

Dry weather water management SITUATION REPORT



SitRep number: WSAE21-22:02 **SitRep effective as at:** 10 December 2021

Key points



- This is the second SitRep leading into the summer of 2021/2022.
- La Niña conditions are expected to be a key climate driver for Aotearoa New Zealand this summer.
- Higher than normal air and marine water temperatures are expected.
- Although overall rainfall for the next 3 months is forecasted to be near average there may be dry periods combined with occasional sub-tropical low-pressure systems which can bring heavy rainfall and possible flooding to NZ, particularly in the northern and eastern parts of the North Island.
- Generally, rivers flows are in a healthy state as we enter the warmer period, but a careful watch is being taken on those rivers that formed part of the Rotorua Focus Zone last summer and have their headwaters in the Mamaku area behind Rotorua. These rivers are still low, and it may take some time for the impacts of the recent rainfall to impact base flows.
- There has been a lack of groundwater recharge over the last three years, however recharge levels this year are generally equal to or higher than last year. Recharge is still low in the Rotorua Focus Zone.
- Groundwater levels are generally stable when compared to last year. Shallow well systems may be unreliable through summer as shallow water table levels lower.
- Monitoring for saline intrusion in high demand areas will be enhanced this summer following localised area of concern raised by users.

Weather forecast



NIWA forecasts December 2021 – February 2022 suggests:

- La Niña conditions developed in the equatorial Pacific during November. Although this La Niña is unlikely to be strong, it is expected to be a key climate driver for Aotearoa New Zealand this summer.
- Marine heatwave conditions were observed in New Zealand's coastal waters during November. Unusually warm seas are expected to continue through summer, similar to 2017-18.
- Summer temperatures are very likely to be above average across the country. Warm overnight temperatures and extended periods of high humidity are likely.
- Rainfall is most likely to be near normal in the north and east of the North Island. Occasional sub-tropical low-pressure systems could bring heavy rainfall and possible flooding to New Zealand, particularly in the northern and eastern North Island.
- On average, one tropical cyclone passes near the country each year, bringing heavy rain, strong winds, and rough seas. For the tropical cyclone season (November 2021-April 2022), NIWA's SW Pacific Tropical Cyclone Outlook indicates the risk for New Zealand is elevated.
- Soil moisture and river flows levels are most likely to be near normal for the Bay of Plenty.

Forecast information from local and global guidance models is used to indicate the deviation from equal chance expected for the coming three-month period, with the following outcomes the most likely (but not certain) for this region:

- Temperatures are very likely to be above average (70% chance). Due to warmer than average coastal sea temperatures, higher humidity, and elevated overnight temperatures are likely.
- Rainfall totals are most likely to be near normal (45% chance) overall, but there may be substantial variability across the region.
- The potential for sub-tropical low-pressure systems is elevated, particularly in the northern part of the region such as Northland. These systems can bring heavy rainfall and cause flooding. The risk is lower for southern and western parts of the region, like Waikato.
- Soil moisture levels and river flows are most likely to be near normal (45% chance).

Rainfall



October brought rainfall totals 1.5-2 times of normal, and this was followed by November rainfalls that were generally below monthly normal across the majority of the region.

Calendar year-to-date rainfall totals are now near normal which is a pleasing sign as we enter the warmer months, however there may be parts of the region still showing impacts for the previous couple of years of rainfall deficits.



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Rainfall Summary

Rainfall Summary Report

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Period Selected: 2021-11-30 00:00 to End of Record

Location Name	Most Recent Sample	Intensity (mm/hr)	Today (mm)	Yesterday (mm)	Last 5 days (mm)	This Month (mm)	Last Month (mm)	Last Month % of Normal	Year To Date - Complete Months (mm)	Year To Date % of Normal
Tuapiro at Farm Bridge	02/12/2021 10:00:00	0.0	0.5	0.5	9.0	1.0	102.0	94%		91%
Te Puna at Odey Rd	02/12/2021 10:00:00	0.0	0.0	5.5	10.0	5.5	86.0		1667.2	
Wairoa at Lower Kaimai	02/12/2021 10:00:00	0.0	0.0	15.0	19.0	15.0				
Ngongotaha at Relph Rd	02/12/2021 10:00:00	0.0	0.0	9.0	15.5	9.0	70.0	80%	1479.2	88%
Rotorua at Upper Oturoa Rd	02/12/2021 10:00:00	0.0	0.0	7.5	17.5	7.5	124.5	100%	1626.3	79%
Waimapu at Glue Pot Rd	02/12/2021 10:00:00	0.0	0.0	7.5	11.5	7.5	74.0	77%	1637.8	93%
Waimapu at McCarrolls	02/12/2021 10:00:00	0.0	0.0	9.0	12.5	9.0	45.5	67%	1155.5	78%
Rotorua at Whakarewarewa	02/12/2021 10:00:00	0.0	0.0	2.5	8.0	2.5	57.0	58%	1173.6	93%
Paraiti (Mangorewa) at Kaharo	02/12/2021 10:00:00	0.0	0.0	8.0	16.5	8.0	62.7	56%	1597.7	93%
Okaro at Okaro Rd	02/12/2021 10:00:00	0.0	0.5	2.5	8.0	3.0	36.0	54%	1108.9	94%
Lake Rototiti at Okawa Bay	02/12/2021 10:00:00	0.0	0.0	4.5	11.5	4.5	37.5	58%	1239.1	88%
Tikitere at SH30	20/09/2021 12:00:00		0.0	0.0	0.0	0.0	0.0		1236.5	
Paraiti (Mangorewa) at Upper	02/12/2021 10:00:00	0.0	0.0	15.0	19.0	15.0	60.2	44%	1863.4	98%
Paraiti (Mangorewa) at Link	02/12/2021 10:00:00	0.0	0.0	8.5	12.0	8.5	48.0	49%	1581.5	98%
Raparapahoe at Collins Lane	02/12/2021 10:00:00	0.0	0.0	0.5	5.0	0.5	29.0	31%	1138.5	74%
Kaituna at Marshalls Farm	02/12/2021 10:00:00	0.0	0.0	0.0	2.5	0.0	31.5	43%	1021.0	77%
Kaituna at Te Matai	02/12/2021 10:00:00	0.5	0.5	4.0	10.5	4.5	32.0	45%	1161.0	93%
Rangitaiki at Kokomoka (Bore 1	02/12/2021 10:10:00	0.0	0.0	0.0	7.5	0.0	49.5	50%	1338.5	96%
Pongakawa at Pongakawa Bush	02/12/2021 10:00:00	0.0	0.0	9.0	14.5	9.0	62.5	81%	1365.0	94%
Outlet at Waitangi Soda Spring	02/12/2021 10:00:00	0.0	0.0	2.5	10.0	2.5	50.5		1688.1	
Te Whaiti at Minginui	02/12/2021 10:00:00	0.0	0.0	1.5	7.5	1.5	43.2		1072.2	
Kawerau at Plunket St	02/12/2021 10:00:00	0.0	0.0	0.5	5.5	0.5	33.5		1460.3	
Tarawera at Hogg Rd	02/12/2021 10:00:00	0.0	0.0	2.5	7.0	2.5	26.0		1552.1	
Ohinekoao at Harris Saddle	02/12/2021 10:00:00	0.0	0.0	0.0	2.5	0.0	55.0	65%	1605.5	92%
Galatea Basin at Horomanga R	02/12/2021 10:00:00	0.0	0.0	4.5	9.5	4.5	61.5	92%	1017.4	94%
Waihua at Clearing	02/12/2021 10:00:00	0.0	0.0	3.0	8.0	3.0	58.5	70%	1477.0	94%
Rangitaiki at Te Teko	02/12/2021 10:00:00	0.0	0.0	1.0	4.5	1.0	22.5	35%	1319.0	113%
Edgecumbe at Edgecumbe	02/12/2021 10:00:00	0.0	0.0	0.0	2.5	0.0	29.5	45%	1253.5	100%
Tarawera at Awakaponga	02/12/2021 10:05:00	0.0	0.0	0.0	2.5	0.0	34.5	45%	1353.5	108%
Rangitaiki Plains at Flax Rd	01/12/2021 12:00:00		0.0	0.5	3.0	0.5	37.0	53%	1381.0	108%

Location Name	Most Recent Sample	Intensity (mm/hr)	Today (mm)	Yesterday (mm)	Last 5 days (mm)	This Month (mm)	Last Month (mm)	Last Month % of Normal	Year To Date - Complete Months (mm)	Year To Date % of Normal
Tarawera at ORC Pump Station	02/12/2021 10:00:00	0.0	0.0	0.5	3.5	0.5	28.5	57%	905.5	94%
Whakatane at Kopeopeo	02/12/2021 10:00:00	0.0	0.0	0.0	2.5	0.0	31.3	57%	1150.8	98%
Rangitaiki at Thornton	02/12/2021 10:00:00	0.0	0.0	1.5	4.0	1.5	25.0	39%	1107.5	98%
Whakatane at Huiarau Summit	02/12/2021 10:10:00	0.0	0.0	3.5	17.5	3.5	156.5	86%	2447.7	110%
Whakatane at Huitieke rain	02/12/2021 10:00:00	0.0	0.0	1.5	8.5	1.5	62.0	53%	1646.5	120%
Whakatane at Awahou Rd	02/12/2021 10:00:00	0.0	0.0	2.0	5.5	2.0	48.0		1805.2	
Wainui-te-whara at Munro's	02/12/2021 10:00:00	0.0	0.0	0.0	3.0	0.0	52.5	70%	1617.0	120%
Tauranga at Omahuru (Ogilvies	02/12/2021 10:05:00	0.0	0.0	2.0	8.5	2.0	88.5		2035.4	
Nukuhou at Nukuhou North	02/12/2021 10:00:00	0.0	0.0	1.0	4.0	1.0	45.5		1775.0	
Ohope Spit at Ohope Golf Course	02/12/2021 10:00:00	0.0	0.0	0.0	2.5	0.0	37.5		1209.9	
Waioeka at Koranga	02/12/2021 10:00:00	0.0	0.0	2.5	16.0	2.5	129.5	78%	1601.2	81%
Waioeka at Cableway	02/12/2021 10:05:00	0.0	0.0	1.0	9.0	1.0	74.5	44%	2554.4	114%
Waioeka at Mouth of Gorge	02/12/2021 10:05:00	0.0	0.0	0.0	2.5	0.0	56.0	50%	1961.1	125%
Otara at Opotiki Wharf	02/12/2021 08:00:00		0.0	0.0	2.5	0.0	38.5	61%	1307.4	112%
Otara at Tutaeotoko	02/12/2021 10:00:00	0.0	0.0	1.5	10.5	1.5	95.0	54%	2526.0	114%
Otara at Browns Bridge	02/12/2021 09:00:00	0.0	0.0	0.0	2.5	0.0	64.5	69%	1542.1	119%
Pakihī at Pakihī Station	02/12/2021 10:05:00	0.0	0.0	0.5	9.5	0.5	103.5	59%	2428.5	117%
Pakihī at Rakanui	02/12/2021 10:00:00	0.0	0.0	1.0	7.5	1.0	98.0	66%	1873.1	101%
Haparapara at Haparapara	02/12/2021 10:00:00	0.0	0.0	1.5	4.0	1.5	162.0	52%	4220.5	105%

River flows



Generally, rivers flows are in a healthy state as we enter the warmer period, but a careful watch is being taken on those rivers that formed part of the Rotorua Focus Zone (RFZ) last summer and have their headwaters in the Mamaku area behind Rotorua. These rivers are still low and it may take some time for the impacts of the recent rainfall to increase base flows.

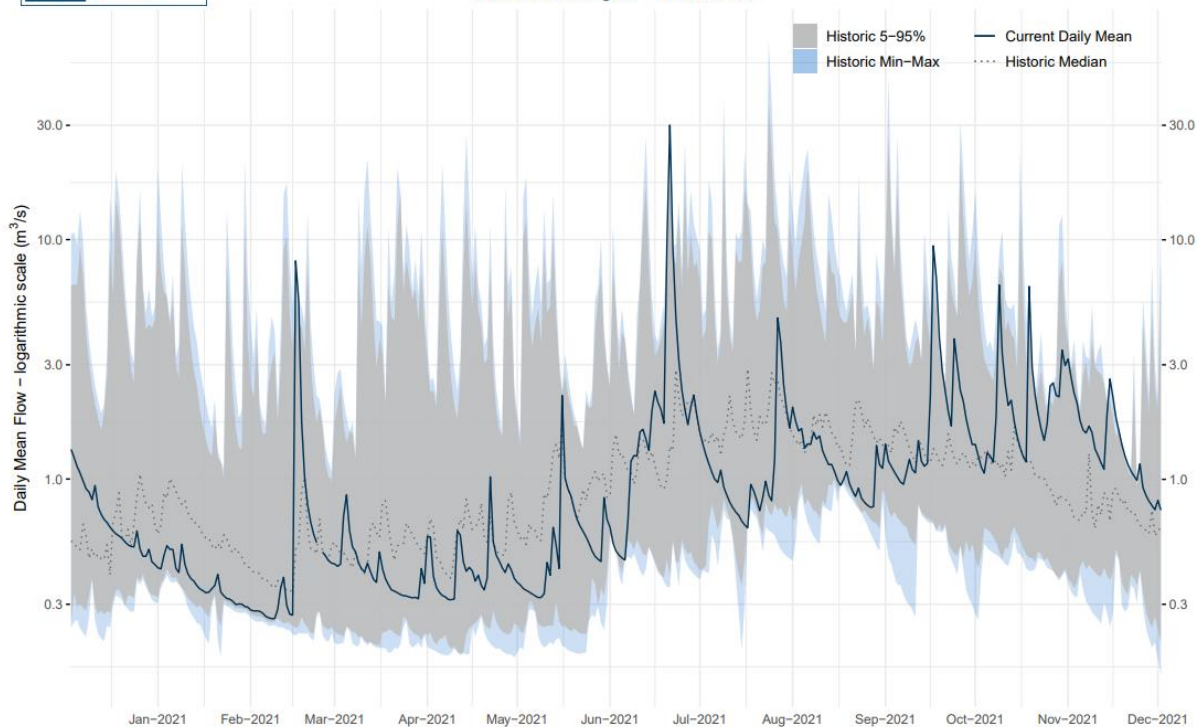
Note: The following graphs are based upon preliminary data and will undergo refinement as further information is collected.

Representative western Bay of Plenty rivers



Tuapiro at Farm Bridge – Current vs Historic Daily Mean Flow

Flow Record Begins – 02 Dec 2010

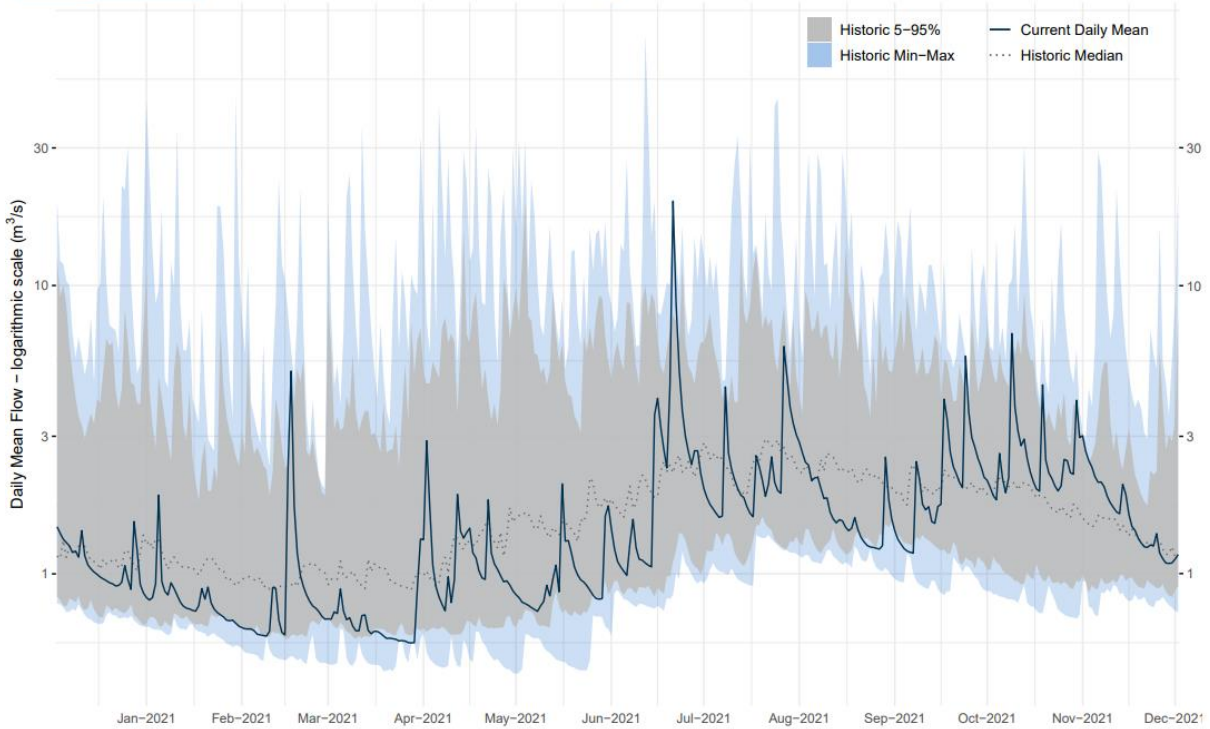


* Solid line shows the daily mean flow at this site over the last 12 months (logarithmic scale). Historic values show the range of flow for the same time period over the entire record. Users should be aware that the most recent discharge data may contain raw data directly from the Councils telemetry system which has yet to go through quality assurance processes.



Waimapu at McCarrolls – Current vs Historic Daily Mean Flow

Flow Record Begins – 12 Mar 1991

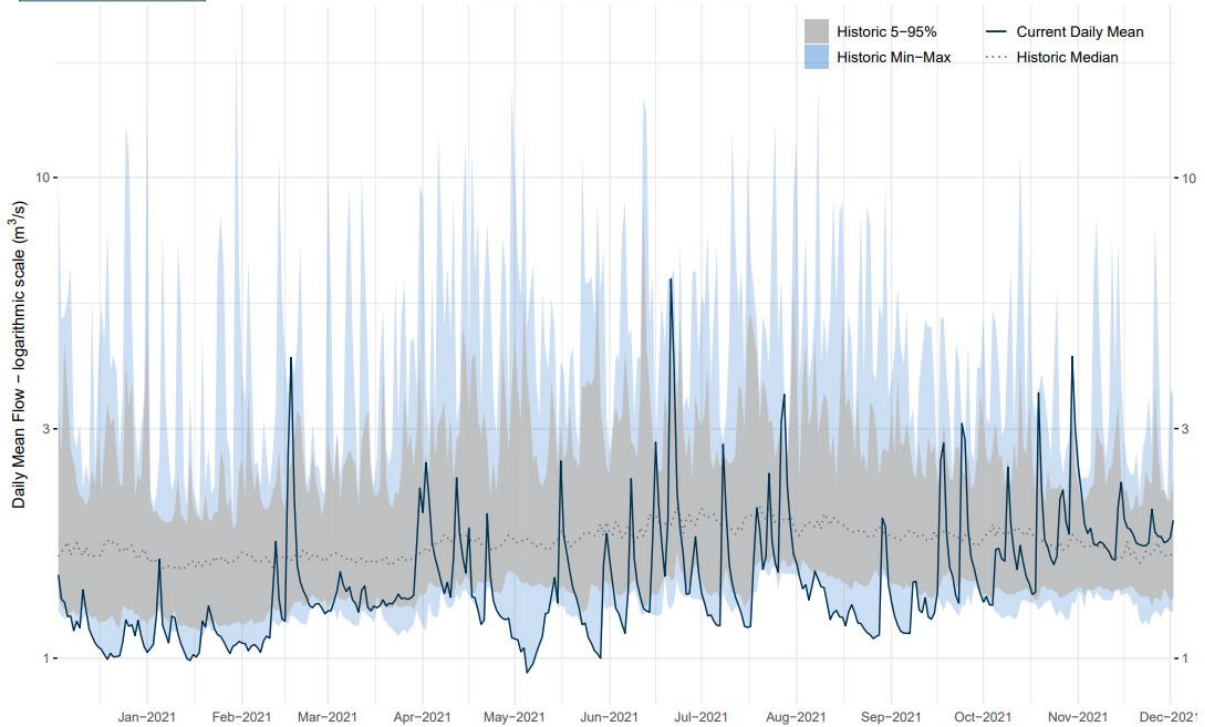


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Kopurererua at SH29 – Current vs Historic Daily Mean Flow

Flow Record Begins – 29 Jun 1990



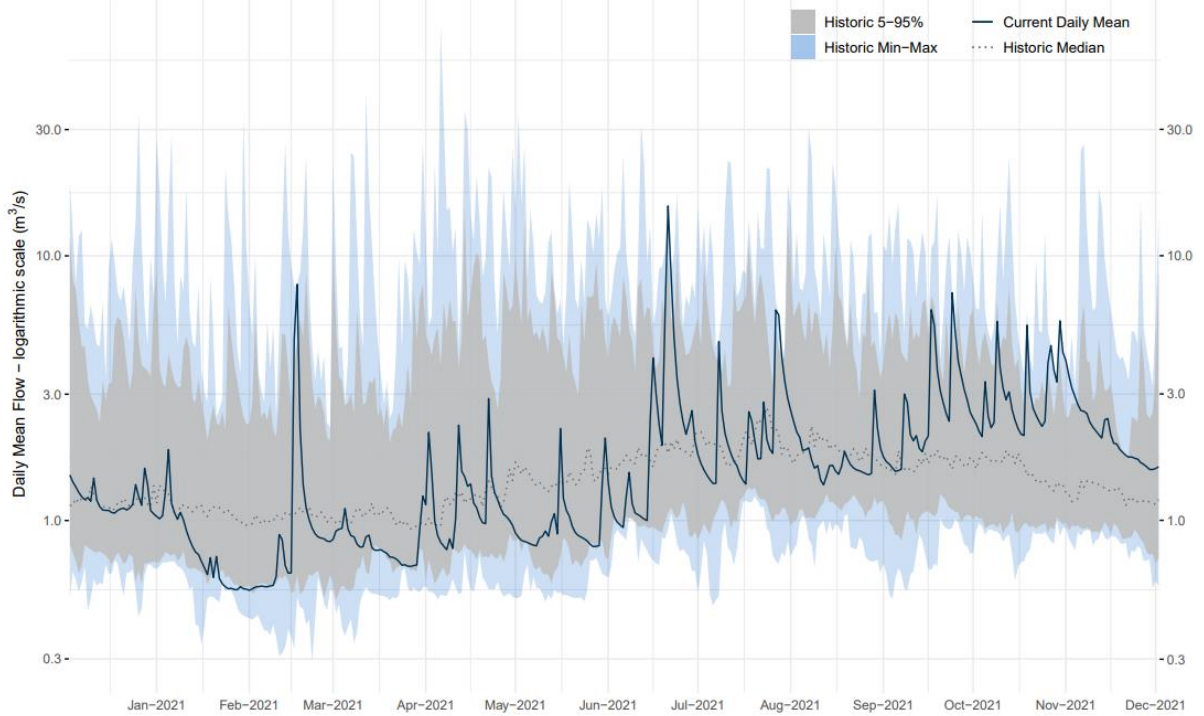
* Solid line shows the daily mean flow at this site over the last 12 months (logarithmic scale). Historic values show the range of flow for the same time period over the entire record. Users should be aware that the most recent discharge data may contain raw data directly from the Councils telemetry system which has yet to go through quality assurance processes.

Representative central Bay of Plenty rivers



Raparapahoe at Above Drop Structure – Current vs Historic Daily Mean Flow

Flow Record Begins – 14 Oct 1991

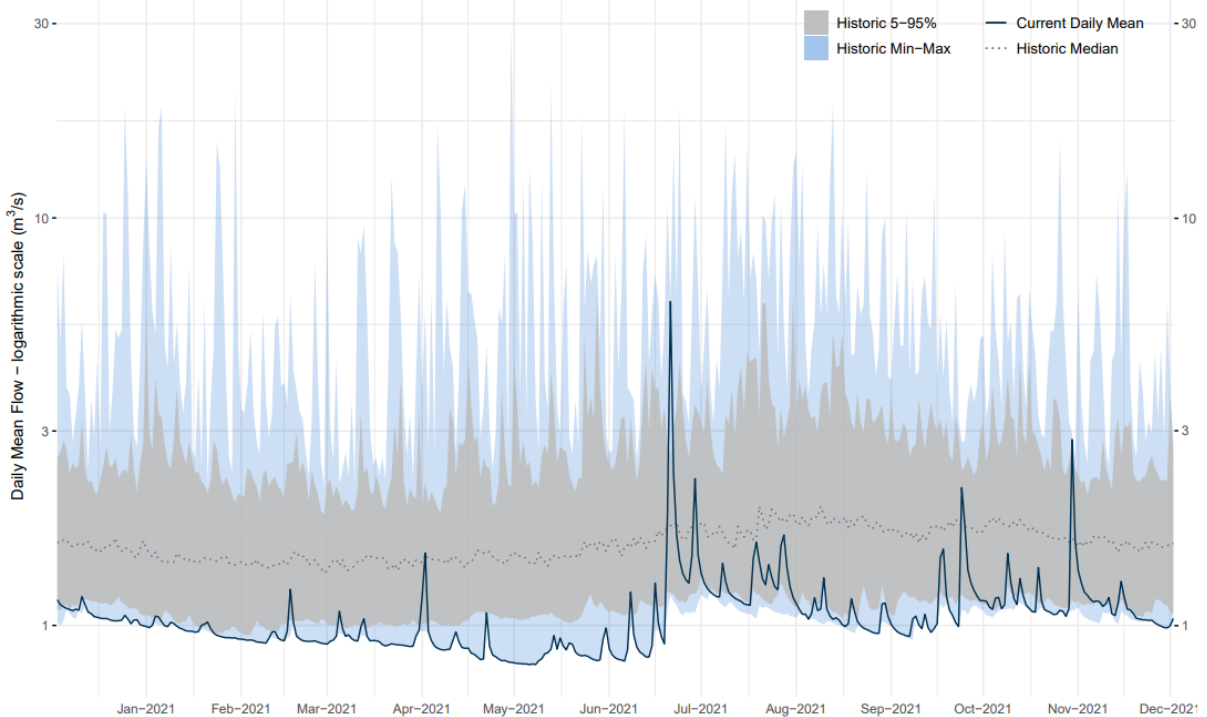


* Solid line shows the daily mean flow at this site over the last 12 months (logarithmic scale). Historic values show the range of flow for the same time period over the entire record. Users should be aware that the most recent discharge data may contain raw data directly from the Councils telemetry system which has yet to go through quality assurance processes.



Ngongotaha at SH5 – Current vs Historic Daily Mean Flow

Flow Record Begins – 03 Jun 1975

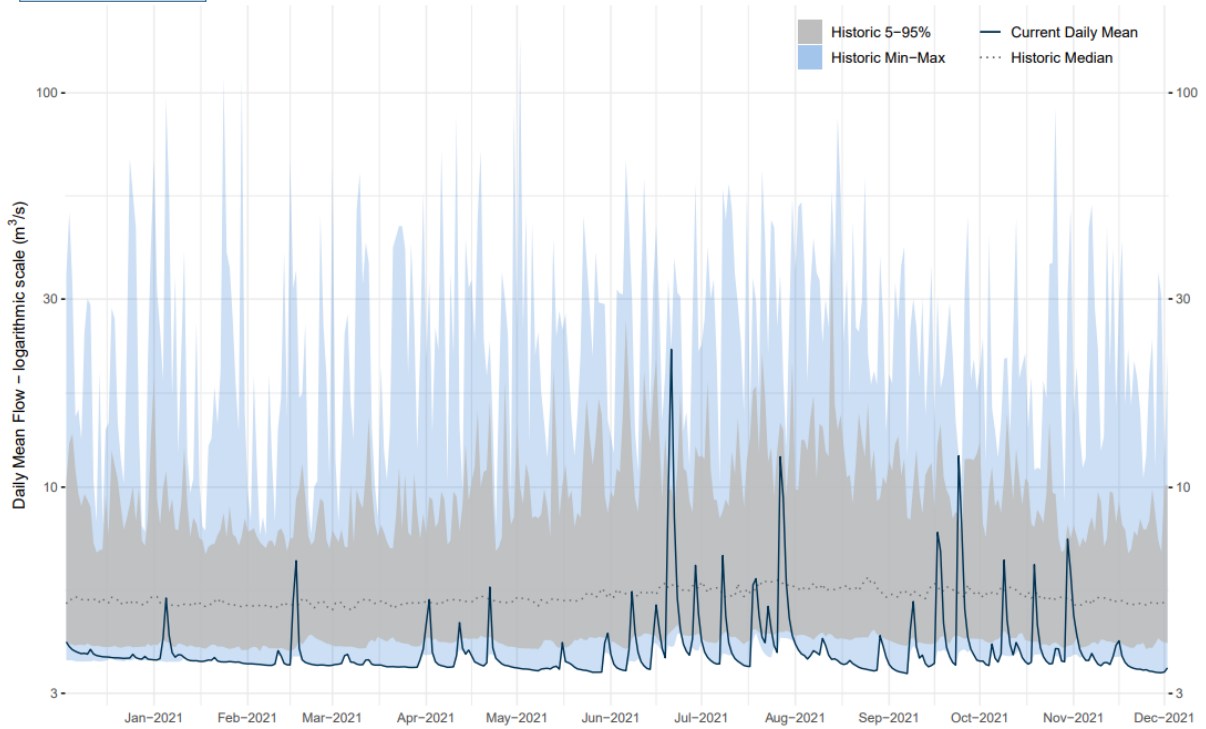


* Solid line shows the daily mean flow at this site over the last 12 months (logarithmic scale). Historic values show the range of flow for the same time period over the entire record. Users should be aware that the most recent discharge data may contain raw data directly from the Councils telemetry system which has yet to go through quality assurance processes.



Paraiti (Mangorewa) at Saunders – Current vs Historic Daily Mean Flow

Flow Record Begins – 05 Aug 1967

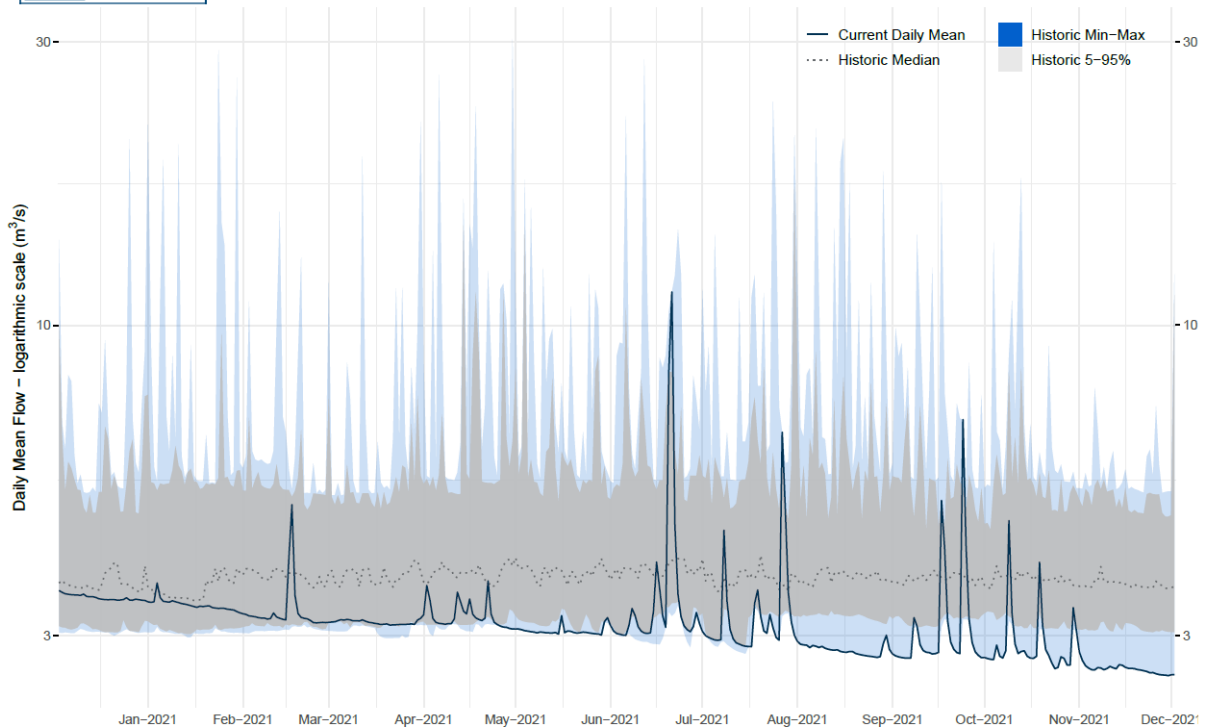


* Solid line shows the daily mean flow at this site over the last 12 months (logarithmic scale). Historic values show the range of flow for the same time period over the entire record. Users should be aware that the most recent discharge data may contain raw data directly from the Council's telemetry system which has yet to go through quality assurance processes.



Waiari at TCC Intake (NIWA) – Current vs Historic Daily Mean Flow

Flow Record Begins – 15 Nov 2000



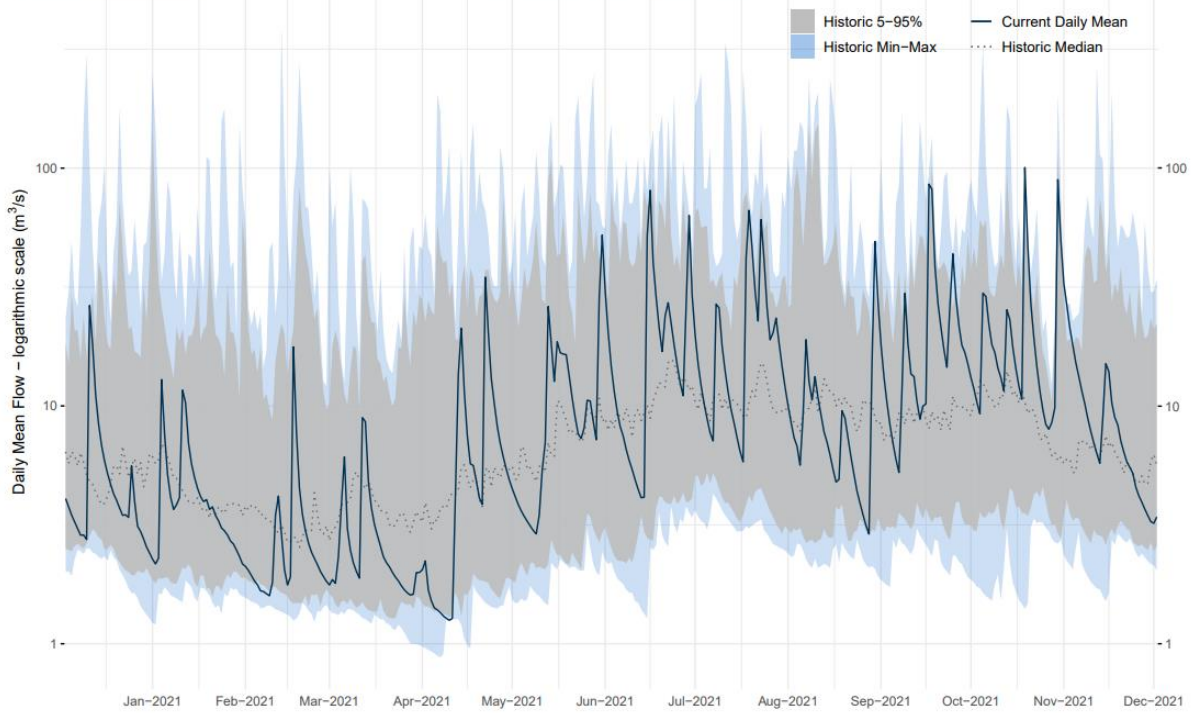
* Solid line shows the daily mean flow at this site over the last 12 months (logarithmic scale). Historic values show the range of flow for the same time period over the entire record. Users should be aware that the most recent discharge data may contain raw data directly from the Council's telemetry system which has yet to go through quality assurance processes.

Representative eastern Bay of Plenty rivers



Otara at Browns Bridge – Current vs Historic Daily Mean Flow

Flow Record Begins – 08 Jan 1990

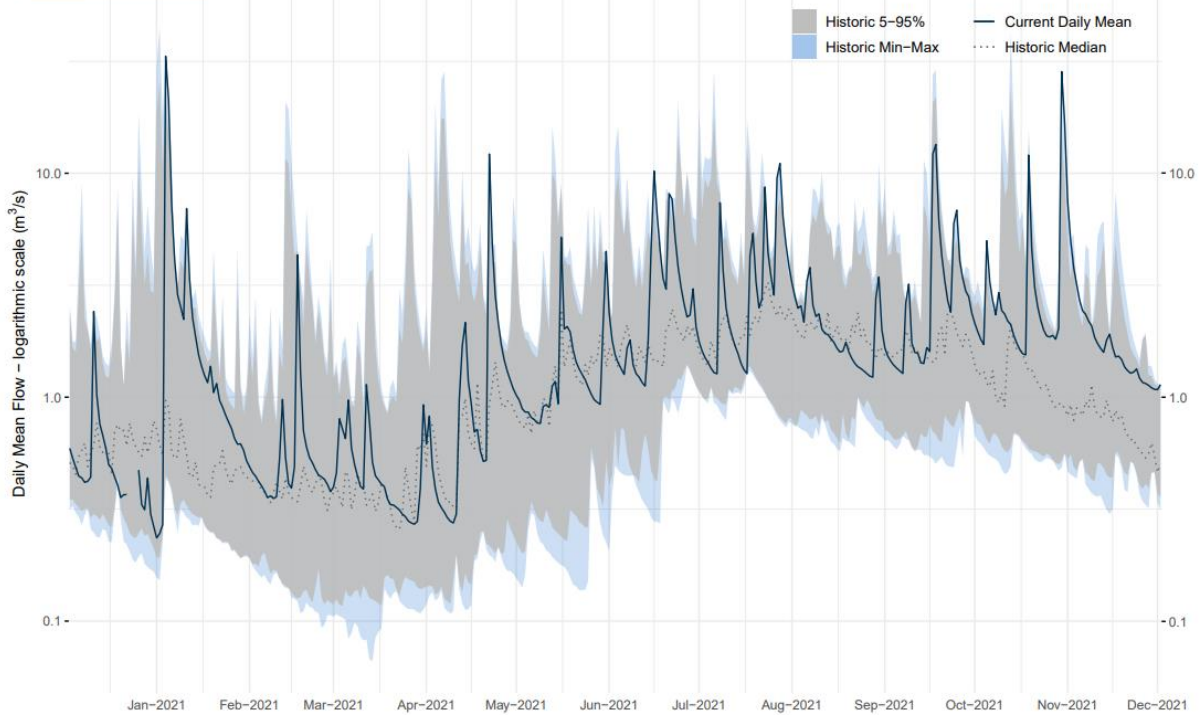


* Solid line shows the daily mean flow at this site over the last 12 months (logarithmic scale). Historic values show the range of flow for the same time period over the entire record. Users should be aware that the most recent discharge data may contain raw data directly from the Council's telemetry system which has yet to go through quality assurance processes.



Nukuhou at Glenholme Rd – Current vs Historic Daily Mean Flow

Flow Record Begins – 07 Oct 2011



* Solid line shows the daily mean flow at this site over the last 12 months (logarithmic scale). Historic values show the range of flow for the same time period over the entire record. Users should be aware that the most recent discharge data may contain raw data directly from the Council's telemetry system which has yet to go through quality assurance processes.

Groundwater



In general, groundwater levels across the Bay of Plenty are stable when compared to last year, with demand increasing as we enter the summer months.

In some very shallow well systems, there is still a risk that access to water may become unreliable during the coming dry months as shallow water table levels lower. These shallow systems are typically used for stock water and/or rural domestic use, rather than large volume irrigation, commercial or municipal use.

Recharge (the rainwater component that enters the groundwater system) totals are generally equal to or higher than last year. However, in some areas (for example in the headwaters from the eastern end of the Kaimai-Mamaku range) recharge is still low compared with the levels seen prior to 2019. This is being seen in lower base flows entering some of the rivers and streams in the area e.g. Paraiti, Kopurererua, Waiari, etc.

The programme of monitoring for saline intrusion into the groundwater systems along the Bay of Plenty coast will be enhanced this summer, with selected existing private wells being monitored for conductivity. Monitoring conductivity is often used to help identify if abstraction pressure is allowing salt water to flow from the sea back inland. This can be caused by a combination of high cumulative abstraction along with reduced groundwater flow (which can result from dry conditions with prolonged periods of low recharge occurring).

Although there have been a couple of localised issues of concern identified by users, proactive salinity monitoring near high demand areas will help provide early alert and will allow Council to implement restrictions on water abstraction if needed.

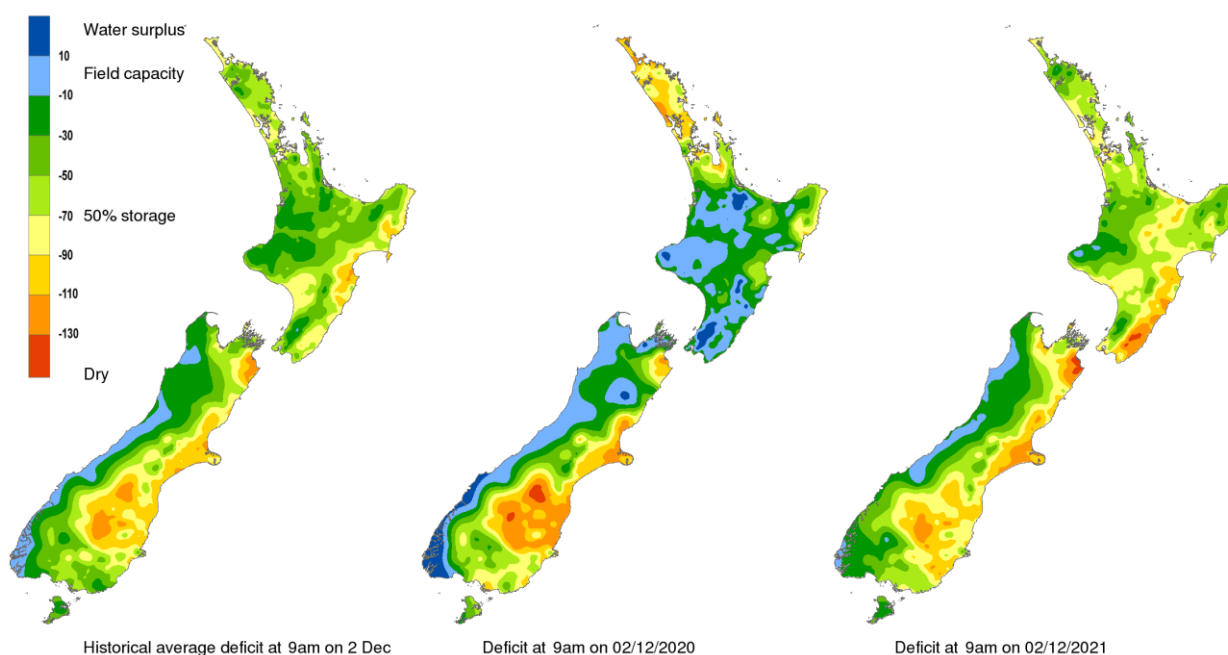
Soil moisture



Soil moisture levels have dropped considerably during November to that observed in October.

This is due to a relatively dry November where many parts of the region only received 50-70% of average monthly rainfall. In addition to the lack of rainfall, air temperatures increased which elevates evapotranspiration rates. When combined, this impacts on soil moisture levels.

Soil moisture deficit (mm) at 9am on 02/12/2021



Report prepared by:

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Raoul Fernandes, TL Science – Water Quantity

Report authorised by:

Steve Pickles, Water Shortage Event Manager

Next Situation Report will be issued:

Early February 2022 (or before if needed)

Date of approval:

10 December 2021