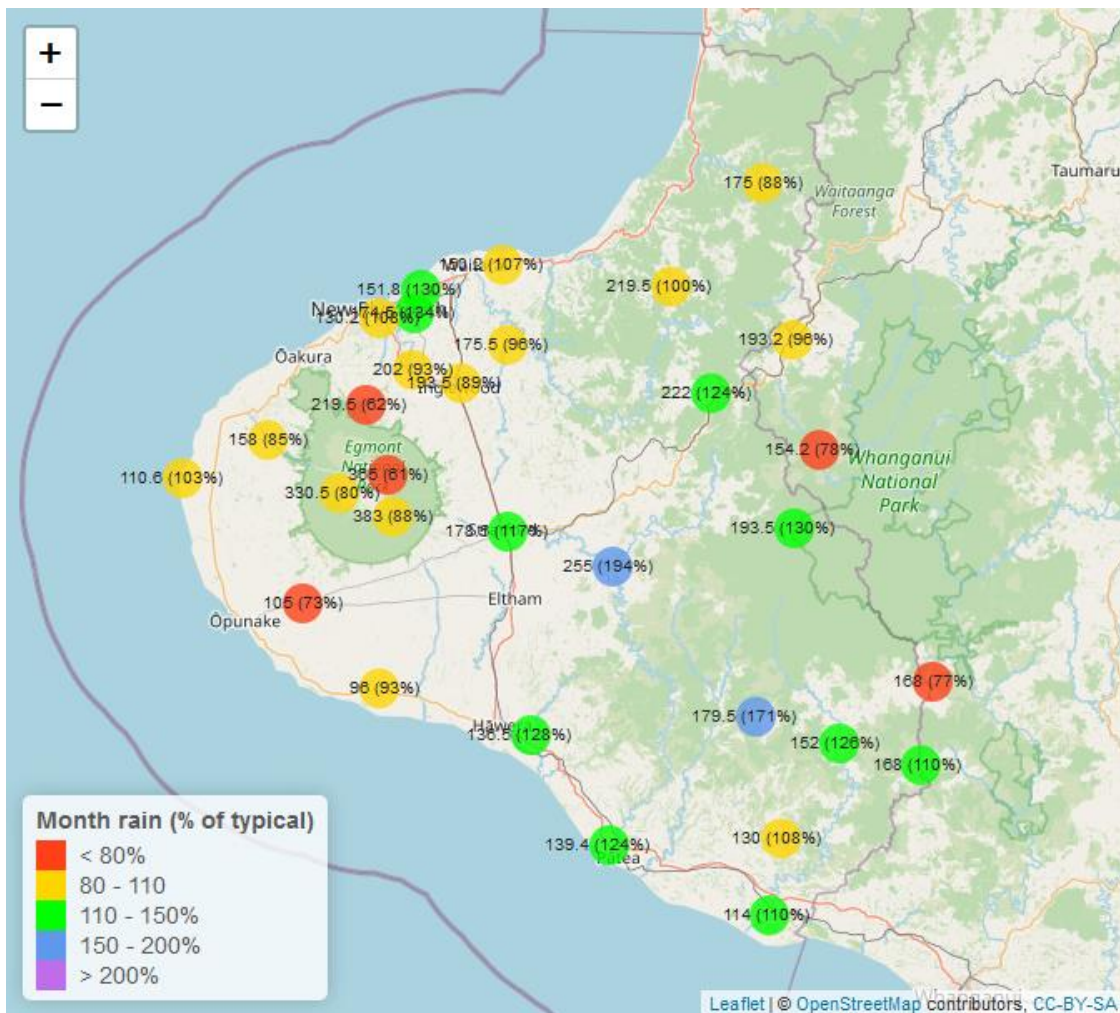


Taranaki Regional Council Monthly Rainfall and Environmental Data Report for December 2022

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).



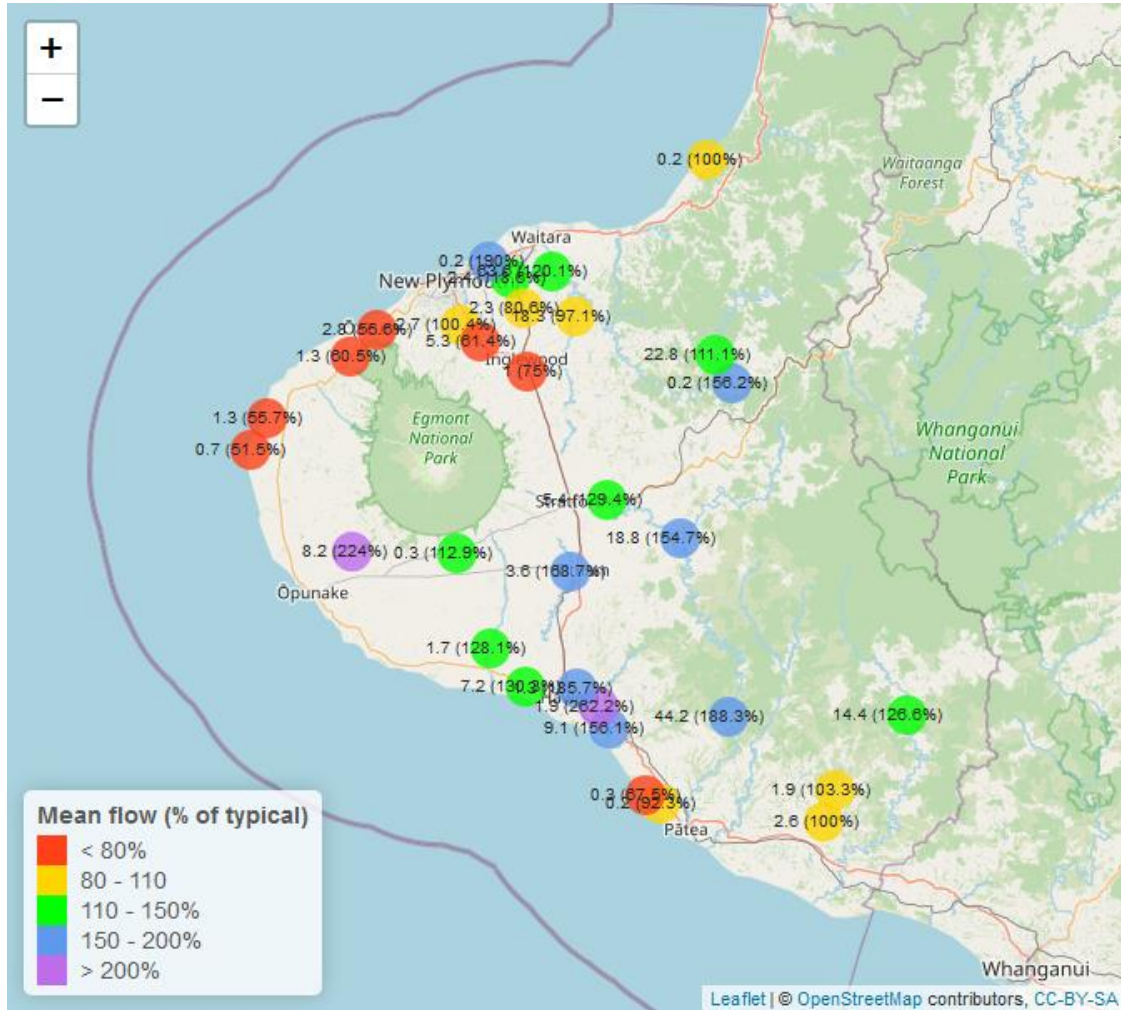
Map 1. Month total rain (mm) and percentage of long-term mean.

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

Rain gauge	December			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	15	365.0	61	8117.5	118	118	1991
Dawson Falls	16	383.0	88	8349.0	141	141	1933
Kahui Hut	20	330.5	80	6154.0	119	119	2006
Forest Hill	16	219.5	62	4447.5	124	124	2017
Hillsborough	14	174.5	134	2294.0	130	130	2012
Brooklands Zoo	17	130.2	108	1930.8	122	122	2012
Bell Block	15	151.8	130	1975.4	132	132	2013
Motunui	17	150.2	107	1998.8	127	127	1998
Egmont Vill	16	202.0	93	3213.0	134	134	1991
Everett Pk	15	175.5	96	2586.5	125	125	1987
Inglewood	16	193.5	89	2845.5	122	122	2000
Stony R	13	158.0	85	2510.5	127	127	2004
Cape Egmont	13	110.6	103	2182.4	158	158	1930
Taungatara	16	105.0	73	2029.5	130	130	2005
Kaupokonui	15	96.0	93	1432.5	123	123	1998
Stratford	17	178.5	117	2554.0	135	135	1999
Mangaehu	18	255.0	194	2250.0	144	144	1999
Kotare OSullivans	16	175.0	88	2409.0	112	112	1998
Uruti Kaka Rd	16	219.5	100	2746.5	124	124	1991
Pohokura Saddle	18	222.0	124	2504.0	127	127	1991
Omaru Charlies	20	193.5	130	2294.5	128	128	2006
Omahine Moana Trg	18	179.5	171	1954.0	137	137	2007
Rimunui Station	16	152.0	126	1701.5	124	124	1994
Ngutuwera	17	130.0	108	1517.0	119	119	1999
Hawera Tawhiti	13	136.5	128	1514.0	139	139	1993
Patea Bore3	15	139.4	124	1562.0	134	134	2006
Hawken Rd	12	114.0	110	1417.8	121	121	2016
Te Tuhi Jn	15	168.0	110	1765.5	132	132	2018
Mataimona Trig	13	168.0	77	2096.5	125	125	2018

Rain gauge	December			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	17	193.2	96	2331.1	124	124	2018
Br to Somewhere	15	154.2	78	2009.5	121	121	2018

2. River Flow at 32 sites in Taranaki



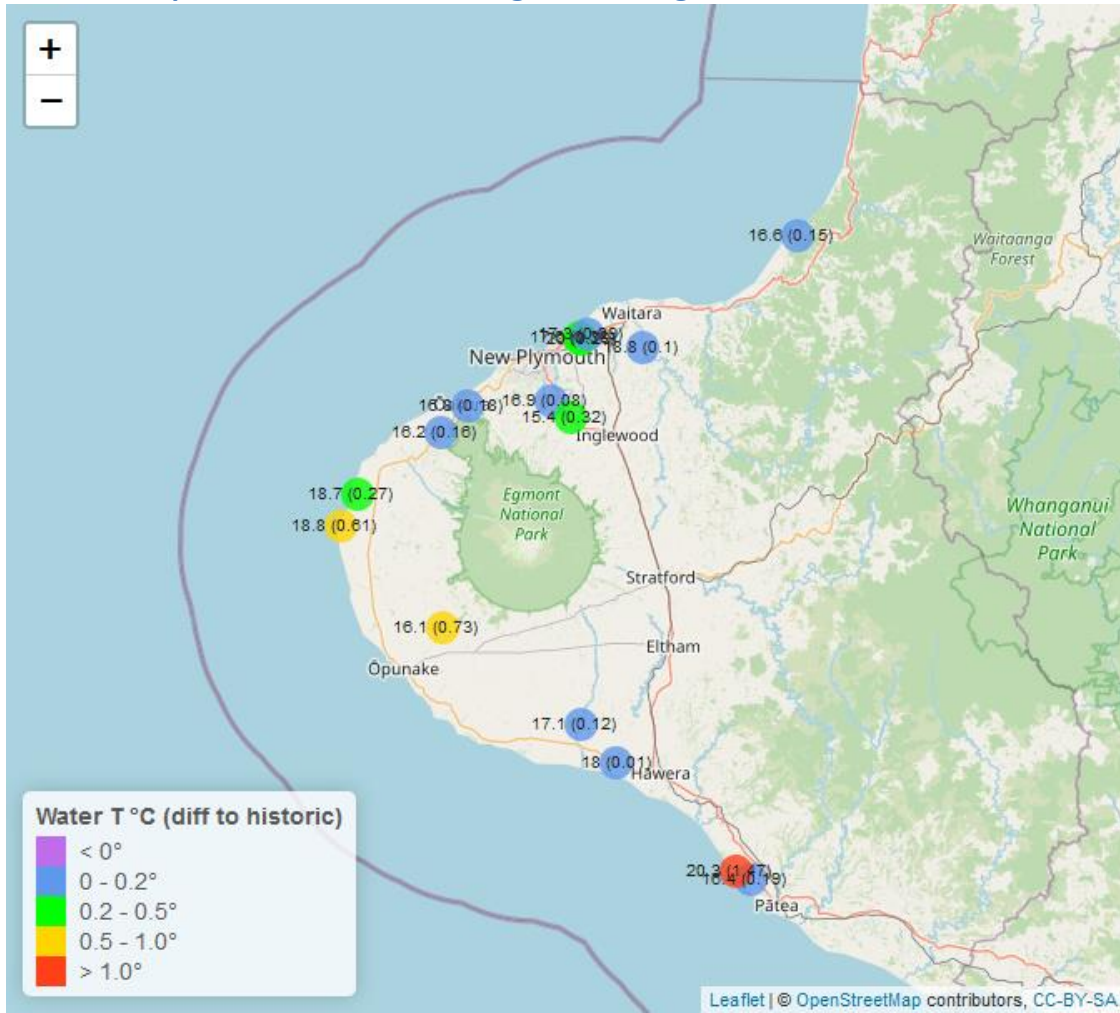
Map 2: Month mean river flows (m³/sec), with difference as % of long-term mean.

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

Recorded flows (m3/sec)								
River and Site	Highs		Lows		Mean		Data years	Records began
	December 2022	December Historic	December 2022	December Historic	December 2022	December Historic		
Kaikura below 7346	0.38	0.55	0.15	0.10	0.2	0.26	8	2014
Kapoiaia at Lighthouse	1.97	4.54	0.24	0.27	0.7	1.32	36	1986
Kapuni at Normanby Rd	2.34	3.21	1.35	0.40	1.7	1.35	21	1999
Mangaehu at Bridge	56.88	44.02	4.85	2.61	18.8	12.13	42	1979
Manganui at Everett Park	41.97	71.46	8.81	3.64	18.3	18.80	31	1991
Mangaoraka at Corbett Rd	4.88	7.10	1.23	0.26	2.4	1.99	42	1975
Mangaroa at Manawapou Rd	0.51	1.01	0.13	0.06	0.3	0.40	4	2018
Mangati at SH3	0.36	0.40	0.12	0.01	0.2	0.10	10	2012
Mangawheroiti Above Intake W.W	0.50	0.63	0.26	0.16	0.3	0.31	10	2012
Mangorei at Pipebridge	6.83	10.46	1.20	0.45	2.7	2.72	13	2009
Matau at Woolshed	0.92	0.66	0.08	0.03	0.2	0.16	5	2017
Moumahaki at Johnston Rd	7.69	10.94	0.85	0.47	2.6	2.63	5	2017
Ngatoro at SH3	2.23	5.53	0.58	0.31	1.0	1.36	28	1981
Oakura at Victoria Rd	7.10	22.31	1.10	0.68	2.8	5.00	4	2018
Patea at McColls Bridge	125.45	68.52	5.67	2.41	44.2	23.47	36	1986
Patea at Skinner Rd	9.57	12.55	3.14	0.74	5.4	4.15	42	1979
Tangahoe below Railway Bridge	30.72	20.47	3.21	1.38	9.1	5.85	5	2017
Tawhiti at Duffys	3.34	1.98	1.40	0.31	1.9	0.74	36	1985
Tawhiti below Meat Plant	1.89	2.01	0.94	0.31	1.3	0.70	12	2009
Timaru at Tataraimaka	3.12	7.99	0.57	0.42	1.3	2.15	9	2013
Waiaua 2 at Barraclough Opua	10.44	12.07	7.12	1.35	8.2	3.66	4	2018

Recorded flows (m3/sec)								
River and Site	Highs		Lows		Mean		Data years	Records began
	December 2022	December Historic	December 2022	December Historic	December 2022	December Historic		
Waikaramarama at Bridge	0.73	1.06	0.04	0.01	0.2	0.21	5	2017
Waingongoro at Eltham Rd	5.23	6.05	2.50	0.44	3.6	2.11	41	1981
Waingongoro at SH45	10.85	15.65	5.00	1.60	7.2	5.55	41	1981
Waiongana at SH3a	5.39	10.17	1.02	0.47	2.3	2.88	41	1981
Waitara at Bertrand Rd	136.37	210.00	26.45	7.91	63.6	52.98	39	1983
Waitara at Purangi Bridge	75.59	97.06	3.42	0.71	22.8	20.56	23	1999
Waitotara at Rimunui Station	52.79	35.61	5.14	4.06	14.4	11.38	17	2005
Waiwhakaiho at Egmont Village	14.05	33.07	2.47	2.01	5.3	8.72	41	1981
Warea at Coast	2.69	10.15	0.72	0.48	1.3	2.35	5	2016
Weraweraonga at 749 Mangawhio Rd	6.88	8.54	0.43	0.22	1.9	1.80	5	2017

3. River Temperature at 28 sites throughout the region

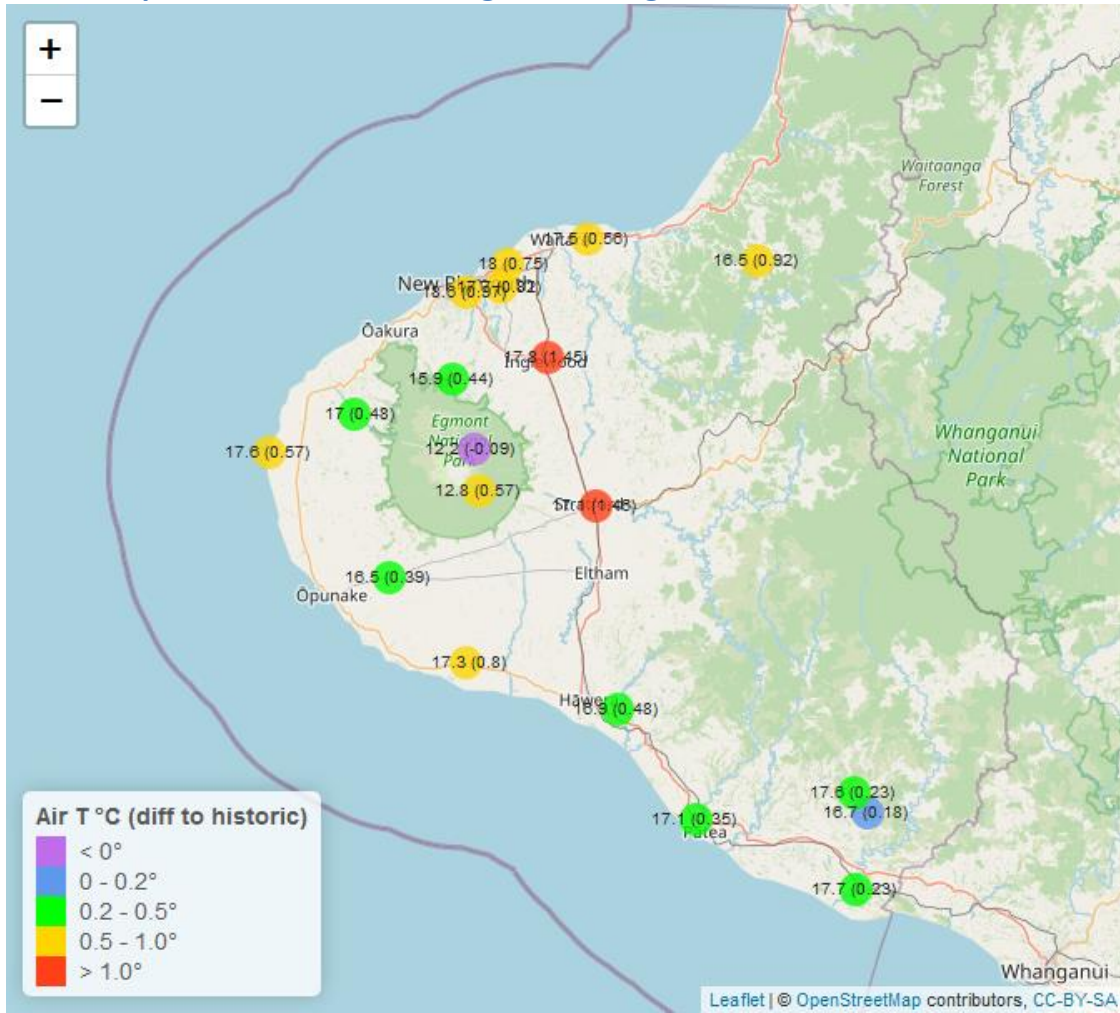


Map 3: Month mean water temperature with difference to long-term mean (°C).

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

Monthly River Temperatures (°C)								
Monitoring Site	Highs		Lows		Mean		Data years	Records began
	December 2022	December Historic	December 2022	December Historic	December 2022	December Historic		
Kaikura below 7346	18.94	18.78	14.12	13.85	16.4	16.21	8	2014
Kapoaiaia at Lighthouse	22.06	22.45	15.45	14.60	18.8	18.21	24	1998
Kapuni at Normanby Rd	21.38	21.67	13.75	13.10	17.1	16.95	21	1999
Mangaroa at Manawapou Rd	22.78	21.44	17.63	16.06	20.3	18.79	4	2018
Mangati at Ponds	22.79	22.90	16.97	17.21	20.0	19.71	4	2018
Mangati at SH3	19.28	19.31	15.50	15.08	17.6	17.18	11	2005
Mangorei at Pipebridge	20.67	21.13	13.86	13.52	16.9	16.84	9	2013
Oakura at Victoria Rd	20.90	20.06	13.33	13.46	16.8	16.65	4	2018
Timaru at Tataraimaka	19.80	19.77	13.19	13.08	16.2	16.00	9	2013
Waiaua 2 at Barraclough Opu	21.69	20.33	12.10	11.56	16.1	15.36	4	2018
Waikaramarama at Bridge	18.71	18.57	15.19	14.06	16.6	16.50	5	2017
Waingongoro at SH45	20.71	21.10	15.43	14.82	18.0	17.95	19	2003
Waitaha 1 at SH3	19.35	19.94	15.28	14.81	17.3	17.20	4	2018
Waitara at Bertrand Rd	21.86	22.20	16.31	15.60	18.8	18.65	33	1983
Waiwhakaiho at Egmont Village	18.76	18.31	12.42	12.00	15.4	15.07	30	1991
Warea at Coast	23.47	22.60	14.79	14.94	18.7	18.40	4	2018

4. Air Temperature at 19 sites throughout the region

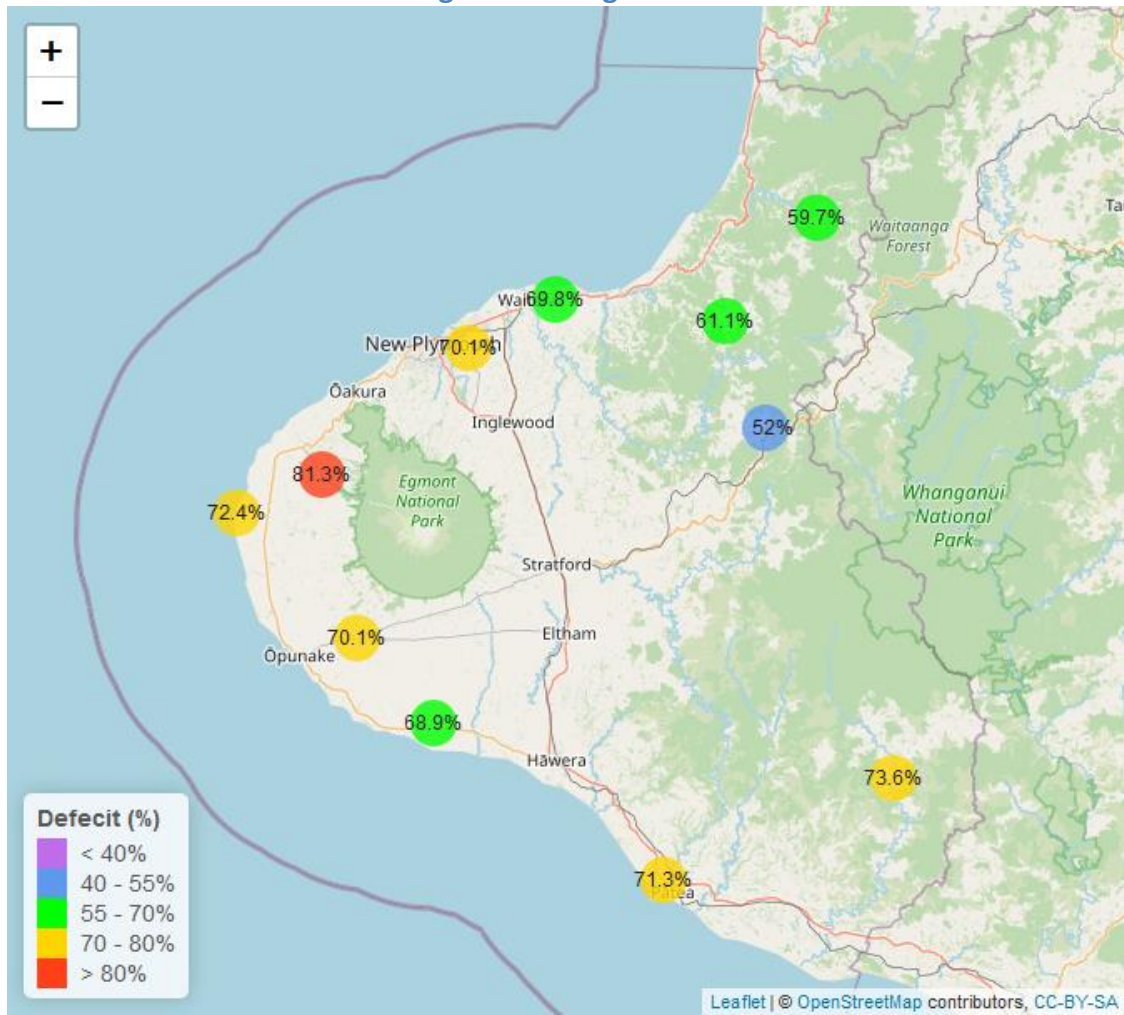


Map 4: Month mean air temperature with difference to long-term mean (°C).

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

Monthly Air Temperatures (°C)								
Monitoring Site	Highs		Lows		Mean		Data years	Records Began
	December 2022	December Historic	December 2022	December Historic	December 2022	December Historic		
Brooklands Zoo at New Plymouth	25.19	23.80	12.97	11.60	18.6	17.63	10	2012
Dawson Falls	19.10	18.49	7.56	6.08	12.8	12.26	7	2015
Inglewood at Oxidation Ponds	24.79	23.14	12.16	9.68	17.8	16.34	11	2011
Kapoaiaia at Lighthouse	21.45	20.88	13.82	12.49	17.6	17.07	10	2012
Kaupokonui at Glenn Rd	22.18	21.65	12.76	11.20	17.3	16.51	8	2014
Mangati at SH3	23.52	21.95	12.61	11.58	18.0	17.20	10	2012
Mangorei Upper at Forest Hill	21.59	20.57	11.16	10.41	15.9	15.46	5	2017
Motunui M39 at Weston W3	22.84	21.66	12.45	11.55	17.5	16.98	6	2016
North Egmont at Visitors Centre	18.41	18.23	6.73	6.47	12.2	12.29	8	2014
Patea at Bore 3	21.24	21.50	12.87	11.65	17.1	16.75	11	2011
Patea at Stratford	23.73	21.86	11.56	9.59	17.1	15.68	11	2011
Stony at Mangatete Bridge	22.55	21.61	12.46	11.52	17.0	16.51	7	2015
Taungatara at Eltham Rd	21.32	20.87	12.23	11.37	16.5	16.08	7	2015
Tawhiti at Duffys	21.78	21.58	11.09	9.61	16.9	16.39	9	2013
Uruti at Kaka Rd	22.83	20.87	11.26	10.32	16.5	15.61	4	2018
Waitotara at Hawken Rd	22.64	22.65	12.82	12.05	17.7	17.43	7	2015
Waitotara at Ngutuwera	21.95	21.56	11.92	11.44	16.7	16.55	5	2017
Waiwhakaihō at Hillsborough	23.17	21.87	12.82	11.68	17.7	16.87	10	2012
Weraweraonga at 749 Mangawhio Rd	23.79	23.63	11.66	10.81	17.6	17.34	5	2017

5. Soil Moisture at 11 sites throughout the region



Map 5: Month mean soil moisture deficit (100 - soil moisture, %).

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

Monthly Soil Moisture Extremes (%)								
Monitoring Site	Highs		Lows		Mean		Data years	Records began
	December 2022	December Historic	December 2022	December Historic	December 2022	December Historic		
Kapoaiaia at Lighthouse	29.36	28.49	26.24	10.08	27.62	21.20	11	2011
Kaupokonui at Glenn Rd	33.54	35.29	29.28	8.72	31.07	26.93	11	2011
Kotare at OSullivans	45.31	47.87	35.65	22.93	40.31	37.21	10	2012
Motunui M39 at Weston W3	32.50	31.53	27.58	15.46	30.16	25.92	9	2013
Patea at Bore 3	31.20	31.07	26.54	21.26	28.72	26.71	6	2016
Pohokura Saddle	54.39	48.74	42.01	31.86	48.04	40.70	8	2014
Stony at Mangatete Bridge	24.47	23.98	12.82	9.75	18.67	15.69	7	2015
Taungatara at Eltham Rd	33.69	42.53	26.40	15.10	29.93	32.08	9	2013
Uruti at Kaka Rd	41.53	44.96	35.07	22.02	38.86	37.68	11	2011
Waitotara at Rimunui Station	29.08	29.09	24.16	19.09	26.42	25.00	5	2017
Waiwhakaiho at Hillsborough	33.37	31.14	26.66	15.04	29.88	25.53	10	2012

6: Soil Temperature at 11 sites throughout the region

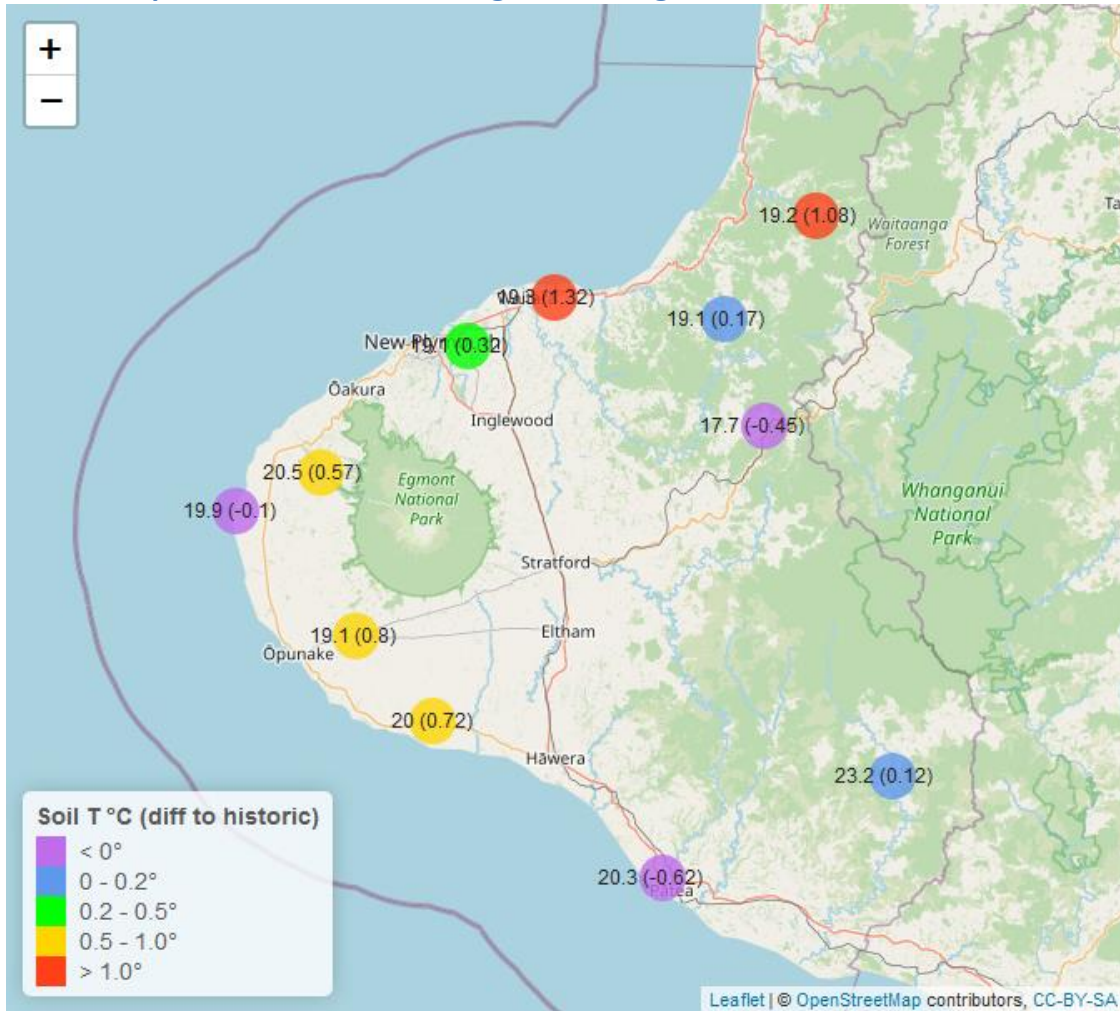


Table 6: Summary of high, low and mean soil temperature for the current reporting month and the same month for all preceding years of record.

Monthly Soil Temperatures (°C)								
Monitoring Site	Highs		Lows		Mean		Data years	Records Began
	December 2022	December Historic	December 2022	December Historic	December 2022	December Historic		
Kapoaiaia at Lighthouse	23.31	24.04	17.42	17.04	19.9	20.03	11	2011
Kaupokonui at Glenn Rd	21.40	23.10	18.30	16.20	20.0	19.26	11	2011
Kotare at OSullivans	21.87	21.61	16.65	14.90	19.2	18.13	10	2012
Motunui M39 at Weston W3	20.88	20.64	16.76	15.60	19.3	17.99	9	2013
Patea at Bore 3	22.26	25.06	17.91	17.56	20.3	20.93	6	2016
Pohokura Saddle	20.45	20.33	15.27	15.90	17.7	18.16	8	2014
Stony at Mangatete Bridge	23.40	23.20	16.80	17.10	20.5	19.89	6	2015
Taungatara at Eltham Rd	21.50	21.30	16.40	15.78	19.1	18.28	9	2013
Uruti at Kaka Rd	21.71	21.54	17.14	16.61	19.1	18.92	11	2011
Waitotara at Rimunui Station	26.77	26.11	20.63	20.27	23.2	23.08	5	2017
Waiwhakaiho at Hillsborough	20.70	21.99	16.36	16.24	19.1	18.74	10	2012

7: Summary of Differences to Historic Data

Differences to Historic Values			
Parameter	December Means	December Highs	December Lows
Air Temp. (deg. C)	+0.6	+0.8	+1.1
Water Temp. (deg. C)	+0.3	+0.2	+0.5
Soil Temp. (deg. C)	+0.4	-0.4	+0.6
Soil Moist. (%)	+3.2	-0.6	+10.6
River flow (%)	+19.6	-18.5	+201.2
Total Rain (%)	+9.1		

Summary of the month's conditions

Rainfall

Rainfall for December was on average 109.1% of the long-term average, and ranged from 62% at Mangorei Upper at Forest Hill to 194% at Mangaehu at Bridge. Rainfall was close to typical monthly values across most of the region, with exceptions on the Maunga where rainfall was only around 60% at North Egmont.

Total rainfall for 2022 ranged from 112% (Kotare at OSullivans) to 158% (Kapoaiaia at Lighthouse) with an average of 128.6% of normal.

River Flow

Mean river flows for December were close to typical December averages at around +19.6%. The low flows were on average three times greater than typical December lows. High flows were generally below (on average 81.5% of) historic December highs.

River Water Temperature

Mean non-mountain river water temperatures were 17.6°C, an average of 0.3°C warmer than long-term December values. Nighttime-low water temperatures were on average 0.5°C warmer than historic lows. Day-time high temperatures were on average 0.2°C cooler than historic highs.

Air Temperature

The average air temperature for the region (excluding Te Maunga sites) was 17.4°C, which is 0.6°C warmer than the long term December average. Low air temperatures for December were on average 1.1°C warmer than previously recorded lows. Day-time high temperatures were on average 0.8°C warmer than historic highs.

Soil Moisture

Mean soil moistures for December were 3.2% higher than typical historical values. On average, low soil moistures were 11% wetter than previous lows, and the highs approximately the same as previous general observations. The average soil moisture was 31.8%.

Soil Temperature

Like November, December soil temperatures were generally 0.4°C warmer than long-term average. Nighttime low soil temperatures were on average 0.6°C warmer than recorded lows, and December upper day-time soil temperatures were on average -0.4°C cooler than long-term high December values.

Notes: We now refer to low and high values, as opposed to maxima and minima, this revision provides the upper and lower 5th percentiles of the data by site, and give a better indication of the general upper and lower range of the historic observations against which to compare the current month. Minimum and maximum values represent more extreme

and rarely occurring conditions, and are less representative of the general situation. In particular, minimum temperatures used to accentuate the difference of the current months colder conditions relative to historical lows.

Report date: 10 January, 2023.