Greater Wellington
Te Pane Matua Taiao

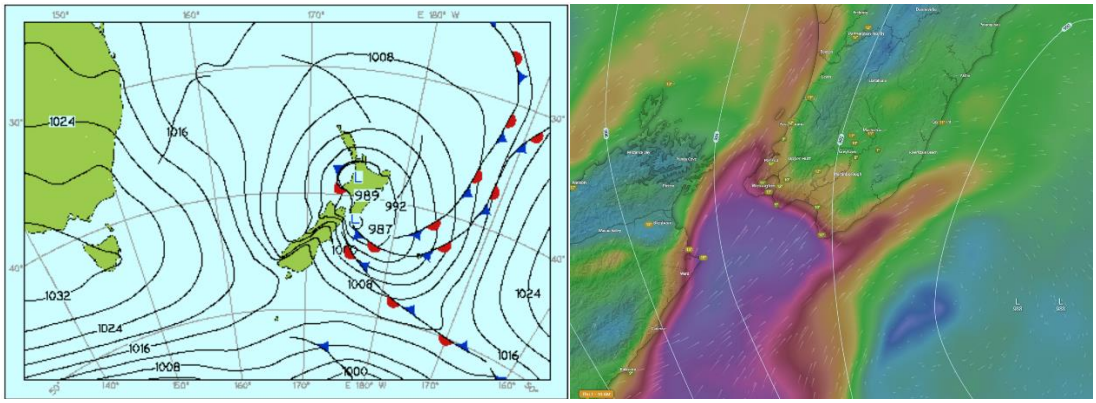
Climate drivers and seasonal outlook for the Wellington Region

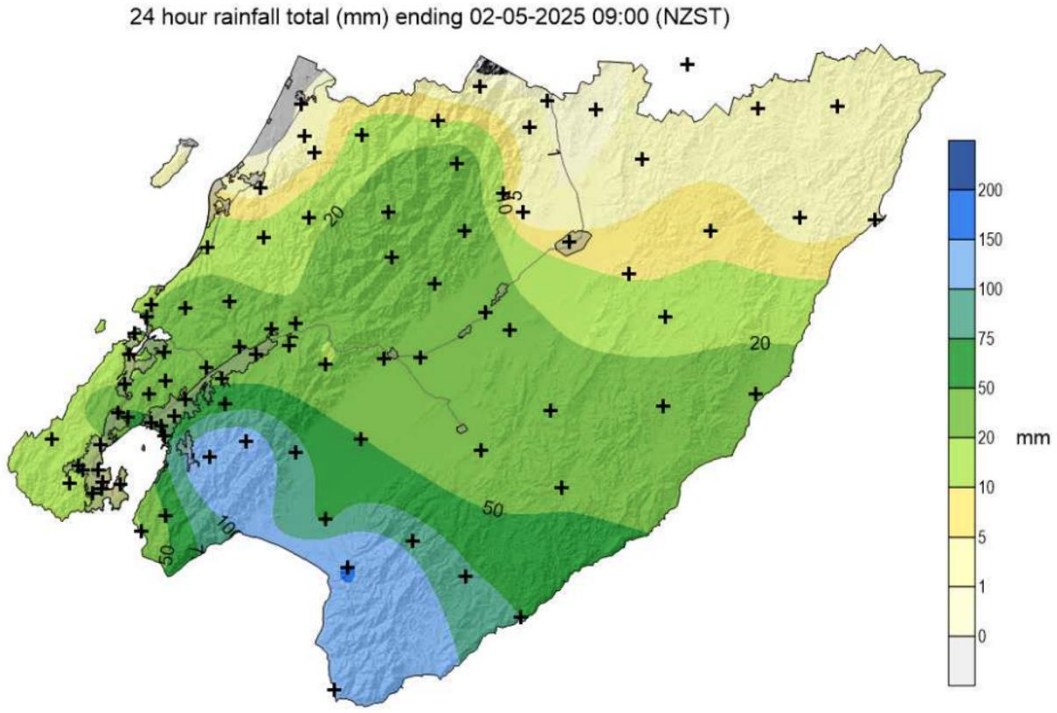
Autumn 2025 summary

Winter 2025 outlook

Release date: 1 July 2025

Knowledge and Insights





On 1 May, Wellington experienced the first red wind warning ever issued for our region (the new colour system has been in place for only a few years). The synoptic flow was very interesting, with a 987 hPa low sitting immediately southeast of Wellington (upper left panel), and a fierce wind fetch mostly concentrated on the south coast (upper right panel). By the morning of 2 May, 24-hour rainfall totals of up to 150 mm had accumulated near the southern Wairarapa coast (bottom panel), on top of nearly 100 mm the day before. These heavy falls were split between April and May, due to the end of month being counted at 9am on the first day of the following month, for hydrological purposes. Source: Mean sea level pressure at 6am (Courtesy of MetService, top left) and wind pattern and sea level pressure at 10am (Credits to Windy, top right) on 1 May 2025. Total 24-hour rainfall at 9am 2 May based on the GWRC hydrological network, with measuring sites indicated by dark crosses (bottom panel).

Overview

Autumn 2025

Autumn 2025 was mostly mild and wet across our region. Wellington airport measured the second warmest autumn on record with total rainfall 35% above average. Castlepoint on the eastern coast experienced total rainfall that was 50% above the long-term average. A heat spell during the Easter holidays, led to 28.2°C being measured in Martinborough on April 19 - the hottest day on record for April since records began in 1986. On the same day, the capital scored an impressive 25.1°C at the airport, the second warmest April day on record for Wellington and meeting the 'NIWA hot day' threshold. On 1 May, MetService issued the first ever red wind warning for Wellington (the new colour system has been in place for just a few years). The severe southerly gusts were mostly concentrated on the southern coast around the capital and southern Wairarapa. Mt Kaukau hit 150 km/h before the anemometer stopped working. Wellington airport had nearly 120km/h gusts, with Martinborough reaching 102 km/h and Upper Hutt hitting 96 km/h (highest gust on record for Upper Hutt, for measurements since 1999). The southerly event on 1 May was also associated with flooding, with the Hutt River bursting its banks and surface flooding on the Petone esplanade. Almost all flights at Wellington airport had to be cancelled on that day, with no Cook Strait ferry crossings possible either due to the high winds.

Climate drivers

Although the climate drivers have been mostly neutral, the oceanic waters around New Zealand remained much warmer than normal as of end of June. The warmer waters create an environment conducive to more evaporation and increased likelihood of heavy rainfall. Interestingly, the synoptic circulation is still responding to a lingering La Niña effect, even though it's been several months since the demise of ENSO's negative phase.

Climate outlook for the rest of winter 2025

International climate models agree that our winter will continue with temperatures near to slightly above the seasonal average. With the occasional La Niña effects still lingering, there is increased likelihood of bursts of subtropical air mass influences and heavy rainfall events through atmospheric rivers, as happened in late June. For the most part, however, the likelihood of flooding should slightly decrease later in the season as the oceanic temperatures start to cool down a little more. The total seasonal rainfall is expected to be near average to above normal west of the ranges (starting well above normal in Wellington during June), progressively becoming more average later in the season.

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1. Climate drivers

1.1 El Niño – Southern Oscillation (ENSO)

The ensemble projections of the Australian climate model below show that the ENSO event is predicted to remain mostly within the neutral range at least until spring.

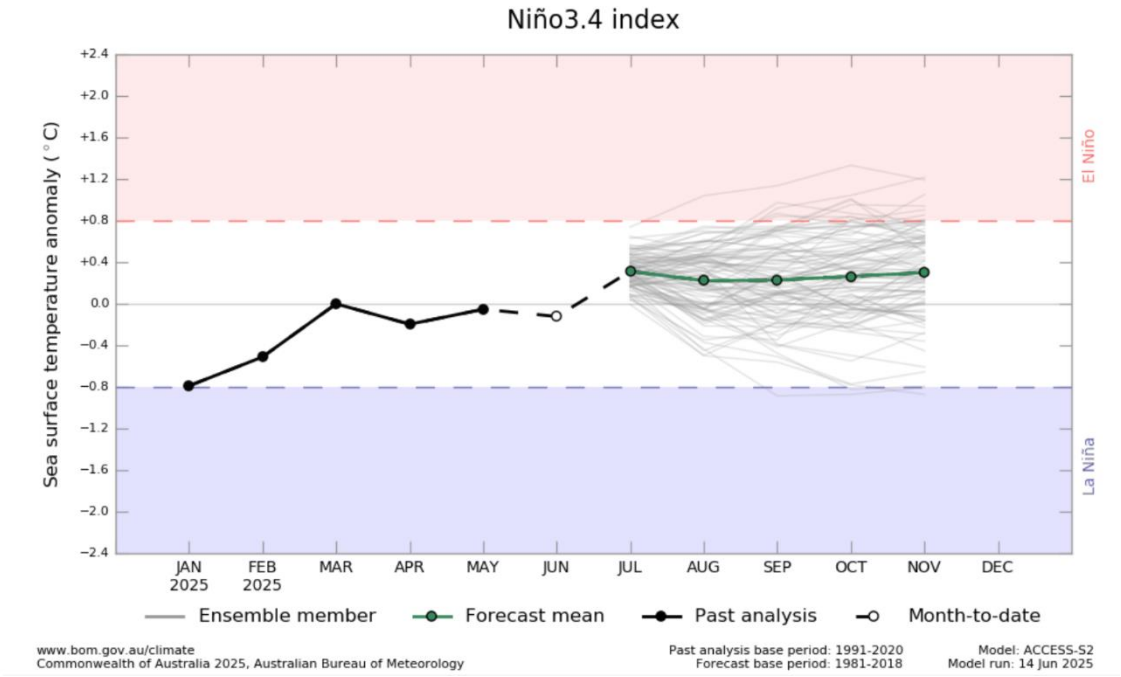


Figure 1.1: Average modelled projections (in green) show that the ENSO phenomenon is expected to remain within the neutral range at least until spring. Source: Australian Bureau of Meteorology.

1.2 Sea Surface Temperature (SST) anomalies

The SST anomalies and the total Sea Ice Extent (SIE, in white) are shown in Figure 1.2, as of 17 June 2025.

The overall pattern shows a neutral equatorial Pacific (i.e. neutral ENSO), with marine heatwave conditions prevailing, especially north and east of New Zealand. Antarctic sea ice is expanding as expected for this time of the year (shown in white) but still sitting at a negative anomaly very similar to what was observed this time last year.

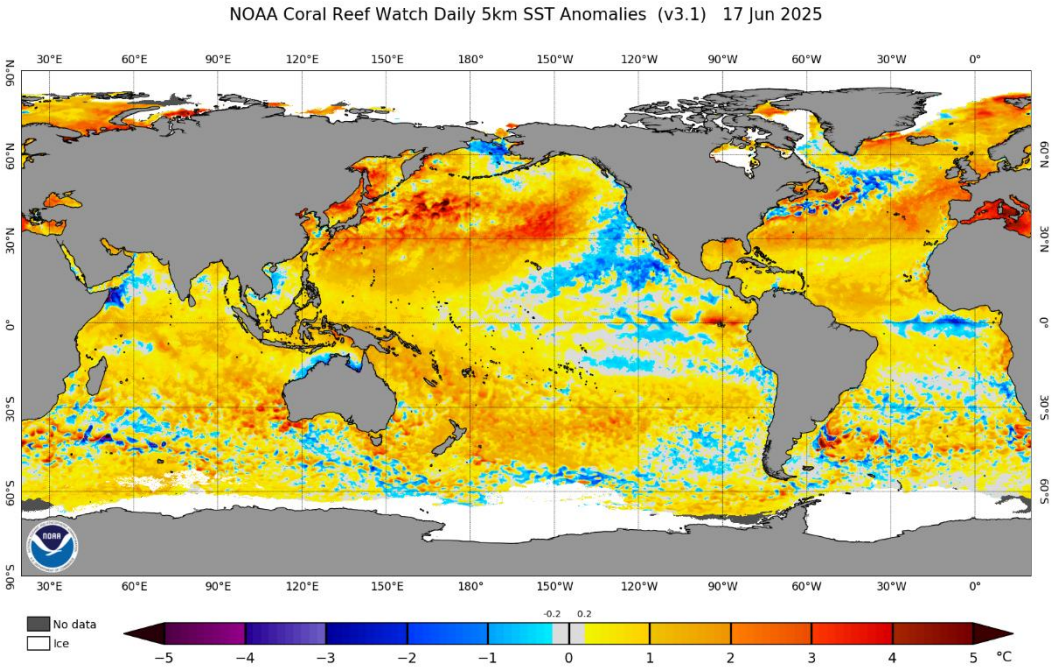


Figure 1.2: Sea Surface Temperature (SST) anomalies as of 17 June 2025. Sea ice coverage is shown in white. The Equatorial Pacific (ENSO) shows neutral ENSO conditions, but marine heatwaves persist around New Zealand. Sea Ice Extent (in white) remain below the long-term average, like last year. Source: NOAA.

1.3 Southern Annular Mode (SAM)

The SAM is the natural pressure oscillation between mid-latitudes and the Antarctic region. Normally, positive SAM is associated with high pressures around the North Island keeping the weather stable and dry/cloud-free (especially in summer), whereas the opposite is expected when the SAM is negative.

The SAM has been oscillating around a neutral range over the last month or so, without a clear preferred pattern. Figure 1.3 shows that the autumn average sea level pressure anomaly was characterised by a strong blocking anticyclone east of New Zealand. This synoptic set up helped explain the anomalous northerly flows with significantly warmer than average conditions, with Wellington measuring the second warmest autumn on record.

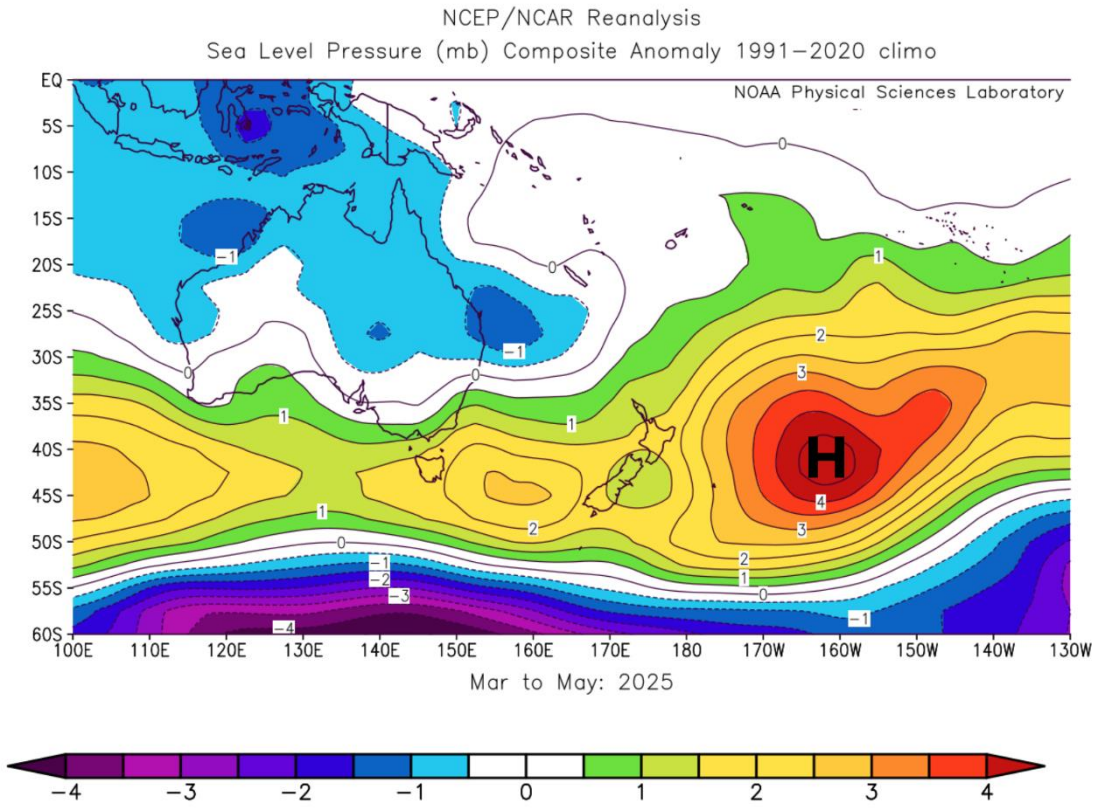


Figure 1.3: Mean sea level pressure anomaly map (hPa) for autumn 2025. The 'H' indicates the centre of the anomalous blocking high pressure east of New Zealand, responsible for favouring a warmer northerly flow. This blocking system was responsible for very mild seasonal temperatures for this time of the year (second warmest autumn on record for Wellington). Source: NCEP Reanalysis.

2. Seasonal variability and outlook

2.1 Trend analysis

The graphs below (Figure 2.1) show summaries of seasonal climate change and variability for Wellington and the Wairarapa using reference climate stations, chosen based on length of data record and availability.

The key climate variables shown are mean temperature, total sunshine hours, mean wind, total rainfall and total number of rain days (above 0.1 mm). Temperature measurements go back to the 1910s, allowing for a meaningful analysis of climate change trends. Most other variables also have long periods of measurement greater than 50 years, except sunshine hours and wind for the Wairarapa; these are only available for less than two decades, which is a very short period climatologically and does not allow for an analysis of trends yet.

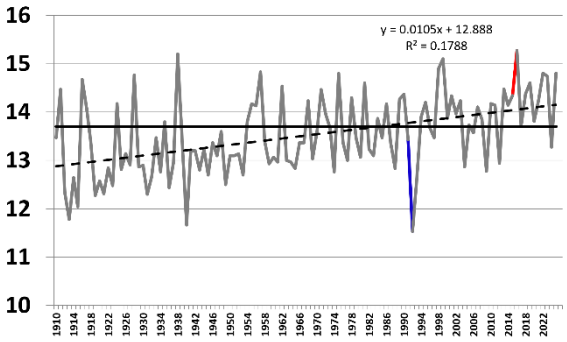
The red and blue bars show the extreme years of the entire measurement period. Red indicates seasons that were warmer, drier, sunnier and windier than average, and blue indicates seasons that were colder, wetter, cloudier and less windy than average. The reference climatological average (1981-2010) is shown by a horizontal bar where available.

An analysis of linear trends associated with climate change is plotted onto the graph only when the trends are statistically different from zero at the 99% confidence level.

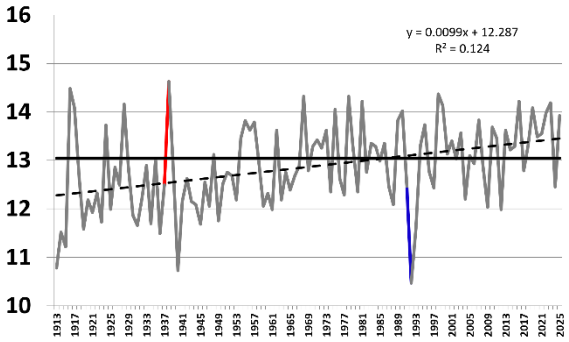
The climate change and variability summary for autumn 2025 is as follows:

- Statistically significant trends are seen only for temperature and wind, meaning that autumn is getting warmer and less windy due to ongoing climate change. The long-term historical warming trend is about one degree per century for both Wellington Masterton;
- Autumn 2025 mean temperatures were well above the long-term average for both Wellington and Wairarapa (second warmest autumn on record for Wellington);
- Sunshine hours were near average for Wellington and Wairarapa (where records are still too short for a 30-year climatology);
- Seasonal average wind speed was near average for both Wellington and Wairarapa;
- Total seasonal rainfall was above average for both Wellington and Wairarapa;
- Total seasonal rain days were near average for both Wellington and Wairarapa.

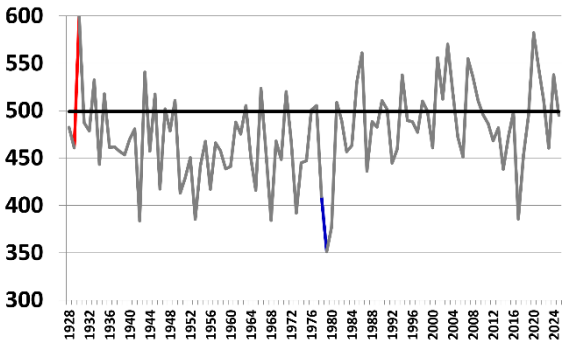
Autumn Mean Temperature (deg C) - Kelburn (1910-2025)



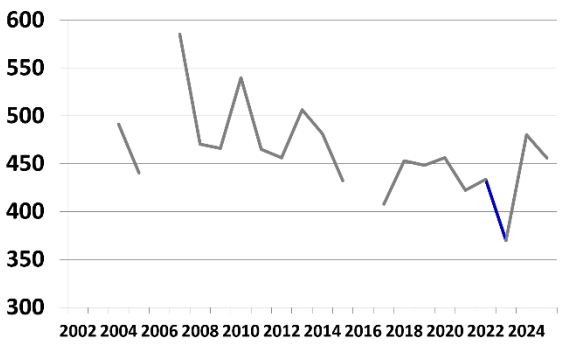
Autumn Mean Temperature (deg C) - Masterton (1913-2025)



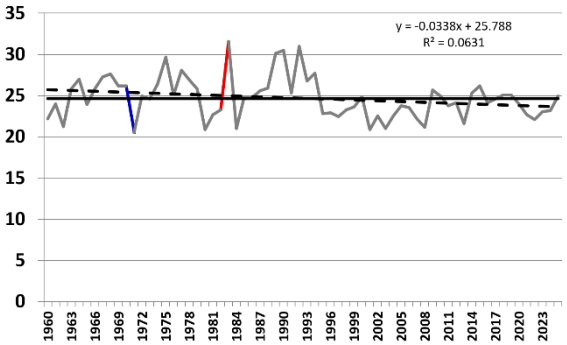
Autumn Total Sunshine Hours - Kelburn (1928-2025)



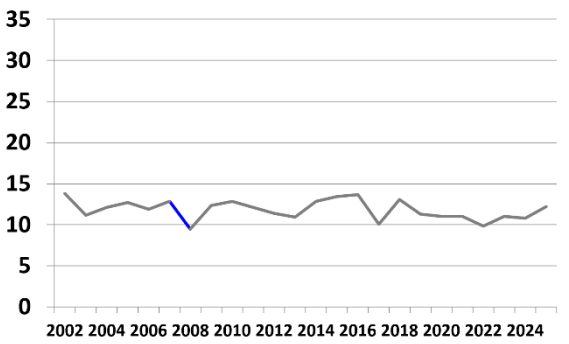
Autumn Total Sunshine Hours - Martinborough (2002-2025)



Autumn Mean Wind (km/h) - Wellington Airport (1960-2025)



Autumn Mean Wind (km/h) - Martinborough (2002-2025)



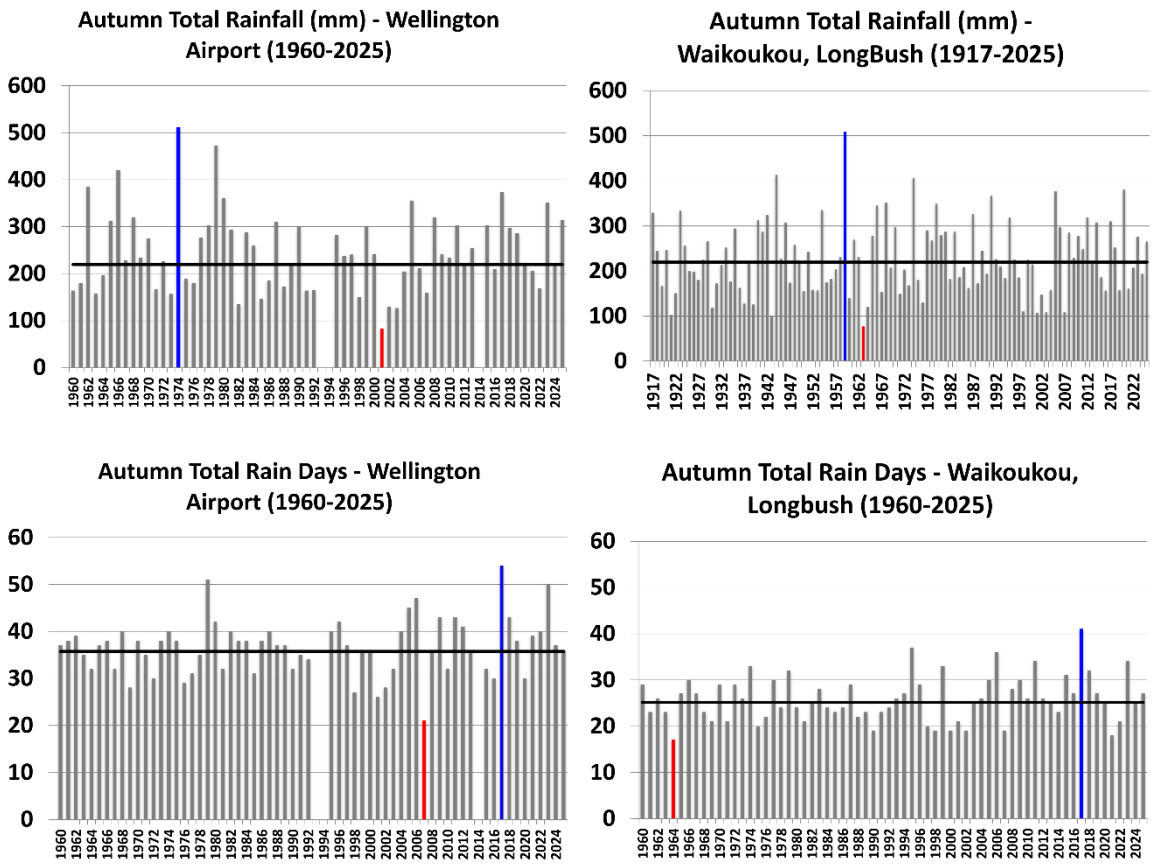


Figure 2.1: Climate change and variability graphs for autumn in Wellington and the Wairarapa. The thick horizontal line shows the 1981-2010 average (where available), and the dashed line shows the linear trend. Trends are plotted only when statistically significant at 99% confidence level. For all graphs, the bright red and blue bars show the extreme min and max values for each time series (red for warmer, drier, sunnier and windier and blue for cooler, wetter, cloudier and calmer). The key variables shown are mean temperature, total number of sunshine hours, mean wind speed, total rainfall and total number of rain days (>0.1mm for Wellington and > 1mm for Waikoukou). Missing bars means that no reliable mean seasonal data was available for that particular year.

2.2 Seasonal Outlook

- Weak residual La Niña flow still lingering for a while
- Warmer than the seasonal average, with rainfall normal to above
- Higher likelihood of heavy rainfall events particularly early in the season, under the influence of subtropical flows
- Regular seasonal frosts, strong at times inland as blocking anticyclones develop

Whaitua*	Variables	Climate outlook for winter 2025*
Wellington Harbour & Hutt Valley	**Temperature:**	Normal to warmer than average, with prevailing northerly flows.
	Rainfall:	Average or above. High chance of extreme rainfall events early in the season
Te Awarua-o-Porirua	**Temperature:**	Normal to warmer than average, with prevailing northerly flows.
	Rainfall:	Average or above. High chance of extreme rainfall events early in the season
Kāpiti Coast	**Temperature:**	Normal to warmer than average with regular frosts.
	Rainfall:	Average or above. High chance of extreme rainfall events early in the season
Ruamāhanga	**Temperature:**	Normal to warmer than average, with regular frosts as blocking anticyclones develop.
	Rainfall:	About average. High chance of extreme rainfall events early in the season
Wairarapa Coast	**Temperature:**	Normal to warmer than average, lingering La Niña easterly flows at times and regular frosts.
	Rainfall:	About average. High chance of extreme rainfall events early in the season

*Whaitua are the whole catchment areas (https://www.gw.govt.nz/environment/freshwater/protecting-the-waters-of-your-area/).

Refer also to the drought monitor for our catchments: https://www.gw.govt.nz/environment/environmental-data-hub/climate-monitoring/drought-check/

Appendix 1 – Seasonal temperature and wind anomalies for selected stations

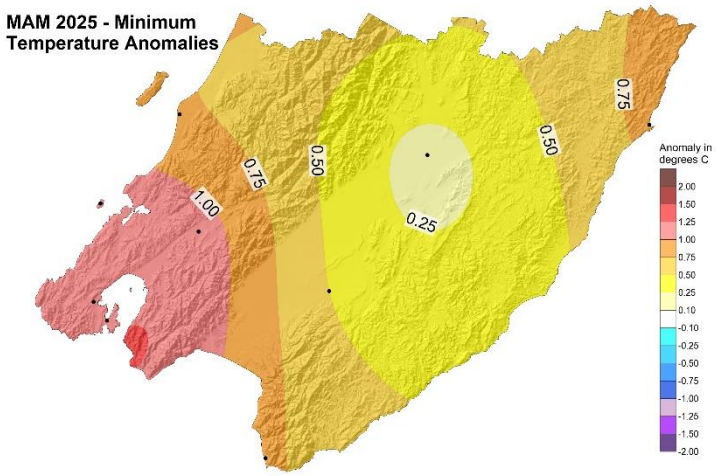
Table 1: Temperature anomalies (°C) for autumn (MAM) 2024-2025 relative to the 1991-2020 climatology. Significant positive and negative anomalies (greater than 0.5°C magnitude) are highlighted in red (warmer than average) or blue (colder than average).

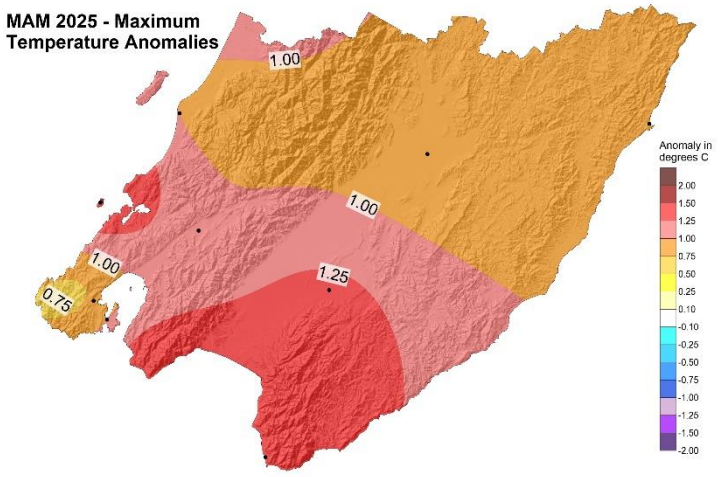
Mar-Apr-May 2025	Min T	Max T
Castlepoint	0.8	0.8
Kelburn	1.1	0.8
Masterton	0.2	0.8
Ngawi	0.8	1.3
Paraparaumu	0.8	1.0
Wellington Airport	1.2	1.0
Martinborough	0.5	1.3
Mana Island	1.1	1.5

Table 2: Wind anomalies (%) for autumn (MAM) 2024-2025 relative to the 1981-2010 climatology. Significant positive and negative anomalies (greater than 5%) are highlighted in red (windier than average) and blue (calmer than average).

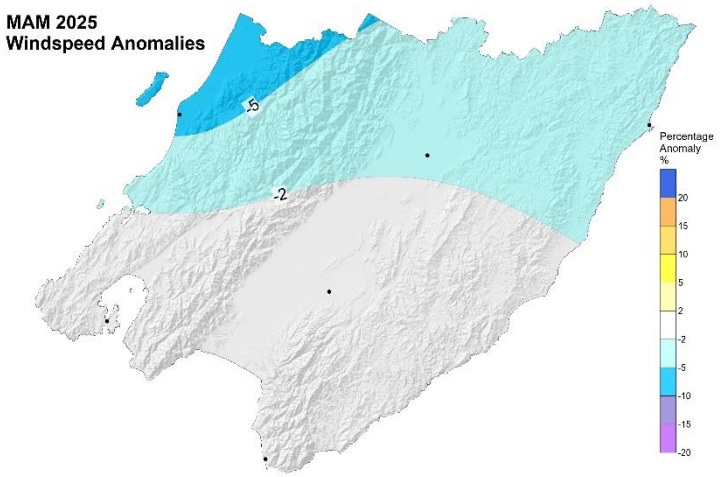
Mar-Apr-May 2025	Wind %
Castlepoint	-3.7
Masterton	-2.5
Ngawi	0.5
Paraparaumu	-5.6
Wellington Airport	1.5
Martinborough	0.9

Appendix 2 – Seasonal anomaly maps relative to the long-term average (1991-2020)

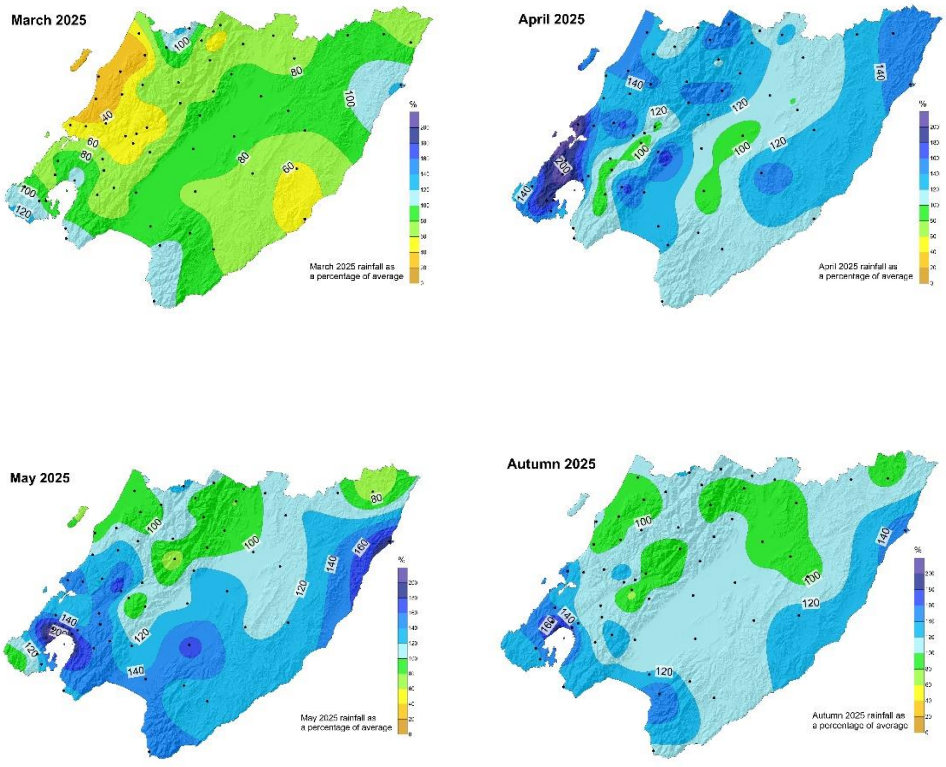




Min and Max Temperature anomalies (°C)



Wind anomalies (%)



Rainfall anomalies (%)

GWRC's climate science tools

- **Seasonal climate hub**
  https://www.gw.govt.nz/environment/environmental-data-hub/climate-monitoring/

- **Daily climate maps**
  https://graphs.gw.govt.nz/envmon/daily-climate-maps?view=rainfall-table

- **Drought Monitor**
  https://www.gw.govt.nz/environment/environmental-data-hub/climate-monitoring/drought-check/

- **Climate change impacts (reports and mapping tools)**
  https://www.gw.govt.nz/environment/climate-change/impacts-on-our-region/