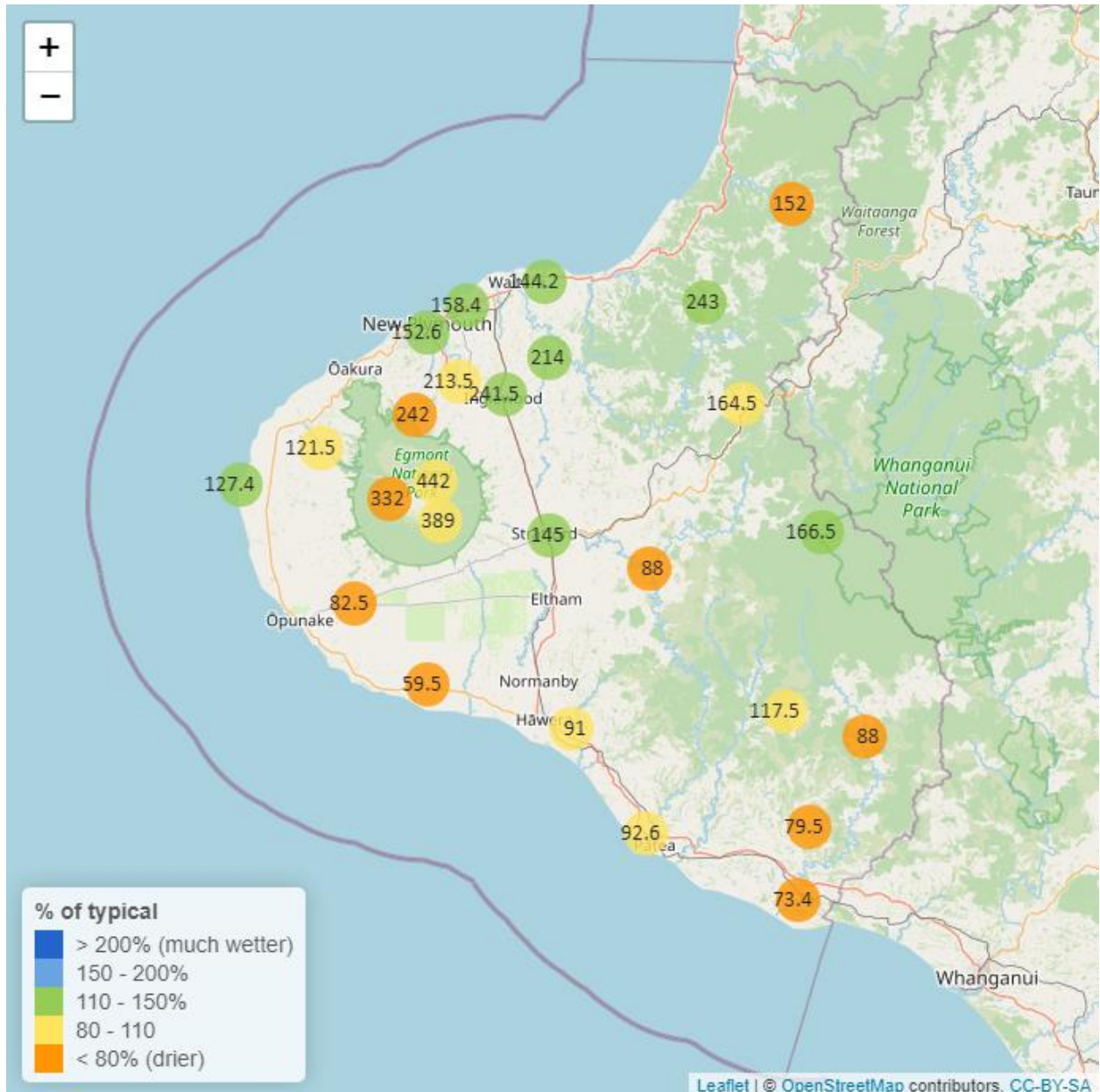


Taranaki Regional Council Monthly Rainfall and Environmental Data Report for November 2023

Note: The data presented here are provisional data only and may change as a result of quality control at a later date.

1. Rainfall

Map 1: November total rainfall (mm) and percentage of long-term mean (colour key).



Map1a. Total rainfall 1 January to end November (mm) and percentage of long-term mean (colour key).

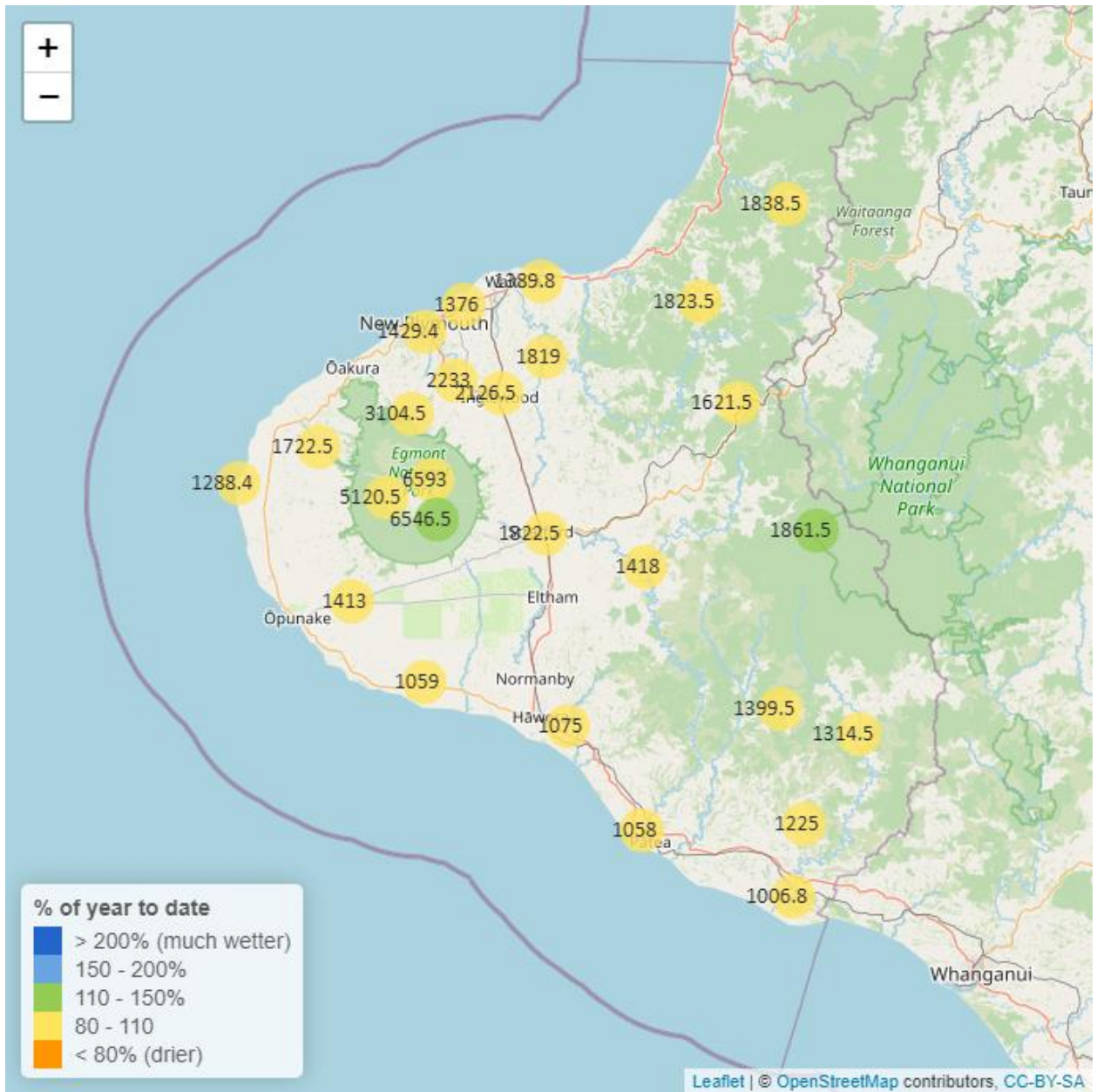


Table 1: Rainfall November and year to date totals for rain gauge sites in Taranaki.

Rain gauge	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	
North Egmont at Visitors Centre	17	442.0	88.7	6593.0	103.8	95.0	1991
Dawson Falls	18	389.0	91.7	6546.5	118.8	110.1	1933
Kapoaiaia at Kahui Hut	19	332.0	79.3	5120.5	105.8	97.6	2006
Mangorei Upper at Forest Hill	12	242.0	74.2	3104.5	90.8	81.6	2018
Waiwhakaiho at Hillsborough	13	196.5	138.6	1631.0	96.1	89.1	2013
Brooklands Zoo at New Plymouth	16	152.6	134.6	1429.4	95.5	88.3	2012
Mangati at SH3	13	158.4	132.1	1376.0	96.3	88.8	2013
Motunui M39 at Weston W3	10	144.2	132.8	1389.8	97.1	88.3	1999
Waiwhakaiho at Egmont Village	14	213.5	106.6	2233.0	101.1	92.1	1991
Manganui at Everett Park	15	214.0	126.0	1819.0	96.0	87.6	1987
Inglewood at Oxidation Ponds	17	241.5	130.2	2126.5	99.5	90.3	2000
Stony at Mangatete Bridge	14	121.5	82.7	1722.5	94.5	85.8	2004
Kapoaiaia at Lighthouse	16	127.4	130.7	1288.4	100.4	92.6	1930
Taungatara at Eltham Rd	15	82.5	68.2	1413.0	97.9	89.1	2005
Kaupokonui at Glenn Rd	11	59.5	67.5	1059.0	99.1	90.4	1998
Patea at Stratford	16	145.0	112.2	1822.5	99.6	91.6	1999
Mangaehu at Bridge	14	88.0	70.9	1418.0	97.3	89.0	1999
Kotare at OSullivans	17	152.0	79.9	1838.5	93.7	85.2	1998
Uruti at Kaka Rd	18	243.0	124.9	1823.5	90.5	81.6	1991
Pohokura Saddle	16	164.5	97.8	1621.5	89.4	81.3	1991
Omaru at Charlies	18	166.5	125.6	1861.5	111.7	102.4	2006

Rain gauge	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	
Omahine at Moana Trig	17	117.5	96.9	1399.5	89.6	82.2	2007
Waitotara at Rimunui Station	13	88.0	75.1	1314.5	104.6	95.4	1994
Waitotara at Ngutuwera	16	79.5	76.4	1225.0	105.1	95.3	1999
Tawhiti at Duffys	13	91.0	101.1	1075.0	107.5	97.1	1994
Patea at Bore 3	15	92.6	106.9	1058.0	98.7	89.2	2006
Waitotara at Hawken Rd	17	73.4	74.1	1006.8	91.4	83.5	2016

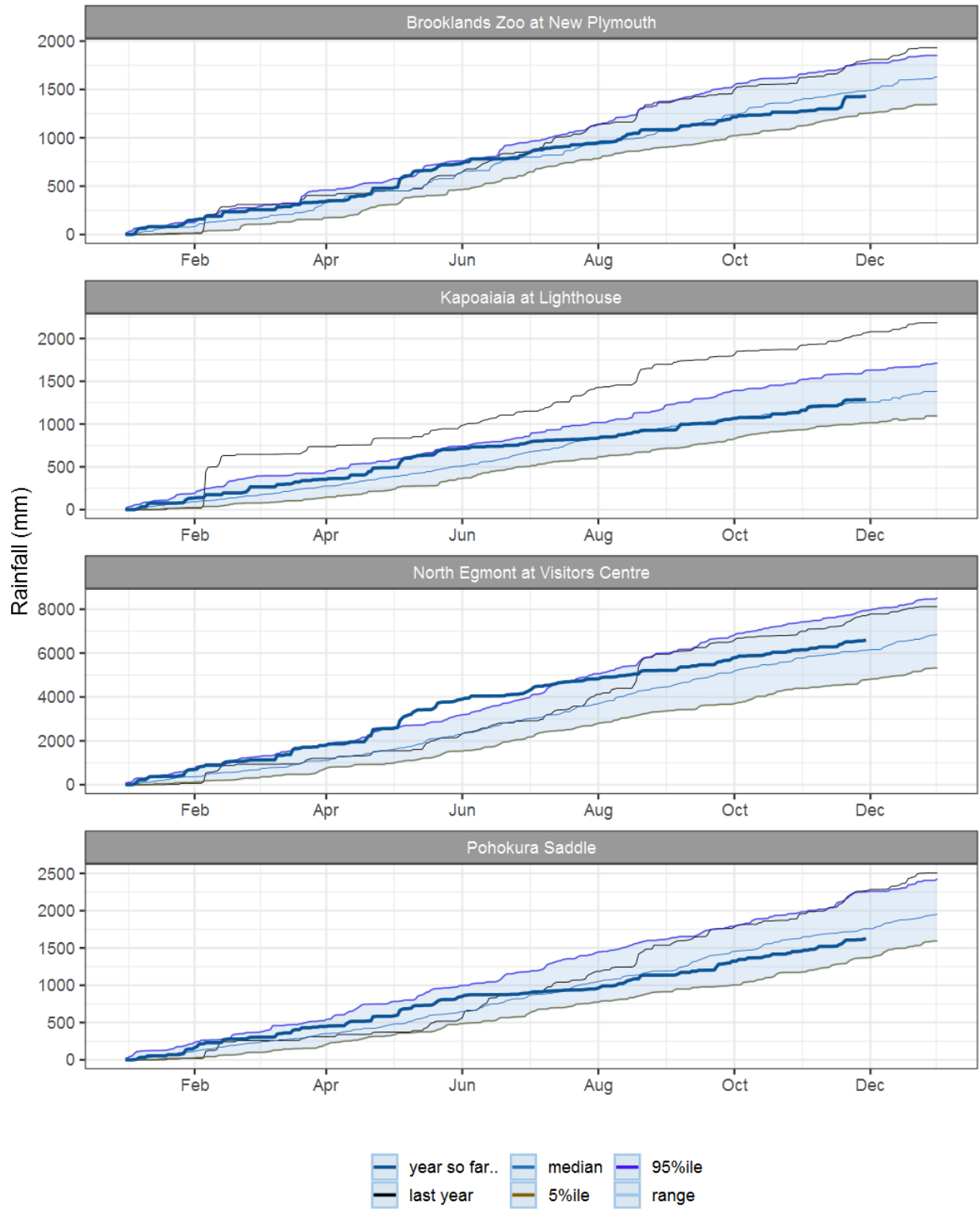


Figure 1.1: This years and last years data set in context of historic record at selected rain gauge sites in Taranaki.

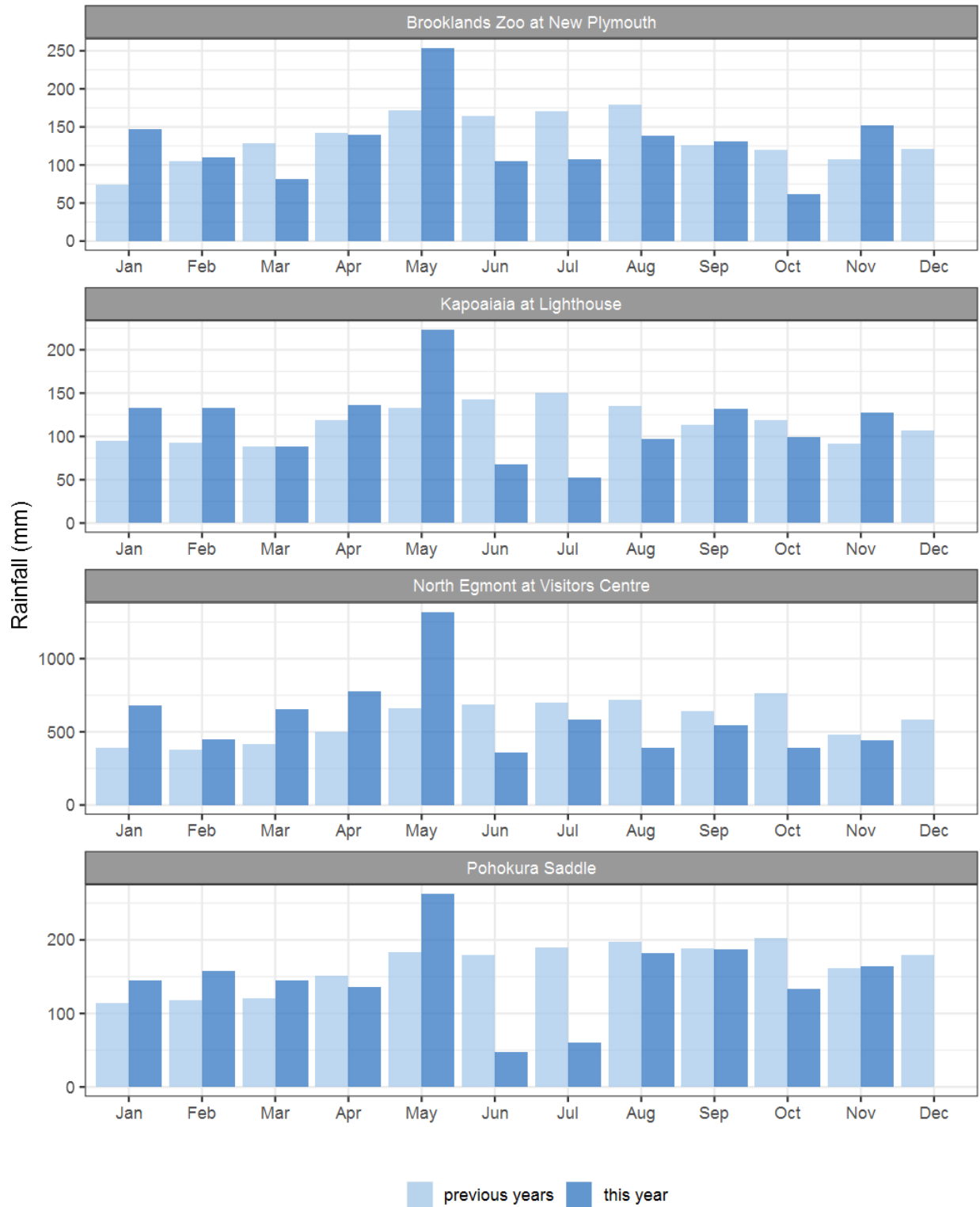


Figure 1.2: Monthly rainfall totals for this month and the mean of all previously recorded months.

2. River Flow

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

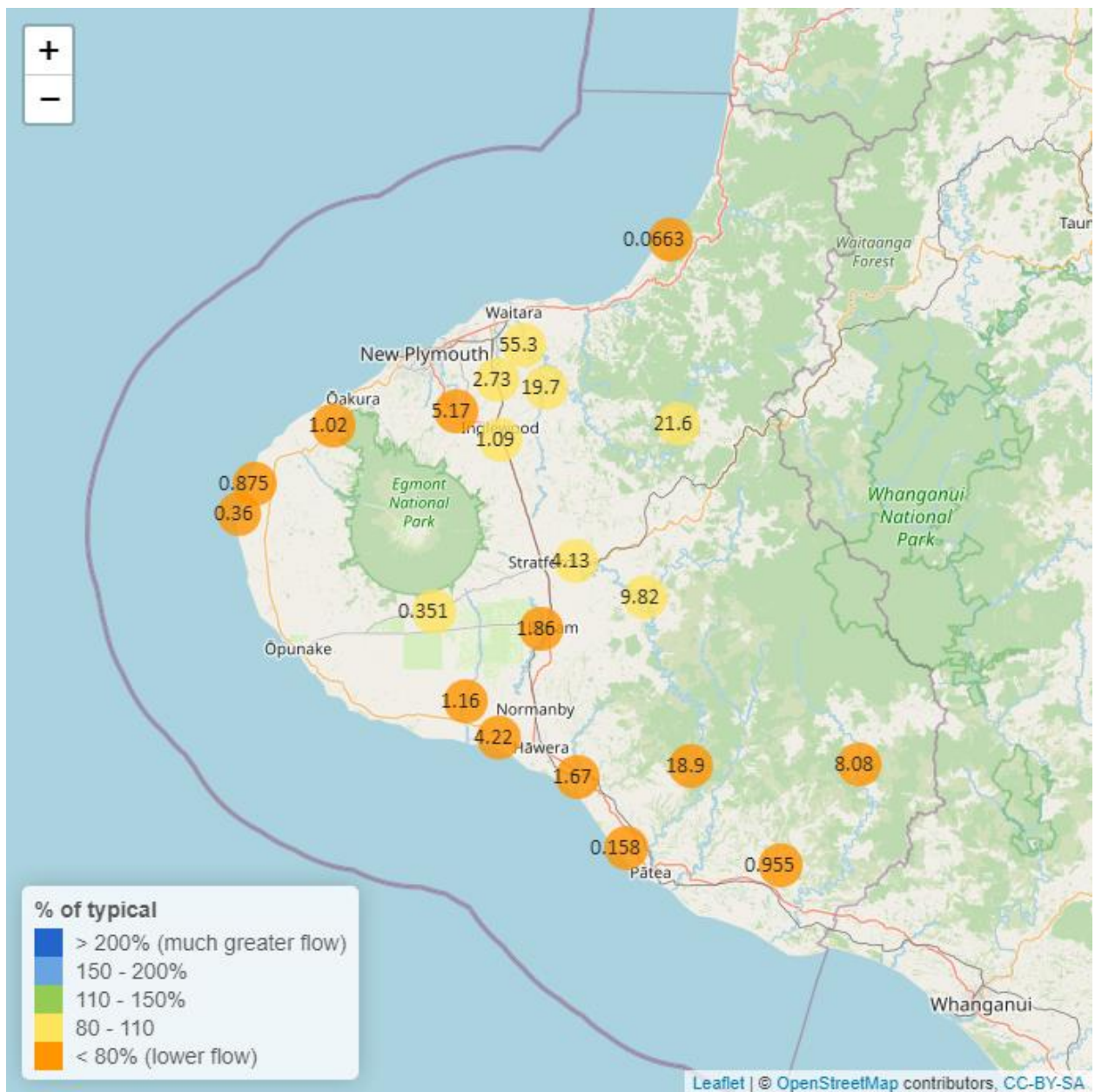


Table 2: Summary of high, low and mean flow for November and for November in all preceding years of record.

November 2023 - Recorded flows (m ³ /sec)								
River and Site	Highs		Lows		Mean		November maximum	Data years
	current month	historic	current month	historic	current month	historic		
Kaikura below 7346	0.27	0.44	0.08	0.09	0.16	0.26	0.60	8

November 2023 - Recorded flows (m3/sec)								
River and Site	Highs		Lows		Mean		November maximum	Data years
	current month	historic	current month	historic	current month	historic		
Kapoaiaia at Lighthouse	1.21	3.07	0.14	0.35	0.36	1.08	3.32	37
Kapuni at Normanby Rd	1.88	3.71	0.74	0.64	1.16	1.66	9.43	24
Mangaehu at Bridge	35.70	39.40	3.55	3.28	9.82	12.10	61.20	45
Manganui at Everett Park	63.00	56.70	7.23	4.44	19.70	18.10	231.00	32
Mangaoraka at Corbett Rd	7.32	5.48	0.66	0.44	2.34	1.86	44.20	48
Mangati at SH3	0.45	0.26	0.08	0.01	0.20	0.09	1.81	11
Mangawheroiti Above Intake W.W	0.55	0.77	0.25	0.19	0.35	0.34	2.71	11
Mangorei at Pipebridge	7.22	6.82	0.50	0.53	2.02	2.29	44.80	14
Moumahaki at Johnston Rd	2.10	7.06	0.49	0.49	0.96	2.16	6.93	6
Ngatoro at SH3	3.19	3.53	0.49	0.33	1.09	1.19	21.80	35
Patea at McColls Bridge	50.30	68.50	3.33	2.37	18.90	26.70	70.50	33
Patea at Skinner Rd	10.60	12.80	1.51	1.12	4.13	4.45	53.90	45
Tangahoe below Railway Bridge	3.52	16.50	0.92	1.47	1.67	5.40	14.60	5
Tawhiti at Duffys	0.91	1.56	0.39	0.31	0.59	0.77	2.59	37
Tawhiti below Meat Plant	0.80	1.34	0.43	0.40	0.55	0.74	1.54	12
Timaru at Tataraimaka	3.56	5.30	0.40	0.51	1.02	1.85	8.93	10
Waikaramarama at Bridge	0.23	0.72	0.01	0.01	0.07	0.17	2.66	6
Waingongoro at Eltham Rd	4.21	6.54	0.76	0.73	1.86	2.43	26.30	48
Waingongoro at SH45	7.82	16.10	2.55	2.58	4.22	6.53	37.30	42
Waiongana at SH3a	9.47	7.71	0.85	0.53	2.73	2.65	54.50	43
Waitara at Bertrand Rd	219.00	205.00	16.30	10.50	55.30	55.60	370.00	42
Waitara at Purangi Bridge	95.10	94.30	3.86	0.93	21.60	21.50	154.00	24
Waitotara at Rimunui Station	21.20	41.50	3.74	4.74	8.08	13.00	68.40	18
Waiwhakaiho at Egmont Village	16.80	23.20	2.24	2.27	5.17	7.68	108.00	43
Warea at Coast	2.28	4.80	0.43	0.53	0.88	1.57	4.57	7
Weraweraonga at 749 Mangawhio Rd	0.89	5.40	0.12	0.20	0.34	1.44	3.19	6

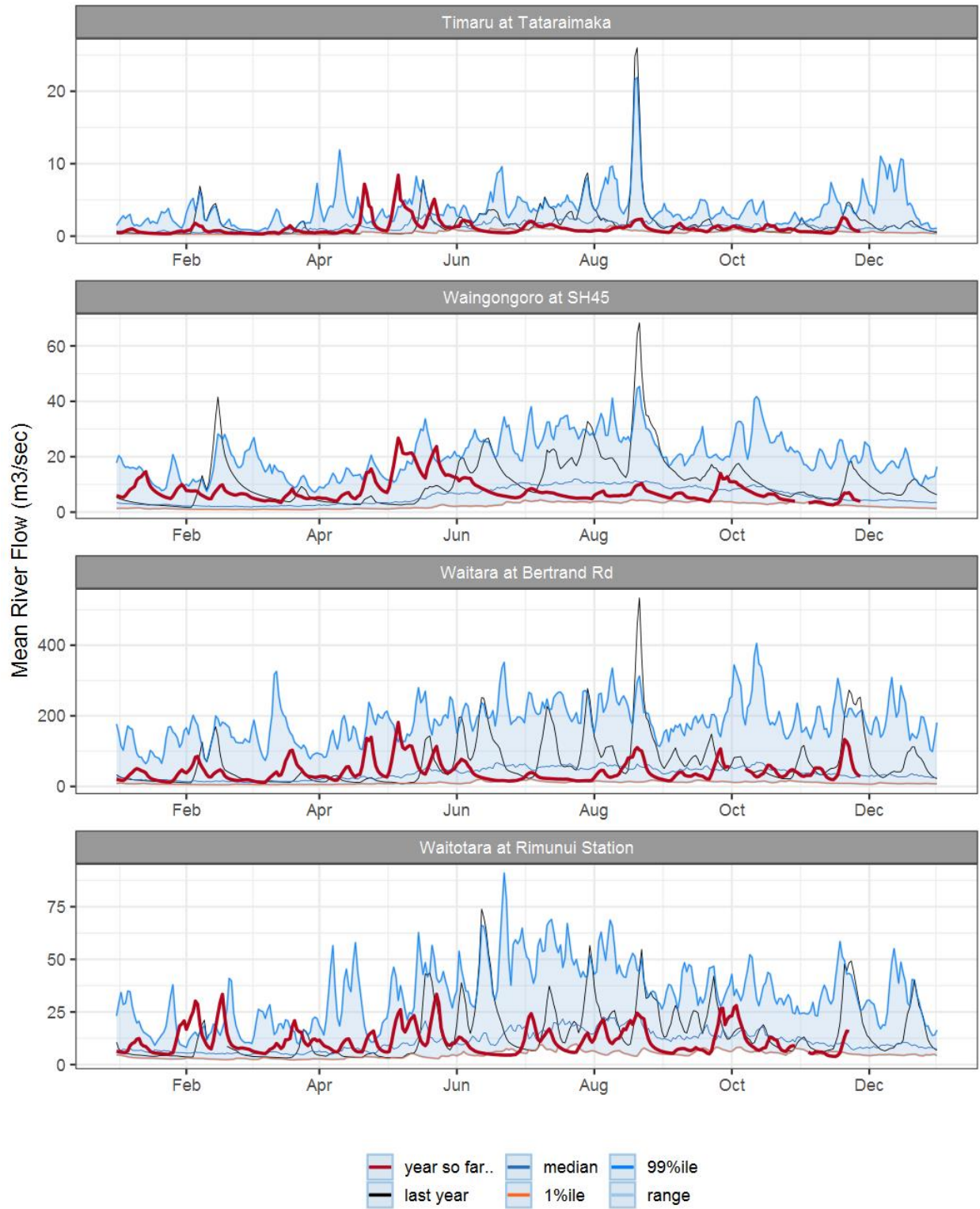


Figure 2.1: Running average river flows for selected sites, set in context of the historic record.

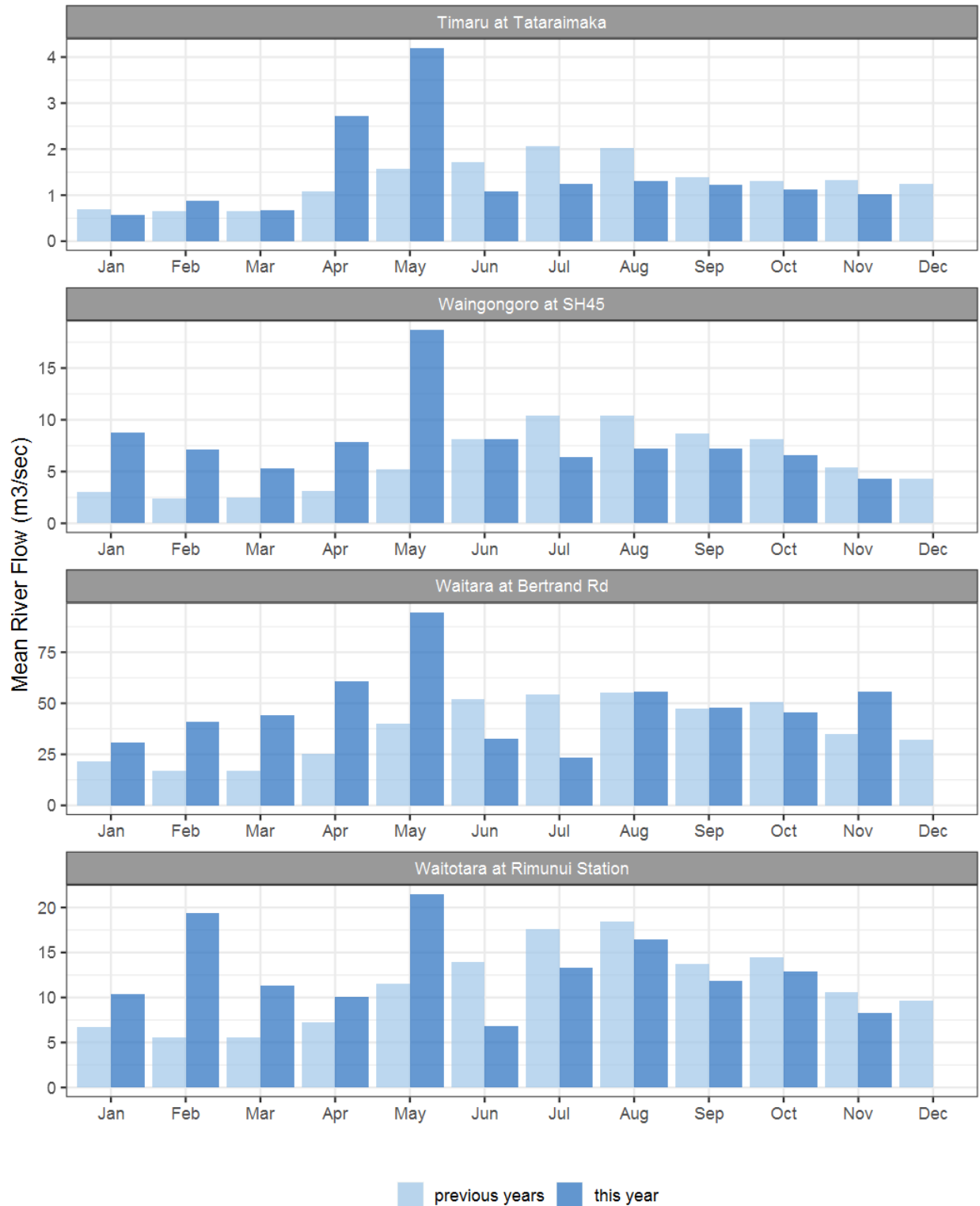


Figure 2.2: Monthly mean river flow for this month and the mean of all previously recorded months.

3. River Temperature

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

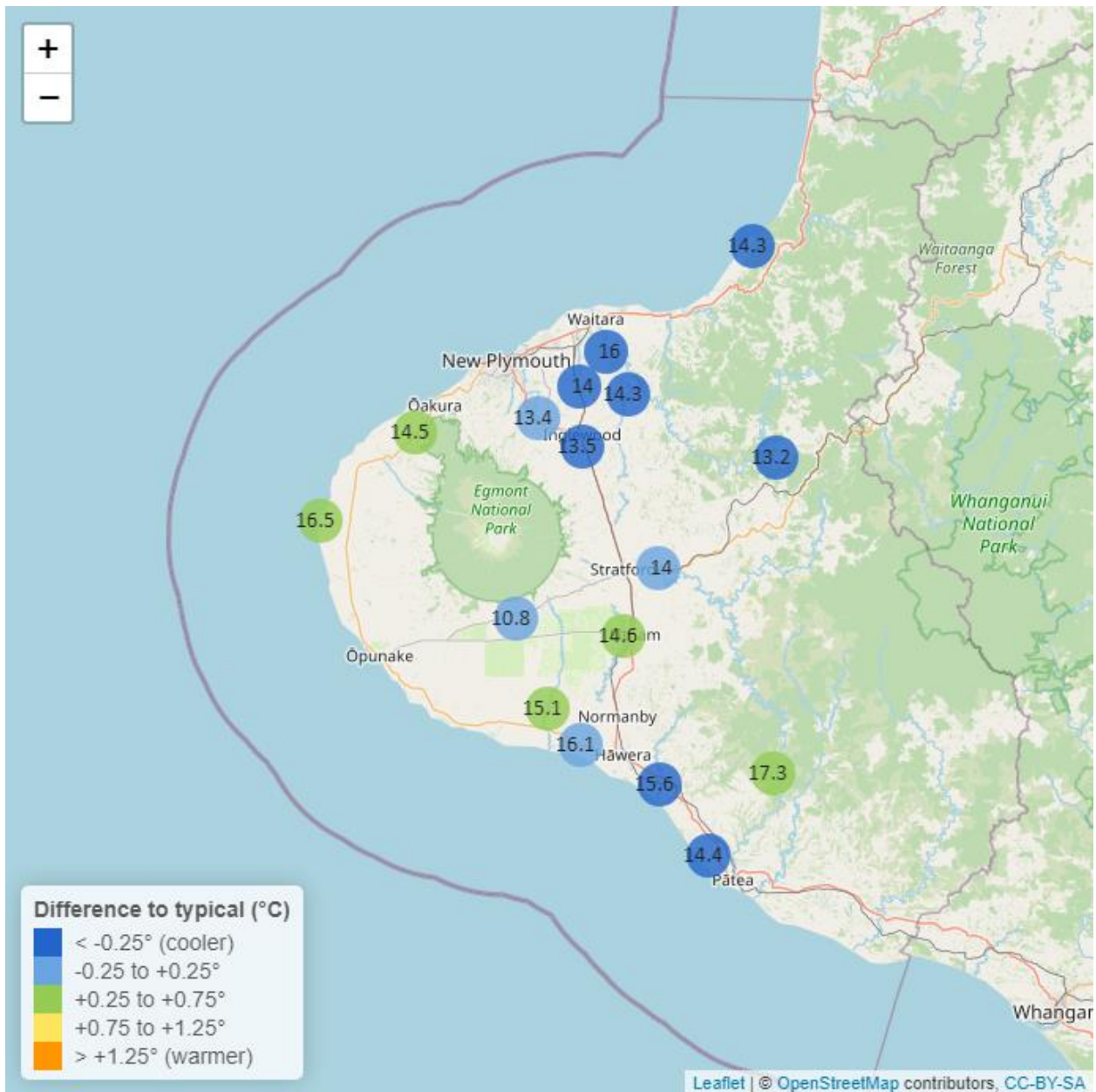


Table 3: Summary of high, low and mean river temperature for November and for November in all preceding years of record.

November 2023 - River Temperatures (°C)								
Monitoring Site	Highs		Lows		Mean		November maximum	data years
	current month	historic	current month	historic	current month	historic		
Kaikura below 7346	16.6	17.2	12.40	12.40	14.4	14.8	18.0	8
Kapoaiaia at Lighthouse	20.2	20.3	13.20	12.60	16.5	16.2	22.2	23
Kapuni at Normanby Rd	18.7	19.3	11.90	11.20	15.1	14.8	20.9	24
Manganui at Everett Park	16.4	18.8	12.30	12.50	14.3	15.3	17.1	15
Mangaoraka at Corbett Rd	17.0	19.1	12.70	12.70	14.9	15.6	19.0	19
Mangati at SH3	17.4	17.9	14.10	13.50	15.9	15.8	18.3	11
Mangawheroiti Above Intake W.W	12.7	13.2	9.04	8.55	10.8	10.8	13.6	11
Mangorei at Pipebridge	17.5	18.6	12.40	11.60	14.8	14.7	18.7	10
Matau at Woolshed	15.9	18.3	10.90	11.70	13.2	14.5	17.1	6
Ngatoro at SH3	16.1	17.0	11.00	10.90	13.5	13.9	18.0	23
Patea at McColls Bridge	19.1	19.5	15.50	14.80	17.3	16.8	19.6	9
Patea at Skinner Rd	16.3	17.6	11.70	11.40	14.0	14.2	17.7	19
Tangahoe below Railway Bridge	18.3	19.1	13.20	13.20	15.6	16.0	19.8	5
Tawhiti at Duffys	16.9	18.2	13.60	12.90	15.3	15.5	18.4	19
Tawhiti below Meat Plant	17.0	17.7	12.70	12.70	14.9	15.1	18.4	24
Timaru at Tataraimaka	16.9	17.6	12.60	11.40	14.5	14.1	18.5	10
Waikaramarama at Bridge	16.1	16.9	12.10	12.80	14.3	14.9	18.1	6
Waingongoro at Eltham Rd	17.6	17.7	12.00	11.20	14.6	14.1	18.9	20
Waingongoro at SH45	18.4	19.2	13.60	13.10	16.1	15.9	19.7	19
Waiongana at SH3a	16.3	17.5	11.60	11.70	14.0	14.4	17.9	12
Waitara at Bertrand Rd	17.8	19.9	14.00	13.90	16.0	16.7	18.9	32
Waiwhakaiho at Egmont Village	16.3	16.5	10.80	10.20	13.4	13.2	18.3	30

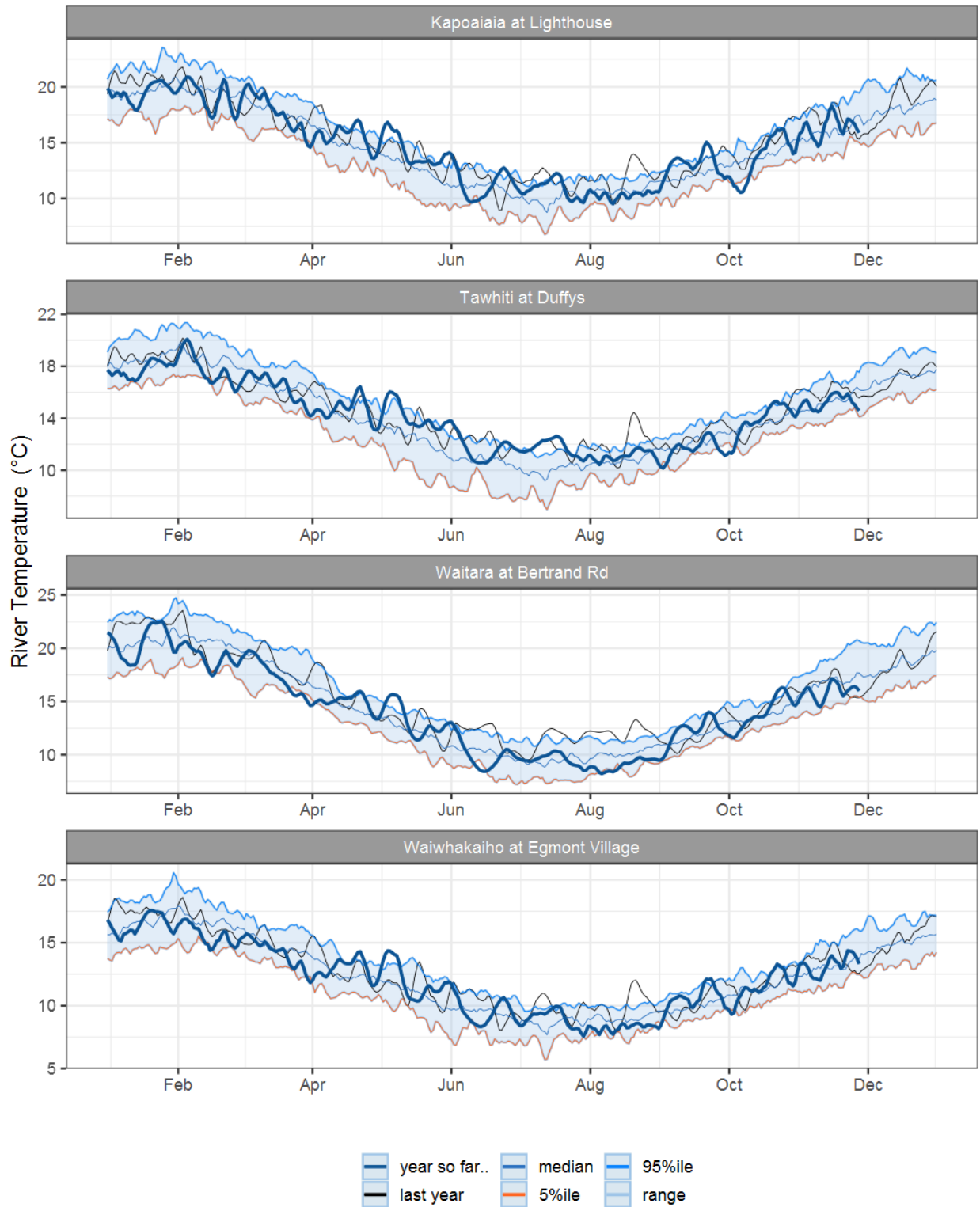


Figure 3.1: Running average river temperature for selected sites, set in context of the historic record.

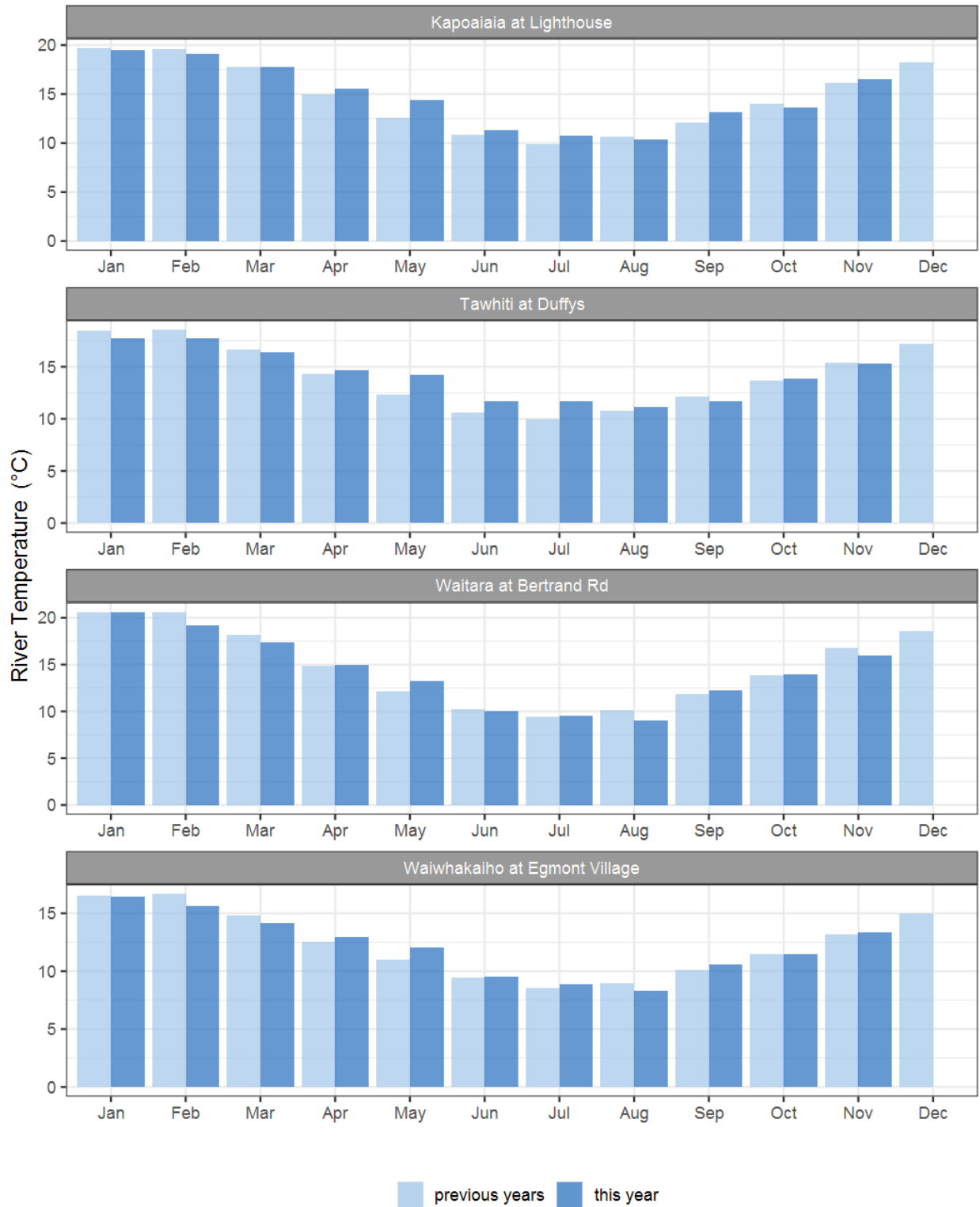


Figure 3.2: Monthly mean river temperature for this month and the mean of all previously recorded months.

4. Air Temperature

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

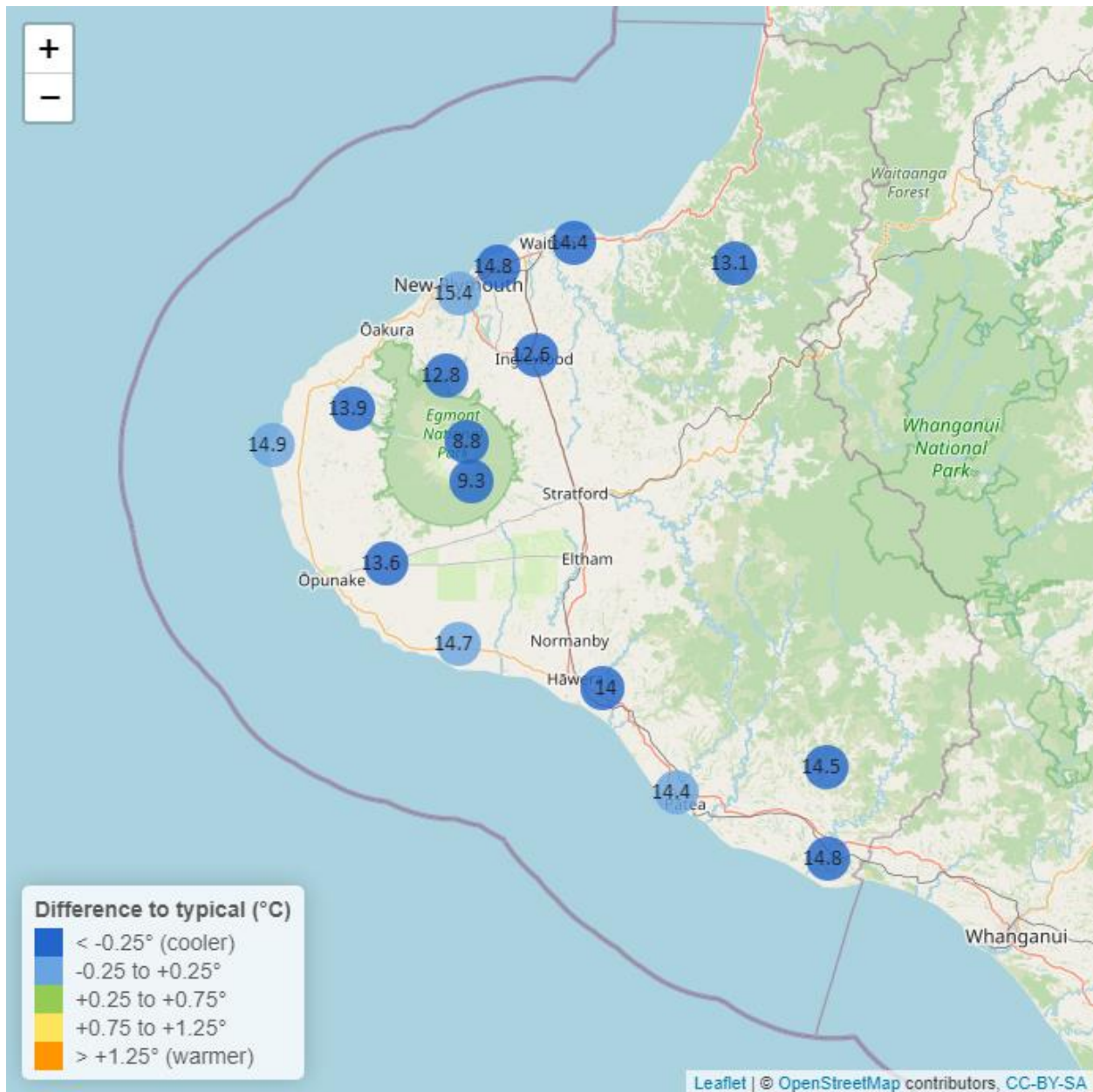


Table 4: Summary of high, low and mean air temperature for November and for November in all preceding years of record.

November 2023 - Air Temperature (°C)								
Monitoring Site	Highs		Lows		Mean		November maximum	data years
	current month	historic	current month	historic	current month	historic		
Brooklands Zoo at New Plymouth	20.8	21.3	10.40	9.62	15.4	15.50	25.8	11
Dawson Falls	15.3	16.7	4.42	4.50	9.3	10.40	17.9	8
Inglewood at Oxidation Ponds	18.2	20.5	7.73	7.57	12.6	14.00	23.2	12
Kapoaiaia at Lighthouse	17.6	18.7	11.50	10.80	14.9	15.10	20.4	11
Kaupokonui at Glenn Rd	19.3	20.1	11.10	9.62	14.7	14.90	21.1	9
Mangati at SH3	18.6	19.7	10.30	9.62	14.8	15.10	22.5	11
Mangorei Upper at Forest Hill	17.4	18.2	8.16	8.42	12.8	13.30	21.5	6
Motunui M39 at Weston W3	18.3	19.6	9.69	10.10	14.4	15.20	22.3	7
North Egmont at Visitors Centre	14.5	16.1	3.86	3.92	8.8	9.89	18.2	9
Patea at Bore 3	18.2	19.1	10.80	9.82	14.4	14.60	20.7	12
Stony at Mangatete Bridge	17.7	19.3	9.79	9.95	13.9	14.70	22.4	7
Taungatara at Eltham Rd	17.2	18.8	10.40	9.51	13.6	14.20	19.4	8
Tawhiti at Duffys	18.3	19.8	7.75	7.93	14.0	14.50	20.6	10
Uruti at Kaka Rd	17.6	19.0	8.57	8.90	13.1	13.90	22.1	5
Waitotara at Hawken Rd	19.4	20.7	10.70	9.82	14.8	15.40	22.0	7
Waitotara at Ngutuwera	18.3	20.1	9.87	9.84	13.8	14.90	21.5	5
Waiwhakaiho at Hillsborough	18.4	19.5	10.60	9.70	14.6	14.70	23.3	11
Weraweraonga at 749 Mangawhio Rd	20.3	22.0	8.61	8.66	14.5	15.40	23.7	6

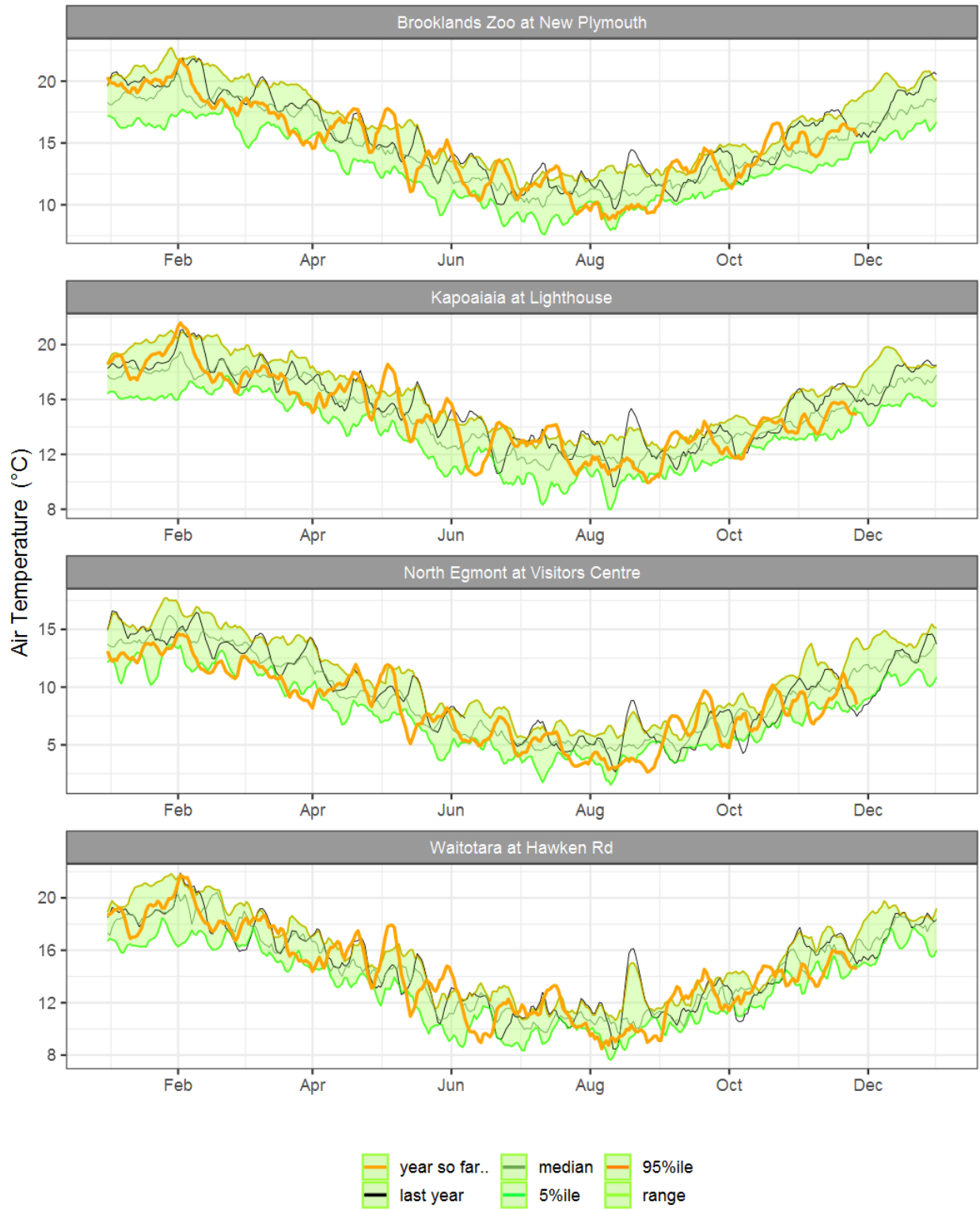


Figure 4.1: Running average air temperature for selected sites, set in context of the historic record.

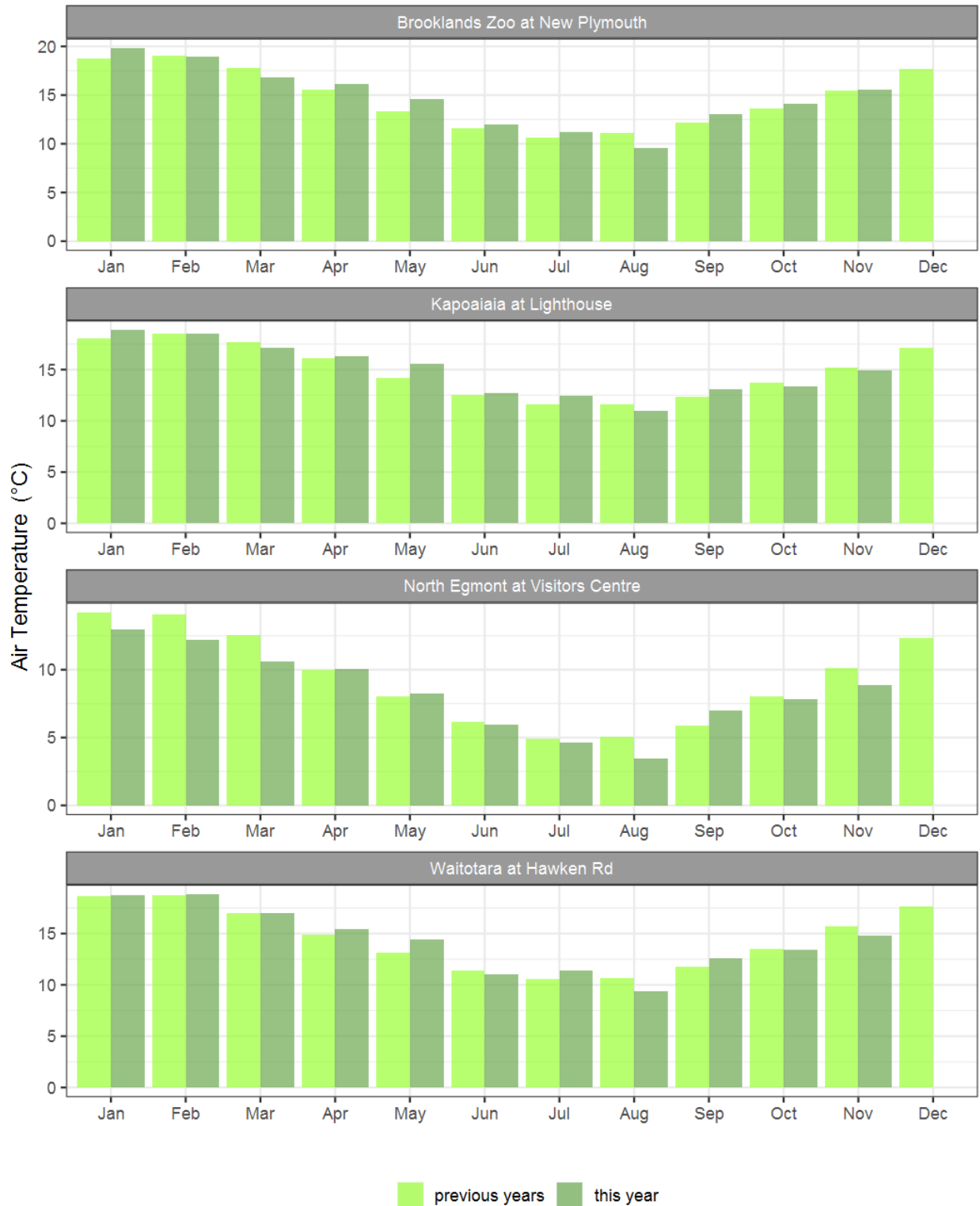


Figure 4.2: Monthly mean air temperature for November and the mean of all previously recorded months.

5. Soil Moisture

Map 5: November mean soil moisture content (%).

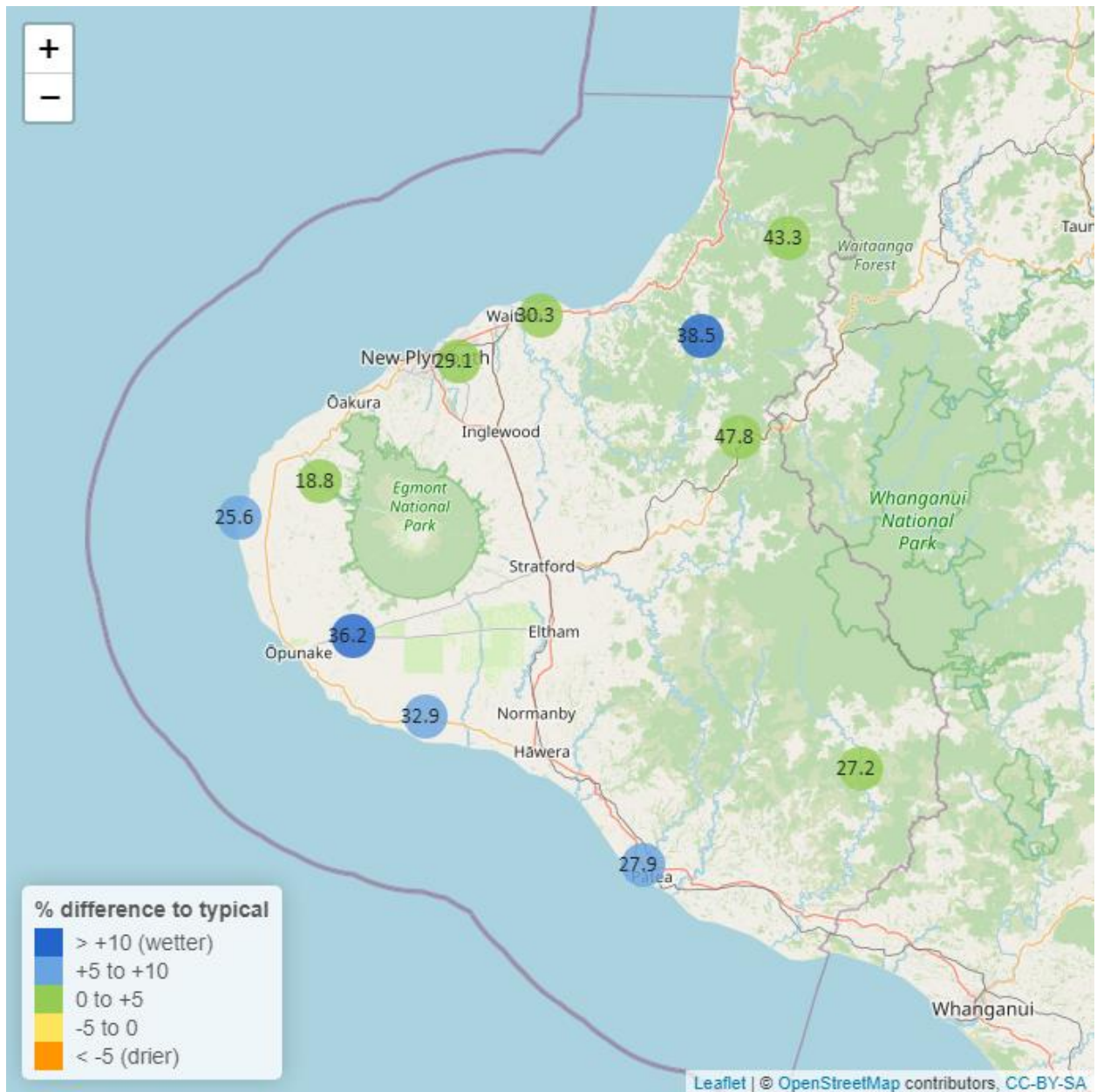


Table 5: Summary of high, low and mean soil moisture for November and for November in all preceding years of record.

November 2023 - Soil Moisture (%)								
Monitoring Site	Highs		Lows		Mean		November maximum	Data years
	current month	historic	current month	historic	current month	historic		
Kapoaiaia at Lighthouse	27.0	29.2	24.3	16.0	25.6	23.6	27.8	11
Kaupokonui at Glenn Rd	33.9	35.6	31.8	23.5	32.9	30.8	34.7	12
Kotare at OSullivans	49.6	48.7	39.1	32.6	43.3	40.2	55.6	11
Motunui M39 at Weston W3	33.3	32.3	28.0	23.2	30.3	28.8	35.0	9
Patea at Bore 3	29.4	30.6	26.2	22.7	27.9	26.9	32.4	7
Pohokura Saddle	51.8	51.4	42.3	36.9	47.8	43.6	53.4	9
Stony at Mangatete Bridge	25.0	24.4	15.3	11.3	18.8	18.0	28.6	7
Taungatara at Eltham Rd	39.0	42.5	33.3	26.5	36.2	34.9	43.9	10
Uruti at Kaka Rd	40.5	45.0	36.3	32.2	38.5	40.5	40.7	12
Waitotara at Rimunui Station	29.5	29.3	25.2	23.4	27.2	26.1	31.4	6
Waiwhakaiho at Hillsborough	32.0	32.0	27.2	23.3	29.1	28.1	34.6	11

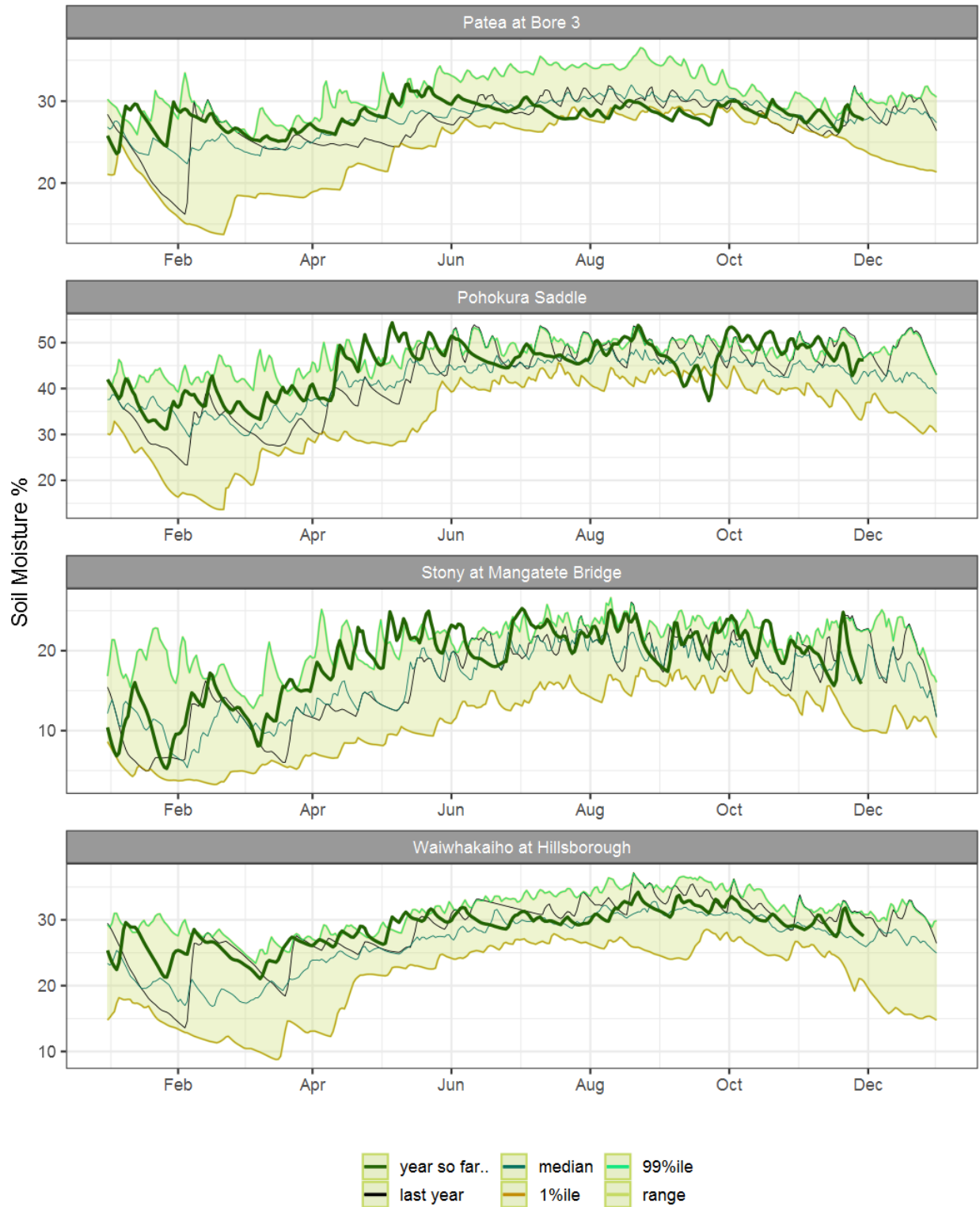


Figure 5.1: Running average soil moisture for selected sites, set in context of the historic record.



Figure 5.2: Monthly mean soil moisture for this month and the mean of all previously recorded months.

6: Soil Temperature

Map 6: November mean soil temperatures with difference to long-term mean (°C).

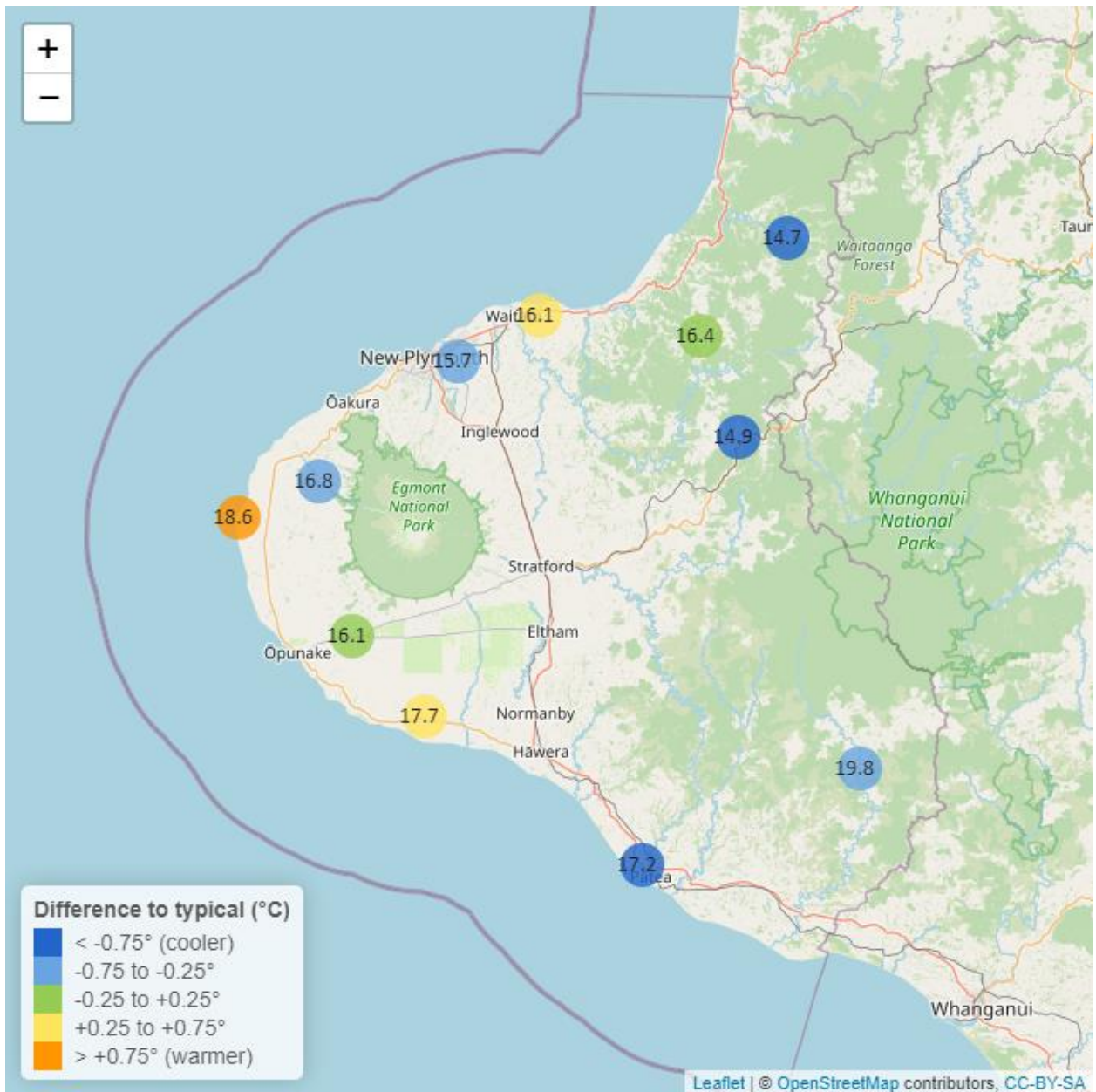


Table 6: Summary of high, low and mean soil temperature for November and for November in all preceding years of record.

November 2023 - Soil Temperatures (°C)								
Monitoring Site	Highs		Lows		Mean		November maximum	data years
	current month	historic	current month	historic	current month	historic		
Kapoaiaia at Lighthouse	22.0	21.1	15.8	14.7	18.6	17.6	23.8	11
Kaupokonui at Glenn Rd	19.5	20.4	15.8	14.2	17.7	17.1	19.9	12
Kotare at OSullivans	15.7	18.5	13.9	12.3	14.7	15.5	15.9	11
Motunui M39 at Weston W3	17.2	18.4	14.8	13.3	16.1	15.7	17.6	9
Patea at Bore 3	19.2	23.0	15.5	15.5	17.2	18.6	20.5	7
Pohokura Saddle	16.5	18.2	13.8	13.7	14.9	15.8	17.3	9
Stony at Mangatete Bridge	18.9	20.1	14.6	14.5	16.8	17.3	20.4	6
Taungatara at Eltham Rd	18.1	18.6	14.0	13.7	16.1	16.0	19.4	10
Uruti at Kaka Rd	17.8	19.4	15.3	14.1	16.4	16.5	18.3	12
Waitotara at Rimunui Station	22.1	23.4	17.8	17.8	19.8	20.5	24.6	6
Waiwhakaiho at Hillsborough	17.8	18.9	14.1	14.0	15.7	16.4	19.0	11

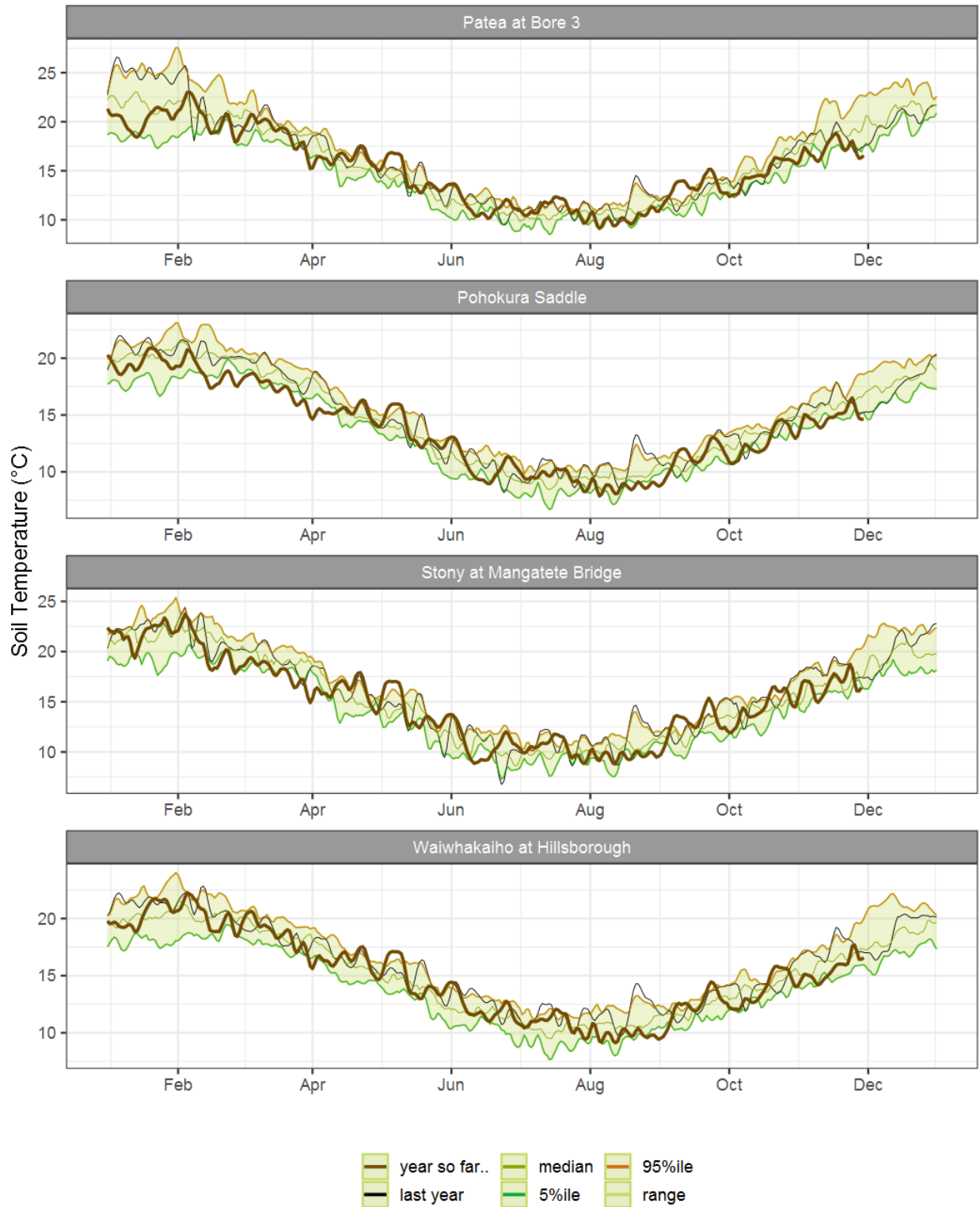


Figure 6.1: Running average soil temperature for selected sites, set in context of the historic record.



Figure 6.2: Monthly mean soil temperature for this month and the mean of all previously recorded months.

7: Wind Speed and Maximum Gusts

Map 7: November mean of wind speed with difference to long-term values (km/hr).

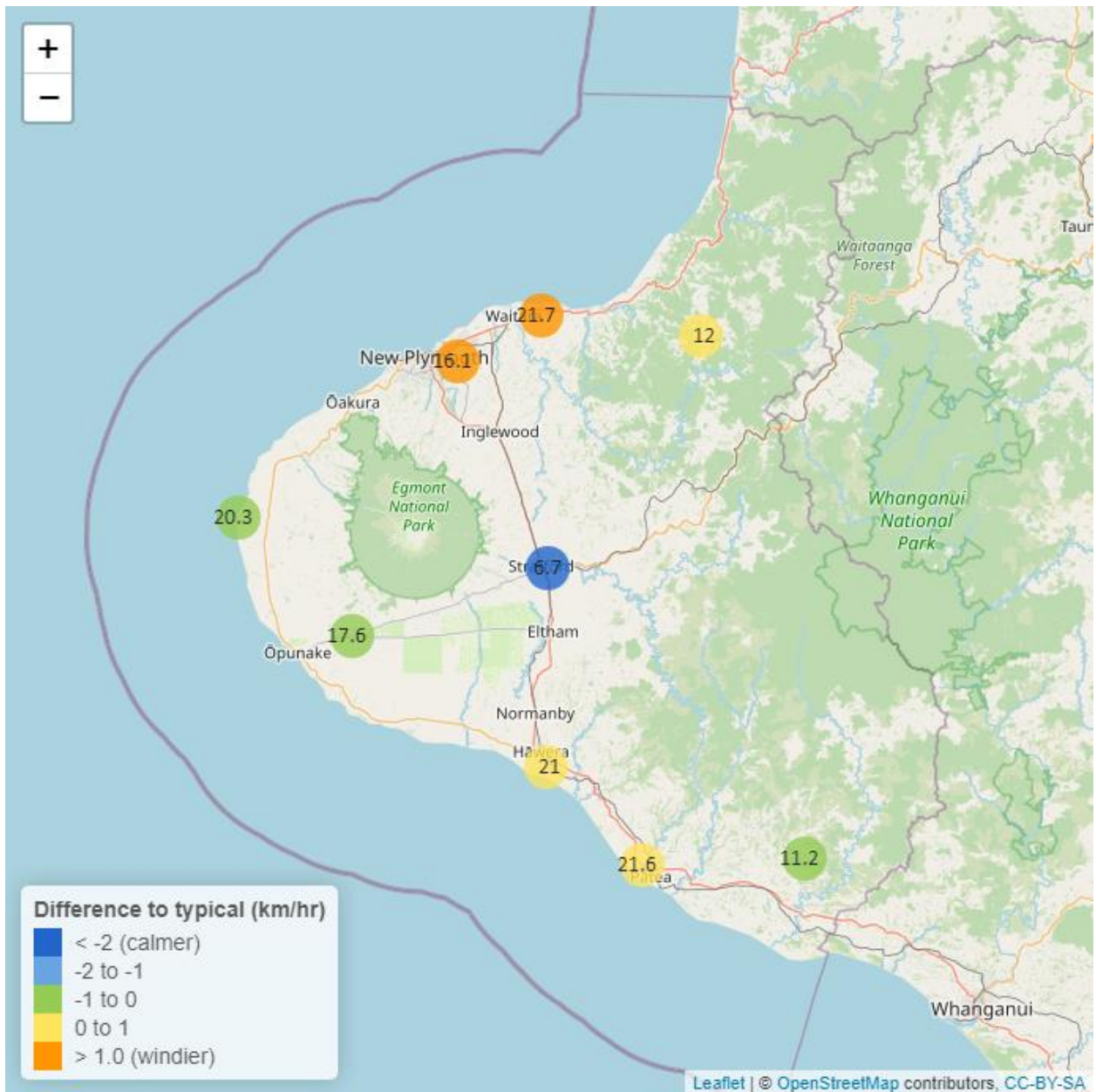


Table 7: Summary of high, low and mean wind speed for November and for November in all preceding years of record.

November 2023 - Wind Speed (average) - (km/hr)								
Monitoring Site	Highs		Lows		Mean		November maximum	Data years
	current month	historic	current month	historic	current month	historic		
Hawera AWS	38.9	38.0	7.41	5.56	21.0	20.20	59.3	18
Kapoaiaia at Lighthouse	40.8	39.5	6.63	6.55	20.3	21.00	62.7	23
New Plymouth AWS	40.7	38.9	6.48	5.56	21.7	20.60	59.3	16
Patea at Bore 3	40.0	41.1	6.94	6.67	21.6	21.50	54.6	8
Patea at Stratford	15.3	19.8	2.00	2.16	6.7	8.95	26.0	17
Taungatara at Eltham Rd	33.0	35.1	6.12	6.42	17.6	18.10	43.0	7
Uruti at Kaka Rd	23.8	23.9	4.08	3.75	12.0	11.60	36.2	26
Waitotara at Ngutuwera	21.6	23.7	3.28	2.38	11.2	11.60	34.2	25
Waiwhakaiho at Hillsborough	33.4	30.0	4.29	4.06	16.1	14.40	49.3	6

Table 8: Summary of high, low and maximum wind gusts for November and for November in all preceding years of record.

November 2023 - Wind Speed (Max. Gust) - (km/hr)								
Monitoring Site	Highs		Lows		Mean		November maximum	Data years
	current month	historic	current month	historic	current month	historic		
Hawera AWS	77.8	74.1	31.5	25.9	49.4	48.5	88.9	18
Kapoaiaia at Lighthouse	81.7	77.7	20.6	23.0	44.4	47.1	90.9	23
New Plymouth AWS	74.1	74.1	31.5	24.1	49.1	47.1	88.9	16
Patea at Bore 3	73.2	78.3	27.2	25.6	49.3	49.3	83.8	8
Patea at Stratford	54.4	63.0	20.2	21.6	33.3	39.4	57.6	17
Taungatara at Eltham Rd	73.7	77.7	28.6	25.6	45.5	47.2	79.9	7
Uruti at Kaka Rd	68.0	72.7	31.0	23.4	42.9	42.3	74.9	25
Waitotara at Ngutuwera	82.1	72.0	28.4	22.3	51.2	44.1	93.2	25
Waiwhakaiho at Hillsborough	76.0	72.1	31.0	23.2	47.0	42.5	88.3	6

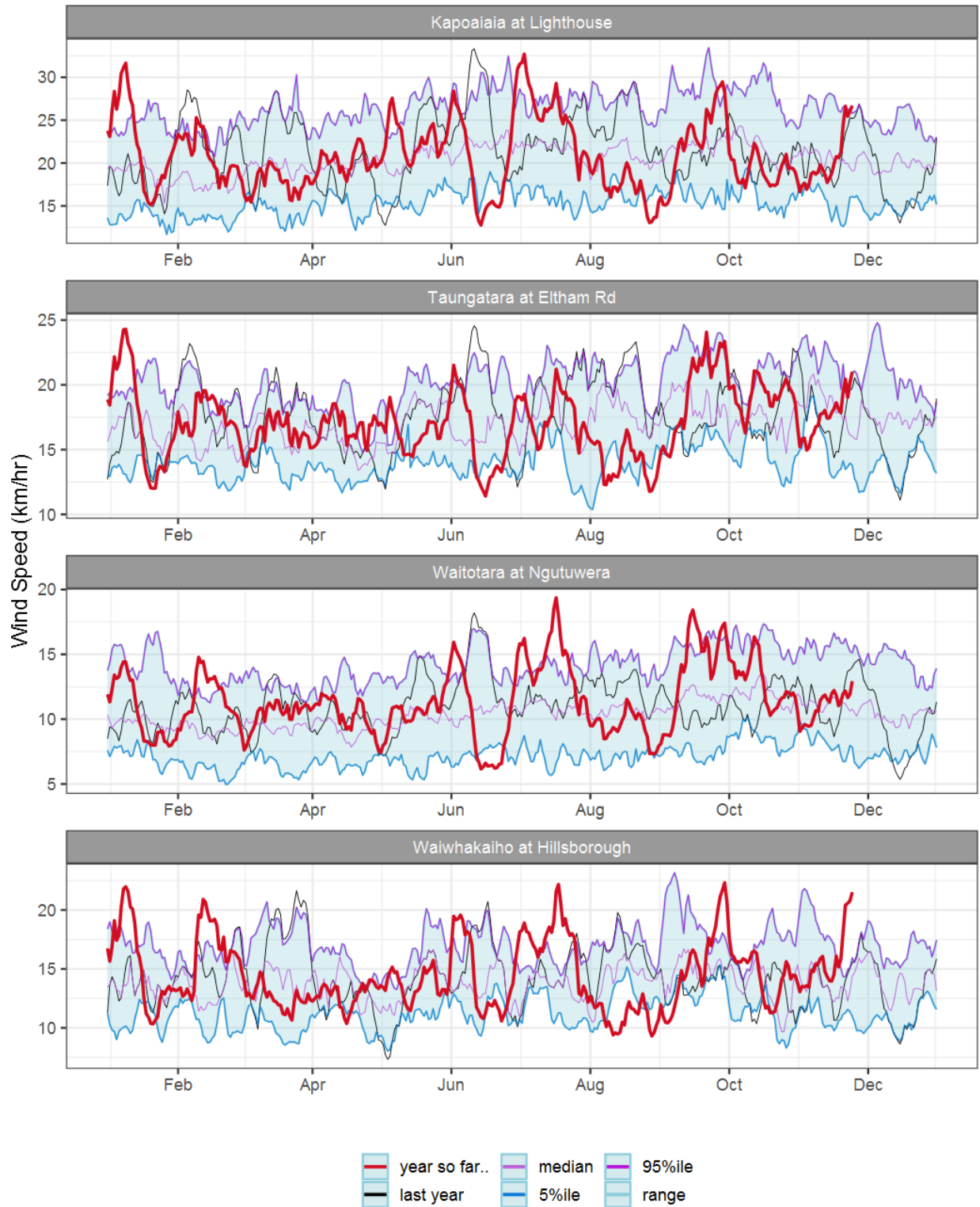


Figure 7.1: Running average wind speed (km/hr) for selected sites, set in context of the historic record.

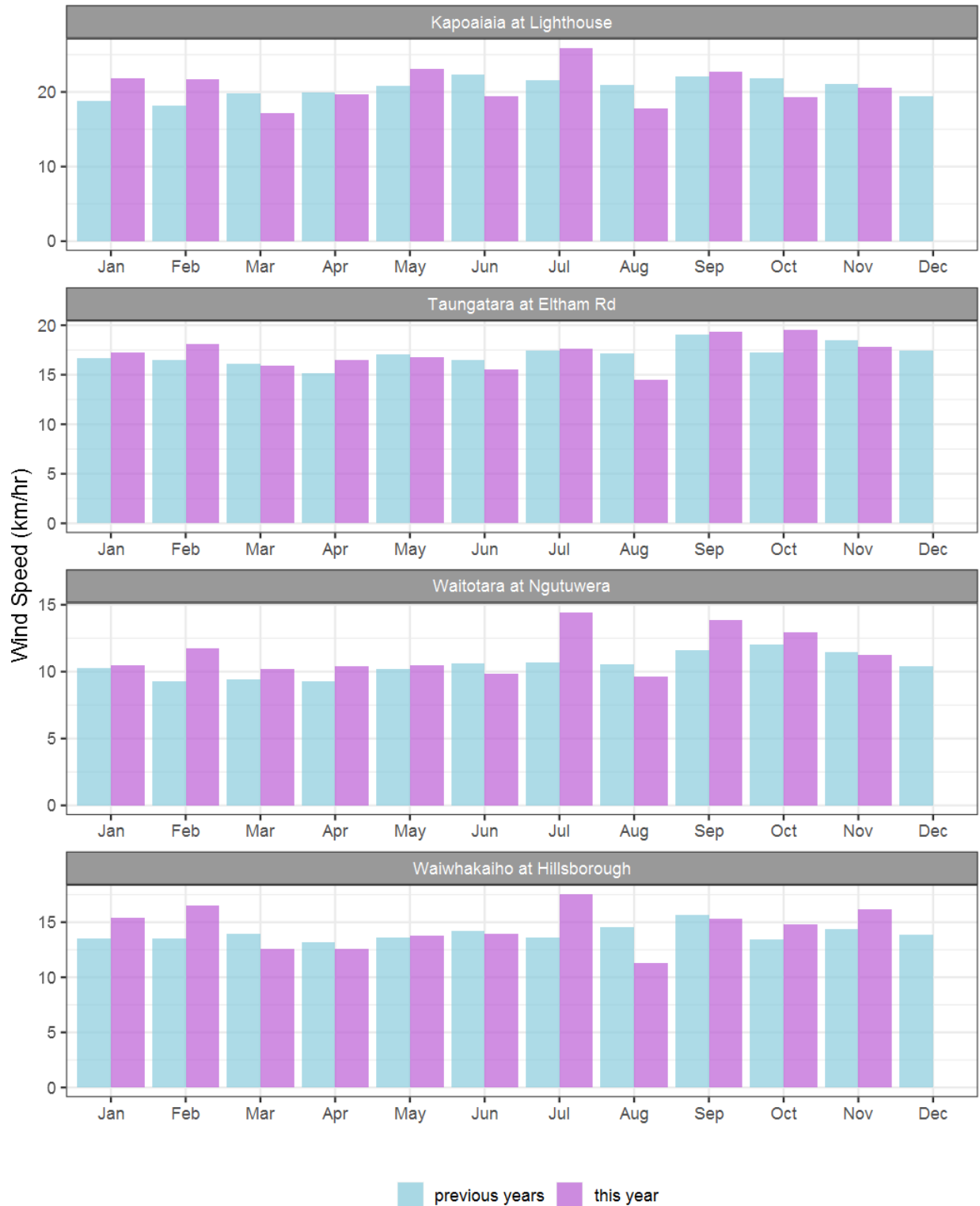


Figure 7.2: Monthly mean wind speed (km/hr) for selected sites, relative to the mean of all previously recorded months.

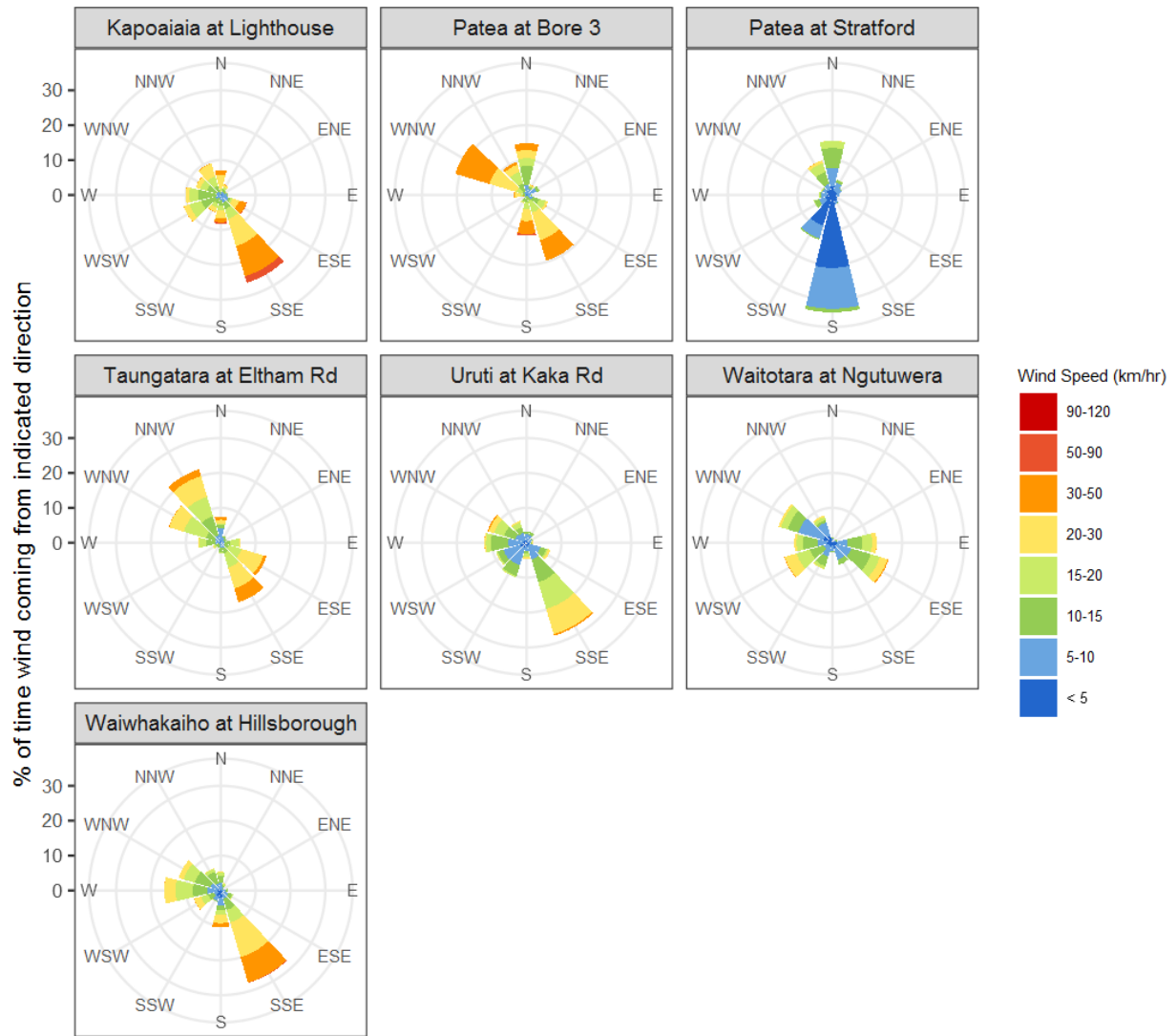


Figure 7.3: Wind roses for November for average wind speed (km/hr).

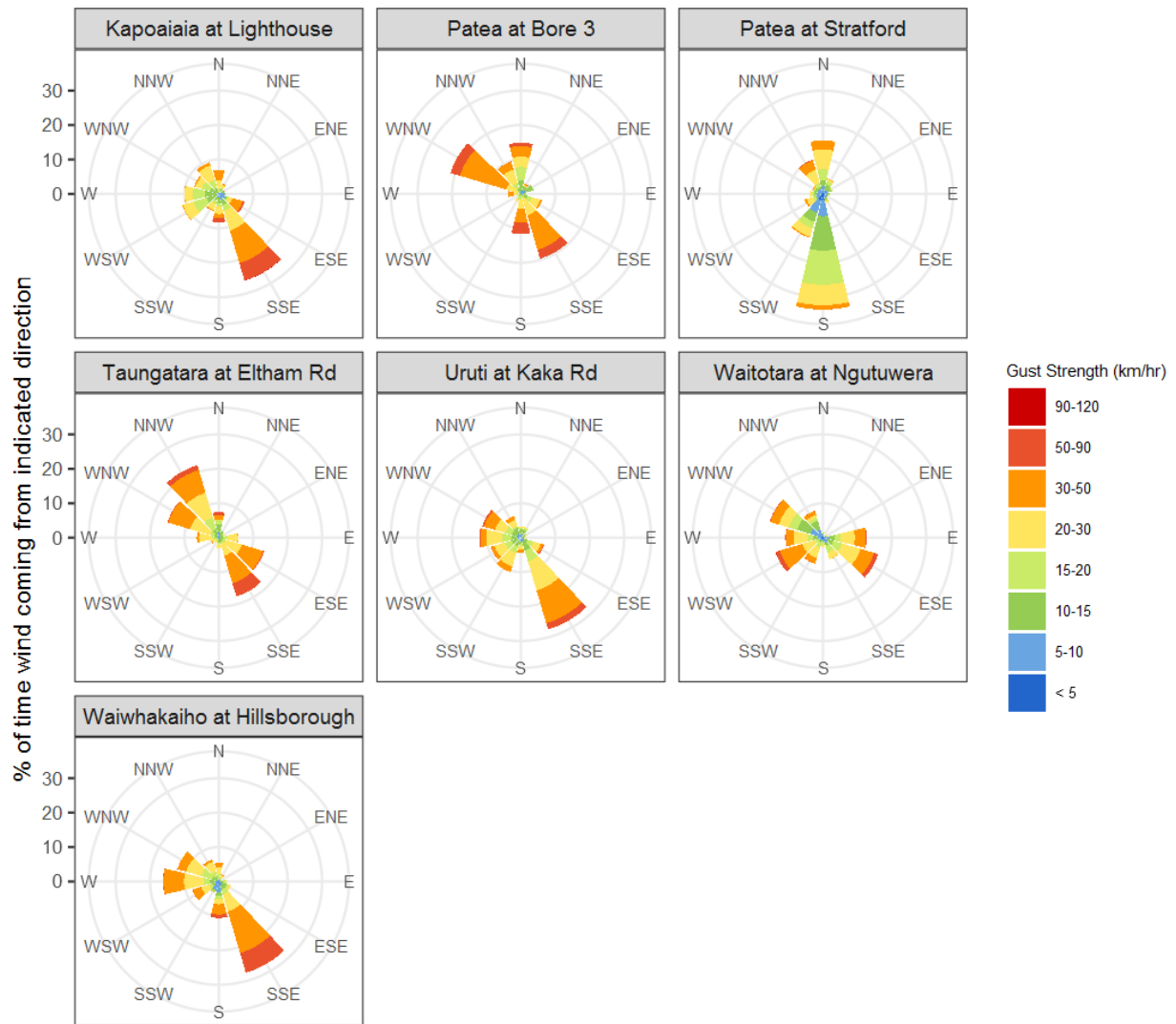


Figure 7.4: Wind roses for November for maximum wind gust (km/hr).

Summary of month's conditions

Rainfall

On average November rainfall was 143.9 mm, 3% more than usual, ranging from 32% less rain at Kaupokonui at Glenn Rd, and 39% more at Waiwhakaiho at Hillsborough.

Year to date rainfall ranges from 11% less rainfall at Pohokura Saddle, and 12% more rainfall at Omaru at Charlies, with an average of 2% less than normal. Compared to typical full year totals, on average sites have already received 89% of a typical years rainfall, with the highest value at Omaru at Charlies, 102% of normal, whereas Pohokura Saddle sits at 81% of the typical years total.

River Flow

Mean river flows for November were 26.6% lower than typical values, low flows were 19.8% greater, and high flows 30.1% lower than typical values. The maximum river flow recorded in November was 370 m³/sec at Waitara at Bertrand Rd.

River Water Temperature

Mean river (non-mountain) water temperatures were 14.7 °C, an average of 0.2 °C cooler than long-term November values. Nighttime-low water temperatures were on average 0.3 °C warmer than historic lows, and day-time high temperatures were on average 1 °C cooler than historic highs. The maximum river water temperature recorded in November was 22.2 °C at Kapoiaia at Lighthouse.

Air Temperature

The average air temperature for the region (excluding Te Maunga sites) was 13.5 °C, which is 0.6 °C cooler than long-term November averages. Low air temperatures for November were on average 0.3 °C warmer than the November average for previous years. Day-time high temperatures were on average 1.3 °C cooler than historic highs. The maximum air temperature recorded in November was 25.8 °C at Brooklands Zoo at New Plymouth.

Soil Moisture

The average soil moisture for November across sites in Taranaki region was 32.5%. Soil moistures were on average 1.4% wetter than typical November values. On average, low soil moistures were 5.2% wetter than previous lows, and the highs were on average 0.9% drier than previous values for November.

Soil Temperature

November soil temperatures were generally 0.3 °C cooler than long-term averages. Average nighttime low soil temperatures were 0.7 °C warmer than recorded lows, and upper day-time soil temperatures were on average 1.4 °C cooler than long-term November highs. The maximum soil temperature recorded in November was 24.6 °C at Waitotara at Rimunui Station.

Wind Speed (average and 10 minute gust)

November average wind speeds were 17.7 km/hr, with average gust strength of 47.4 km/hr, these were 0.3 km/hr stronger, and 1.3 km/hr gustier than the long-term average. Average calm weather wind speeds were 0.5 km/hr stronger than recorded lows, and windy conditions were on average 0.2 km/hr stronger than long-term November highs. The maximum wind gust recorded in November was 93.2 km/hr at Waitotara at Ngutuwera. Cape Egmont is generally the windiest station the TRC monitors, and Stratford is often the calmest.

Notes: Low and high values refer to the upper and lower 5th percentiles of the historic record for each site (wind, river flow and soil moisture are upper and lower 1st percentiles). These percentile values give a better indication of the general upper and lower range of the historic data against which to compare the current month. For example, minimum air temperature, because it is the lowest recorded value, accentuates the difference of the current month's colder conditions relative to the historical data. The start year (records began) for each site and variable in the respective tables shows the length of data used to compute historic highs, lows, and "typical values". Sites with a longer data record will generally provide a more reliable comparison to values in the current year.

Report date: 11 December, 2023.