

Hydrology of Marlborough Summary for April 2023

Report prepared by Charlotte Tomlinson, 3rd May 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

Settled weather continued in April, with rainfall near average for much of the region. Rainfall in Blenheim was 35.8 mm, which is slightly below the long-term average for April. Higher rainfall totals were seen in the Rai Valley area, with 350 mm total rainfall recorded at Tunakino, which is 170% of average April rainfall.

The Wairau River at State Highway One stayed above median flow (60 m³/s) for most of April, with two small flushes mid-month. The Rai and Pelorus rivers had their maximum monthly flows on the 19th of April, with peaks of 200 m³/s in the Rai at Falls, and 550 m³/s in the Pelorus above the campground. The peaks in both rivers were below mean annual flood level.

Average shallow soil moisture (5-35 cm depth) at the Grovetown Park weather station was 27.4% for April, very close to the long-term average. The soil moisture deficit for the main growing areas of Marlborough is near to the historic average for this time of year.

ENSO-neutral conditions continued through April. During early May, a northerly airflow will bring warm temperatures and tropical moisture to Marlborough and may deliver heavy rain. From early winter, southerly winds will become more common, which may result in lower than normal rainfall. These southerly winds, along with increasing sea temperatures along the equatorial Pacific, are consistent with a developing El Niño.

Rainfall

As recorded at the Grovetown Park weather station, total rainfall in Blenheim was 35.8 mm in April, which is 74% of the long-term average. There were 8 rain days in April (defined as 1 mm or more of rain), while the long-term average is 5.5 rain days (data courtesy of the Marlborough Research Centre).

Rainfall at the Awatere at Awapiri and Flaxbourne sites was also slightly below average in April. In contrast, rainfall at Tunakino, Waikawa, and the Branch were all above average for the month. Tunakino recorded 350 mm of rain in April, while the average total is just over 200 mm.

Figure 1. Monthly rainfall totals for 2023 from 6 key sites around Marlborough, compared to average monthly rainfall totals.



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

Site	January	February	March	April
Awatere at Awapiri	36	103	84	60
Awatere Glenbrae NRFA	50	46	38	29
Beneagle at Farm Stream	78	57	49	48
Blenheim at MDC Office	56	38	44	37
Branch at Branch Recorder	41	138	86	141
Flaxbourne at Corrie Downs	54	109	42	55
Kaituna Rainfall at Higgins Bridge	101	111	103	122
Kenepuru Head NRFA	179	247	168	172
Koromiko NRFA	233	111	139	122
Lake Elterwater Climate	67	113	48	51
Lansdowne NRFA	42	87	74	113
Malings	14	90	186	99
Mid Awatere Valley NRFA	25	90	97	42
Molesworth NRFA	18	89	62	51
Omaka at Ramshead Saddle	73	78	100	70
Onamalutu at Bartletts Creek Saddle	88	109	108	170
Onamalutu at Hilltop Road NRFA	110	98	107	199
Picton Climate at Waitohi Domain	194	147		
Pudding Hill NRFA	60			43
Rai at Rai Falls	145		142	299
Rai Valley NRFA	188	173	181	250
Rarangi at Driving Range	76	77	86	50
Red Hills	46	140	112	174
St Arnaud NRFA	42	84	129	112
Taylor at Taylor Pass Landfill	53	41	33	50
Taylor at Tinpot	104	74	60	75
Te Rapa	52	165	93	85
Top Valley at Staircase Ridge	71	145	141	195
Tor Darroch NRFA	36	91	131	106
Tunakino	191	182	202	349
Upper Clarence NRFA	20	22	32	26
Waihopai at Craiglochart	21	81	62	59
Waihopai at Spray Confluence	21	77	82	85
Waikakaho	95	56	61	66
Waikawa at Boons Valley	243	169	122	202
Wairau at Narrows	43	54	51	98
Wairau Valley at Southwold	41	108	56	95
Wakamarina at Twin Falls	100	139	119	212
Ward NRFA	36	115	54	57
Wye at Charlies Rest		63	84	89

River Flows

The Taylor River upstream of the Dam (Borough Weir site) had low flows throughout April, with flows near 50 l/s through the first half of the month, and rainfall on the 19th raising flow to a maximum of 0.5 m³/s. Mean flow for April 2023 was 166 l/s, just 38% of the April long-term average.

The Rai and Pelorus rivers responded to rain on the 19th of April, with peak flow of 200 m³/s in the Rai, and 550 m³/s in the Pelorus. The peaks in both rivers were below mean annual flood level.

The Wairau River at Barnett's Bank has stayed above median flow (60 m³/s) for most of April, with two small flushes on the 11th and 19th of April.

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

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

River	Site	April mean flow 2023 (m ³ /s)	April mean flow all records (m ³ /s)	% of monthly average	Records begin	Catchment area (km ²)
Pelorus	Bryants	30.93	18.45	168	1977	375
Rai	Rai Falls	20.30	9.02	225	1979	211
Kaituna	Higgins Bridge	3.73	2.96	126	2006	133
Branch	Intake Weir	21.58	20.30	106	1958	550
Wairau	Barnetts Bank	97.05	81.68	119	1960	3,430
Ohinemahuta	Domain	1.23	1.06	116	1998	33
Waihopai	Craiglochart	17.88	11.35	158	1960	764
Awatere	Awapiri	11.82	8.89	133	1977	987
Omaka	Gorge	1.05	0.75	140	1994	90
Taylor	Borough Weir	0.166	0.44	38	1961	64

Soil Moisture

During April, average shallow soil moisture (5-35 cm depth) at the Grovetown Park weather station was 27.4%. This is 2.6% higher than the long-term average soil moisture for April of 24.8%.

As of the 30th of April 2023, the soil moisture deficit for the main growing areas of Marlborough is near to the historic average (see Figure 2 below). Soils generally have slightly more water storage than the same time last year. The soil moisture anomaly map (Figure 3) shows that soils are neutral to slightly wetter than normal, up to 20-40mm wetter than normal in the north of the region.

Soil moisture deficit (mm) at 9am on 30/04/2023

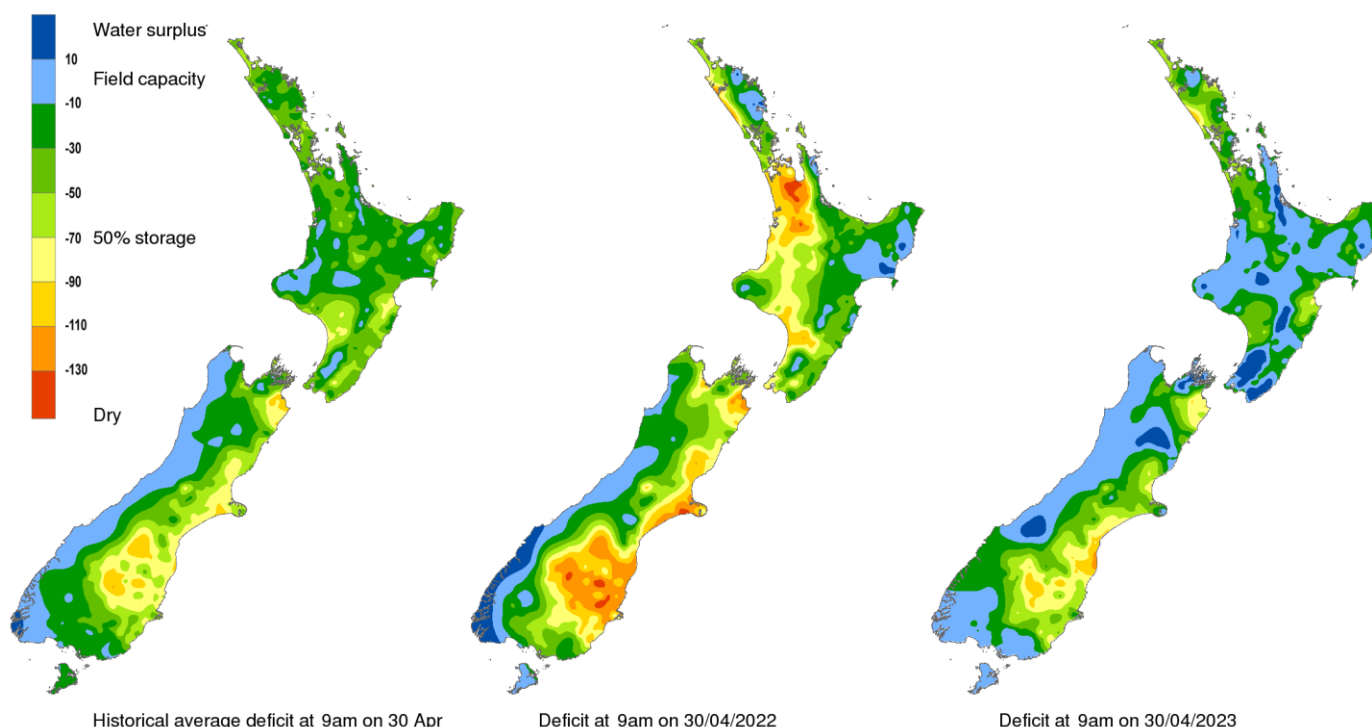


Figure 2. Soil moisture deficit maps of New Zealand, retrieved from NIWA on 30/04/2023.

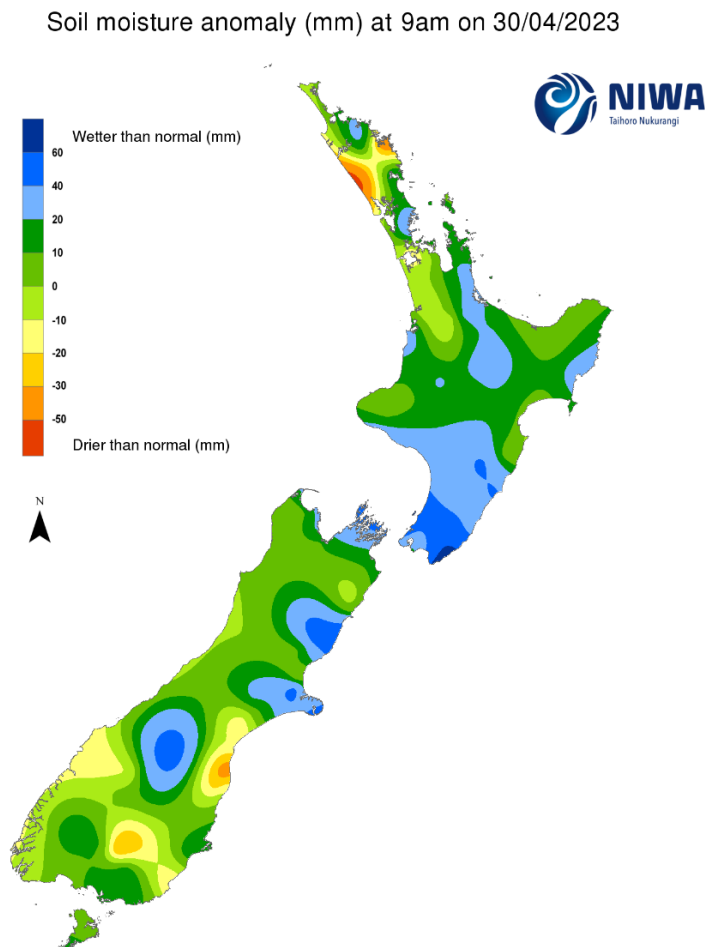


Figure 3. Soil moisture anomaly map of New Zealand, retrieved from NIWA 30/04/2023.

NIWA Seasonal Climate Outlook May – July 2023

ENSO-neutral conditions continued in April, while sea temperatures continued to increase across the equatorial Pacific, which is consistent with a developing El Niño. During early May, a northerly airflow will bring warm temperatures and tropical moisture to New Zealand, which may deliver heavy rain to Marlborough. From early winter, southerly winds will become more common, which may result in lower than normal rainfall. This increased frequency of southerly flows is consistent with a developing El Niño.

The predictions for Marlborough/Tasman from May to July are:

- 🌡️ Temperature – above average
- ☁️ Rainfall – near or above average
- 🌿 Soil Moisture – near or below average
- 🌊 River Flows – near or below average