

# 2021/22 Hydrology monitoring



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## Disclaimer

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In preparing this report, the authors have used the best currently available data and have exercised all reasonable skill and care in presenting and interpreting these data. Nevertheless, GW does not accept any liability, whether direct, indirect, or consequential, arising out of the provision of the data and associated information within this report. Furthermore, as GW endeavours to continuously improve data quality, amendments to data included in, or used in the preparation of, this report may occur without notice at any time.

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For the latest available results go to the [GW environmental data hub](#).

## Overview

Greater Wellington (GW) operates a hydrometric network for measuring rainfall, river levels and flow, lake and wetland levels, groundwater levels, tidal levels and soil moisture. There are approximately 270 monitoring stations on the hydrometric network, of which the majority are automated to operate continuously and to send the data to the office via a radio or cell phone telemetry system.

This report contains key results for each of the five main whitua (main river) catchments with recorded data for the year summarised and compared to long term averages and any significant hydrological events that occurred.

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## Monitoring objectives

- Provide information on the state of the Region's water resources and the baseline quantity of water.
- Detect long and short-term trends in climate and water resources.
- Provide data on the state of the Region's freshwater resources to enable informed decisions on sustainable allocation and use.
- Inform whitua committees to enable the creation of a unique vision and to prioritise objectives for land and water management.
- Provide a flood warning monitoring network and alerting system for the Region.
- Monitor drought conditions and enable drought warnings.
- Inform policy and Regional Plan development and review.
- Contribute to resource consent compliance monitoring.

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## Monitoring results

Summary results are presented in the following sections for a representative subset of the sites shown on the monitoring network map below. Use the links below to navigate to each.

- [Rainfall](#) – annual and sub-annual totals, maximum and minimum rainfalls for 45 sites.
- [River levels/flows](#) – averages, maximums, and minimums for 33 sites.
- [Groundwater levels](#) – daily averages for 15 sites in selected groundwater zones.
- [Lake & wetland levels](#) – daily and monthly summaries for 5 sites.
- [Soil moisture](#) – daily averages for 2 sites.

# Monitoring network

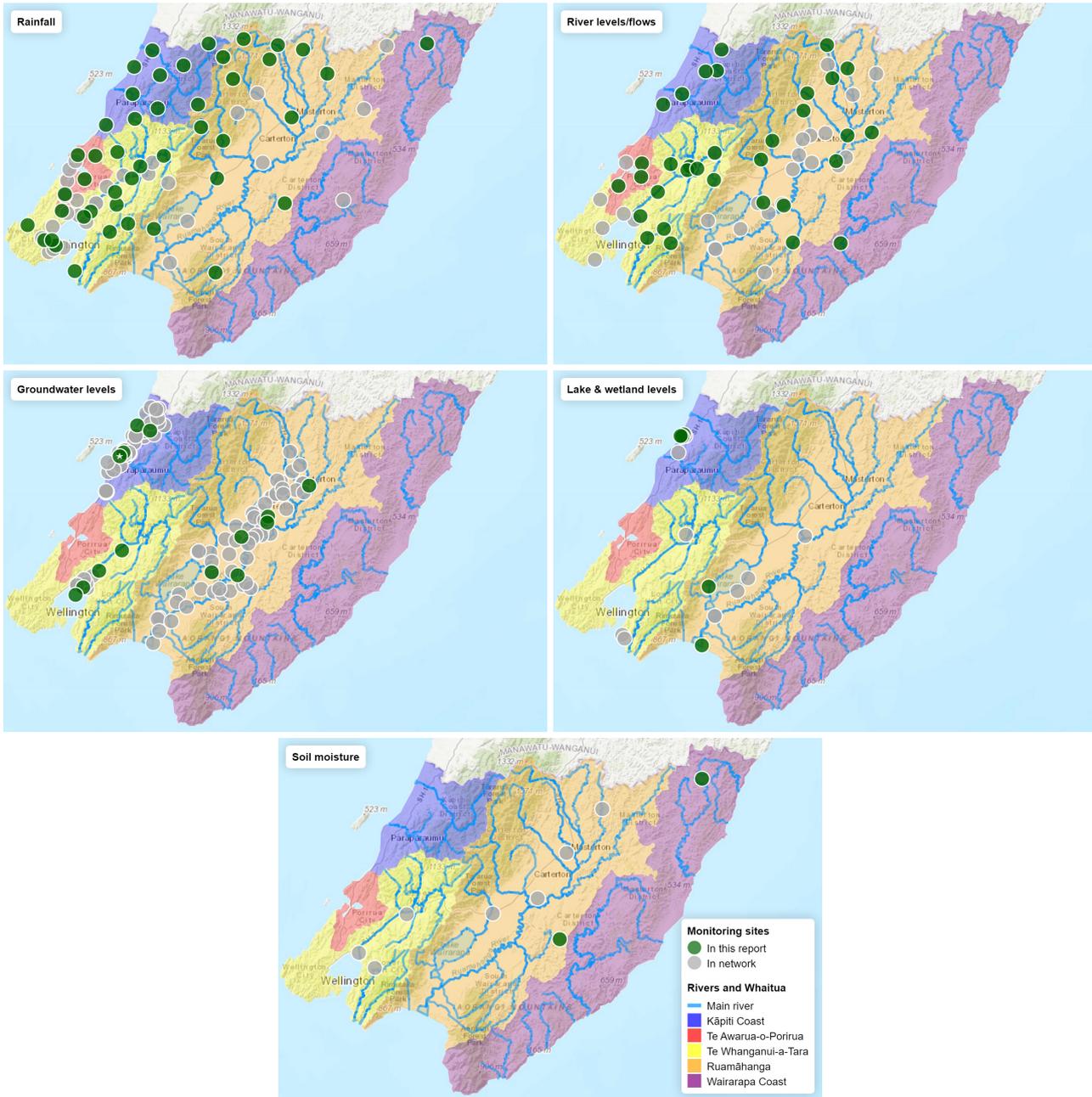


Figure 1: Hydrology monitoring site locations for each hydrometric network. Green circles indicate sites with data summarised in this report, while data for sites shown by grey circles are not reported. *Note: circles marked with a star (★) indicate there are two bores in the same location at different depths.*

# Rainfall results

## Annual totals

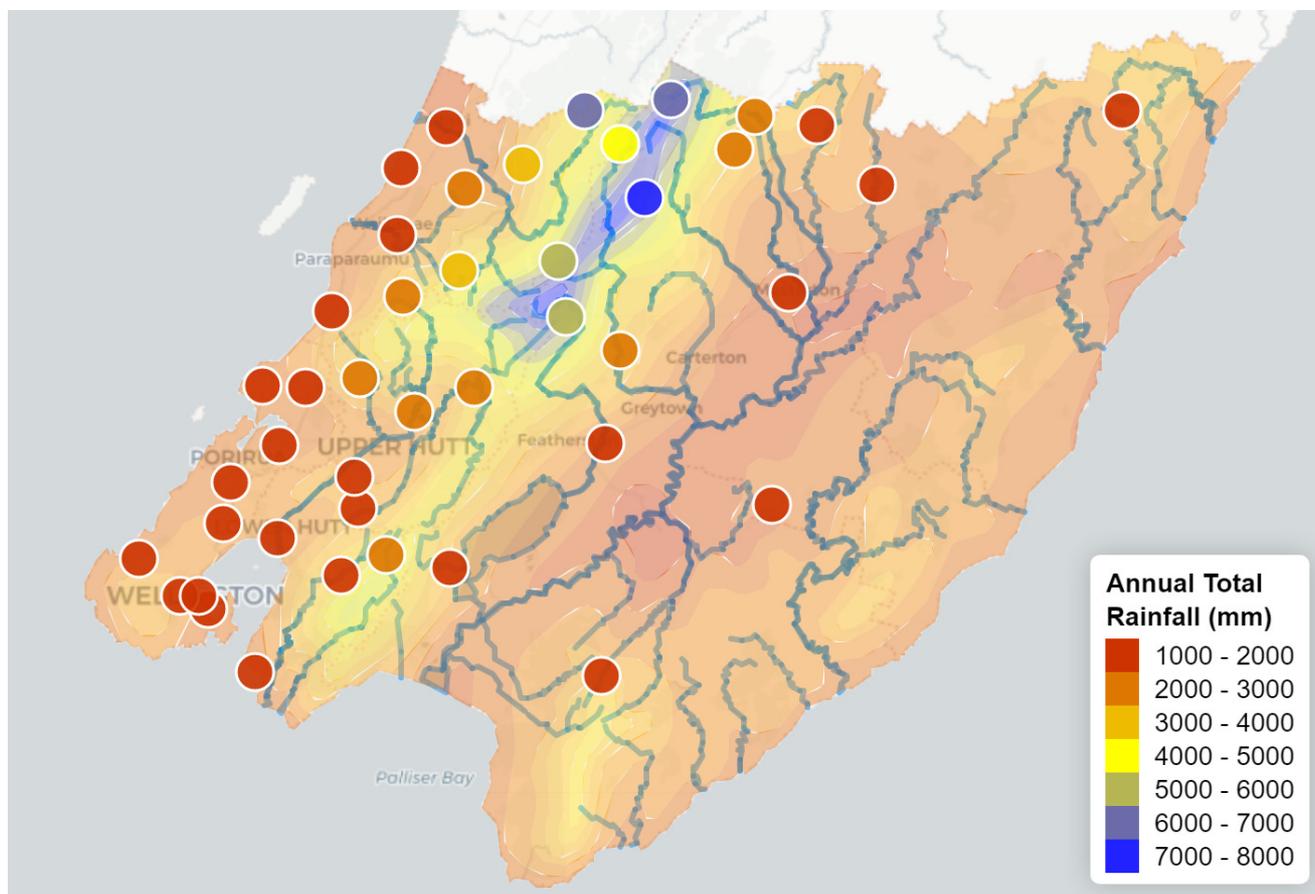


Figure 2: Annual total rainfall (mm) at a range of monitoring sites across the region. The shaded areas under the monitoring sites show the long term mean annual rainfall over the entire region.

Table 1: Annual total rainfall (mm) at a range of monitoring sites across the region. Sites with greater than 20 percent difference from their long-term average have table rows shaded orange (**below average**) or blue (**above average**). Abbreviations: **KC**: Kāpiti Coast, **TP**: Te Awarua-o-Porirua, **TW**: Te Whanganui-a-Tara, **RU**: Ruamāhanga, **WC**: Wairarapa Coast.

Whaitua	Site	Catchment	Annual total mm	Long-term average mm (years)	% of long-term average
KC	Kapakapanui (Taranua)	Ōtaki	3075	2447 (1993-2022)	126
KC	MacKays Crossing	Whareroa	1658	1084 (2003-2022)	153
KC	Mangaone Stream (Transmission Lines)	Mangaone	2027	1594 (1994-2022)	127
KC	McIntosh (Taranua)	Ōtaki	5732	5094 (1993-2022)	113
KC	Ōtaki River (Depot)	Ōtaki	1455	1000 (1972-2022)	146
KC	Oriwa (Taranua)	Ōtaki	6033	4800 (1993-2022)	126
KC	Taungata (Taranua)	Ōtaki	3312	2875 (1993-2022)	115
KC	Te Hāpua Wetland (Shoveler Lagoon)	Te Hāpua Wetlands	1489	1026 (2010-2022)	145

Whaitua	Site	Catchment	Annual total mm	Long-term average mm (years)	% of long-term average
KC	Waikanae River (Water Treatment Plant)	Waikanae	1617	1237 (1996-2022)	131
RU	Angle Knob (Taranua)	Waingawa	7169	6823 (1976-2022)	105
RU	Bannister Basin (Taranua)	Ruamāhanga	6756	5941 (1976-2022)	114
RU	Bull Mound (Taranua)	Tauherenikau	5219	4365 (1977-2022)	120
RU	Carkeek (Taranua)	Waiohine	4506	4470 (1976-2022)	101
RU	Masterton (Wairarapa College)	Ruamāhanga	1129	892 (2003-2022)	127
RU	Mauriceville	Kōpuaranga	1785	1470 (2009-2022)	121
RU	Ruakōkopatuna River (Iraia)	Iraia	1628	1672 (1970-2022)	97
RU	Ruamāhanga River (Mt Bruce)	Ruamāhanga	2855	2334 (1985-2022)	122
RU	Tauherenikau (Racecourse)	Tauherenikau	1403	983 (1964-2022)	143
RU	Waikoukou (Longbush)	Waikoukou	1103	954 (2008-2022)	116
RU	Waiohine River (Gorge)	Waiohine	2922	2173 (1975-2022)	134
RU	Waiorongomai (Matthews)	Waiorongomai	1830	1454 (2010-2022)	126
RU	Waipoua (Westons)	Waipoua	2827	2415 (2009-2022)	117
RU	Whangaehu River (Waihi)	Whangaehu	1353	1092 (2002-2022)	124
TP	Horokiri Stream (Battle Hill)	Horokiri	1753	1258 (2004-2022)	139
TP	James Cook Reservoir	Duck Creek	1370	1201 (2018-2022)	114
TP	Seton Nossiter Park	Porirua	1775	1217 (1993-2022)	146
TP	Taupō Stream (Whenua Tapu)	Taupō	1585	1059 (1992-2022)	150
TP	Tawa Pool	Porirua	1465	993 (1998-2022)	147
TW	Akatarawa River (Cemetery)	Akatarawa	2298	1704 (1989-2022)	135
TW	Akatarawa River (Warwicks)	Akatarawa	2630	2229 (1981-2022)	118
TW	Hataitai (Post Office)	Wellington City	1363	915 (1998-2022)	149
TW	Hutt River (Kaitoke Headworks)	Hutt	2608	2231 (1952-2022)	117
TW	Karori Reservoir	Kaiwharawhara	1638	1308 (1952-2022)	125
TW	Mangaroa River (Tasman Vaccine Ltd)	Mangaroa	1966	1505 (1969-2022)	131
TW	Orongo Swamp	Ōrongorongo	2713	2436 (1982-2022)	111
TW	Pencarrow Lakes	Pencarrow Lakes	1075	895 (2009-2022)	120
TW	Quartz Hill	Mākara	1250	1063 (2009-2022)	118
TW	Shandon Golf Club	Hutt	1420	1068 (2001-2022)	133
TW	Te Papa	Wellington City	1425	1025 (1997-2022)	139
TW	Upper Hutt (Pinehaven)	Hutt	1222	1127 (1999-2022)	108
TW	Wainuiomata Reservoir	Wainuiomata	1933	1866 (1950-2022)	104
TW	Whakatikei River (Blue Gum Spur)	Whakatikei	2404	1846 (1983-2022)	130
WC	Tanawa Hut	Whareama	1450	1295 (1957-2022)	112

## Long-term

The charts below show annual total rainfall (mm) at a number of sites graphed against the site average total (black line). Years when recorded rainfall was above average are coloured **orange** while years with below average rainfall are **blue**.

### Kāpiti Coast

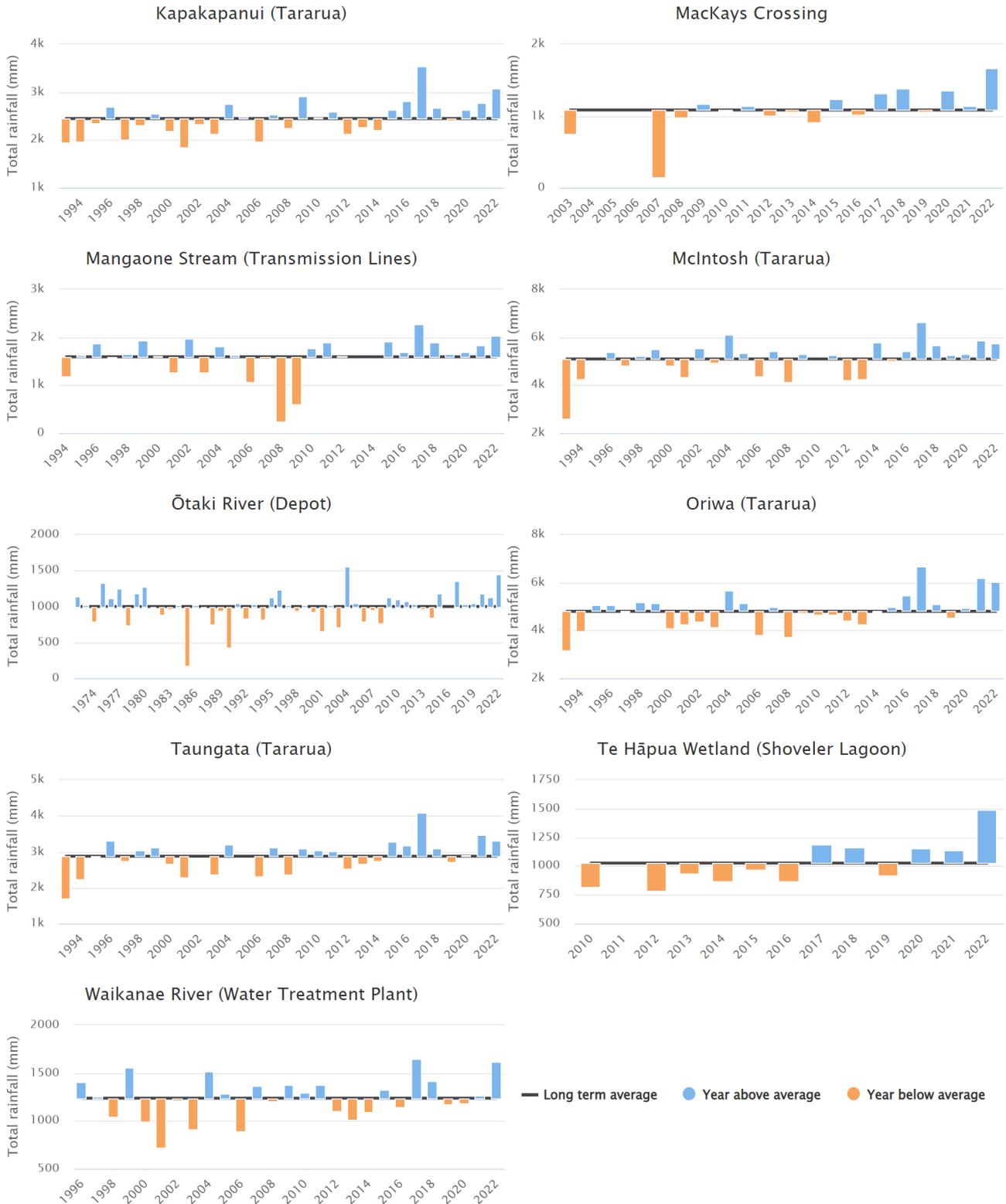


Figure 3: Yearly total rainfall and long-term averages in the Kāpiti Coast whitua.

## Te Awarua-o-Porirua

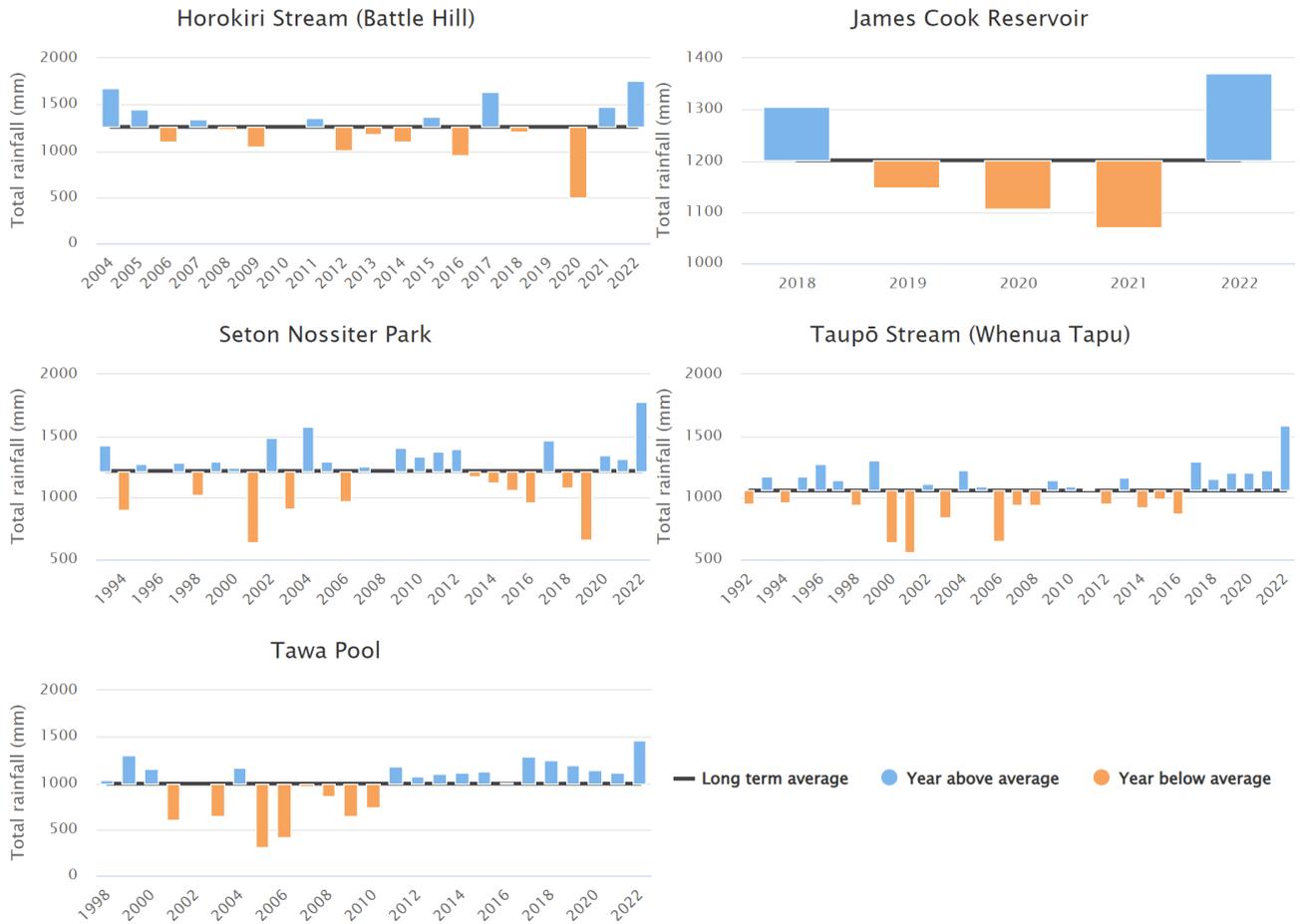


Figure 4: Yearly total rainfall and long-term averages in the Te Awarua-o-Porirua whaitua.

# Te Whanganui-a-Tara

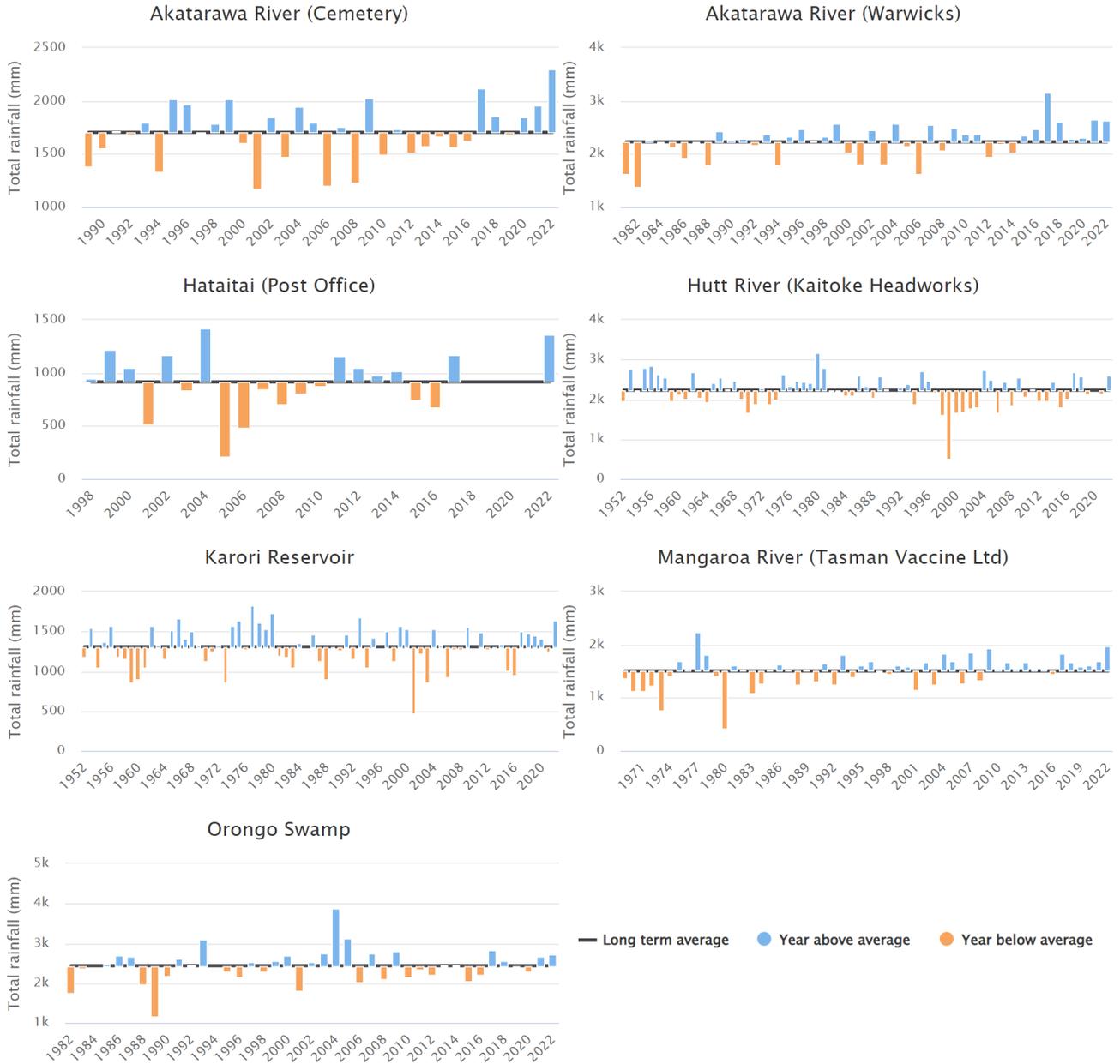


Figure 5: Yearly total rainfall and long-term averages in the Te Whanganui-a-Tara whaitua.



Figure 6: More yearly total rainfall and long-term averages in the Te Whanganui-a-Tara whaitua.

# Ruamāhanga

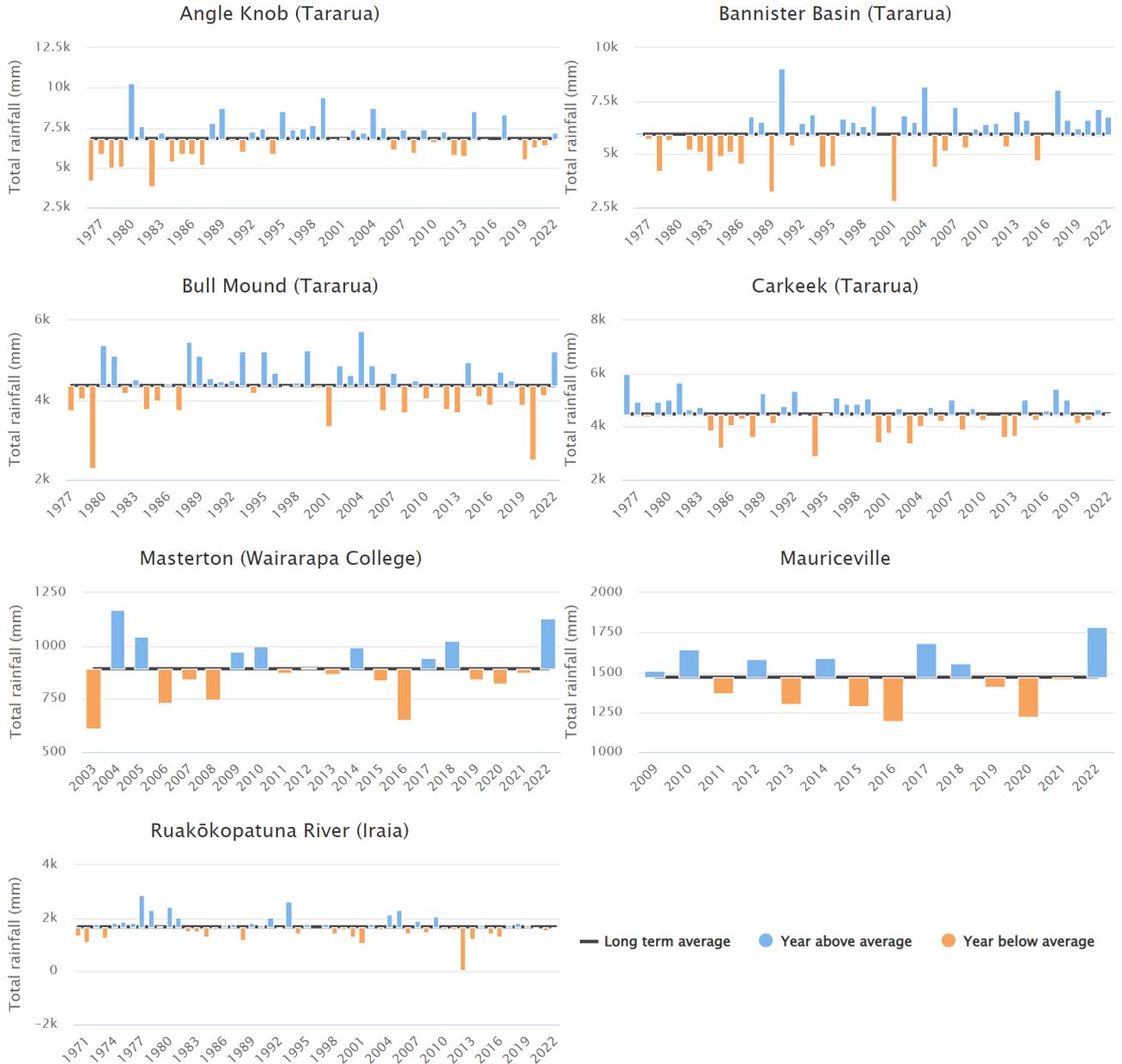


Figure 7: Yearly total rainfall and long-term averages in the Ruamāhanga whaitua.

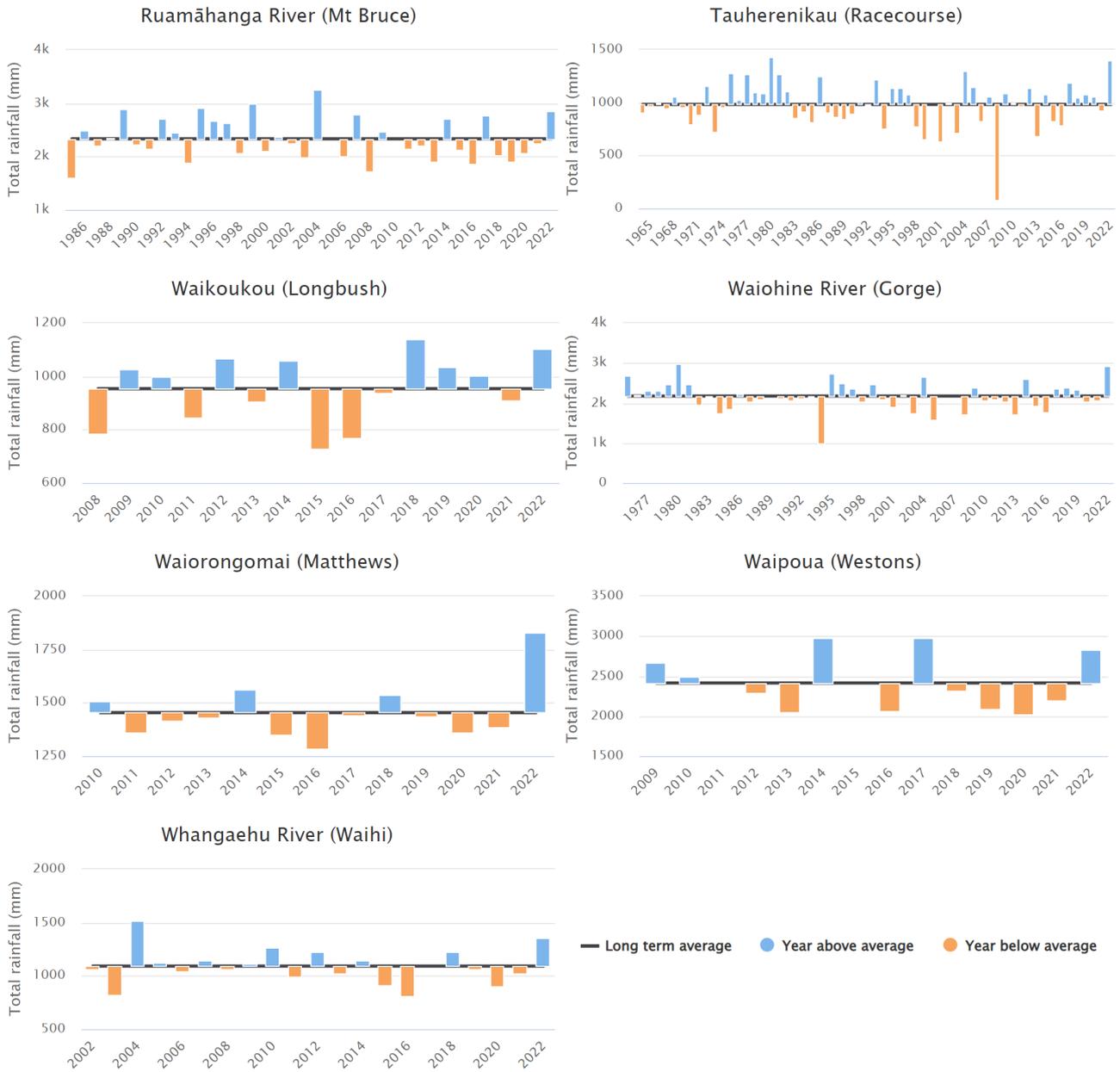


Figure 8: More yearly total rainfall and long-term averages in the Ruamāhanga whaitua.

## Wairarapa Coast

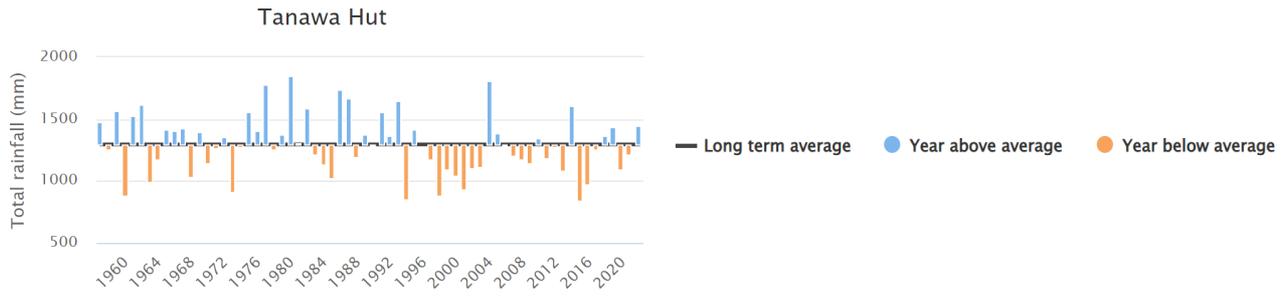


Figure 9: Yearly total rainfall and long-term averages in the Wairarapa Coast whitua.

# Subannual totals

The charts below show monthly total, and cumulative monthly, rainfall (mm) at several monitoring sites compared to the previous year and the long-term monthly average.

## Kāpiti Coast

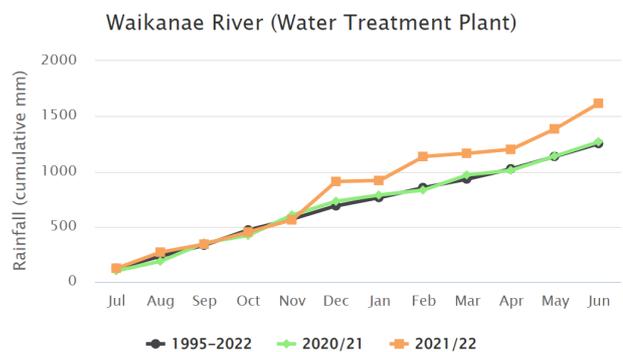
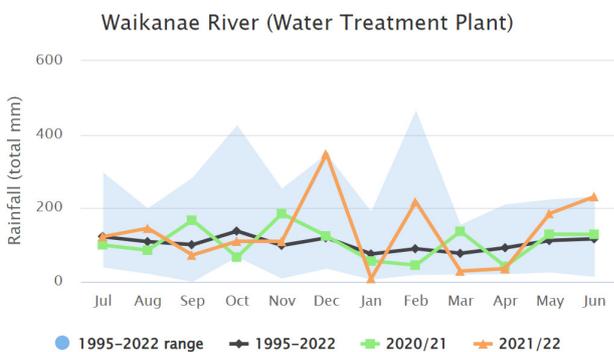
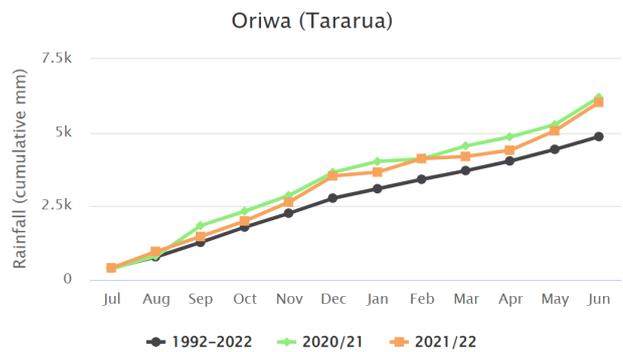
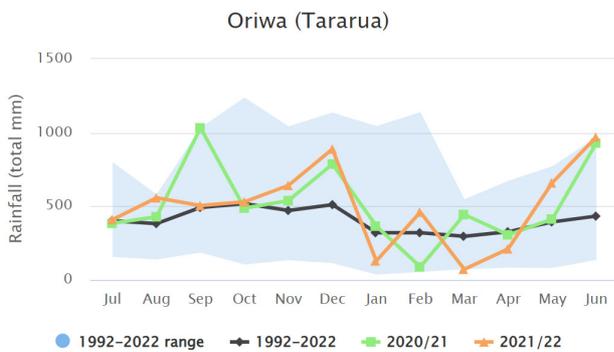
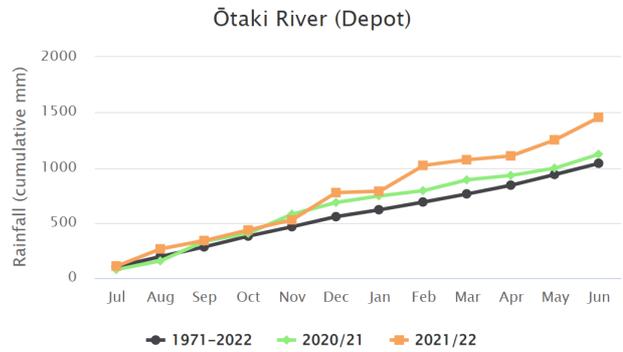
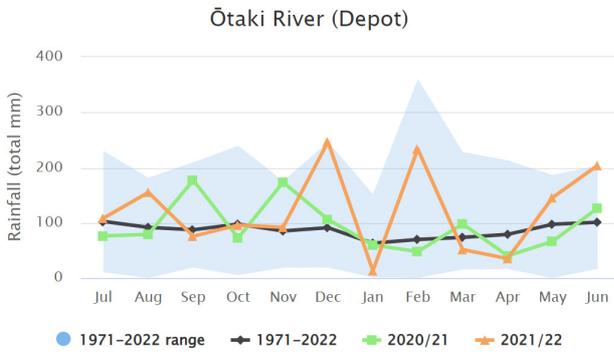


Figure 10: Monthly total and cumulative rainfall in the Kāpiti Coast whitua.

# Te Awarua-o-Porirua

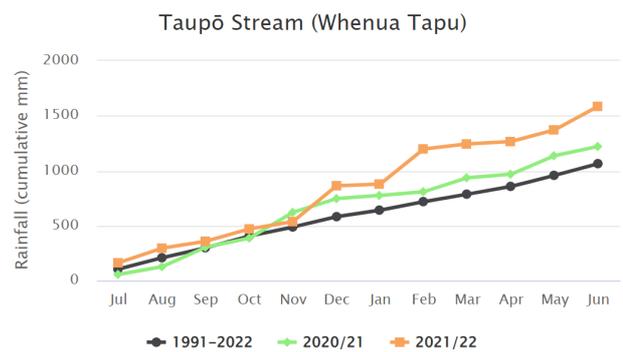
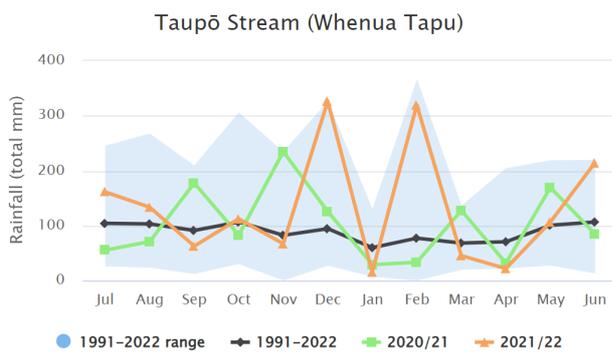
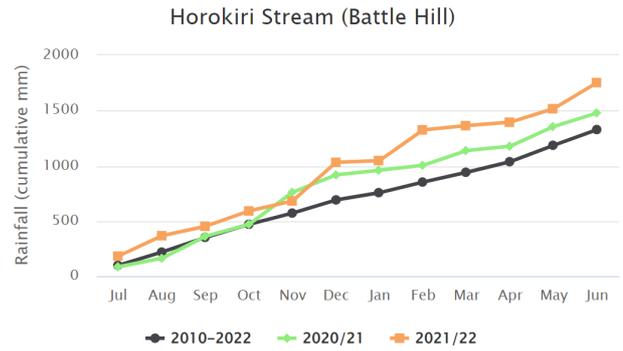
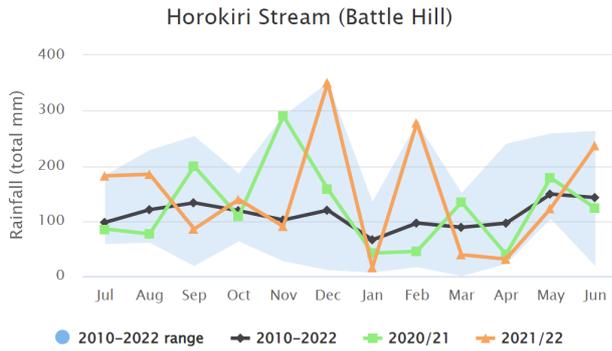


Figure 11: Monthly total and cumulative rainfall in the Te Awarua-o-Porirua whaitua.

# Te Whanganui-a-Tara



Figure 12: Monthly total and cumulative rainfall in the Te Whanganui-a-Tara whaitua.

# Ruamāhanga

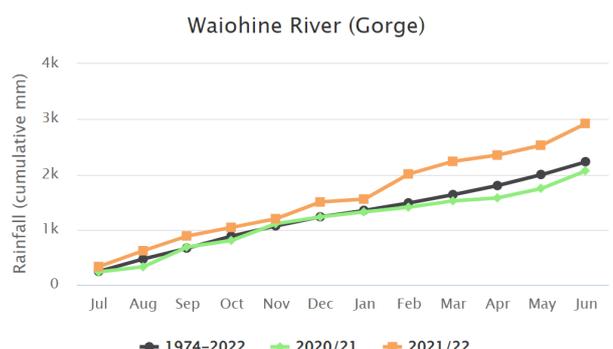
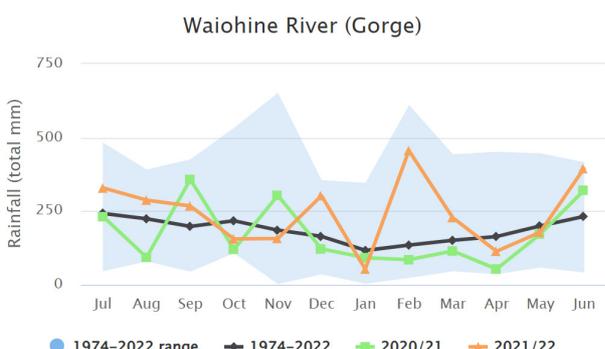
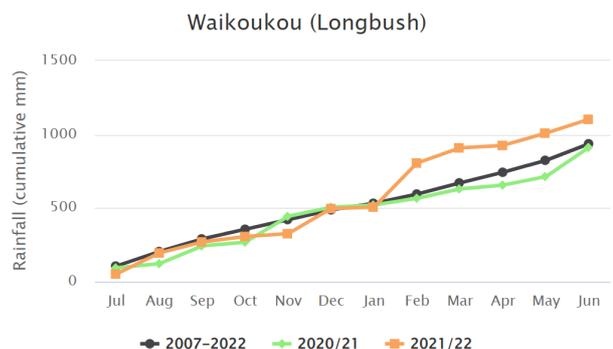
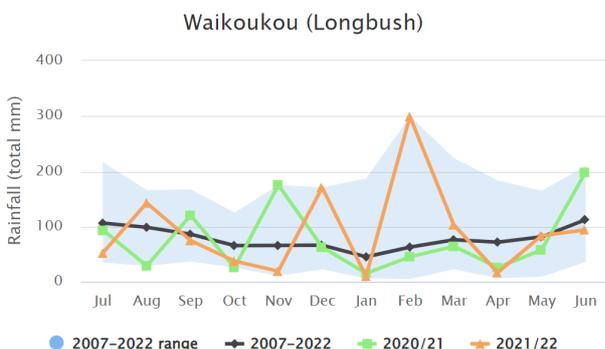
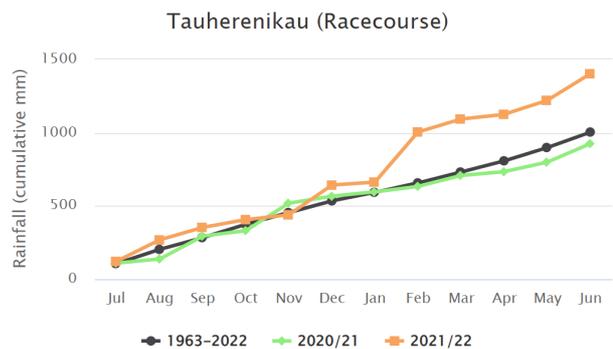
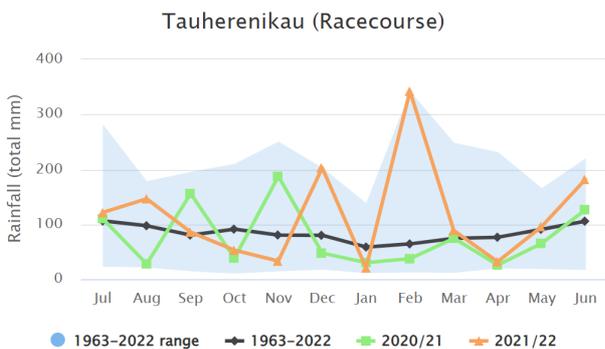
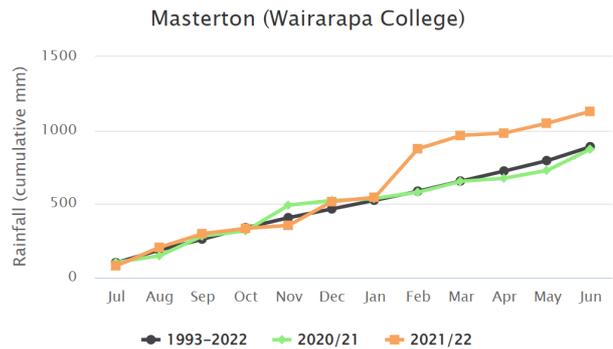
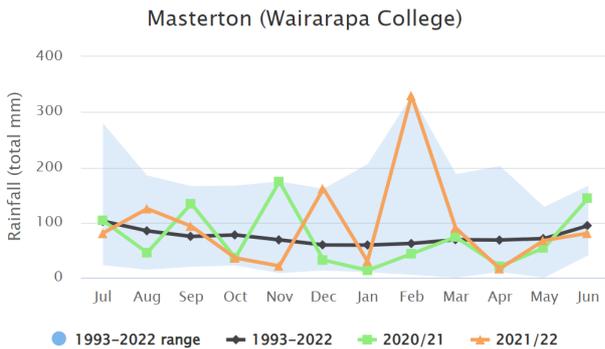
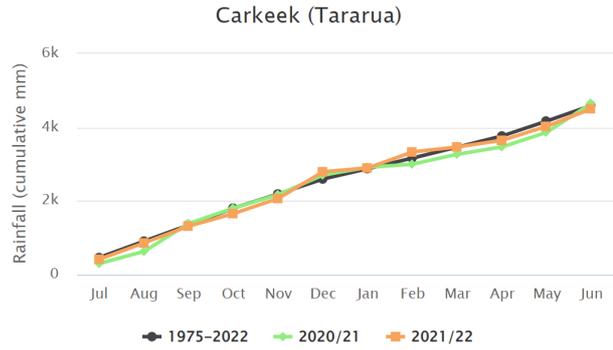
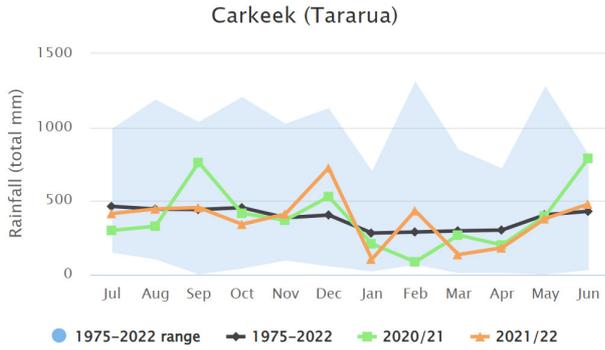


Figure 13: Monthly total and cumulative rainfall in the Ruamāhanga whitua.

## Wairarapa Coast

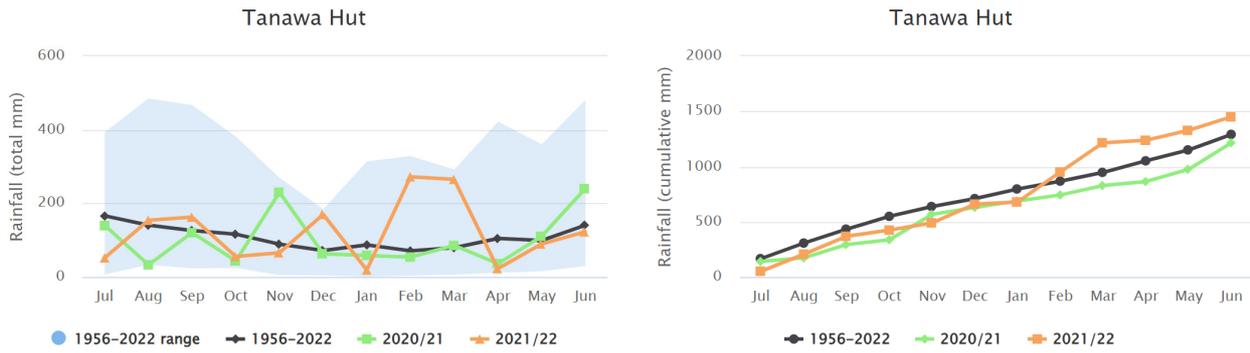


Figure 14: Monthly total and cumulative rainfall in the Wairarapa Coast whitua.

## Seasonal totals

Table 2: Seasonal rainfall totals for select monitoring sites. Those sites that have a greater than 20 percent difference from their long-term seasonal average are shaded orange (**below average**) or blue (**above average**).

Site	Winter	Spring	Summer	Autumn
Carkeek (Taranua)	105	95	132	70
Hutt River (Kaitoke Headworks)	144	96	170	65
Karori Reservoir	140	83	250	62
Lower Hutt (Birch Lane)	147	73	185	74
MacKays Crossing	172	87	360	65
Masterton (Wairarapa College)	103	69	315	87
Ōtaki River (Depot)	165	101	229	94
Oriwa (Taranua)	166	114	131	92
Quartz Hill	141	79	256	50
Ruamāhanga River (Mt Bruce)	138	96	180	83
Seton Nossiter Park	176	82	270	79
Tanawa Hut	74	85	205	134
Tauherenikau (Racecourse)	151	69	291	89
Waikanae River (Water Treatment Plant)	150	88	217	88
Waikoukou (Longbush)	95	62	313	88
Wainuiomata Reservoir	109	82	178	70
Whangaehu River (Waihi)	99	87	278	97

## Maximum recorded rainfalls

The highest and lowest recorded rainfall totals throughout the year at various monitoring sites have been assigned estimated return periods based on frequency analysis of long term recorded data (see [NIWA's HIRDS V4](#) for more information). **Blue** shaded values indicate a rainfall total with a 5-year return period or greater.

Note that for all frequency analysis results (rainfall and flows) a return period expressed as 100 years can be assigned a probability of occurring being 1/100, or 1% in any one year. Similarly, a 5-year return period event equates to 1/5 or a 20% chance of occurring in any one year.

Table 3: Maximum recorded rainfalls over short duration periods. Rainfall values are in mm, and return periods in years.

Site	1 hour			6 hours			12 hours		
	Rainfall	Start date	Return period	Rainfall	Start date	Return period	Rainfall	Start date	Return period
Bannister Basin (Taranua)	31.0	Jun 11, 2022	<2	124.0	Nov 21, 2021	2	175.5	Nov 21, 2021	<2
Karori Reservoir	29.2	Dec 06, 2021	4	63.6	Feb 12, 2022	8	95.2	Feb 12, 2022	29
MacKays Crossing	43.2	Dec 02, 2021	86	75.2	Dec 06, 2021	30	107.8	Dec 06, 2021	58
Masterton (Wairarapa College)	13.4	Feb 12, 2022	<2	47.2	Feb 12, 2022	8	76.8	Feb 12, 2022	12
Ōtaki River (Depot)	20.2	Jun 10, 2022	<2	37.4	Feb 05, 2022	<2	65.4	Feb 05, 2022	6
Oriwa (Taranua)	69.5	Jun 10, 2022	13	131.5	May 20, 2022	2	157.0	Nov 21, 2021	<2
Shandon Golf Club	24.2	Dec 06, 2021	6	53.8	Feb 12, 2022	4	87.6	Jul 17, 2021	7
Tanawa Hut	20.5	Mar 24, 2022	3	69.0	Mar 24, 2022	6	100.0	Mar 24, 2022	8
Tauherenikau (Racecourse)	18.8	Feb 12, 2022	4	54.8	Feb 12, 2022	41	89.8	Feb 12, 2022	69
Wainuiomata Reservoir	21.6	Dec 06, 2021	3	65.2	Feb 13, 2022	3	85.2	Feb 13, 2022	<2
Waiohine River (Gorge)	42.5	Mar 22, 2022	38	56.5	Feb 12, 2022	<2	94.0	Jul 17, 2021	<2

Table 4: Maximum recorded rainfalls over long duration periods. Rainfall values are in mm, and return periods in years.

Site	24 hours			48 hours			72 hours		
	Rainfall	Start date	Return period	Rainfall	Start date	Return period	Rainfall	Start date	Return period
Bannister Basin (Tararua)	232.5	Dec 07, 2021	<2	379.0	Dec 06, 2021	4	479.5	Dec 05, 2021	9
Karori Reservoir	143.4	Feb 12, 2022	100	174.8	Feb 12, 2022	59	179.8	Feb 11, 2022	19
MacKays Crossing	121.2	Dec 05, 2021	30	166.6	Dec 06, 2021	71	173.4	Dec 05, 2021	47
Masterton (Wairarapa College)	116.6	Feb 12, 2022	19	176.8	Feb 11, 2022	82	182.2	Feb 11, 2022	50
Ōtaki River (Depot)	93.4	Feb 04, 2022	18	127.2	Dec 06, 2021	18	133.2	Dec 05, 2021	19
Oriwa (Tararua)	228.0	Dec 07, 2021	<2	334.5	Jun 09, 2022	2	422.0	Jun 10, 2022	5
Shandon Golf Club	113.0	Feb 12, 2022	5	130.0	Feb 12, 2022	4	139.0	Feb 11, 2022	3
Tanawa Hut	137.0	Mar 24, 2022	9	202.5	Mar 23, 2022	13	208.0	Mar 22, 2022	10
Tauherenikau (Racecourse)	145.2	Feb 12, 2022	49	183.8	Feb 11, 2022	52	187.4	Feb 11, 2022	44
Wainuiomata Reservoir	151.8	Feb 12, 2022	6	178.6	Feb 12, 2022	3	187.8	Feb 11, 2022	3
Waiohine River (Gorge)	162.5	Jul 17, 2021	8	209.5	Jul 17, 2021	7	224.0	Jul 15, 2021	6

## Lowest recorded rainfalls

Table 5: Minimum total rainfalls (mm) over periods of 14, 28, and 90 days.

Site	14 days		28 days		3 months	
	Rainfall	Start date	Rainfall	Start date	Rainfall	Start date
Bannister Basin (Tararua)	9.5	Feb 26, 2022	45.0	Feb 20, 2022	680.0	Feb 13, 2022
Horokiri Stream (Battle Hill)	0.2	Jan 11, 2022	5.0	Feb 20, 2022	151.4	Feb 27, 2022
Horokiri Stream (Battle Hill)	0.2	Feb 27, 2022	5.0	Feb 20, 2022	151.4	Feb 27, 2022
Karori Reservoir	0.0	Feb 20, 2022	2.8	Feb 20, 2022	166.2	Feb 20, 2022
MacKays Crossing	0.4	Feb 20, 2022	1.2	Feb 20, 2022	132.2	Feb 13, 2022
Masterton (Wairarapa College)	0.6	Apr 25, 2022	6.4	Feb 20, 2022	148.8	Aug 30, 2021
Ōtaki River (Depot)	0.0	Mar 02, 2022	0.2	Feb 20, 2022	140.4	Feb 13, 2022
Oriwa (Tararua)	1.5	Feb 21, 2022	16.0	Feb 20, 2022	452.0	Feb 13, 2022
Savage Park	0.0	Dec 29, 2021	2.4	Dec 28, 2021	186.2	Feb 26, 2022
Savage Park	0.0	Mar 02, 2022	2.4	Dec 28, 2021	186.2	Feb 26, 2022
Shandon Golf Club	0.0	Feb 26, 2022	1.2	Feb 20, 2022	155.8	Feb 14, 2022
Tanawa Hut	0.5	Dec 29, 2021	10.5	Apr 07, 2022	207.0	Nov 07, 2021
Tauherenikau (Racecourse)	0.4	Feb 26, 2022	4.4	Feb 20, 2022	171.4	Aug 30, 2021
Tawa Pool	0.0	Jan 11, 2022	1.6	Feb 20, 2022	145.4	Feb 14, 2022
Waikanae River (Water Treatment Plant)	0.0	Feb 26, 2022	0.2	Feb 20, 2022	133.4	Feb 13, 2022
Waikoukou (Longbush)	1.4	Dec 29, 2021	6.2	Dec 29, 2021	130.4	Sep 01, 2021
Wainuiomata Reservoir	1.8	Dec 29, 2021	17.6	Dec 21, 2021	280.4	Feb 14, 2022
Waiohine River (Gorge)	2.5	Apr 25, 2022	22.5	Feb 20, 2022	444.5	Feb 14, 2022

# River level and flow results

## Average flows

Mean monthly river flows (m<sup>3</sup>/s) for the year compared against the previous year and the long-term average/range.

### Kāpiti Coast

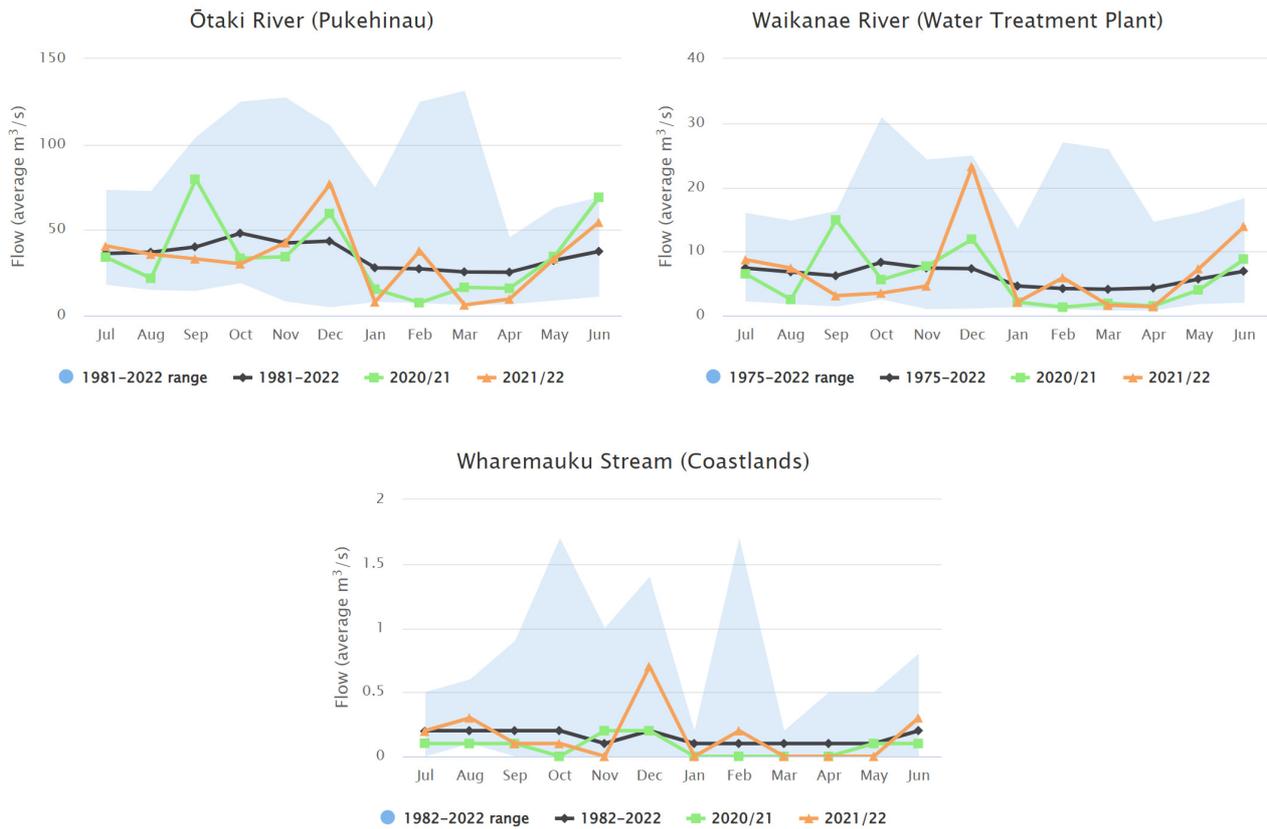


Figure 15: Monthly average river flow in the Kāpiti Coast whitua.

## Te Awarua-o-Porirua

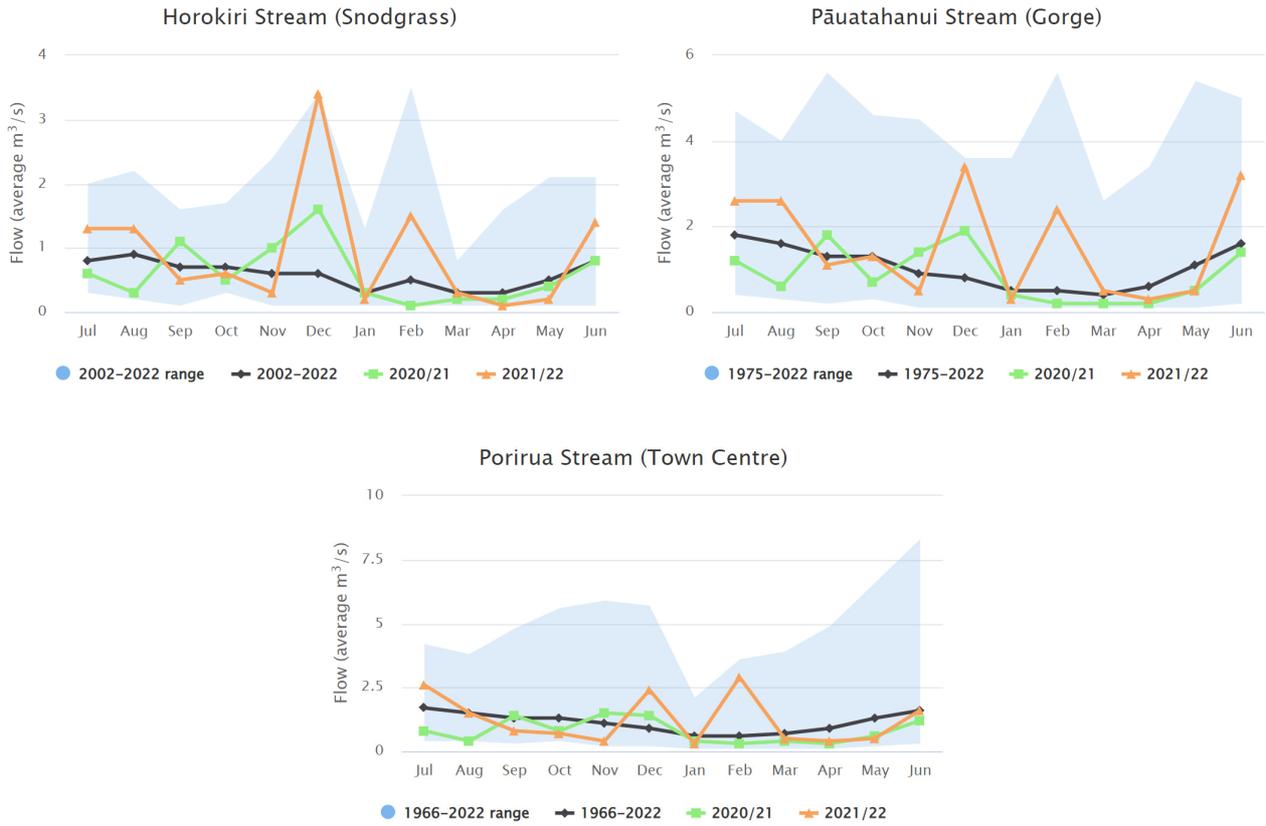


Figure 16: Monthly average river flow in the Te Awarua-o-Porirua whitua.

## Te Whanganui-a-Tara

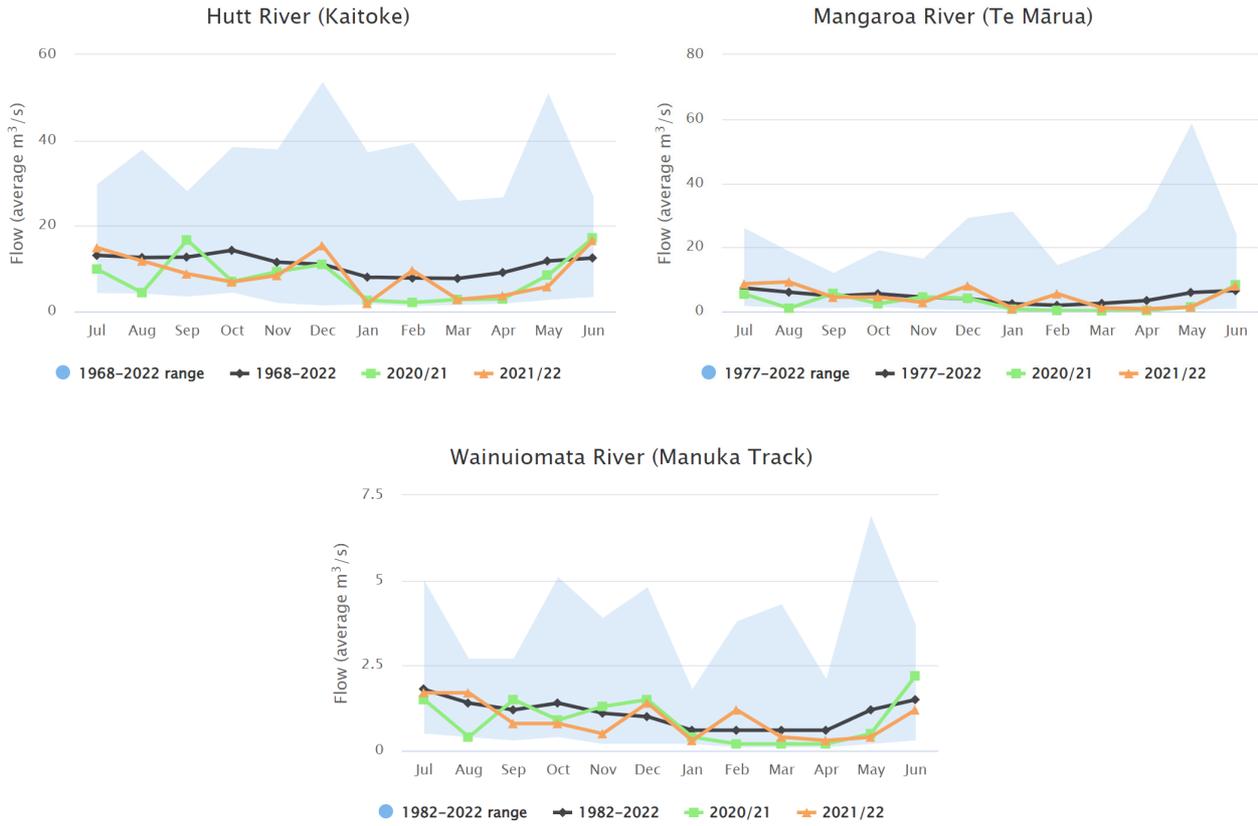


Figure 17: Monthly average river flow in the Te Whanganui-a-Tara whaitua.

# Ruamāhanga

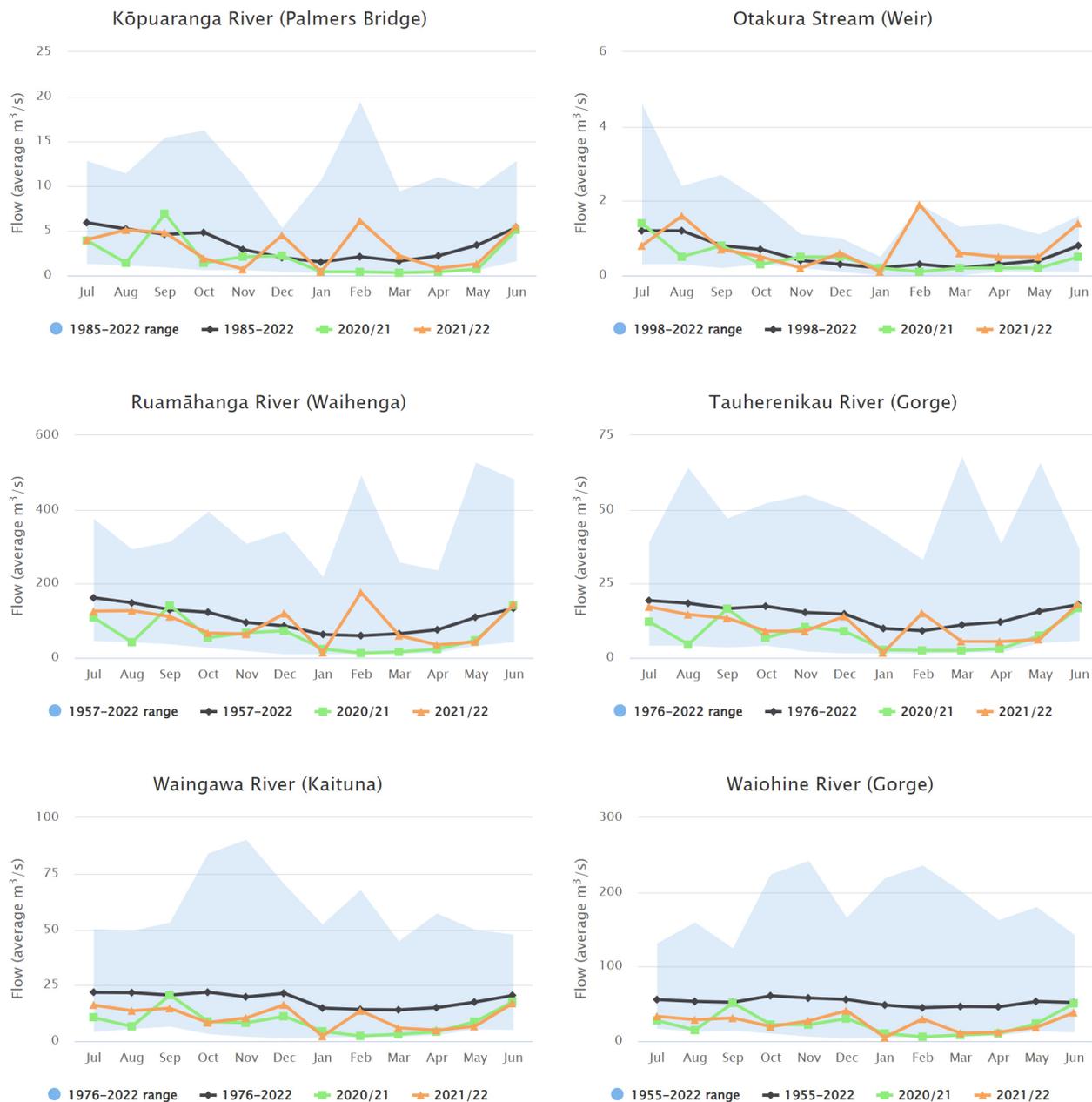


Figure 18: Monthly average river flow in the Ruamāhanga whaitua.

## Wairarapa Coast

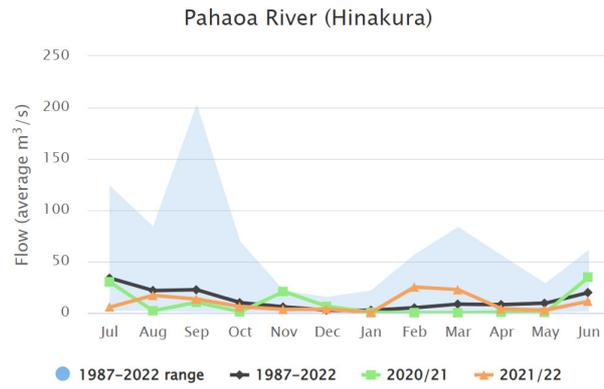


Figure 19: Monthly average river flow in the Wairarapa Coast whitua.

## Maximum flows

Table 6: Maximum recorded river flows with return periods derived by flood frequency analysis of annual peak flows recorded at each site. Sites highlighted in **blue** indicate a flood flow in excess of a 5-year return period. Note that for all frequency analysis results (high or low flows and rainfall) a return period expressed as 100 years can be assigned a probability of occurring being 1/100, or 1% in any one year. Similarly, a 5-year return period event equates to 1/5 or a 20% chance of occurring in any one year.

Site	Date of occurrence	Max flow (m <sup>3</sup> /s)	Estimated return period (yrs)
Ōtaki River (Pukehinau)	Nov 22, 2021	673	<2
Akatarawa River (Cemetery)	Dec 06, 2021	270	<2
Horokiri Stream (Snodgrass)	Dec 06, 2021	41	3
Huangaaru (Hautotara)	Feb 13, 2022	212	2
Hutt River (Birchville)	Jun 12, 2022	855	3
Hutt River (Kaitoke)	Jun 12, 2022	481	67
Hutt River (Taita Gorge)	Jun 12, 2022	927	2
Kōpuaranga River (Palmer's Bridge)	Feb 13, 2022	64	2
Mangaone Stream (Ratanui)	May 14, 2022	9	<2
Mangaroa River (Te Mārua)	Jun 12, 2022	126	<2
Mangatarere River (Gorge)	Feb 12, 2022	76	2
Pāuatahanui Stream (Gorge)	Jun 09, 2022	55	5
Pahaoa River (Hinakura)	Feb 13, 2022	413	<2
Pakuratahi River (Truss Bridge)	Feb 13, 2022	83	<2
Porirua Stream (Town Centre)	Jul 17, 2021	73	40
Ruamāhanga River (Gladstone Bridge)	Feb 13, 2022	1079	5
Ruamāhanga River (Mt Bruce)	Jun 11, 2022	235	<2
Ruamāhanga River (Waihenga)	Feb 13, 2022	1567	7
Ruamāhanga River (Wardells)	Feb 12, 2022	636	6
Taueru River (Te Weraiti)	Feb 13, 2022	208	2
Tauherenikau River (Gorge)	Jun 12, 2022	373	4
Waikanae River (Water Treatment Plant)	Jun 12, 2022	253	9
Waingawa River (Kaituna)	Jul 17, 2021	219	<2
Wainuiomata River (Leonard Wood Park)	Feb 13, 2022	61	<2
Wainuiomata River (Manuka Track)	Jul 17, 2021	27	<2
Waiohine River (Gorge)	Sep 13, 2021	496	<2
Waipoua River (Mikimiki Bridge)	Jul 17, 2021	133	<2
Waiwhetū Stream (Whites Line East)	Feb 13, 2022	15	3
Whakatikei River (Dude Ranch)	Dec 06, 2021	126	6

## Low flow periods

Table 7: Minimum recorded river flows (m<sup>3</sup>/s averaged over 7- and 28-day periods). Significant flow events (5-year return period or greater) are shaded **blue**. Note that for all frequency analysis results (high or low flows and rainfall) a return period expressed as 100 years can be assigned a probability of occurring being 1/100, or 1% in any one year. Similarly, a 5-year return period event equates to 1/5 or a 20% chance of occurring in any one year.

Site	7-day duration			28-day duration		
	Lowest mean flow	Start date	Return period	Lowest mean flow	Start date	Return period
Akatarawa River (Cemetery)	0.91	Apr 26, 2022	<2	1.14	Apr 11, 2022	<2
Horokiri Stream (Snodgrass)	0.12	Apr 15, 2022	<2	0.13	Apr 11, 2022	<2
Hutt River (Birchville)	3.47	May 02, 2022	<2	4.48	Jan 08, 2022	<2
Hutt River (Kaitoke)	1.21	Jan 29, 2022	<2	1.61	Jan 08, 2022	<2
Hutt River (Taita Gorge)	2.56	Jan 29, 2022	<2	3.41	Jan 08, 2022	<2
Kōpuaranga River (Palmer's Bridge)	0.29	Jan 29, 2022	<2	0.34	Jan 08, 2022	<2
Mangaone Stream (Ratanui)	0.17	Mar 30, 2022	<2	0.17	Mar 09, 2022	<2
Mangaroa River (Te Mārua)	0.35	May 02, 2022	<2	0.57	Apr 16, 2022	<2
Mangatarere River (Gorge)	0.14	Jan 29, 2022	<2	0.22	Jan 08, 2022	<2
Ōtaki River (Pukehinau)	3.81	Mar 29, 2022	<2	5.50	Mar 08, 2022	<2
Pahaoa River (Hinakura)	0.10	Jan 29, 2022	<2	0.19	Jan 08, 2022	<2
Pakuratahi River (Truss Bridge)	0.17	Jan 29, 2022	<2	0.29	Jan 08, 2022	<2
Porirua Stream (Town Centre)	0.21	Jan 28, 2022	<2	0.28	Jan 07, 2022	<2
Ruamāhanga River (Mt Bruce)	1.31	Jan 29, 2022	<2	1.82	Jan 08, 2022	<2
Ruamāhanga River (Waihenga)	8.16	Jan 29, 2022	<2	11.98	Jan 08, 2022	<2
Ruamāhanga River (Wardells)	2.69	Jan 29, 2022	<2	3.54	Jan 08, 2022	<2
Tauherenikau River (Gorge)	1.15	Jan 29, 2022	<2	1.49	Jan 08, 2022	<2
Waikanae River (Water Treatment Plant)	1.20	Apr 26, 2022	<2	1.30	Apr 11, 2022	<2
Waingawa River (Kaituna)	1.21	Jan 29, 2022	<2	1.96	Jan 08, 2022	<2

Site	7-day duration			28-day duration		
	Lowest mean flow	Start date	Return period	Lowest mean flow	Start date	Return period
Wainuiomata River (Manuka Track)	0.18	Jan 29, 2022	<2	0.23	Jan 08, 2022	<2
Waiohine River (Gorge)	2.90	Jan 29, 2022	<2	4.63	Jan 08, 2022	<2
Waipoua River (Mikimiki Bridge)	1.33	Jul 08, 2021	<2	3.40	Jul 03, 2021	<2
Whakatikei River (Dude Ranch)	0.36	Apr 29, 2022	<2	0.36	Apr 29, 2022	<2

## Low flow exceedances

Table 8: GW has defined low flow thresholds on several rivers and streams across the Region to signify when restrictions on abstractions should begin (restriction thresholds) and when all abstractions shall stop (minimum flows). These are defined in the [GW Freshwater Plan](#)). This table summarises the number of instances that the first restriction threshold was reached for rivers and streams as specified in the Regional Freshwater Plan. Values for the current year are in **bold** and results from the previous three years are included for comparison.

Site	First restriction threshold (m <sup>3</sup> /s)	Number of days below threshold			
		2018/19	2019/20	2020/21	2021/22
Hutt River (Birchville)	1.45	0	0	0	<b>0</b>
Kōpuaranga River (Palmer's Bridge)	0.27	0	65	27	<b>0</b>
Mangaone Stream (Ratanui)	0.05	0	0	0	<b>0</b>
Mangatarere River (Gorge)	0.33	81	119	106	<b>42</b>
Ōtaki River (Pukehinau)	4.38	4	0	3	<b>21</b>
Orongorongo River (Truss Bridge)	0.10	3	0	0	<b>0</b>
Ruamāhanga River (Waihenga)	9.80	16	53	33	<b>9</b>
Ruamāhanga River (Wardells)	2.70	14	51	35	<b>4</b>
Tauherenikau River (Gorge)	1.35	13	49	28	<b>14</b>
Waikanae River (Water Treatment Plant)	0.90	2	0	0	<b>0</b>
Waingawa River (Kaituna)	1.90	61	86	65	<b>48</b>
Wainuiomata River (Leonard Wood Park)	0.36	30	13	0	<b>28</b>
Waiohine River (Gorge)	3.04	4	16	8	<b>6</b>
Waipoua River (Mikimiki Bridge)	0.30	41	63	37	<b>0</b>
Waitohu Stream (Water Supply Intake)	0.18	19	54	0	<b>0</b>

## High river level alarms

As part of its flood warning and response service, GW sets high river level alarms on many of its monitoring sites to provide early warning of rising river levels and possible flooding.

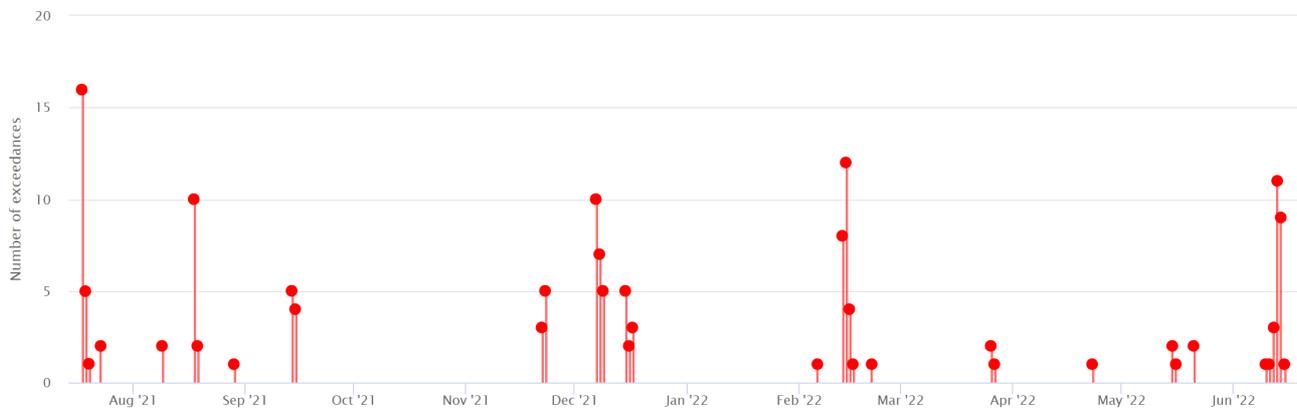


Figure 20: Number of flood warning alarms triggered by date.

Table 9: River levels that triggered alarms at each site with thresholds included.

Site	Event date	River level (m)	Threshold (m)
Akatarawa River (Cemetery)	Jul 18, 2021	1.61	1.30
Akatarawa River (Cemetery)	Aug 18, 2021	1.83	1.80
Akatarawa River (Cemetery)	Dec 07, 2021	1.48	1.30
Akatarawa River (Cemetery)	Jun 13, 2022	1.67	1.30
Horokiri Stream (Snodgrass)	Dec 09, 2021	3.67	3.20
Horokiri Stream (Snodgrass)	Dec 15, 2021	3.43	3.20
Horokiri Stream (Snodgrass)	Dec 17, 2021	3.57	3.35
Horokiri Stream (Snodgrass)	Feb 14, 2022	1.81	1.30
Hutt River (Birchville)	Jun 14, 2022	2.73	2.50
Hutt River (Kaitoke)	Jul 23, 2021	1.00	0.90
Hutt River (Kaitoke)	May 21, 2022	3.48	3.35
Mangatarere River (Gorge)	Feb 13, 2022	1.79	1.30
Ōtaki River (Pukehinau)	Nov 22, 2021	2.77	2.50
Ōtaki River (Pukehinau)	Nov 23, 2021	2.77	2.50
Ōtaki River (Pukehinau)	Dec 08, 2021	2.19	2.15
Porirua Stream (Town Centre)	Jul 19, 2021	2.13	1.90
Porirua Stream (Town Centre)	Aug 09, 2021	1.34	1.30
Porirua Stream (Town Centre)	Aug 29, 2021	0.93	0.90
Porirua Stream (Town Centre)	Feb 06, 2022	1.20	0.90
Porirua Stream (Town Centre)	Feb 21, 2022	0.92	0.90
Porirua Stream (Town Centre)	Apr 23, 2022	1.18	0.90
Ruamāhanga River (Gladstone Bridge)	Aug 19, 2021	4.68	3.35
Ruamāhanga River (Gladstone Bridge)	Sep 14, 2021	2.87	2.50
Ruamāhanga River (Gladstone Bridge)	Sep 15, 2021	2.61	2.50
Ruamāhanga River (Gladstone Bridge)	Dec 16, 2021	3.92	3.35
Ruamāhanga River (Gladstone Bridge)	Feb 15, 2022	9.84	9.00
Ruamāhanga River (Gladstone Bridge)	Mar 26, 2022	3.46	3.35

<b>Site</b>	<b>Event date</b>	<b>River level (m)</b>	<b>Threshold (m)</b>
Ruamāhanga River (Gladstone Bridge)	Jun 12, 2022	3.62	3.00
Ruamāhanga River (Waihenga)	Jul 20, 2021	4.61	3.35
Ruamāhanga River (Waihenga)	Feb 16, 2022	3.72	3.35
Ruamāhanga River (Waihenga)	Mar 27, 2022	3.44	3.35
Ruamāhanga River (Waihenga)	Jun 15, 2022	3.94	3.35
Waikanae River (Water Treatment Plant)	May 15, 2022	2.21	2.15
Waikanae River (Water Treatment Plant)	May 16, 2022	3.42	3.20
Waikanae River (Water Treatment Plant)	Jun 11, 2022	3.29	3.20
Waiwhetū Stream (Whites Line East)	Jun 10, 2022	1.52	1.30

# Groundwater level results

The figures below show mean daily groundwater levels for this and last year compared to historical mean daily levels. All units are metres above average sea level.

## Rumahāhanga



Figure 21: Daily groundwater levels in the Rumahāhanga whaitua.

# Te Whanganui-a-Tara

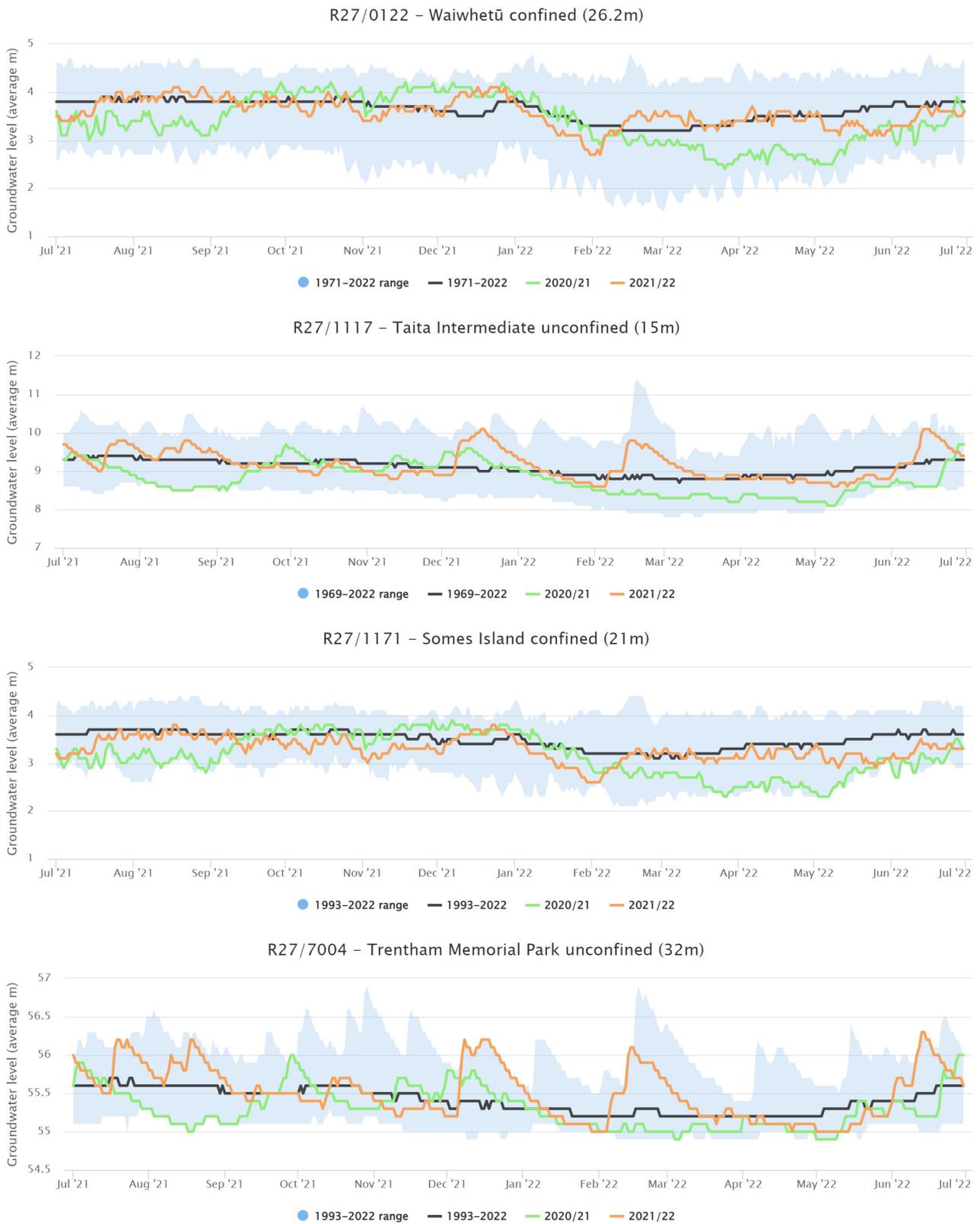


Figure 22: Daily groundwater levels in the Te Whanganui-a-Tara whitua.

# Kāpiti Coast

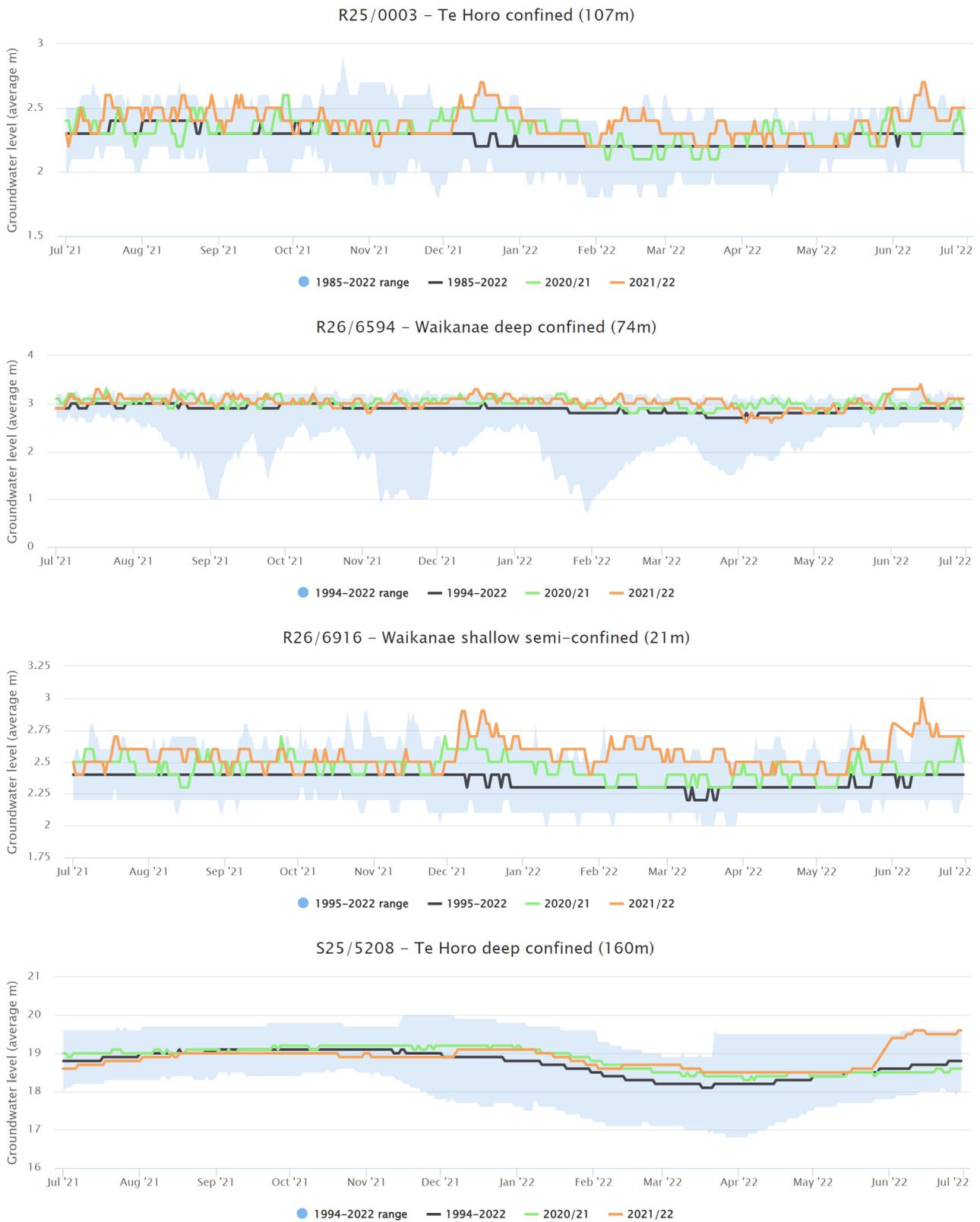


Figure 23: Daily groundwater levels in the Kāpiti Coast whaitua.

# Lake & wetland level results

## Lakes

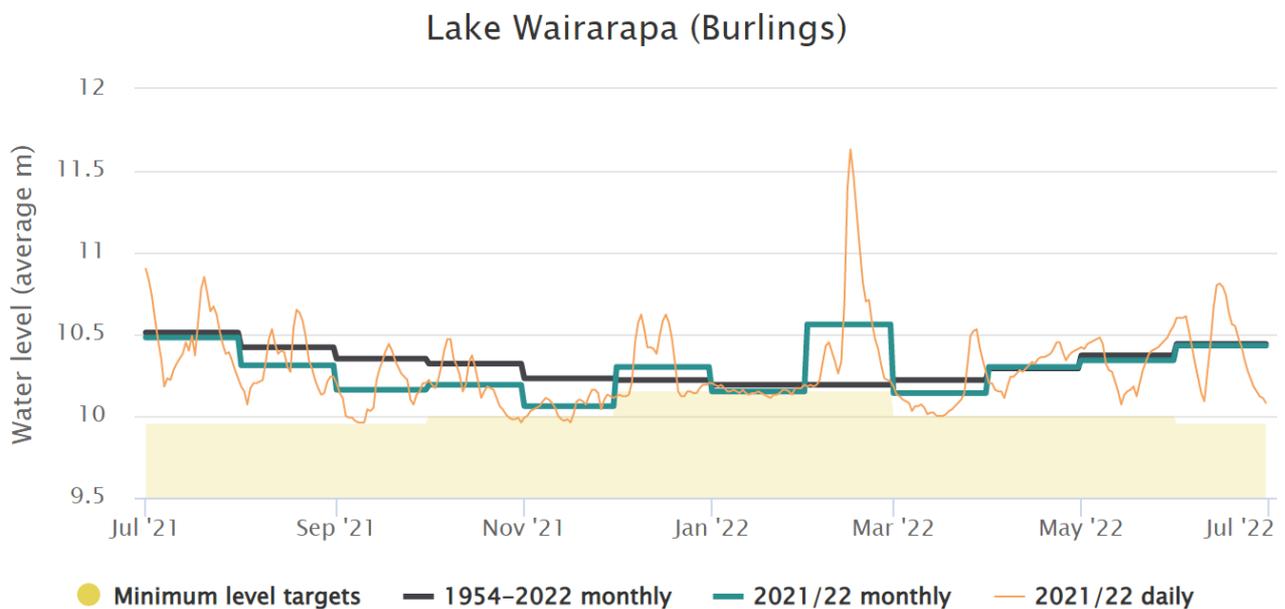
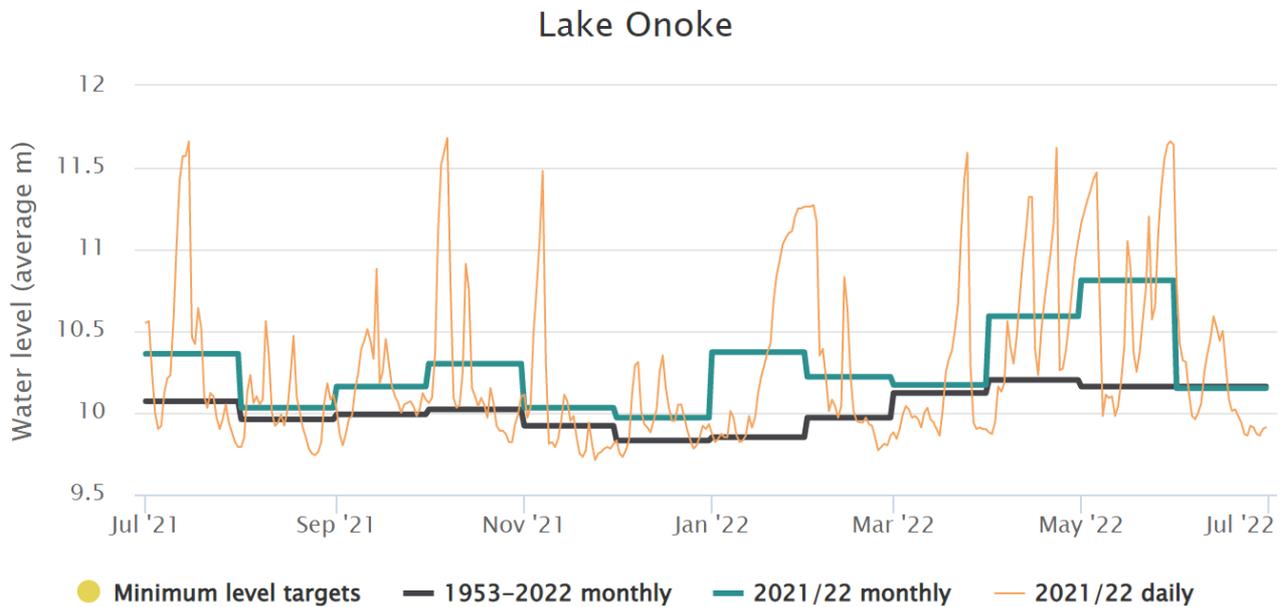


Figure 24: Recorded lake levels (metres above average sea level) at Lake Wairarapa and Lake Onoke. This year’s data are presented as a daily mean level and a monthly mean level with the long-term monthly mean for comparison. The minimum lake water level for Lake Wairarapa (as specified in the [GW Regional Freshwater Plan](#)) is shown by the shaded yellow area. There is no minimum level set for Lake Onoke.

# Wetlands

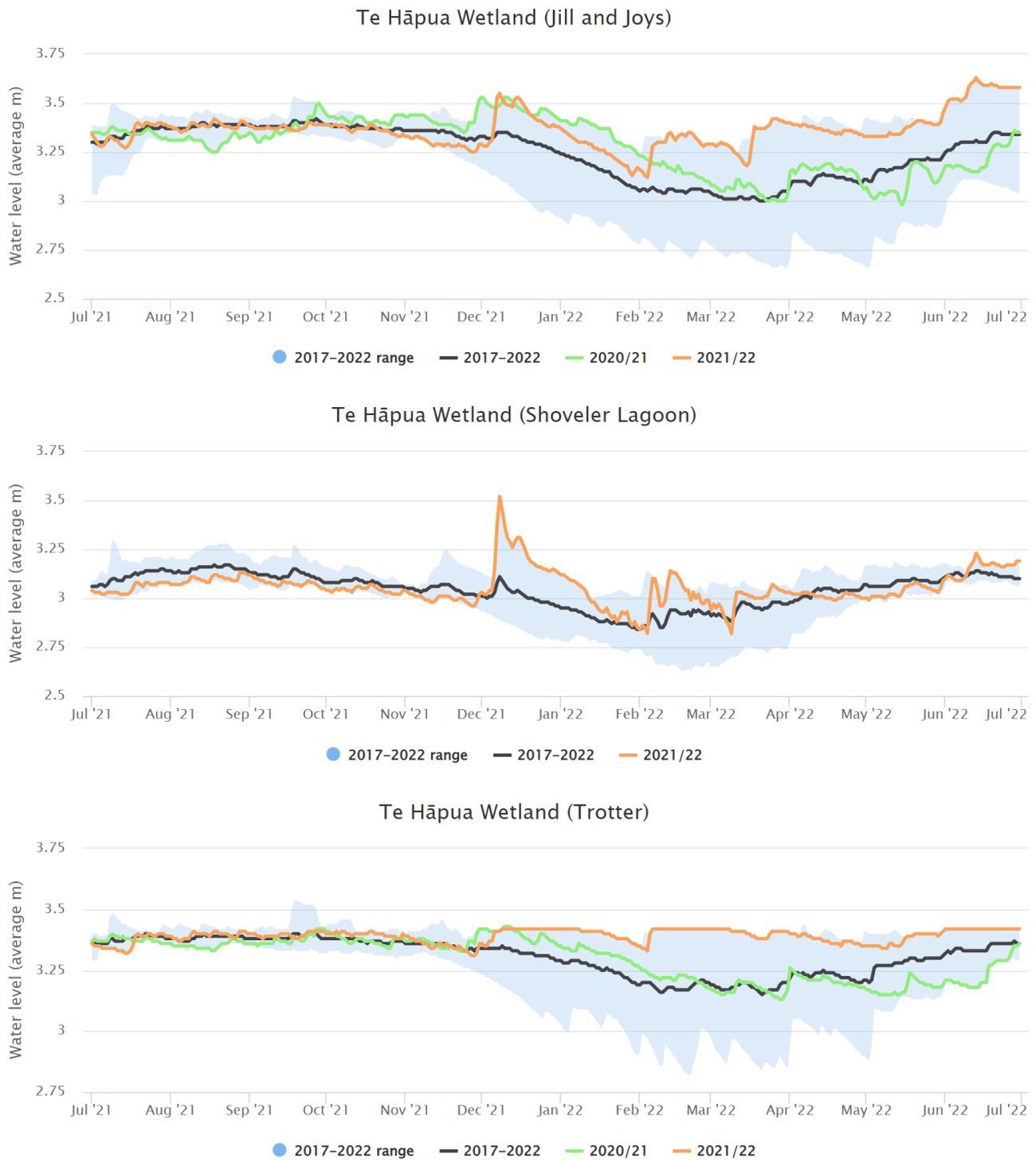


Figure 25: Water levels have been recorded at three monitoring sites within the Te Hāpua wetland complex on the Kāpiti Coast since 2008. Below shows this years recorded daily mean water levels (metres above average sea level) at each site in comparison to last year and historical averages/ranges.

# Soil moisture results

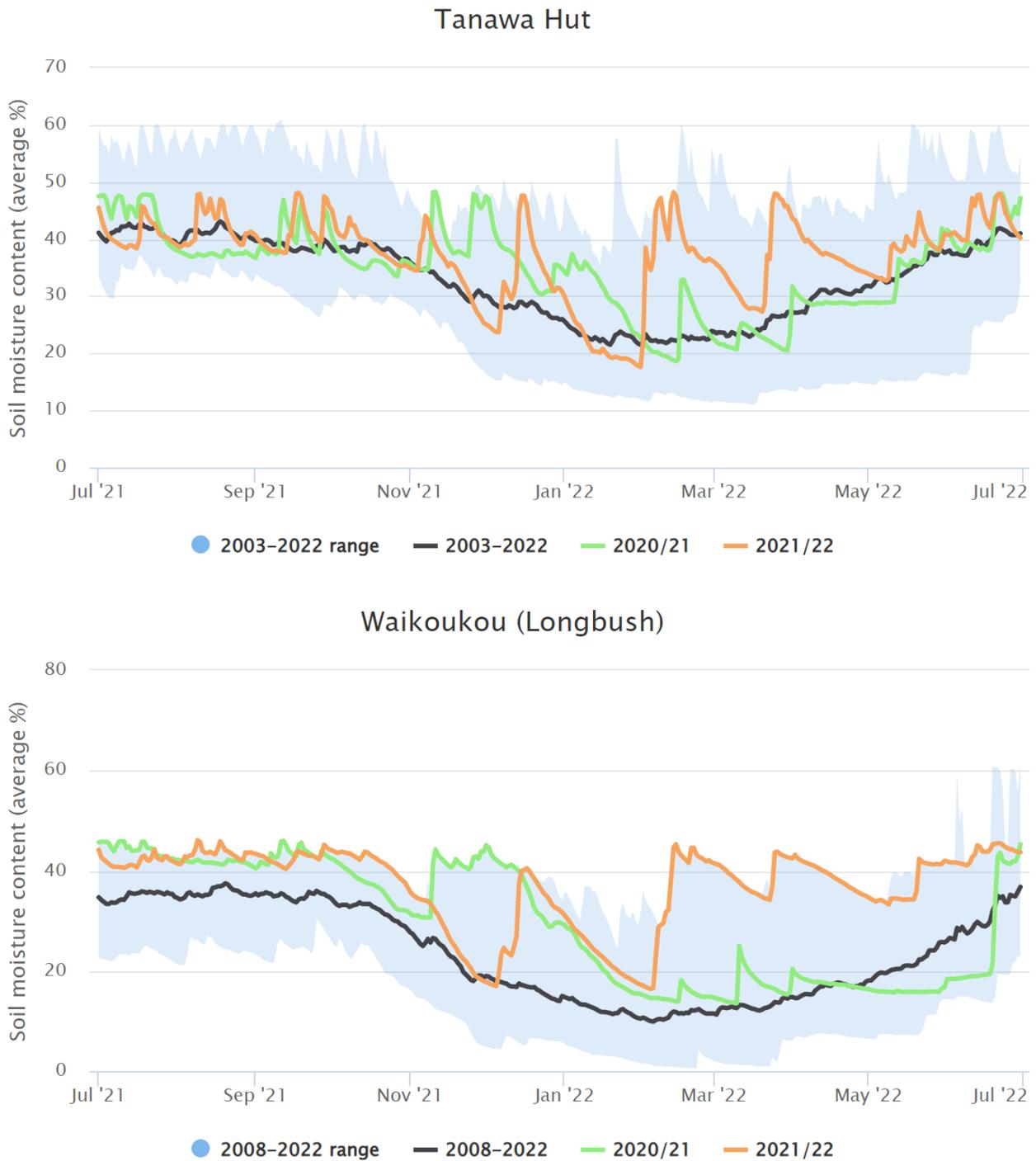


Figure 26: Daily average soil moisture content (%) is shown below for the Tanawa Hut (near Tinui) and Waikoukou (Longbush) monitoring sites. The previous year and long-term average/range are also shown for comparison.