

Hydrology of Marlborough Summary July 2023

Report prepared by Charlotte Tomlinson, 7th August 2023.

Data from the Marlborough District Council's Environmental Monitoring network was primarily used in preparing this report and supplemented with data from sites operated by the Marlborough Research Centre, MetService, NIWA, and FENZ.

Executive Summary

July continues a relatively dry winter season in Marlborough. This is in contrast to the 2022 winter season, which was the wettest winter in over 100 years in the Wairau Valley.

Rainfall was below average in northern and central Marlborough in July, with 23 mm of rain recorded in Blenheim, just 35% of the long-term average. River flows were correspondingly low in the Te Hoiere / Pelorus and on the northbank of the Wairau, with mean river flows of around 25% of their long-term averages.

The Awatere and East Coast had average to above average rainfall for the month. The Flaxbourne River had flows well above average, with two peaks on the 9th and 22nd of July. Maximum flow was 25 m³/s, which is below the mean annual flood level of 34 m³/s.

Average shallow soil moisture for July was 36% at Grovetown Park in Blenheim, slightly below field capacity of 38%.

El Niño is not yet in full force, with oceanic indicators indicating El Niño conditions but atmospheric indicators remaining neutral. Full El Niño conditions are expected to develop over the next three months. Air pressure changes will lead to more south-westerly winds across the country and stronger winds than normal. Warmer than average sea surface temperatures may reduce the intensity of cold snaps brought on by southerly air masses that occur during late winter and spring.

Rainfall

Low rainfall totals continued for much of the region in July. Compared to average July rainfall, northern and central Marlborough had much less rainfall. For example, rainfall at Tunakino was in the lowest 10% of July totals, with just 72 mm recorded (average July rainfall is 246 mm).

South-east Marlborough had average or above average rainfall in July. 81 mm of rain was recorded at Awatere at Awapiri which is near average, while at the Flaxbourne 101 mm of rainfall is well above the average of 61 mm.

Blenheim rainfall was 23 mm for the month, which is only 35% of the long-term average for July.

Monthly rainfall totals for July (compared to average) for 6 key sites in Marlborough, can be seen in Figure 1.

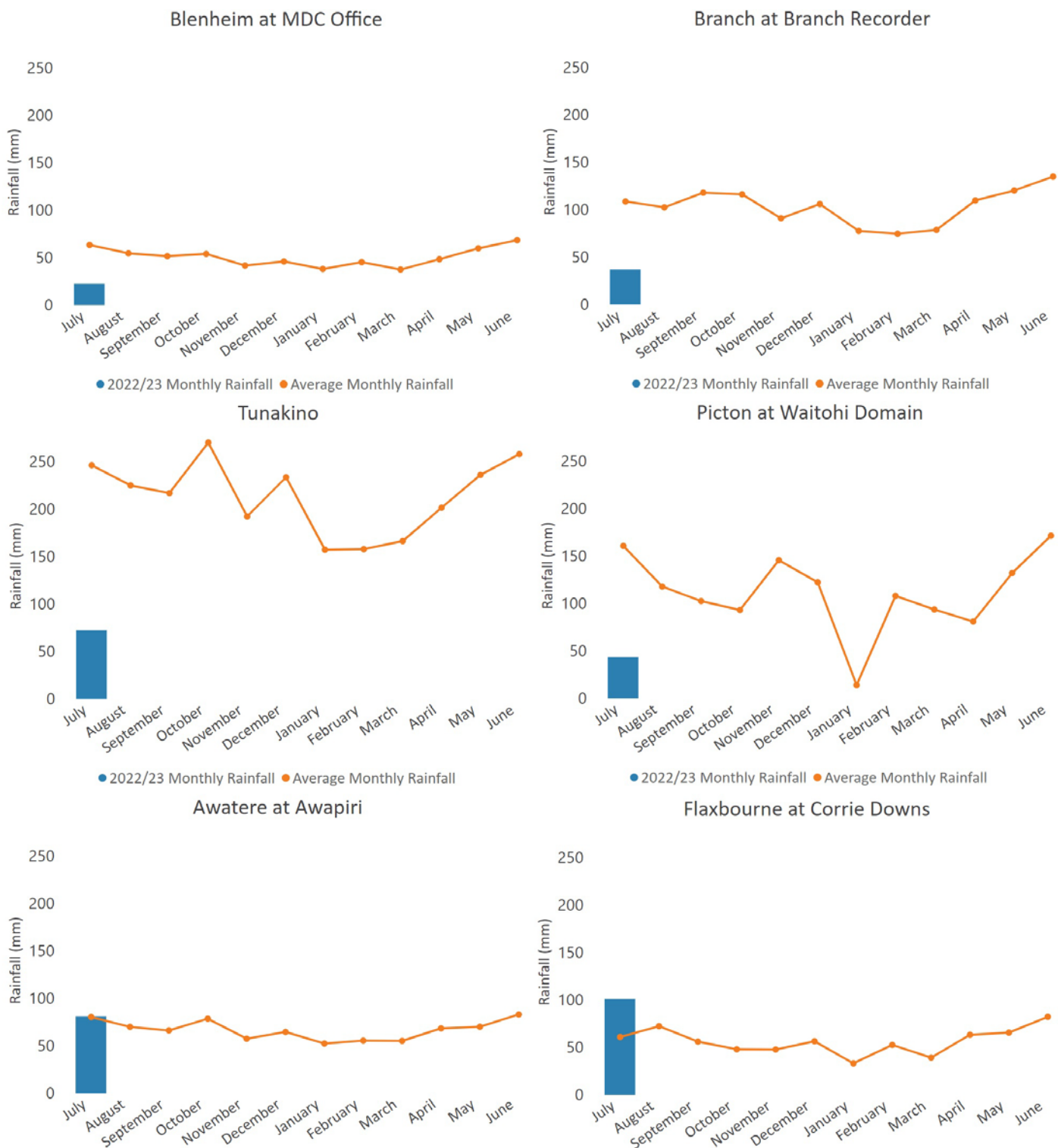


Figure 1. Monthly rainfall totals for 2022/23 from 6 key sites around Marlborough, compared to average monthly rainfall totals.

Table 1. Winter 2023 monthly rainfall totals (mm) at rainfall monitoring sites in Marlborough.

Site	June	July
Awatere at Awapiri	124	81
Awatere Glenbrae NRFA	26	44
Beneagle at Farm Stream	36	49
Blenheim at MDC Office	22	23
Branch at Branch Recorder	57	37
Branch at Mt Morris	72	29
Flaxbourne at Corrie Downs	39	101
Kaituna Rainfall at Higgins Bridge	45	41
Kenepuru Head NRFA	78	62
Koromiko NRFA	76	46
Lake Elterwater Climate	37	97
Lansdowne NRFA	40	46
Malings	58	56
Mid Awatere Valley NRFA	92	39
Molesworth NRFA	52	41
Omaka at Ramshead Saddle	57	40
Onamalutu at Bartletts Creek Saddle	90	64
Onamalutu at Hilltop Road NRFA	106	48
Picton Climate at Waitohi Domain	45	43
Pudding Hill NRFA	49	54
Rai at Rai Falls	99	44
Rai Valley NRFA	115	50
Rarangi at Driving Range	34	31
Red Hills	139	36
St Arnaud NRFA	44	57
Taylor at Taylor Pass Landfill	26	36
Taylor at Tinpot	80	74
Te Rapa	66	160
Top Valley at Staircase Ridge	151	46
Tor Darroch NRFA	71	47
Tunakino	103	72
Upper Clarence NRFA	85	106
Waihopai at Craiglochchart	18	26
Waihopai at Spray Confluence	56	35
Waikakaho	46	46
Waikawa at Boons Valley	49	61
Wairau Valley at Southwold	58	46
Wakamarina at Twin Falls	87	43
Ward NRFA	55	136
Wye at Charlies Rest	52	32

River Flows

Mean river flows for July were around 25% of their long-term average in the Te Hoiere / Pelorus area, as well as the north bank tributaries of the Wairau. Following on from a small fresh on the 8th/9th, flows receded throughout the rest of July.

Maximum flow in the Wairau was 140 m³/s on the 9th of July, receding down below 30 m³/s at the end of the month.

The Flaxbourne River had well above average flows in July, with two freshes on the 9th and 22nd. Peak flows of 20 and 25 m³/s respectively are below the mean annual flood flow of 34 m³/s.

A summary of river flows for July 2023 can be seen below in Table 2.

Table 2. A summary of river flows in Marlborough for July 2023.

Site Name	Mean Flow 2023 (m3/s)	Long-Term Mean Flow (m3/s)	% of long-term mean	Flow Record Begins	Catchment Area (km2)
▲ Rai River at Rai Falls	4.11	15.53	26	1979	211
Pelorus River at Bryants	5.99	26.32	23	1977	375
Kaituna River at Higgins Bridge	1.39	6.67	21	1989	135
Branch River at Weir Intake	12.04	22.91	53	1958	551
Goulter River at Horseshoe Bend	3.60	12.80	28	2010	154
Waihopai River at Craiglochart	12.41	20.17	62	1960	745
Ohinemahuta River at Domain	0.55	2.19	25	2013	33
Are Are Creek at Kaituna Tuamarina Track	0.46	1.07	43	2007	32
Tuamarina River at Para Road	0.49	3.61	14	2004	100
Wairau River at Tuamarina	55.99	125.59	45	1960	3430
Omaka River at Gorge	1.73	2.29	76	1993	91
Taylor River at Borough Weir	0.55	1.54	36	1961	65
Flaxbourne River at Corrie Downs	3.36	1.33	253	2003	71
Awatere River at Awapiri	17.77	18.65	95	1977	983

Soil Moisture

Average shallow soil moisture for July was 36% at Grovetown Park, slightly below field capacity of 38%. Both June and July have had low rainfall, and farmers will be hoping for decent rainfall in August and throughout spring to recharge soil moisture.

The two maps below (Figures 2 & 3) show soil moisture deficit for New Zealand, as of the 31st of July, and the soil moisture anomaly, i.e. how much wetter or drier than normal the soil is for the time of year.

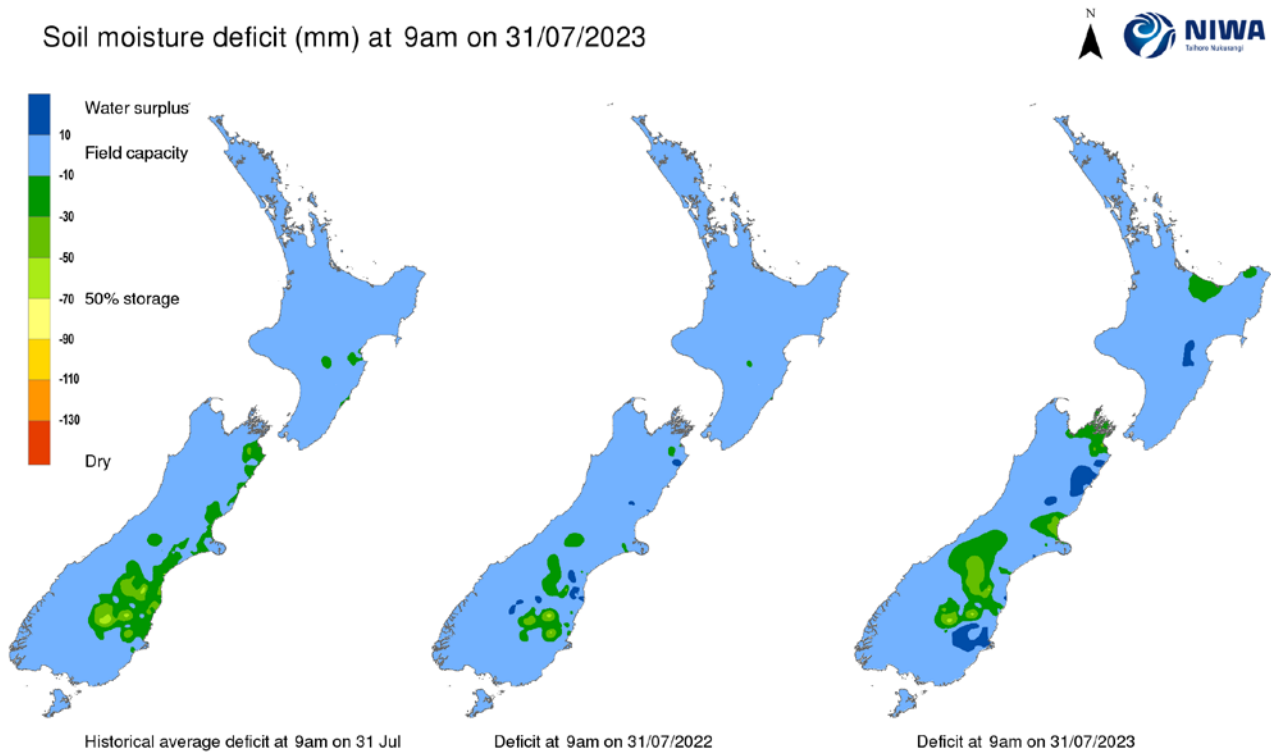


Figure 2. Soil moisture deficit maps of New Zealand, retrieved from NIWA on 31/07/2023.

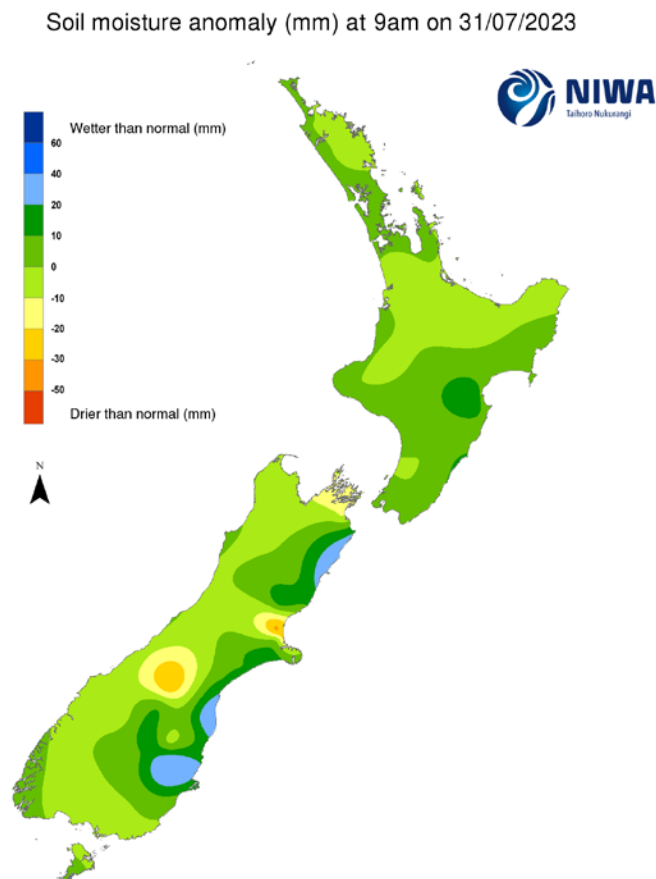


Figure 3. Soil moisture anomaly map of New Zealand, retrieved from NIWA 31/07/2023.





NIWA Seasonal Climate Outlook August – October 2023

El Niño is not yet in full force: sea temperatures in the central equatorial Pacific currently exceed the El Niño threshold, but the atmospheric indicator of El Niño (the Southern Oscillation Index), remains neutral. Full El Niño conditions are expected to develop over the next three months.

Air pressure is forecast to be above normal to the north-west of New Zealand and below normal to the south, leading to more south-westerly winds across the country. Wind speeds are also forecast to be stronger than normal. Warmer than average sea surface temperatures may reduce the intensity of cold snaps brought on by southerly air masses that occur during late winter and spring.

The last two weeks of August may bring more westerly winds, causing fronts and low pressure systems in Marlborough.

The predictions for Marlborough/Tasman from August to October are:

-  Temperature – above average
-  Rainfall – near or above average
-  Soil Moisture – near average
-  River Flows – near or below average