

Hydrology of Marlborough Summary for March 2023

Report prepared by Charlotte Tomlinson, 3rd April 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

Early autumn has brought settled weather to Marlborough in 2023, with rainfall across the region near average for March this year. Rainfall in Blenheim was 55.6 mm, slightly above the March long-term average.

The Awatere and Omaka Rivers had higher than average flows during March, due to south-easterly rain events throughout the month. Average monthly flow in the Wairau River at State Highway One was 47 m³/s, which is near average.

Average shallow soil moisture at the Grovetown Park weather station was 24.5% for March, slightly above the long-term average of 20.2%.

We are currently in neutral ENSO conditions, after a 3-year run of La Niña which ended during March. El Niño conditions may arrive as early as winter, with the transition bringing changeable weather patterns to Aotearoa in the coming months. A period of northerly winds in mid-April may cause tropical moisture to move towards Aotearoa, increasing the chance for heavy rainfall in Marlborough.

Rainfall

Rainfall was near average across the region in March, as can be seen in the monthly rainfall graphs for the 6 key sites (Figure 1 below).

As recorded at the Marlborough Research Centre, in Blenheim there were 6 rain days throughout March (days recording 1.0 mm or more of rain), totalling 55.6 mm of rain for the month. This is 136% of the long-term average for March.

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

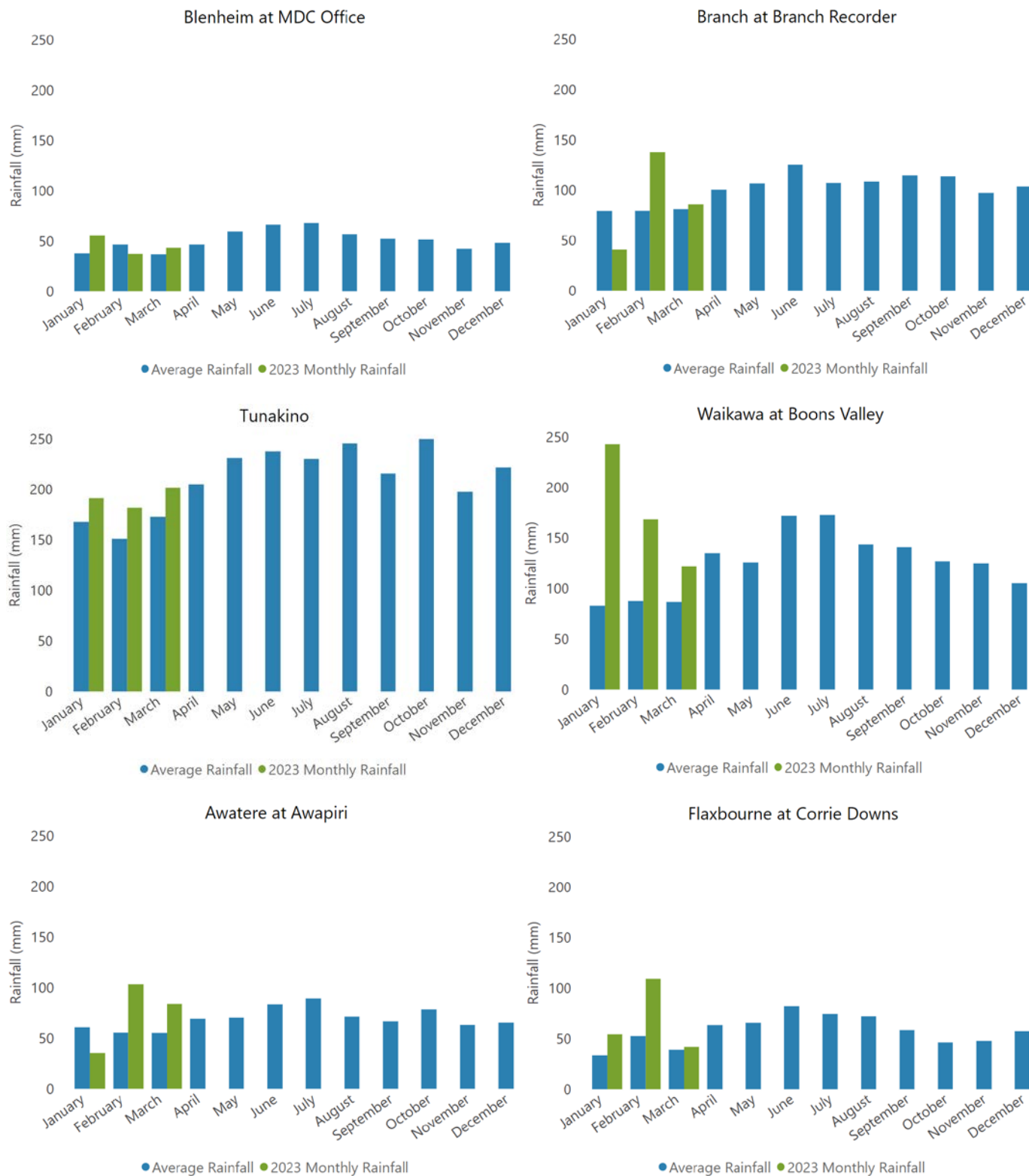


Table 1. 2023 monthly rainfall totals (mm) at rainfall monitoring sites in Marlborough.

Site	January	February	March
Awatere at Awapiri	36	103	84
Awatere Glenbrae NRFA	50	46	38
Beneagle at Farm Stream	78	57	49
Blenheim at MDC Office	56	38	44
Branch at Branch Recorder	41	138	86
Flaxbourne at Corrie Downs	54	109	42
Kaituna Rainfall at Higgins Bridge	101	111	103
Kenepuru Head NRFA	179	247	168
Koromiko NRFA	233	111	139
Lake Elterwater Climate	67	113	
Lansdowne NRFA	42	87	74
Malings	14	90	186
Mid Awatere Valley NRFA	25	90	97
Molesworth NRFA	18	89	62
Omaka at Ramshead Saddle	73	78	100
Onamalutu at Bartletts Creek Saddle	88	109	108
Onamalutu at Hilltop Road NRFA	110	98	107
Picton Climate at Waitohi Domain	194	147	
Pudding Hill NRFA	60		
Rai at Rai Falls	150	156	135
Rai Valley NRFA	188	173	181
Rarangi at Driving Range	76	77	86
Red Hills	46	140	112
St Arnaud NRFA	42	84	129
Taylor at Taylor Pass Landfill	53	41	33
Taylor at Tinpot	104	74	60
Te Rapa	52	152	93
Top Valley at Staircase Ridge	71	145	141
Tor Darroch NRFA	36	91	131
Tunakino	191	182	202
Upper Clarence NRFA	20	22	32
Waihopai at Craiglochart	21	81	62
Waihopai at Spray Confluence	21	77	82
Waikakaho	95	56	61
Waikawa at Boons Valley	243	169	122
Wairau at Narrows	43	54	51
Wairau Valley at Southwold	41	97	50
Wakamarina at Twin Falls	100	139	119
Ward NRFA	36	115	54
Wye at Charlies Rest		63	84

River Flows

In March, the Awatere River at Awapiri had a higher mean flow than average (181% of average), due to south-easterly rain events throughout the month. The highest flow for the month was 90 m³/s on March 5th.

Rain events on the 10th and 17th of March raised levels in the Omaka River, with the Omaka River at Gorge site recording a monthly mean flow of about 0.7 m³/s, 163% of average flow for March.

The Waihopai River was also affected by the rain events on the 5th and 17th of March, which had peak flows at the Craiglochart site of 90 and 50 m³/s respectively.

The Wairau River at State Highway One also had a fresh on the 17th of March, with flow rising to a peak of 180 m³/s. The mean flow for March 2023 was 47 m³/s, which is near average.

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

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

River	Site	March mean flow 2023 (m ³ /s)	March mean flow all records (m ³ /s)	% of monthly average	Records begin	Catchment area (km ²)
Pelorus	Bryants	10.94	11.67	94	1977	375
Rai	Rai Falls	7.56	6.18	122	1979	211
Kaituna	Higgins Bridge	1.41	1.27	111	2006	133
Branch	Intake Weir	13.18	16.10	82	1958	550
Wairau	Barnetts Bank	47.05	51.15	92	1960	3,430
Ohinemahuta	Domain	0.311	0.388	80	1998	33
Waihopai	Craiglochart	10.17	7.90	129	1960	764
Awatere	Awapiri	14.29	7.89	181	1977	987
Omaka	Gorge	0.696	0.427	163	1994	90
Taylor	Borough Weir	0.119	0.298	40	1961	64

Soil Moisture

At the Grovetown Park weather station, average shallow soil moisture was 24.5% for March, slightly above the long-term average of 20.2%. The soil moisture deficit at the end of March can be seen below in Figure 2, while the soil moisture anomaly map (Figure 3) shows Marlborough soils are normal to slightly wetter than normal for this time of year.

Soil moisture deficit (mm) at 9am on 30/03/2023

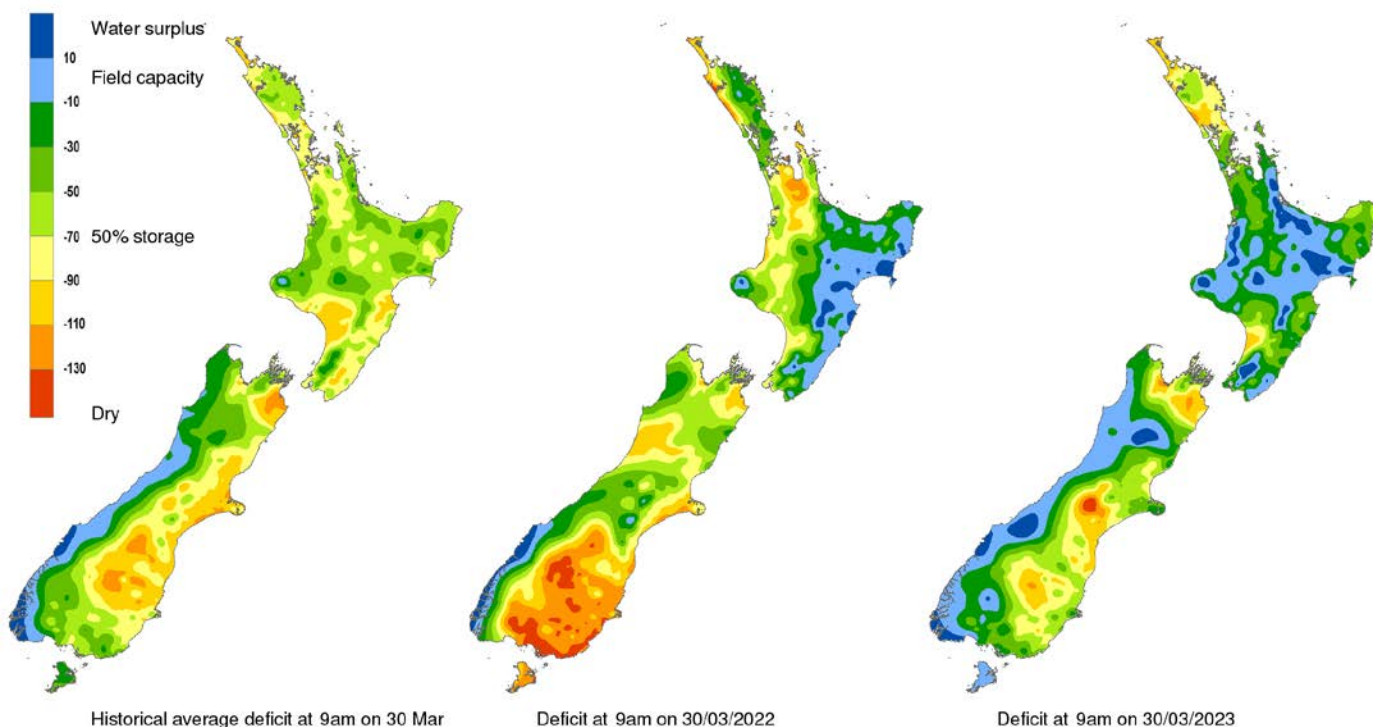


Figure 2. Soil moisture deficit maps of New Zealand, retrieved from NIWA on 30/03/2023.

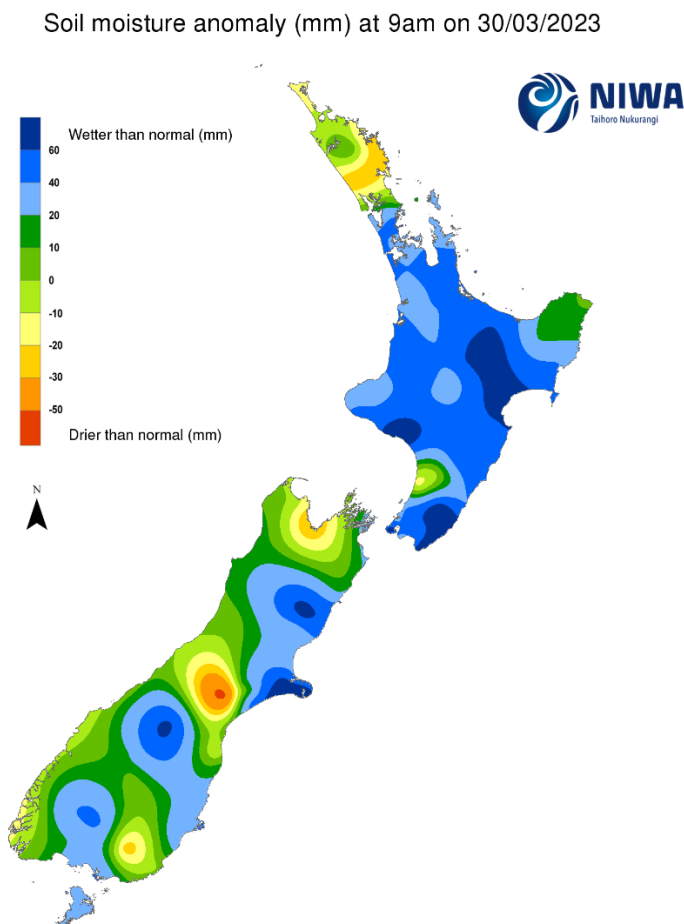


Figure 3. Soil moisture anomaly map of New Zealand, retrieved from NIWA 30/03/2023.

NIWA Seasonal Climate Outlook April – June 2023

La Niña ended during March after a 3-year run, with neutral ENSO conditions currently. El Niño conditions may arrive as early as winter. The transition between ENSO conditions will mean weather patterns in New Zealand will be changeable in the coming months. A period of northerly winds in mid-April may cause tropical moisture to move towards Aotearoa, increasing the chance for heavy rainfall in Marlborough.

The predictions for Marlborough/Tasman from April to June are:

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