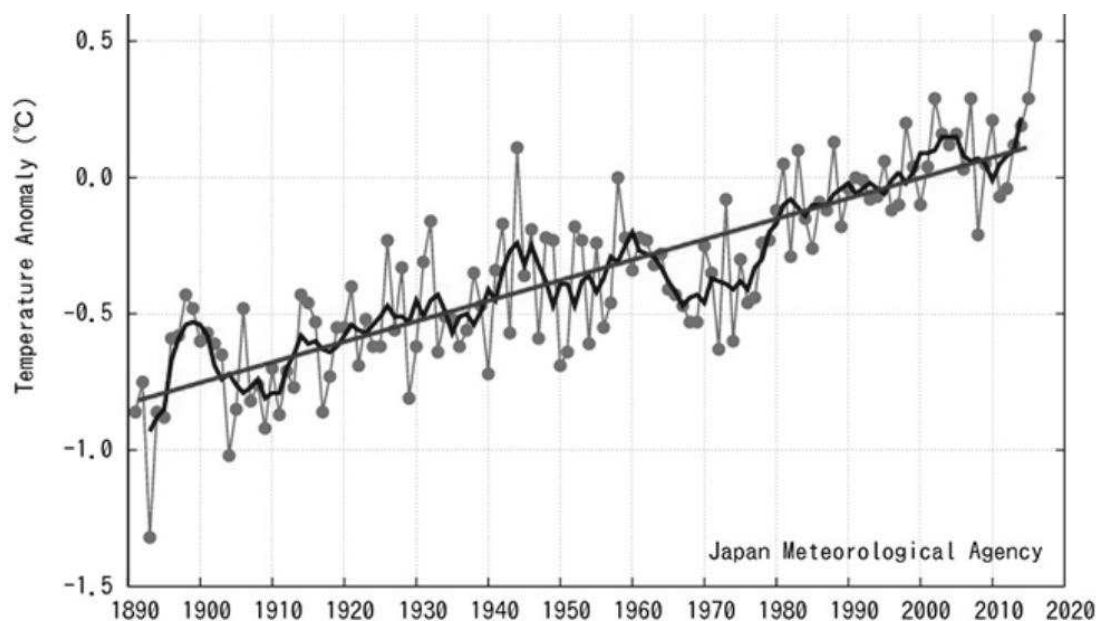
<https://weather.com/news/climate/news/record-warmest-january-global-2016>

January 2016 was not only Earth's warmest January on record, but also featured the largest warm departure from average for any month, according to two separate analyses released this week.

The first month of 2016 started with a global temperature departure of 1.13 degrees Celsius above the 1951-1980 average, according to NASA's Goddard Institute for Space Studies.



January 2016 temperature departures from average, in degrees Celsius, relative to 1951-1980 average. Brown/blue contours correspond to temperatures most above/below January averages. (NASA/GISS)



January global temperature departures from 1891-2010 average (degrees Celsius) from 1891 through 2016 shown as gray lines and dots. Five-year running mean is shown in blue. Long-term trend is shown in red. (Japan Meteorological Agency)

That may not sound impressive, but ingesting temperature data over the entire surface of the Earth, NASA's analysis found this was the largest monthly warm temperature anomaly in their database dating to 1880, topping a record set the previous month.



A separate analysis from the European Centre for Medium-Range Weather Forecasting also found January 2016 set a new record-warm anomaly for the globe, 0.72 degrees Celsius above the 1981-2010 average. That reanalysis, however, dates only to 1979.

The Japanese Meteorological Agency's calculations also found January 2016 was the globe's warmest on record.

There were some colder spots in January, relative to average, including much of Scandinavia, central Russia, the Kamchatka peninsula, northeast Africa, Antarctica and the north Atlantic Ocean from off Newfoundland to Iceland, according to NASA.

January 2016 continues a string of 371 consecutive months at or warmer than average. The last colder-than-average month in NASA's database was February 1985, and Earth's last colder-than-average January was 40 years ago, in 1976. (Abridged)

Wild weather causes flooding

Wednesday, 17 February 2016 Cherie Howie

http://m.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11590814



A slip at Cemetery Hill, Ross near Hokitika as heavy rain hit the West Coast. Photo / NZTA

Hokitika residents have been hit with flooding, while thunder and lightning have been recorded in the Milford Sound.

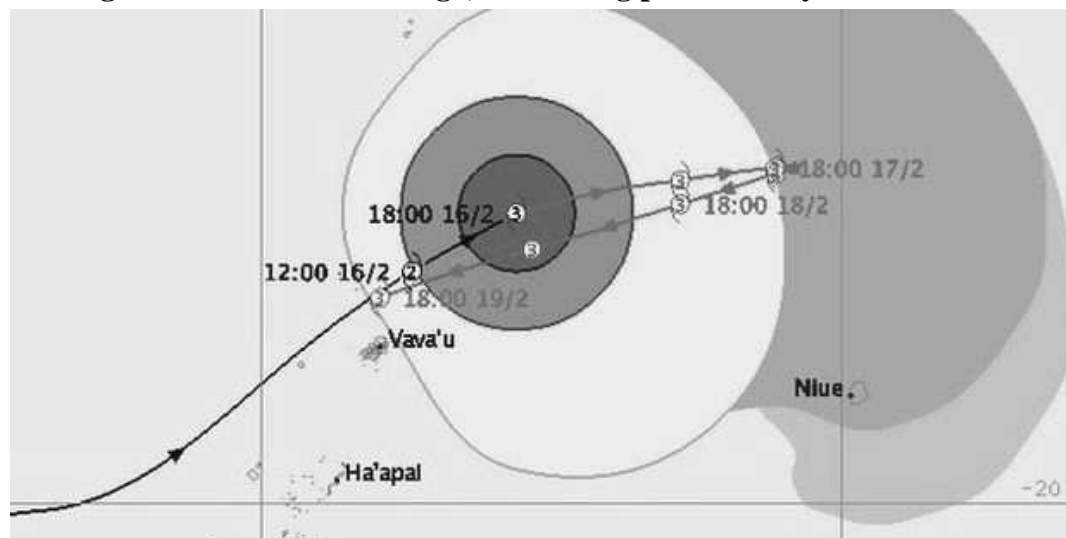
By 7am, Hokitika had received 200mm of rain since 10pm yesterday. A further 220mm of rain was expected by tomorrow afternoon.

Further south, the Jackson Bay Road - closed by multiple slips caused by heavy rain three weeks ago - was also closed again.

Part of the Ross Cemetery hill came down in the rain and closed the road temporarily.

The extreme weather was a result of a front moving up the country, MetService meteorologist Lisa Murray said. Rain is expected to ease in Westland for a period this afternoon and early evening, but more heavy rain is likely Friday morning.

Meanwhile, Cyclone Winston has re-intensified back to a severe, category three, cyclone. It has been tracking northeast towards Tonga, after being pushed away from New Zealand by a large high.



Tropical Cyclone Winston has moved so far back north it has returned to a Category 3 cyclone, making it severe again. Photo / MetService



North Island hit by onslaught of wild weather

18 February 18 2016

<http://www.stuff.co.nz/auckland/77011969/north-island-hit-by-onslaught-of-wild-weather>



JASON DORDAY / FAIRFAX *Best to pack the brolly today, as MetService reports the wild weather in the Northern regions is not yet over.*

MetService duty forecaster Chelsea Glue said the Auckland region had experienced heavy rainfall, and gusty winds which had not yet died down on Thursday morning.

"Some gusts in particularly exposed spots are reportedly 35 knots -

which is around 70 kilometres."

Much of the Auckland region had felt over 30 millilitres of rain in the past 12 hours - enough to help out the gardens. Taranaki had experienced torrential rain, with over 200 millilitres of rainfall in the past 12 hours alone. (Abridged)

Wild weather in the Bay

Thursday 18 Feb, 2016 Bay of Plenty Times

http://www.nzherald.co.nz/bay-of-plenty-times/news/article.cfm?c_id=1503343&objectid=11591889



Windsurfer in Kulim Park. *Photo/John Borren*

A severe thunderstorm watch has been issued for the Bay of Plenty this evening.

A slow moving front lies over the northeast of the North Island tonight and early tomorrow morning, bringing periods of heavy rain and a few thunderstorms.

There is warning for the possibility of localised

downpours of 25 to 40mm/hr over Auckland near the Hauraki Gulf, the Coromandel Peninsula and Kaimai Range, also Bay of Plenty and eastern parts of Taupo.

Windsurfers took to the water in Tauranga to make the most of the gusty conditions earlier today. According to MetService wind gusts got up to 52km/h. (Abridged)

Cyclone WINSTON may reach Category 5

Thursday, 18 February 2016 By Vaimoana Tapaleao

http://m.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11591832

Tonga is bracing for a severe hit from a tropical cyclone that has the potential to reach category 5 in strength - bringing winds of up to 300km/h. Cyclone Winston is forecast to reach the Vava'u group of islands late tomorrow and expected to stay through to Saturday.

MetService duty meteorologist Micky Malivuk said there was potential for the tropical cyclone,



which was tonight category 4, to reach a category 5 status - the most dangerous and destructive of all storms.

Regular weather warnings in the Pacific region were being issued by the Fiji Meteorological Service, Mr Malivuk said. The advice to locals was to "brace for impact".

"The other areas of Tonga will experience high seas and heavy rain too. But Vava'u, specifically, will get the strongest winds," he said.

Vava'u - north of Tongatapu, where the capital Nuku'alofa is - has already bore the brunt of the same cyclone earlier this week. Despite the cyclone system passing through, it has effectively done a U-turn in the past few days.



*Photo of damage in Tonga.
Photo / Supplied*

Mr Malivuk said Cyclone Winston is forecast to leave Tonga later on Saturday and head towards Fiji. The Met-Service said tonight that at this stage, the cyclone system was not expected to head towards New Zealand.

However, wild weather caused havoc in some parts of New Zealand today and last night.

A front moving over the west of the country brought huge amounts of rain and strong winds to both islands. (Abridged0

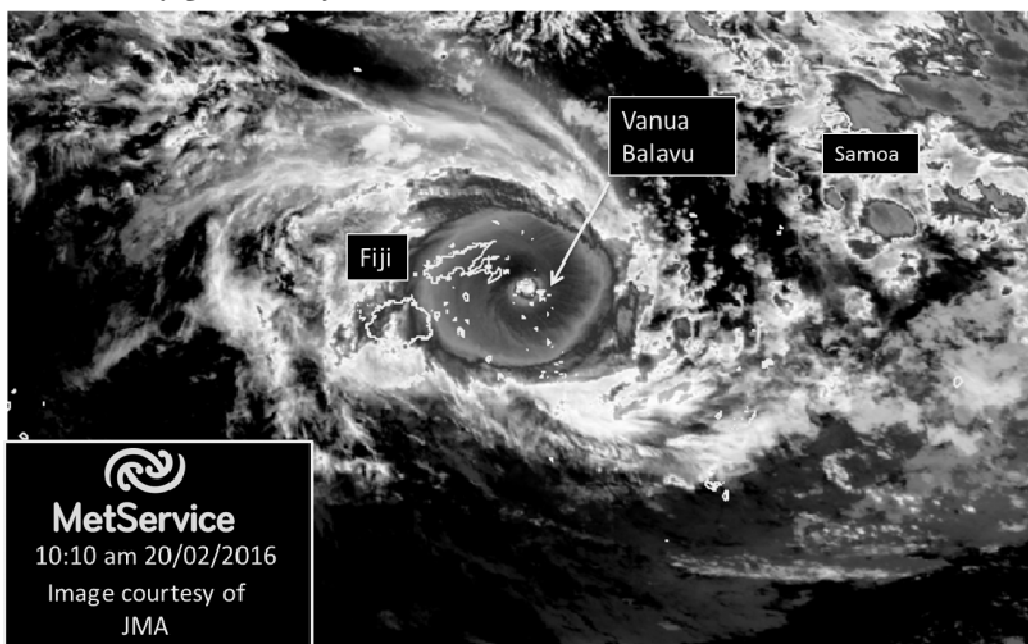
Category 5 Tropical Cyclone Winston tracking across FIJI

20 Feb 2016 By MetService meteorologist Emma Blades

<http://blog.metservice.com/node/1120>

All times are in New Zealand local time.

Tropical Cyclone Winston was upgraded to a category five cyclone last night. This morning the centre tracked near to the Fiji Island of Vanua Balavu, where average wind speeds of 185km/h were recorded. Wind speeds even closer to the centre of the cyclone are estimated to average 220km/h, with momentary gusts likely to reach 315km/h.



Infrared satellite image (indicating cold cloud top temperatures) showing the location of TC Winston at 10.10am Saturday 20th February 2016.

Future Track

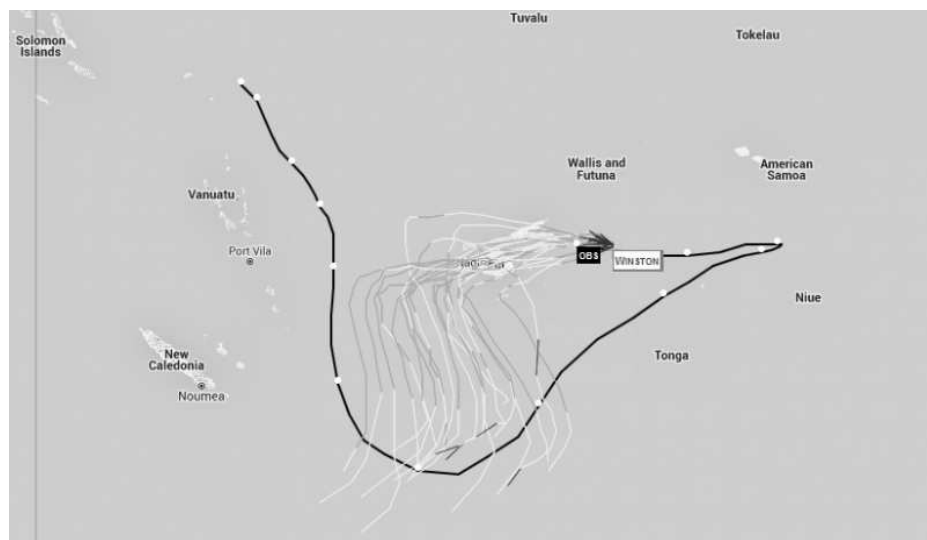
Over the next couple of days, the winds close to the centre of TC Winston are forecast to weaken a touch, but still remaining around 200km/h. TC Winston is expected to move west-southwest over Fiji, before tracking south.

Impact on NZ

There are currently no direct impacts expected for New Zealand in the next few days as TC Winston moves westward and then takes a more southerly track. Most global weather models expect the fu-



ture track to move southwest and then northwest before weakening near the Coral Sea, but there are also some models who have the track moving further south. (Abridged)



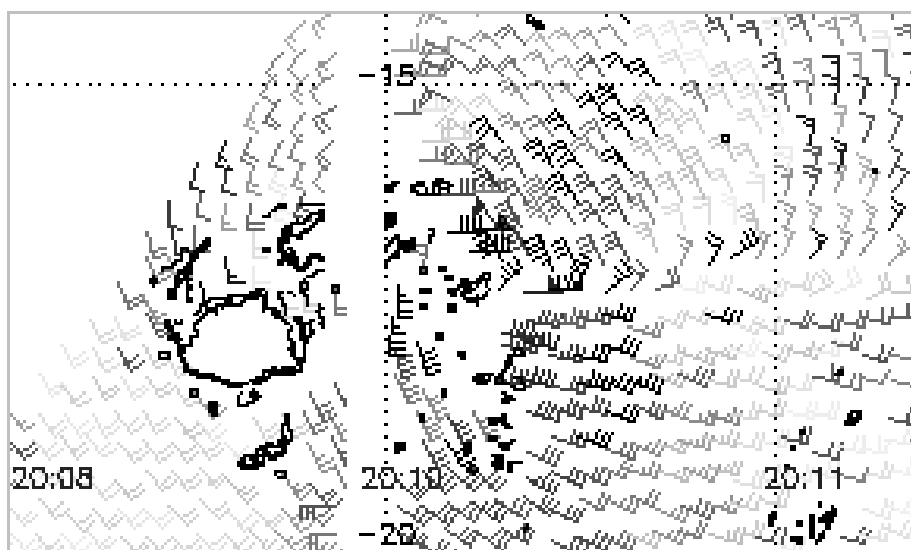
Range of possible future tracks for Severe TC Winston over the next 5 days, based on GEFS data. Image from NOAA Earth System Research Laboratory.

Severe Tropical Cyclone Winston- the strongest TC to ever hit Fiji

20 Feb 2016 (afternoon update)
By MetService Communications
Meteorologist Lisa Murray
<http://blog.metservice.com/>

node/1121

Category 5 Severe Tropical Cyclone (TC) Winston is now the strongest category 5 tropical cyclone to make landfall over Fiji.



RapidScat Wind observations at 12.12pm today (Saturday) at 12.5km resolution. Wind barbs show wind speed in knots (not km/h), each barb=10 knots. (Abridged)

Historic Cat 5 Cyclone Winston makes Landfall on Fiji's main island, but now returns to sea
20/02/2016 - 22:00

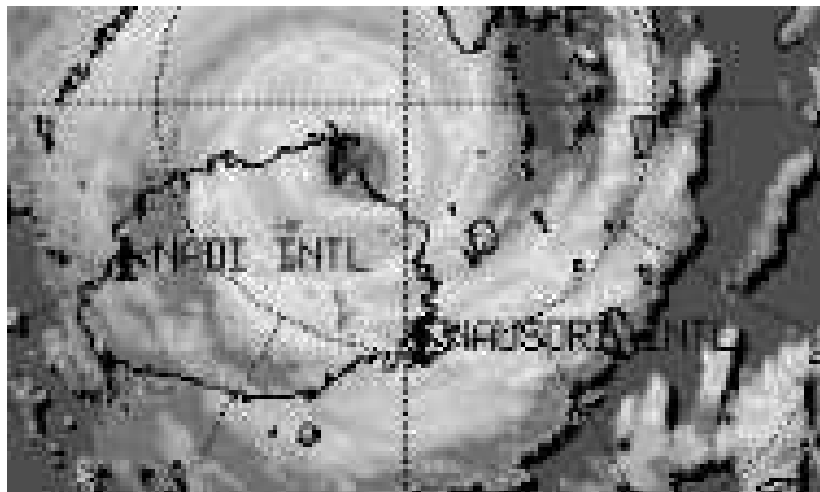
<http://www.weatherwatch.co.nz/content/category-5-cyclone-winston-about-make-landfall-viti-levu-fijis-main-island>

UPDATED 10pm NZT -- Severe Category 5 Tropical Cyclone Winston has made landfall in northern Fiji according to WeatherWatch.co.nz and backed up by Fijian rain radar images which clearly show the eye making a direct hit around 7pm local time (8pm NZT).

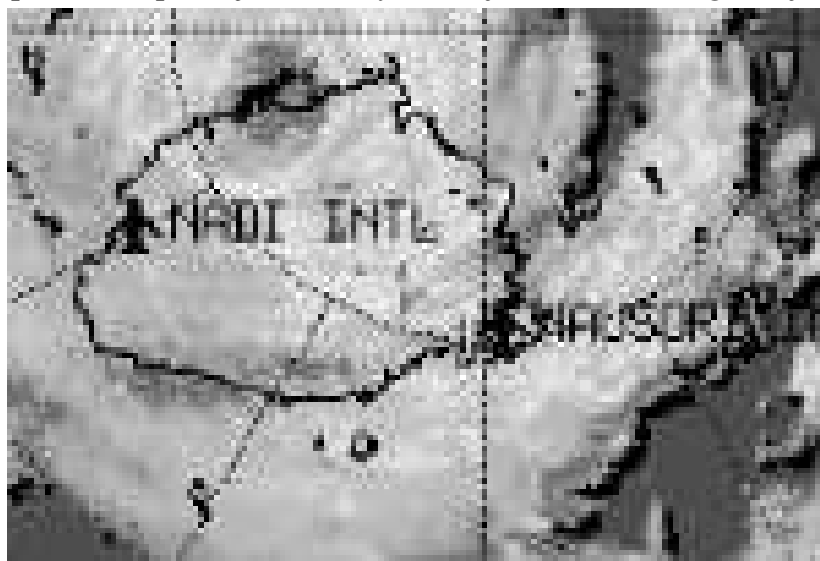
For 60 to 90 minutes the centre of the eye directly crossed the north of the island.

WeatherWatch.co.nz says the entire northern half of Viti Levu is exposed to damaging hurricane force winds and 250 to 500mm of rain overnight. This is an extremely serious situation - this is Fiji's strongest storm in recorded history.

The storm also peaked in strength just as it approached Fiji from the east. (Abridged)



8pm NZT (7pm Fiji time) - Eyewall of Winston making landfall in Fiji /. IMAGE via FIJI MET



9:10pm NZT (8:10pm Fiji time) - The eye of Cyclone Winston returns to sea

Queensland weather: Big waves to continue this week

22 February, 2016 Sydney Morning Herald

<http://www.smh.com.au/environment/weather/queensland-weather-big-waves-to-continue-this-week-20160222-gn040c.html>

Cyclone Winston whips up big swell on the Gold Coast, prompting mass rescues and a warning from lifesavers; "don't go in". *Nine News*

The Bureau of Meteorology has warned anyone venturing out the surf will be "deceptively powerful" over the next two days, with more beach closures expected to follow those at the weekend.



Surfers were enjoying big waves at Snapper Rocks. Photo: Chris Hyde

BOM's Jess Carey said surf along the south-east coast was being powered by strong easterly winds from Cyclone Winston, which lashed Fiji at the weekend, and is tracking south west across the Pacific.

The easterlies came after big waves at the end of last week were caused by a strong southern low that pushed up

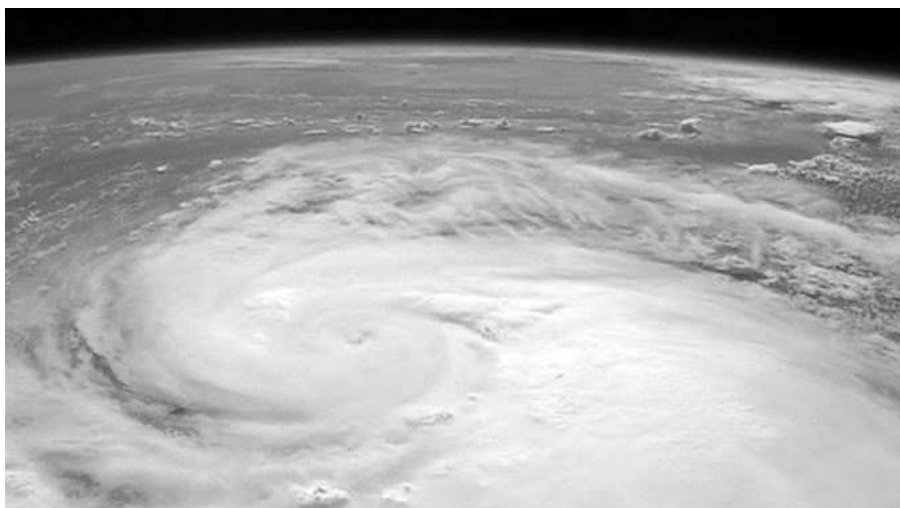
from Bass Strait and, before that, by the remnants of Cyclone Tatiana. "Really over the past seven to 10 days we have had large conditions." (Abridged)



Cyclone Winston looking set to bring stormy weekend, says WeatherWatch

22 February 2016, News Talk ZB

<http://www.newstalkzb.co.nz/news/national/cyclone-winston-looking-set-to-bring-stormy-weekend/>



NZME Remnants of Tropical Cyclone Winston are expected to end up in the Tasman Sea

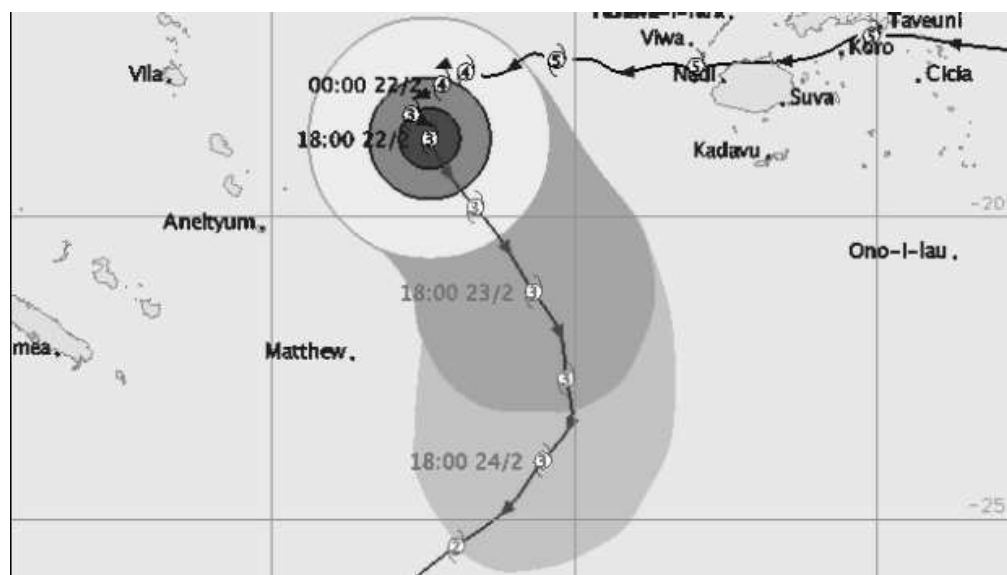
WeatherWatch analyst Philip Duncan said it will possibly affect New Zealand over the weekend. "So at this stage the main effect from Winston will be dangerous beach conditions around the upper North Island because this storm is generating swells or peak wave heights of 13 metres." (Abridged)

Cyclone Winston's remnants increasingly likely to head for NZ, says NIWA

23 February 2016 MICHAEL DALY

<http://www.stuff.co.nz/national/77177525/Cyclone-Winstons-remnants-increasingly-likely-to-head-for-New-Zealand>

NIWA forecasters are becoming increasingly confident that the remnants of Cyclone Winston will head for New Zealand, possibly bringing tropical downpours, gusty wind and rough surf. As a result, the weekend could be a write-off for many parts of the North Island.



NADI TROPICAL CYCLONE WARNING CENTRE Cyclone Winston and its expected track at 7am Tuesday. The map shows UTC times which are 13 hours behind NZDT.

Tropical downpours were possible ahead of the storm across the northern North Island on Sunday into the early part of next week, Niwa meteorologists said on Tuesday.

"This may result in localised instances of flooding

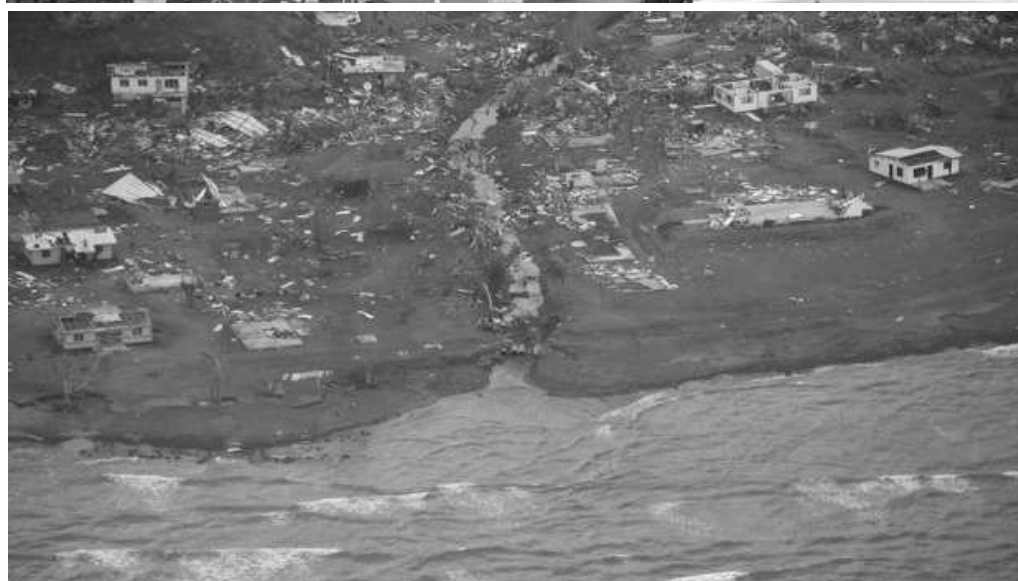
and slips, especially in low-lying and poor drainage areas. The actual remnants of Winston could arrive during the early stages of next week, bringing a period of heavy rain, strong, gusty wind, and rough surf, most likely to the North Island."

Niwa meteorologists expect Winston to continue on a southward path in the 24 hours from late-morning Tuesday, heading into the open waters of the South Pacific. "Thereafter, confidence is increasing that the storm will take a south-eastward turn into the Tasman Sea on a slow, but steady path toward New Zealand," Niwa said.

It cautioned: "While confidence is growing on the storm's impacts to New Zealand, NIWA meteorologists consider this a rapidly evolving weather situation with forecast confidence rated medium."



The new hospital in the town of Ba ruined by Cyclone Winston



NZDF/FACEBOOK
Complete villages have been destroyed by Cyclone WINSTON.

Seasonal forecasts: try predicting 1000 coin tosses by everyone on Earth

23 February 2016 Michael Daly

<http://www.stuff.co.nz/science/76827016/seasonal-forecasts-try-predicting-1000-coin-tosses-by-everyone-on-earth>



Mark McGuinness *It's been a splendid summer –and it's rained enough too*

Trying to communicate how hard it is to predict the weather a few months into the future, Niwa has turned to a mind blowing analogy to provide some idea of the complexity involved.

"If you could imagine correctly predicting the outcome of every person on Earth tossing a coin 1000 times, you'd still be nowhere near the degree of complexity required to forecast seasons," the crown research institute says in a recent article.

Despite those odds, each month Niwa staff have a go at producing a three-month outlook.



The publication puts a percentage figure on the probability that four climate features - rainfall, temperature, soil moisture and river flows - will be above average, near average or below average.

So how hard is it to predict the weather for the next three months?

According to Niwa, the number of molecules interacting in the Earth's atmosphere has been estimated at 100 tredecillion – 1 followed by 44 zeros. Perfect weather predictions would have to account for all those molecules and solve equations for their interactions all at once. A change in even one of the interactions could change exponentially the interactions of millions of others. "The scale of chaos in weather is breathtaking."

Dr Nico Fauchereau, who runs Niwa's seasonal forecasting project, says the challenge of long range forecasting is the randomness inherent in the climate. "The climate itself hasn't yet settled on what it will do next season – so we can't forecast it with the certainty we have for tomorrow's weather. You can't predict something where outcomes are influenced by a massive degree of randomness."



**JOHN COWPLAND/
PHOTOSPORT** *Where's that dry spell when you need it? The cricket ODI between New Zealand and Pakistan was called off after heavy rain fell in the often dry Napier. Is it worth it?*

Dr Brett Mullan, Niwa's principal scientist for climate variability, says the seasonal forecasts are useful as an indication of the likely climate. Groups that find the seasonal forecasts worthwhile in-

clude farmers, emergency services, regional planners and policymakers.

When the odds of a particular weather pattern are high, people ought to pay attention to the probability of droughts or high rainfall, he says. "Over the course of several seasons, this knowledge and use of climatic odds translate into dollars saved."

And if Niwa hopes to get any better at long range forecasting then it has to do the work. "There is a proliferation of people trying this in different parts of the world. We need to be up with the state of play," Mullan says.

"We have to actually practice it in order to have any chance to get any better."

How accurate are the Niwa seasonal forecasts?

if predictions were made randomly, they would be right about a third of the time, given the three choices - below average, average, and above average. Mullan reckons Niwa gets long range rainfall forecasts right about 40 per cent of the time, and long range temperature right about half the time.

Clear signals of a dominant trend, for example strong El Ninos such as the one now in place can mean better long range forecasts. Despite that, even with the strength of the current El Nino, the weather in this country hasn't followed the likely pattern particularly closely.

How is it done?

The forecasts are based on Niwa and international models. Increasingly those models take account of randomness by running ensembles of forecasts - multiple forecasts starting with slightly different initial weather patterns. A record is kept of how accurate nine different models have been with seasonal and monthly forecasts. That information is used to give a weighting to each model according to its real world performance.

"We're building algorithms that will weigh the influence of the individual models when they are merged to produce a single forecast," Dr Trevor Carey-Smith says.

Mullan emphasises that human involvement is still crucial. "Statistical models and automated validation are going to improve the accuracy of seasonal forecasts in normal conditions and with strong climate signals like El Ninos. But at the moment it's humans who are best at recognising and responding to the weird and unusual patterns."

How about a cautionary tale or two

It will be a long time before the UK Met Office lives down its predictions for summer 2009. It's not the only time the office has been off the mark, but this time it raised the stakes by promising the British people - who had suffered through dismal summers in the previous two years - that they



were in for a "barbecue summer". Rainfall would be average or below and temperatures much higher than usual, regularly topping 30 degrees Celsius.

That prediction was made at the end of April. There was a nice fortnight in June but by the end of a soggy July, the Met Office revised its outlook.

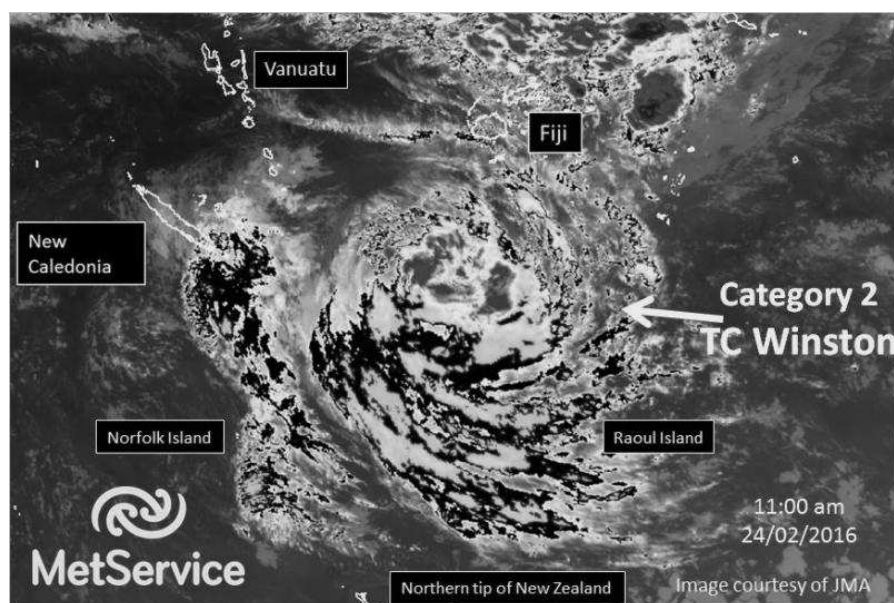
Then there's Robert FitzRoy, former New Zealand Governor and captain of HMS Beagle during Charles Darwin's famous voyage. The Niwa supercomputer that crunches seasonal data is named after him. In 1854 he was appointed as chief of a new department in the UK to deal with the collection of weather data at sea. Land stations were also established to send him daily weather reports by telegraph. FitzRoy turned the data into the first ever daily weather forecasts, published in *The Times* in 1861. The forecasts became massively popular but were also lampooned for regular inaccuracy. "In battle with critics, FitzRoy worked hard to decode the British weather," Niwa says. "He published a book and gave lectures, but in 1865 he retired, exhausted and beset by depression. He took his own life that year."

Tropical Cyclone Winston loses an eye!

24 Feb 2016 update By MetService Communications Meteorologist Lisa Murray

<http://blog.metservice.com/node/1126>

Please note: all times listed in the text below are New Zealand local time



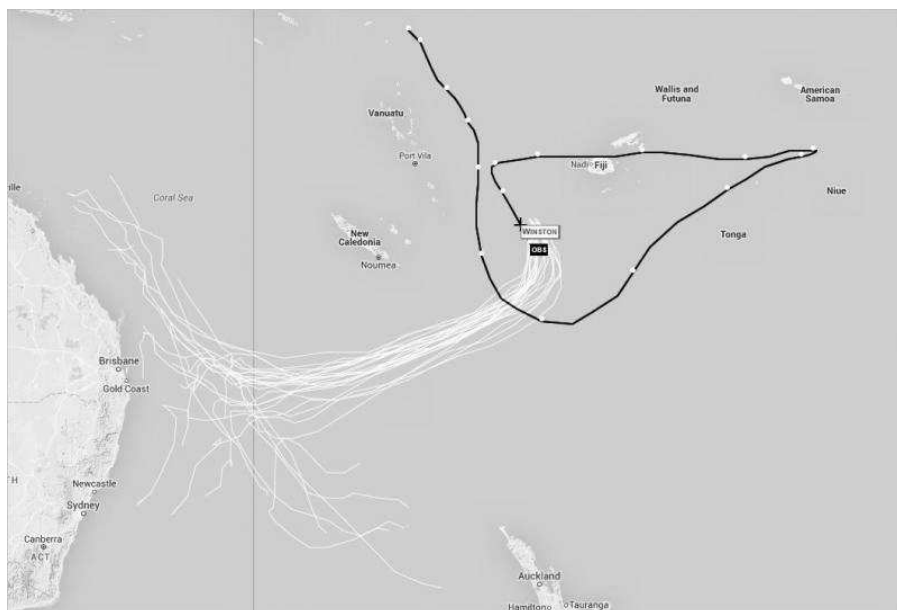
Infrared satellite image of Tropical Cyclone Winston at 11.00am today (Wednesday 24th February). Note that the "eye" of the TC can no longer be seen as it is covered by cloud, this happens as the TC becomes less intense.

Future track

The tropical cyclone is expected to continue to move in a more south-west direction, with the expectation that it will be reclassified to a category 1 cyclone.

As Tropical Cyclone Winston crosses latitude 25 south overnight Thursday, MetService New Zealand's Tropical Cyclone Warning

Centre (TCWC) will take over responsibility from the Fiji Meteorological Service for issuing all official advisories and bulletins about TC Winston. Beyond this time, Winston is forecast to track towards the mid-Tasman Sea and as it does, it will lose its tropical cyclone characteristics and evolve into a mid-latitude low.



Impact on NZ

Looking at a range of global weather models, most are keen to move TC Winston across the Tasman and towards the Coral Sea.

Range of possible future tracks for Severe TC Winston based on UKMO data. Image from NOAA Earth System Research Laboratory.

Death Toll Rises to 42 in Fiji Following Tropical Cyclone Winston

24 Feb 24 2016 By Sean Breslin

<https://weather.com/news/>



weather/news/tropical-cyclone-winston-impacts-pacific-fiji

At least 42 people were killed in Fiji and four people remain missing, including a 10-month-old baby, after Tropical Cyclone Winston hit the South Pacific island nation of Fiji.

The deadly Cat. 5 tropical cyclone made landfall in Fiji on Saturday, leaving more than 13,000 in shelters. Strong winds and flooding from Winston have caused severe damage across the island nation. A month-long state of disaster has also been declared.

Bainimarama announced that Koro Island, one of the hardest hits areas, would be a priority for relief crews going forward. Government spokesperson Ewan Perrin told the Associated Press the island suffered severe damage to nearly all of its structures, and at least 10 people died there.

An initial damage report shows schools have suffered \$2.3 million worth of damage, and that only covers 60 percent of the total schools damaged by Winston, says the FBC. The sugar industry is initially estimated to suffer \$83 million in damages following the storm.

Damage done to the Nabouwalu and Savusavu wharves has made transportation to and from the Northern Division difficult, the Fiji Times reported. Parts of the Savusavu wharf were washed away and beams of the Nabouwalu wharf were destroyed by heavy blows from waves.



In this Sunday, Feb. 21, 2016 aerial photo supplied by the New Zealand Defense Force, debris is scattered around damaged buildings at Muamua on Vanua Blava Island in Fiji, after Cyclone Winston tore through the island nation. (New Zealand Defense Force via AP)

This could be our hottest summer ever

25 February 2016 By Tess Nichol

http://m.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11595073

Think it's been hotter than usual this month? You're right - and forecasters say the scorching days and cloying mugginess could linger until at least mid-March.

The abnormally hot spell is on track to smash February records in some main centres but weather analysts are divided about what's causing it.



	Average Feb temp	Feb 2016 so far	Record for February
Auckland	20.3C	22.0C	22.5C 1998
Hamilton	18.7C	21.7C	21.5C 1974
Tauranga	19.6C	21.7C	21.7C 2011
Wellington	17.2C	19.6C	19.3C 1998
Christchurch	16.8C	18.8C	19.7C 1998
Dunedin	14.8C	17.9C	17.1C 1998-99

MetService says El Nino is responsible; Niwa and WeatherWatch argue bouts of rain this summer are out of character for an El Nino season.

MetService and WeatherWatch acknowledge that climate change could be playing a part, but a longer trend of rising temperatures will be needed to confirm that - so, for now at least, super-hot summers are not "the new normal".

Meteorologist Georgina Griffiths of MetService says with five days of the month to go, four of the six main centres are on track for their warmest February on record. The previous hottest February in all but two of the major cities was in 1998 - the last time there was a "super-strong El Nino".

Ms Griffiths said it was normal for an El Nino summer to have such a high number of February days with temperatures topping 25C, but the slow creep of climate change was probably playing a part as well.



Severe thunderstorm warning as heavy rains hit North Island

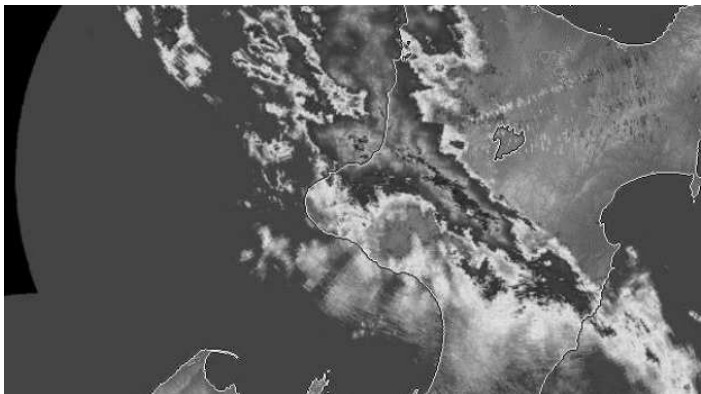
27 February 27 2016

<http://www.stuff.co.nz/national/77344110/Wet-and-sticky-weather-in-Auckland-and-western-North-Island>

Auckland was soaked with a burst of rain that started at about 4.30pm on Saturday.

The heavy rain knocked out power to around 1600 homes in the city.

MetService's rain radar showed heavy falls hitting the New Plymouth area and moving inland towards Whanganui National Park. The sodden weather has been brought by a very moist tropical air mass moving onto the North Island from the northwest. (Abridged)



METSERVICE The rain radar shows a downpour over the North Island, red=heaviest

No end to hot sticky nights just yet: Humidity Cyclone Winston's last horrible act

29 Feb, 2016 NZ Herald

http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11597125



Many Kiwis will have felt like sleeping in the fridge last night. Photo / iStock

The coldest point of last night for most of the upper North Island was still 20 degrees with humidity between 90 and 100 per cent. Today will be no different WeatherWatch warned, with wet, warm air left over from Cyclone Winston 'stuck' over the upper North Island for the next couple of days.

How to beat the heat

- "Ice water in a hottie bottle under the feet works a treat :) Or put it in the freezer with water in for 1 hour, don't forget that its in there tho!!!"
- "Wet a sarong, wring it out so just damp, place on your naked body with a fan going - the sarong dries as the night gets cooler :)"
- "I live in the tropics and have a ceiling fan, have a cool shower and wear a damp t-shirt to bed"

Keeping your bedroom cool

Dr. Alex Bartle of the Sleep Well Clinic said the optimal temperature for sleep is between 16 to 18C but getting your bedroom under 20C will suffice.

He said a cooler bedroom can be achieved by keeping the room dark during the day. Having the curtains closed and the door shut will prevent sunlight getting in and heating the room.

While air-con is ideal, a cheap fan will do the trick. Fans not only circulate and cool air, they also provide white-noise which is proven to help people sleep.

White-noise is a sound which remains constant without frequency fluctuation. The 'background noise', which can be the sound of the ocean, washing machine, or in this case, fan provides a barrier to other sounds which are more variable like a dog barking.

Humans are conditioned to be responsive to sound during sleep as a survival mechanism, but white-noise will mask other variable noises allowing us to sleep peacefully.