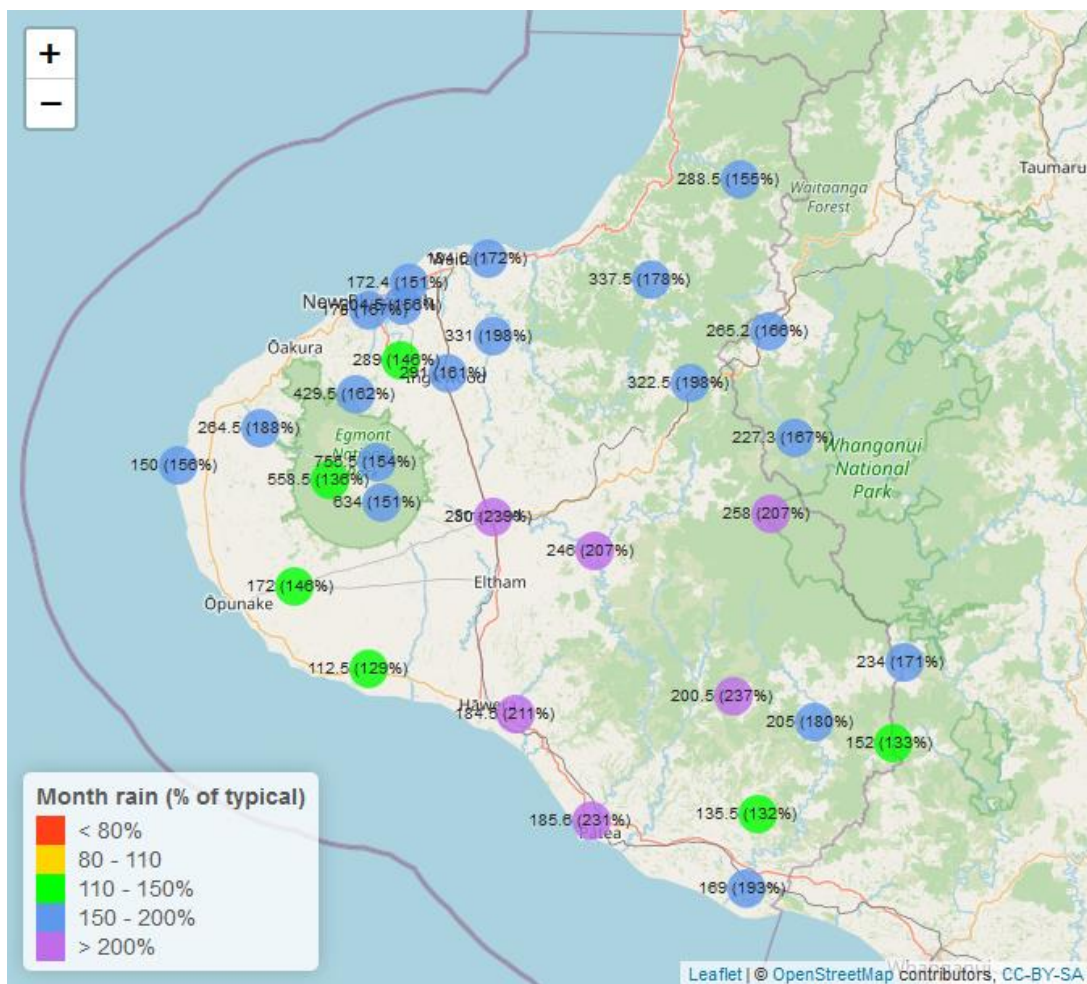


Taranaki Regional Council Monthly Rainfall and Environmental Data Report for November 2022

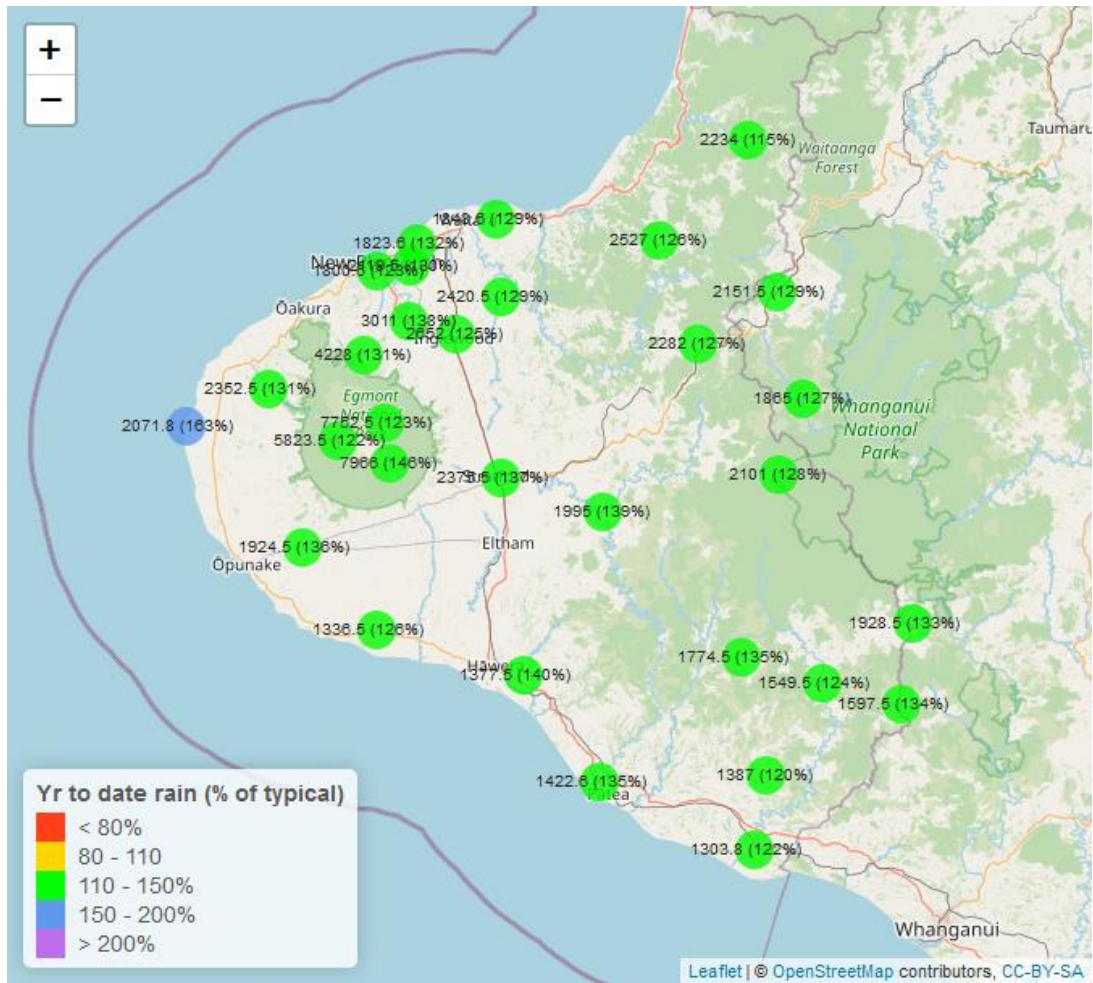
Note: Provisional Data Only.

1. Rain gauge values at 28 sites in Taranaki

Taranaki Regional Council co-owns rain-gauges with Horizons, so we can assess rainfalls right over the Eastern Hill Country (these are included in our reporting since August 2022).



Map1. Month total rain (mm) and percentage of long-term mean



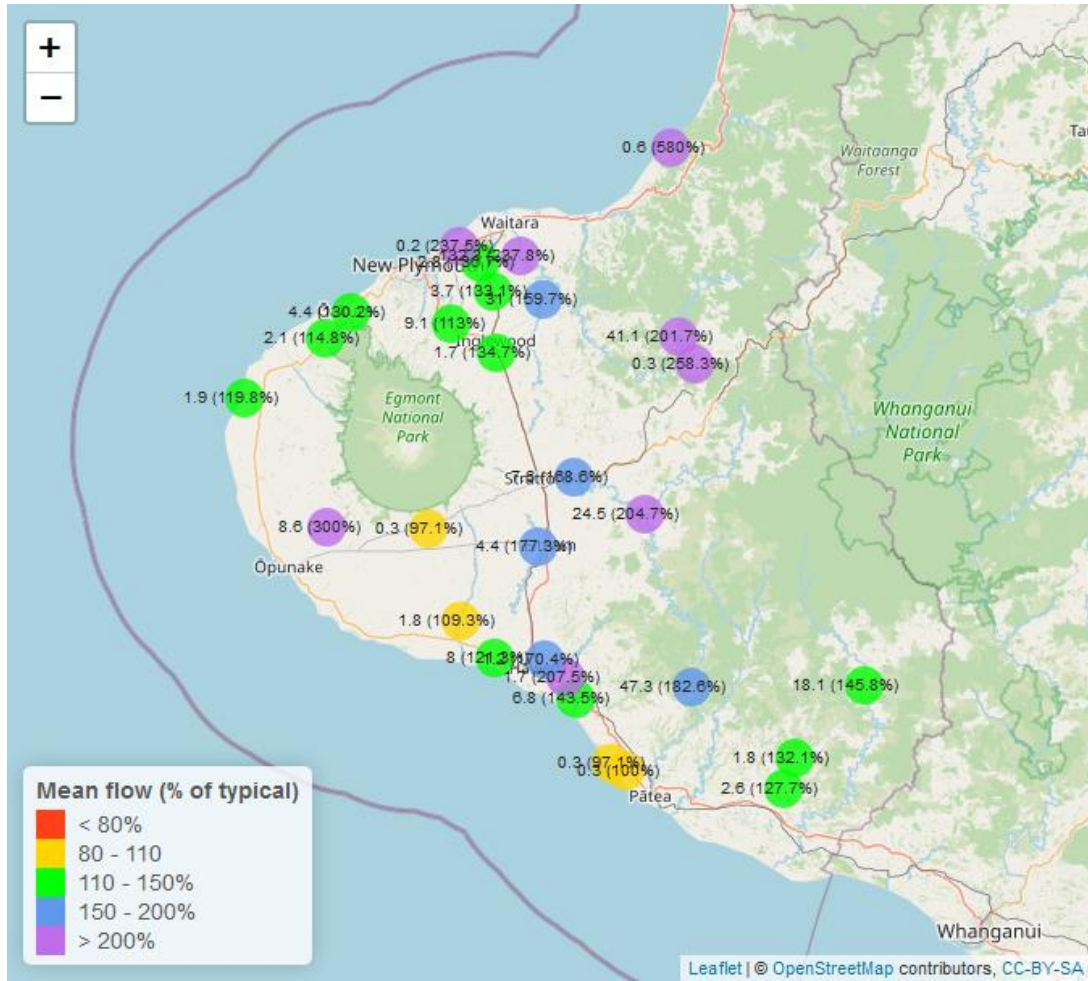
Map1a. YTD total rain (mm) and percentage of long-term mean

Table 1: Table 1: Rainfall monthly and year to date totals at 27 rain gauge sites in Taranaki.

Hydro_Sites	November			Year to Date			Records Began
	# days with rain	Total rain (mm)	% of typical month	Total to date (mm)	% of typical year to date	% of typical full year	
N Egmont VC	24	755.5	154	7752.5	123	112	1991
Dawson Falls	26	634.0	151	7966.0	146	135	1933
Kahui Hut	27	558.5	136	5823.5	122	112	2006
Forest Hill	22	429.5	162	4228.0	131	118	2017
Hillsborough	19	204.5	156	2119.5	130	120	2012
Brooklands Zoo	23	178.0	167	1800.6	123	113	2012
Bell Block	20	172.4	151	1823.6	132	121	2013
Motunui	20	184.6	172	1848.6	129	117	1998
Egmont Vill	20	289.0	146	3011.0	138	125	1991
Everett Pk	21	331.0	198	2420.5	129	117	1987
Inglewood	21	291.0	161	2652.0	125	114	2000
Stony R	23	264.5	188	2352.5	131	119	2004
Cape Egmont	22	150.0	156	2071.8	163	150	1930
Taungatara	20	172.0	146	1924.5	136	123	2005
Kaupokonui	18	112.5	129	1336.5	126	115	1998
Stratford	21	280.0	239	2375.5	137	126	1999
Mangaehu	21	246.0	207	1995.0	139	127	1999
Kotare OSullivans	21	288.5	155	2234.0	115	104	1998
Uruti Kaka Rd	20	337.5	178	2527.0	126	114	1991
Pohokura Saddle	23	322.5	198	2282.0	127	115	1991
Omaru Charlies	20	258.0	207	2101.0	128	117	2006
Omahine Moana Trg	24	200.5	237	1774.5	135	125	2007
Rimunui Station	22	205.0	180	1549.5	124	113	1994
Ngutuwera	21	135.5	132	1387.0	120	109	1999
Hawera Tawhiti	19	184.5	211	1377.5	140	127	1993
Patea Bore3	23	185.6	231	1422.6	135	122	2006
Hawken Rd	17	169.0	193	1303.8	122	111	2016
Te Tuhi Jn	22	152.0	133	1597.5	134	119	2018
Mataimona Trig	23	234.0	171	1928.5	133	115	2018

Hydro_Sites	November			Year to Date			Records Began
	# days with rain	Total rain (mm)	% of typical month	Total to date (mm)	% of typical year to date	% of typical full year	
Marco Road	23	265.2	166	2151.5	129	115	2018
Br to Somewhere	20	227.3	167	1865.0	127	112	2018

2. River Flow at 32 sites in Taranaki



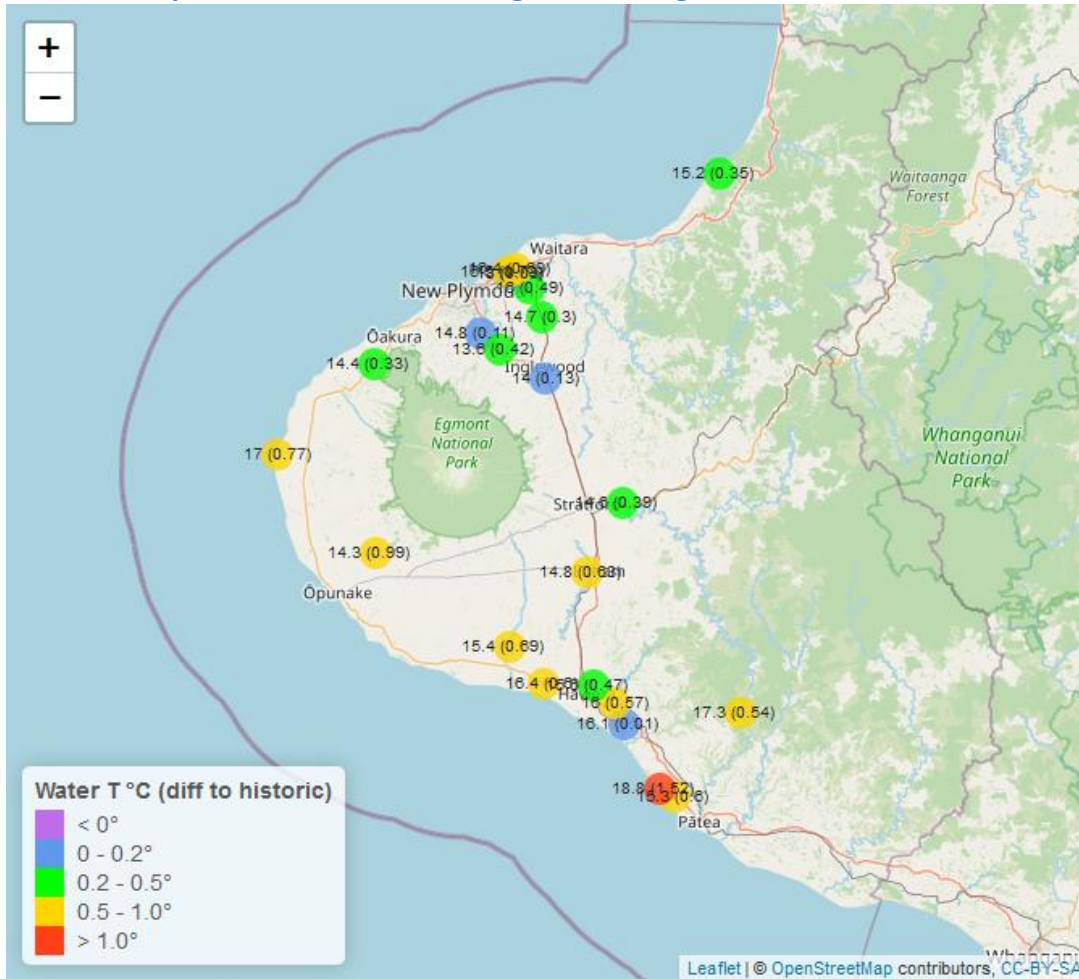
Map2: Month mean river flows (m³/sec), with difference as % of long-term mean

Table 2: Table 2: Summary of maximum, minimum and mean flow for the current reporting month and the same month for all preceding years of record.

Recorded flows (m3/sec)								
Hilltop	Maximum		Minimum		Mean		Data years	Records began
	November 2022	November historic	November 2022	November historic	November 2022	November historic		
Kaikura below 7346	1.65	5.55	0.14	0.06	0.3	0.26	7	2014
Kapuni at Normanby Rd	10.75	103.56	0.70	0.47	1.8	1.61	21	1999
Mangaehu at Bridge	119.71	317.93	4.50	2.19	24.5	11.98	43	1978
Manganui at Everett Park	228.29	798.47	0.52	3.11	31.0	19.39	31	1991
Mangaoraka at Corbett Rd	10.46	133.12	1.01	0.21	2.8	2.07	42	1975
Mangaroa at Manawapou Rd	1.46	2.59	0.02	0.03	0.3	0.34	4	2018
Mangati at SH3	2.86	7.73	0.09	0.01	0.2	0.08	10	2012
Mangawheroiti Above Intake W.W	1.38	5.04	0.18	0.16	0.3	0.35	10	2012
Matau at Woolshed	2.14	3.29	0.07	0.03	0.3	0.12	5	2017
Moumahaki at Johnston Rd	11.35	70.52	0.78	0.38	2.6	2.06	5	2017
Ngatoro at SH3	23.84	76.89	0.54	0.25	1.7	1.24	28	1981
Oakura at Victoria Rd	32.12	83.34	1.29	0.67	4.4	3.41	4	2018
Patea at McColls Bridge	190.61	442.12	2.45	1.07	47.3	25.89	35	1987
Patea at Skinner Rd	57.75	179.56	2.42	0.68	7.6	4.49	43	1978
Tangahoe below Railway Bridge	47.67	198.20	1.79	1.15	6.8	4.74	5	2017
Tawhiti at Duffys	4.82	17.01	0.11	0.15	1.7	0.80	37	1985
Tawhiti below Meat Plant	4.25	11.32	0.75	0.26	1.2	0.71	12	2010
Timaru at Tataraimaka	15.78	91.66	0.54	0.42	2.1	1.82	9	2013
Waiaua 2 at Barraclough Opua	22.14	27.22	6.30	1.16	8.6	2.86	4	2018
Waikaramarama at Bridge	25.57	5.86	0.02	0.01	0.6	0.10	5	2017
Waingongoro at Eltham Rd	30.83	112.33	2.06	0.50	4.4	2.47	41	1981

Recorded flows (m3/sec)								
Hilltop	Maximum		Minimum		Mean		Data years	Records began
	November 2022	November historic	November 2022	November historic	November 2022	November historic		
Waingongoro at SH45	41.34	139.63	3.67	1.83	8.0	6.62	40	1982
Waiongana at SH3a	23.39	145.34	1.09	0.34	3.7	2.81	41	1981
Waitara at Bertrand Rd	636.46	1252.00	23.71	5.89	132.3	55.64	39	1983
Waitara at Purangi Bridge	201.47	547.52	4.27	0.10	41.1	20.39	23	1999
Waitotara at Rimunui Station	83.56	177.61	4.16	3.22	18.1	12.42	17	2005
Waiwhakaiho at Egmont Village	104.46	388.81	2.60	1.79	9.1	8.01	41	1981
Warea at Coast	17.54	26.54	0.63	0.22	1.9	1.62	5	2016
Weraweraonga at 749 Mangawhio Rd	13.49	94.77	0.37	0.16	1.8	1.37	5	2017

3. River Temperature at 28 sites throughout the region



Map3: Month mean water temperature with difference to long-term mean (°C)

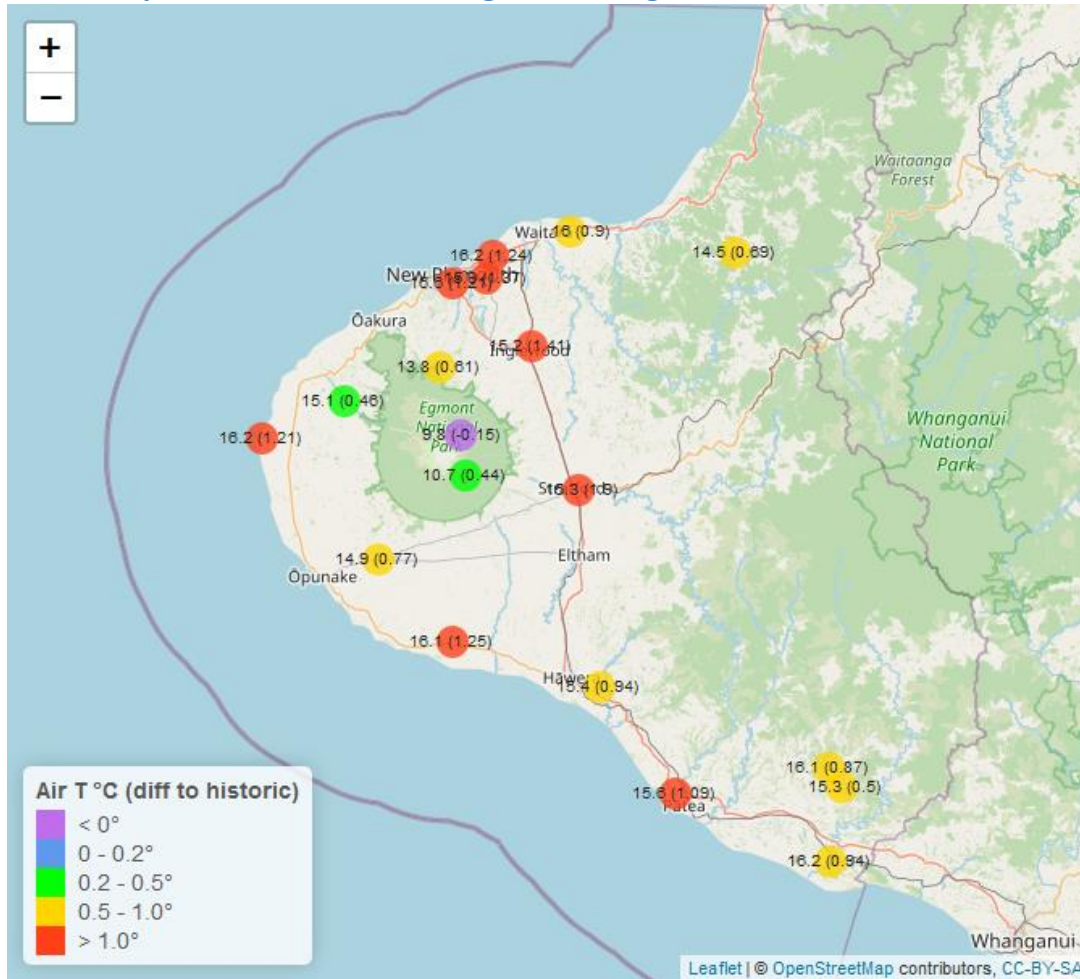
Table 3: Table 3: Summary of maximum, minimum and mean river temperature for the current reporting month and the same month for all preceding years of record.

Monthly River Temperatures (°C)								
Hilltop	Maximum		Minimum		Mean		Data years	Records began
	November 2022	November historic	November 2022	November historic	November 2022	November historic		
Kaikura below 7346	18.50	19.48	12.50	9.78	15.3	14.68	7	2014
Kapoiaia at Lighthouse	23.47	25.70	12.94	8.01	17.0	16.25	24	1998
Kapuni at Normanby Rd	21.75	25.40	11.38	7.70	15.4	14.74	21	1999
Mangaoraka at Corbett Rd	19.97	23.10	13.35	9.75	16.0	15.56	18	2004
Mangaroa at Manawapou Rd	21.72	22.30	16.35	12.94	18.8	17.23	4	2018
Mangati at Ponds	22.49	24.17	12.25	12.18	18.0	17.99	4	2018
Mangati at SH3	19.21	19.97	10.41	11.07	16.5	15.76	10	2012
Mangorei at Pipebridge	19.51	22.33	11.95	8.50	14.8	14.71	9	2013
Ngatoro at SH3	18.44	20.90	11.12	7.51	14.0	13.83	22	1981
Patea at McColls Bridge	19.25	22.75	14.88	11.75	17.3	16.77	8	2014
Patea at Skinner Rd	19.33	22.10	12.18	8.57	14.6	14.19	18	2004
Tangahoe below Railway Bridge	20.06	22.31	13.50	10.88	16.1	16.14	5	2017
Tawhiti at Duffys	18.47	21.30	13.62	10.10	16.0	15.46	18	2004
Tawhiti below Meat Plant	18.64	20.62	13.07	10.14	15.6	15.12	24	1993
Timaru at Tataraimaka	18.74	21.53	12.11	8.78	14.4	14.10	9	2013
Waiaua 2 at Barraclough Opuā	22.01	21.57	10.08	6.82	14.3	13.36	4	2018
Waikaramarama at Bridge	17.97	19.07	13.01	11.12	15.2	14.83	5	2017
Waingongoro at Eltham Rd	19.01	21.60	12.23	7.20	14.8	14.12	19	2000
Waingongoro at SH45	20.75	22.70	13.80	9.90	16.4	15.84	18	2004
Waiongana at SH3a	18.88	21.60	12.06	9.06	14.7	14.36	11	2011
Waitaha 1 at SH3	19.69	21.25	10.20	11.25	16.4	15.73	4	2018

Monthly River Temperatures (°C)

Hilltop	Maximum		Minimum		Mean		Data years	Records began
	November 2022	November historic	November 2022	November historic	November 2022	November historic		
Waiwhakaiho at Egmont Village	18.15	20.38	10.55	7.60	13.6	13.18	30	1991

4. Air Temperature at 19 sites throughout the region

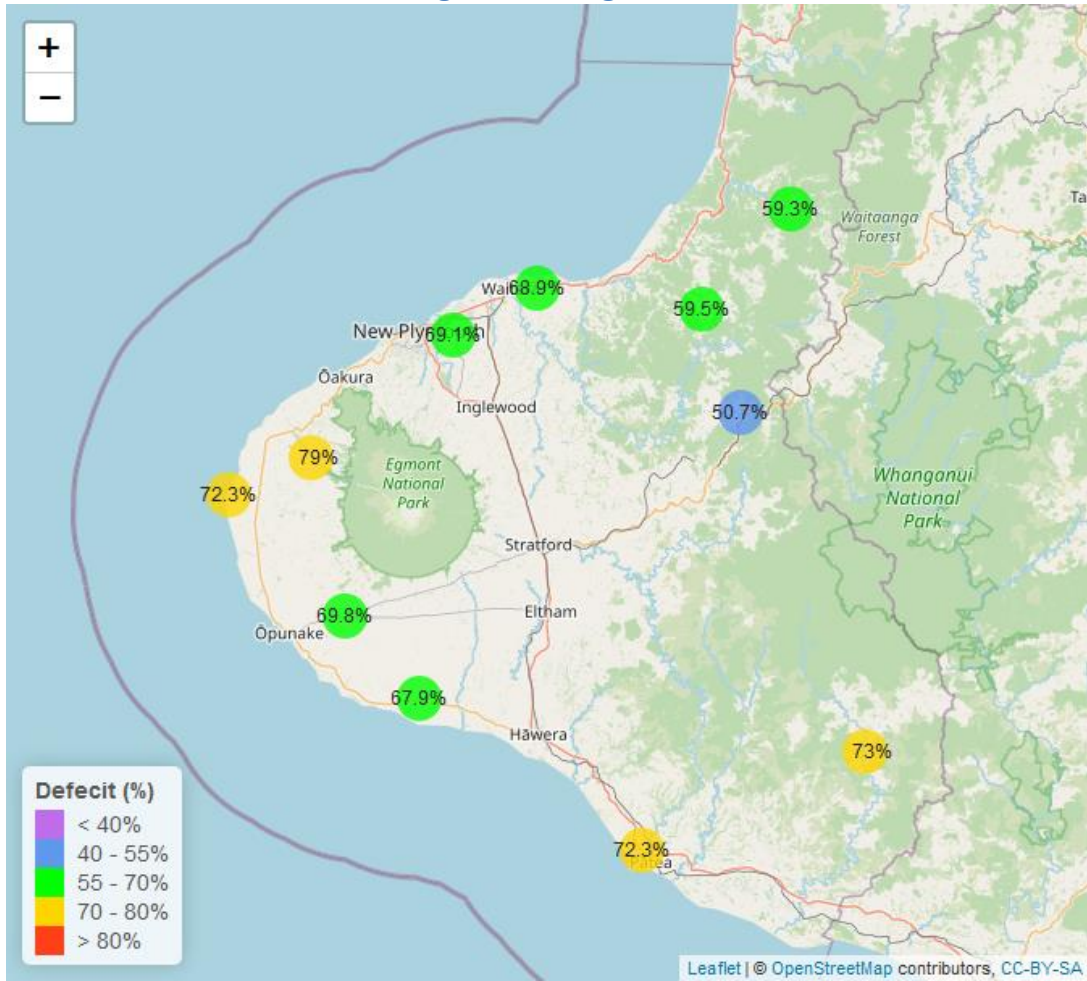


Map4: Month mean air temperature with difference to long-term mean (°C)

Table 4: Table 4: Summary of maximum, minimum and mean air temperature for the current reporting month and the same month for all preceding years of record.

Monthly Air Temperatures (°C)								
Hilltop	Maximum		Minimum		Mean		Data years	Records Began
	November 2022	November historic	November 2022	November historic	November 2022	November historic		
Brooklands Zoo at New Plymouth	25.97	27.68	8.82	3.96	16.6	15.40	10	2012
Dawson Falls	19.18	25.79	3.63	-0.46	10.7	10.30	7	2015
Inglewood at Oxidation Ponds	26.07	26.46	8.31	1.59	15.2	13.84	11	2011
Kapoiaiaia at Lighthouse	21.06	22.45	8.09	4.23	16.2	15.03	10	2012
Kaupokonui at Glenn Rd	23.81	24.18	7.63	0.37	16.1	14.81	8	2014
Mangati at SH3	22.77	26.09	9.03	3.52	16.2	14.98	10	2012
Mangorei Upper at Forest Hill	21.97	24.21	7.27	3.08	13.8	13.18	5	2017
Motunui M39 at Weston W3	23.34	23.96	8.93	3.34	16.0	15.06	6	2016
North Egmont at Visitors Centre	19.07	24.77	2.43	-0.44	9.8	9.91	8	2014
Patea at Bore 3	23.06	24.22	8.05	0.82	15.6	14.54	11	2011
Patea at Stratford	27.92	25.72	7.50	0.76	15.3	13.37	11	2011
Stony at Mangatete Bridge	22.81	23.73	8.13	4.52	15.1	14.61	6	2016
Taungatara at Eltham Rd	21.51	22.62	7.97	2.64	14.9	14.15	7	2015
Tawhiti at Duffys	22.57	23.57	4.49	-1.05	15.4	14.44	9	2013
Uruti at Kaka Rd	24.04	24.23	7.77	2.70	14.5	13.79	4	2018
Waitotara at Hawken Rd	23.69	25.86	8.56	0.69	16.2	15.29	7	2015
Waitotara at Ngutuwera	23.90	24.41	7.70	4.57	15.3	14.82	4	2018
Waiwhakaiho at Hillsborough	23.90	24.96	8.29	5.01	15.9	14.56	10	2012
Weraweraonga at 749 Mangawhio Rd	25.56	28.28	7.36	2.82	16.1	15.28	5	2017

5. Soil Moisture at 11 sites throughout the region

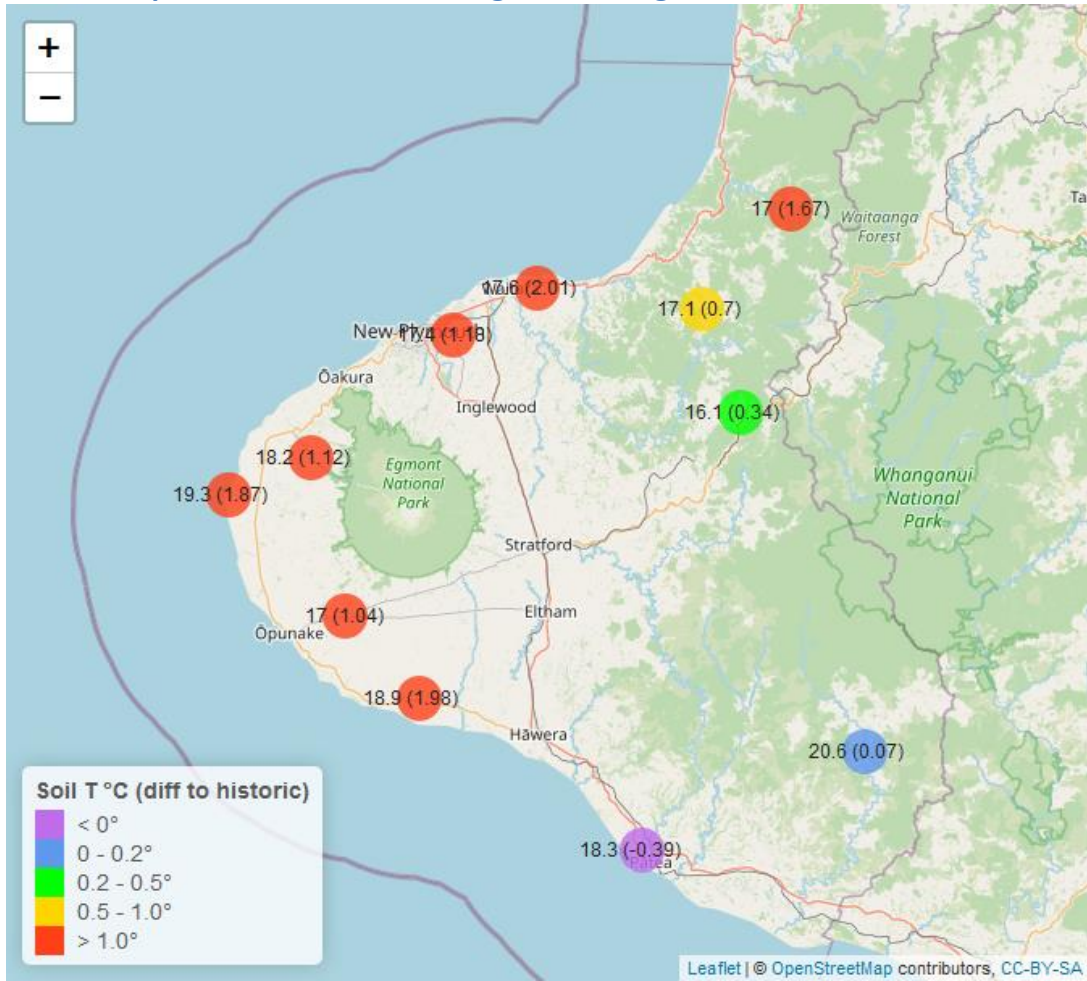


Map5: Month mean soil moisture deficit (100 - soil moisture, %)

Table 5: Table 5: Summary of maximum, minimum and mean soil moisture for the current reporting month and the same month for all preceding years of record.

Monthly Soil Moisture Extremes (%)								
Hilltop	Maximum		Minimum		Mean		Data years	Records began
	November 2022	November historic	November 2022	November historic	November 2022	November historic		
Kapoaiaia at Lighthouse	30.29	32.91	26.21	11.86	27.65	23.24	10	2011
Kaupokonui at Glenn Rd	34.74	44.41	30.77	11.81	32.14	30.66	11	2011
Kotare at OSullivans	51.72	57.48	35.55	26.97	40.71	40.16	10	2012
Motunui M39 at Weston W3	34.21	33.82	29.08	21.14	31.06	28.50	9	2013
Patea at Bore 3	43.21	37.50	25.19	20.76	27.66	26.75	6	2016
Pohokura Saddle	54.42	55.74	42.86	32.10	49.29	42.88	8	2014
Stony at Mangatete Bridge	31.57	33.66	15.00	9.49	20.95	17.48	6	2016
Taungatara at Eltham Rd	39.42	53.60	13.70	22.78	30.20	35.40	9	2013
Uruti at Kaka Rd	43.53	49.16	36.86	25.62	40.55	40.52	11	2011
Waitotara at Rimunui Station	31.82	32.77	24.33	22.69	26.95	25.93	5	2017
Waiwhakaiho at Hillsborough	35.59	36.56	28.82	17.66	30.89	27.80	10	2012

6: Soil Temperature at 11 sites throughout the region



Map3: Month mean soil temperatures with difference to long-term mean (°C)

Table 6: Table 6: Summary of maximum, minimum and mean soil temperature for the current reporting month and the same month for all preceding years of record.

Monthly Soil Temperatures (°C)								
Hilltop	Maximum		Minimum		Mean		Data years	Records Began
	November 2022	November historic	November 2022	November historic	November 2022	November historic		
Kapoaiaia at Lighthouse	25.94	23.76	15.99	13.50	19.3	17.42	10	2011
Kaupokonui at Glenn Rd	21.40	23.90	17.30	12.65	18.9	16.93	11	2011
Kotare at OSullivans	18.65	23.38	15.91	10.51	17.0	15.34	10	2012
Motunui M39 at Weston W3	19.82	20.13	15.98	12.08	17.6	15.60	9	2013
Patea at Bore 3	21.97	26.52	15.32	12.28	18.3	18.69	6	2016
Pohokura Saddle	18.65	19.89	14.52	12.85	16.1	15.75	8	2014
Stony at Mangatete Bridge	21.10	23.60	15.70	12.30	18.2	17.10	5	2016
Taungatara at Eltham Rd	27.18	20.90	15.10	11.60	17.0	15.94	9	2013
Uruti at Kaka Rd	18.86	23.50	15.87	12.06	17.1	16.43	11	2011
Waitotara at Rimunui Station	23.83	26.14	18.29	14.81	20.6	20.48	5	2017
Waiwhakaiho at Hillsborough	19.84	23.33	15.42	12.40	17.4	16.25	10	2012

Summary of months conditions

Rainfall

Rainfall for November was on average 176.3% of the long-term average, and ranged from 129% at Kaupokonui at Glenn Rd to 239% in Stratford. A number of larger storms contributed to the high rainfall total across most of the region.

Year to date rainfall is sitting between 115% (Kotare at OSullivans) and 163% (Kapoaiaia at Lighthouse) with an average of 130.9% of normal. Compared to typical full year totals, on average sites have already received 118.7% of a typical years rainfall, with the highest value 150% at Kapoaiaia at Lighthouse, whereas Kotare at OSullivans sits at 104% of the typical years total.

River Flow

Following the heavy rainfall, mean river flows for November were generally well above typical November averages at around 187.3%. The minimum flows were all well above typical November lows (at 251.8%), suggesting continued seepage of groundwater recharged in the preceding wetter months. Maximum flows were below (on average 36% of) historic November values.

River Water Temperature

Mean river water temperatures were 15.7°C, an average of 0.5°C above long-term November values. Nighttime-low water temperatures were on average 2.9°C above historic lows. Peak temperatures were on average -2.1°C below historic highs.

Air Temperature

The average air temperature for the region (excluding Te Maunga sites) was 15.7°C, which is 0.9°C higher than the long term November average. Minimum air temperatures for November were on average 5.1°C below previously recorded lows, reflecting a cold period similar to October.

Soil Moisture

Mean soil moistures for November were close to typical values. On average, minimum soil moistures were 1.7% above previous lows, and the maxima well below previous highs. The average soil moisture was 32.5%.

Soil Temperature

Like October, November soil temperatures were generally 1.1°C above the long-term average. Nighttime minimum soil temperatures were on average 3.5°C above recorded minima, and maximum November soil temperatures were on average -1.6°C below long-term maximum November values.

Report date 08 December, 2022.