

National Wastewater Surveillance Programme - COVID-19

Week 18 2022 (Week ending 8 May 2022)

Report prepared on 12 May 2022

Overview

SARS-CoV-2, the virus that causes COVID-19 disease, is shed in the faeces of people that are infected and so the viral RNA can be detected in wastewater. As such, testing wastewater for SARS-CoV-2 RNA is an efficient population-based COVID-19 surveillance tool. Based on national and international data, this method has been shown to be an indicator of increasing and decreasing cases (i.e., early warning system) and complements other surveillance tools. A national wastewater COVID-19 surveillance programme was established in 2021 by the Institute of Environmental Science and Research (ESR). This work is funded by the New Zealand Ministry of Health and is part of New Zealand's COVID-19 response.

Wastewater samples are collected from wastewater treatment plants across both the North and South islands of New Zealand. In addition, in Auckland there are a small number of sample sites that are pump stations and manholes. Most sites are sampled at least weekly between Monday and Thursday of any given week. The number of sites and frequency of collection varies over time. Grab or 24-hour composite samples are collected.

Approach

Samples are sent from each wastewater treatment plant to one of the ESR laboratories (Porirua or Christchurch). Processing involves the concentration of virus and extraction of viral RNA. The presence of SARS-CoV-2 RNA in the sample is then determined using RT-qPCR.

A result of '**not detected**', means that SARS-CoV-2 RNA is either absent from the sample, or at a level too low to be detected. When SARS-CoV-2 RNA is **detected**, the concentration in the sample can be calculated. Low amounts of SARS-CoV-2 RNA in a sample may not be able to be accurately quantified and are recorded as less than the limit of quantitation. For quantitation, the raw concentration data (i.e., genome copies per L or per mL) is converted to a viral load of **genome copies per day per person**. This calculation takes into account the flow rate of wastewater entering the wastewater treatment plant and the population in the catchment. This is the population-normalised viral load.

Key Points and Limitations

- SARS-CoV-2 RNA concentrations **should not be compared between wastewater catchments**.
- Day to day variability in SARS-CoV-2 RNA concentrations, especially in smaller catchments, is to be expected. Greater variability is expected with grab samples.
- Generally, increasing viral loads are associated with increasing numbers of people with SARS-CoV-2 infection and vice versa (decreasing concentrations indicating decreasing cases). However, there are a number of factors that affect the amount of viral RNA detected and so data from wastewater surveillance cannot indicate the exact number of COVID-19 cases in the catchment area.
- Results from wastewater testing should not be used in isolation but as an additional tool used for early detection and monitoring trends.
- The number of COVID-19 cases reported via individual testing are reported for each region to provide a comparison to the wastewater results. The cases in each catchment area are an estimate of the number of people in that wastewater catchment area that have reported a positive test. However, because the wastewater catchments do not exactly align with regional boundaries, the number of cases estimated by region and by water catchment area may be different.
- Data are provisional and may be subject to change by location.
- As septic tank systems are not connected to wastewater treatment plants, the wastewater from these households will not be represented in the data.

Please see notes at the end of the document for further details.

Results from Week 18 2022

In the week ending 8 May 2022, 176 wastewater samples from 114 different sites have been collected and analysed.

SARS-CoV-2 RNA was detected in all the samples except for samples from two sites – Paeroa and Waihi.

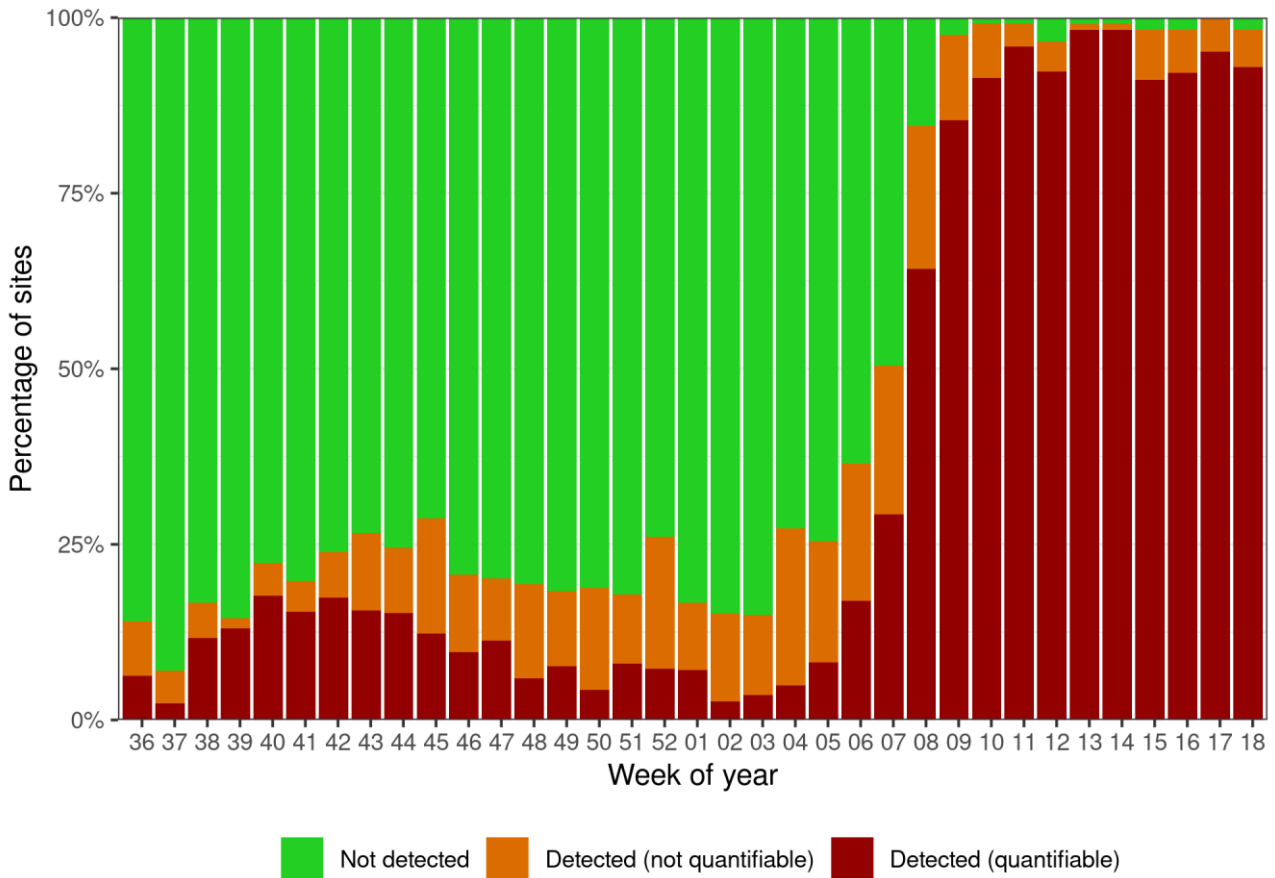


Figure 1. Results for SARS-CoV-2 RNA in wastewater collected across New Zealand by week

This report also includes a visual representation of sampling locations (Figure 2), individual graphs from sampling locations, and a weekly summary of results from each site.

Note that the **case data** in each catchment is now shown as a **rolling seven-day average of new cases** in the catchment based on onset date of illness, or if not available the laboratory sample date.



Figure 2 Location of sampling sites and latest results in the last two weeks. Interactive map of weekly results available publicly at <https://www.esr.cri.nz/our-expertise/covid-19-response/wastewater-testing-results>

Interpreting site graphs

Sample collection method. Results based on autosampler may be more representative than grab sample-based results.

Wastewater Results

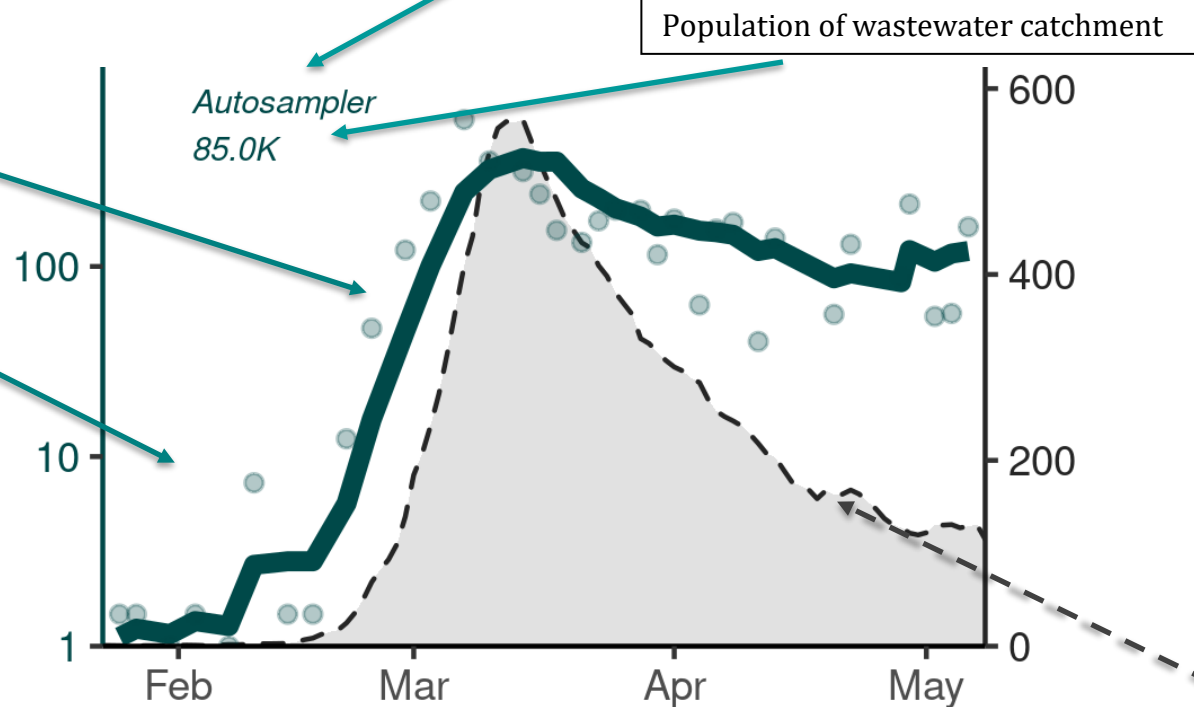
Rolling 14-day average of genome copies/day/person shown as solid line

Individual wastewater sample results are shown as circles

Log₁₀ scale

Genome copies/mL x Daily wastewater influent (m³) = genome copies x 10⁴/day

Genome copies/day ÷ population = genome copies x 10⁴/day/person



Rolling seven-day average new cases in the catchment based on onset date of illness, or if not available the laboratory sample date

Dotted line (shaded)

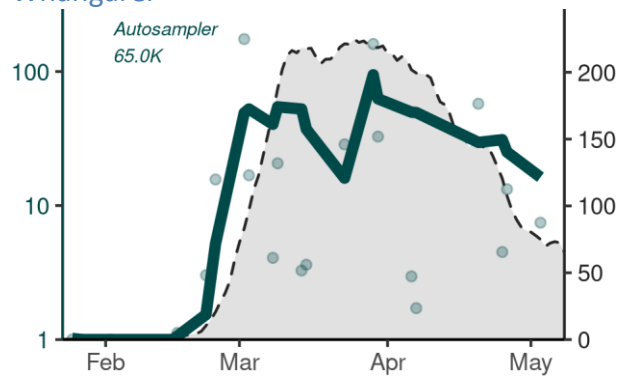
Linear scale

Note the scales may differ for each graph

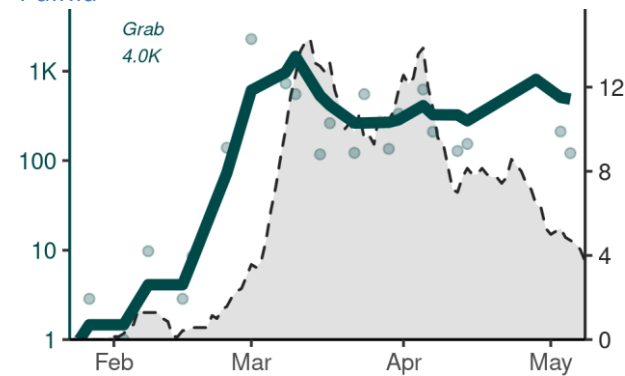
Wastewater results are on log₁₀ scale, while case data is on a linear scale.

Northland

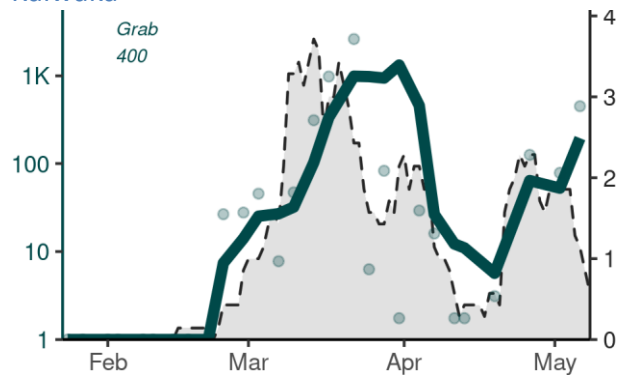
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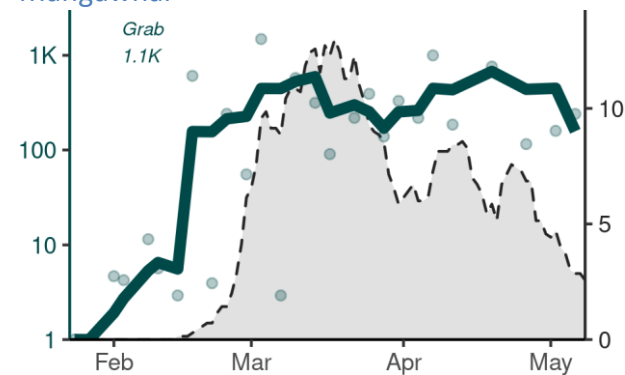
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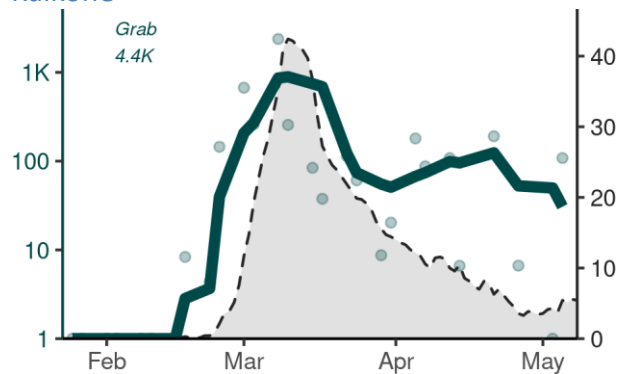
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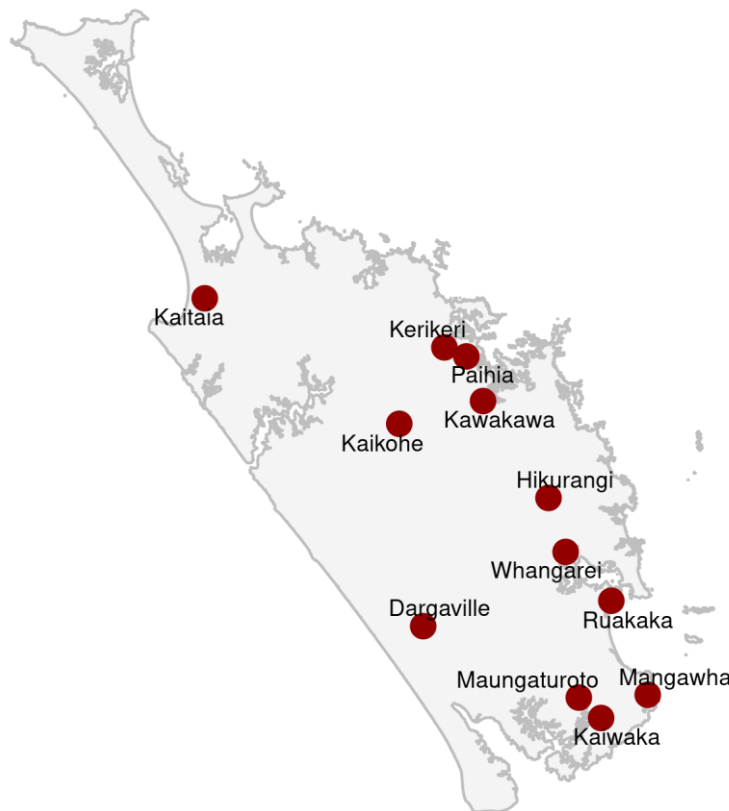
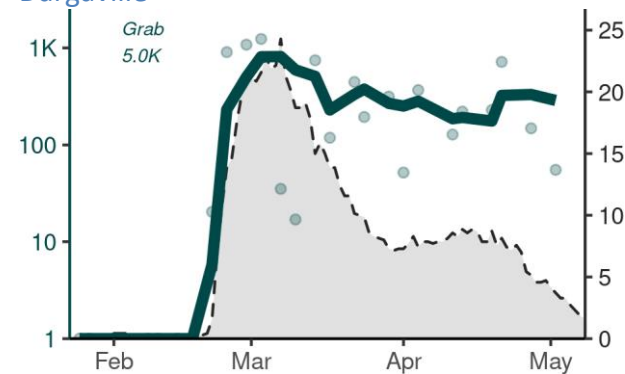
Mangawhai



Kaikohu

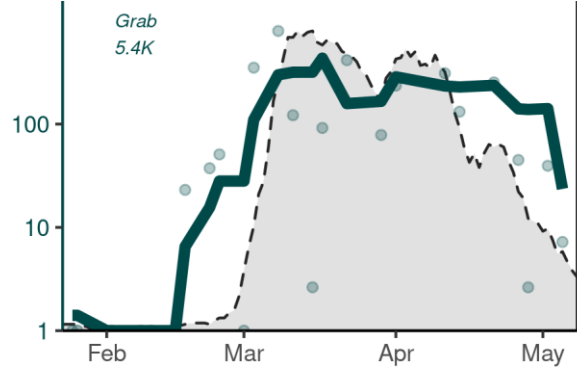


Dargaville

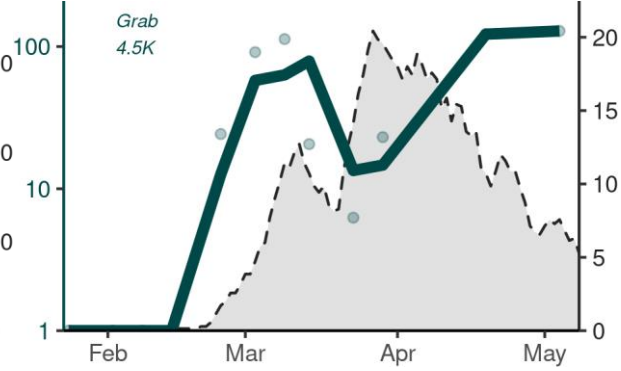


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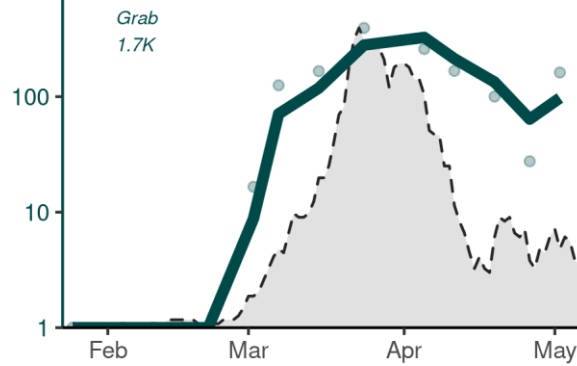
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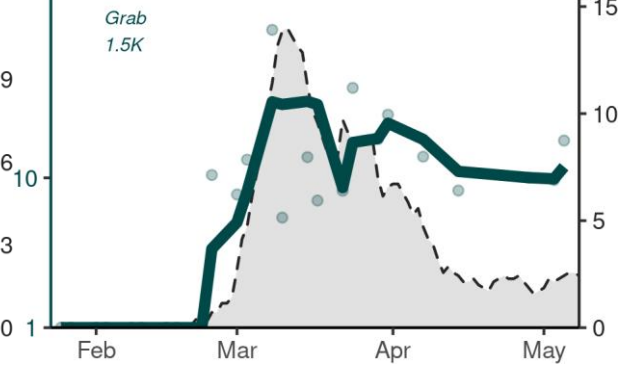
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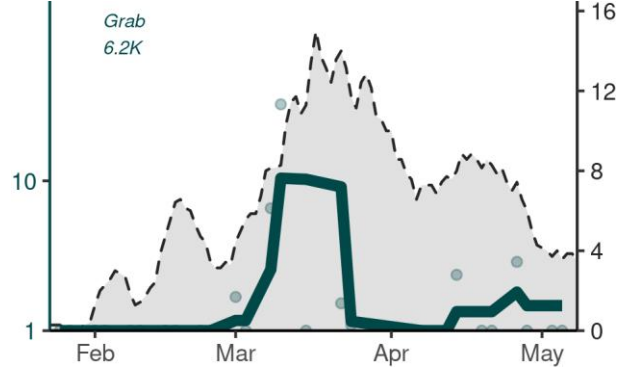
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Kawakawa

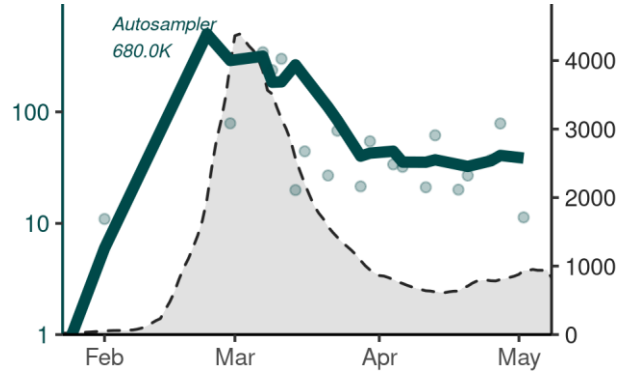


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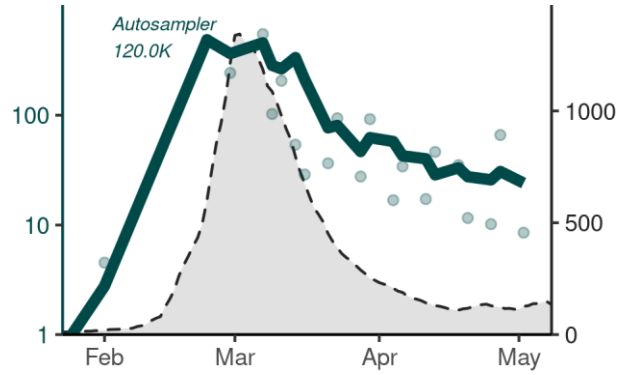


Auckland

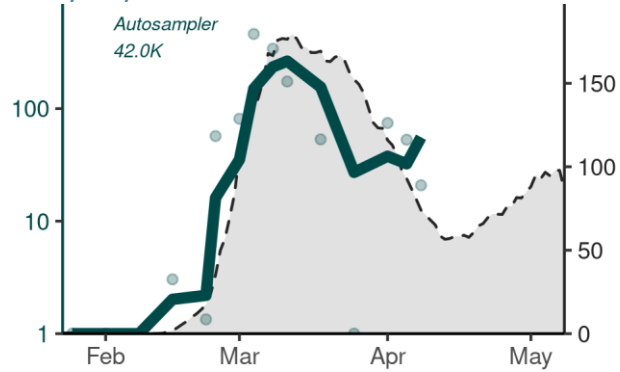
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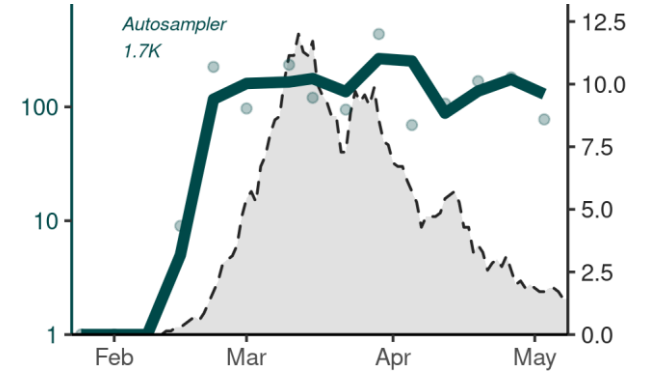
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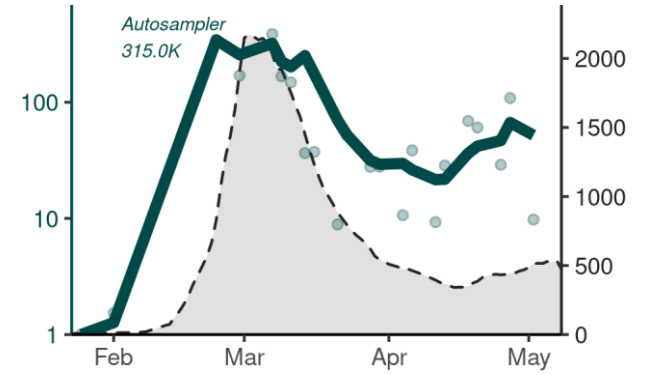
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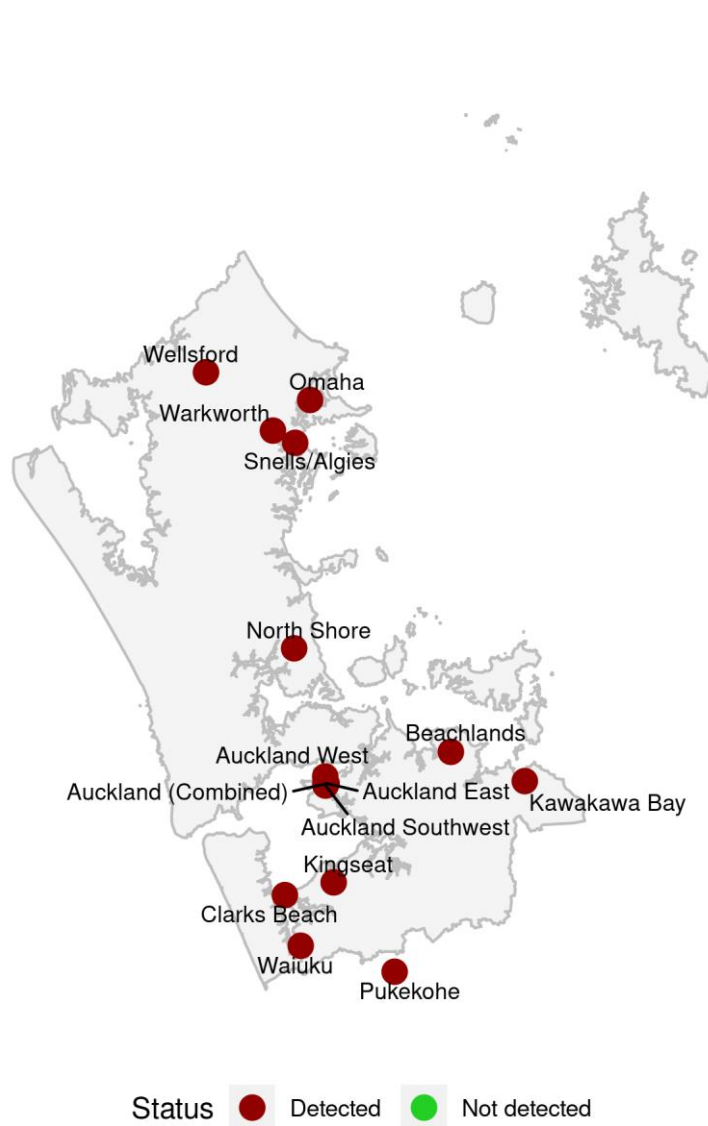
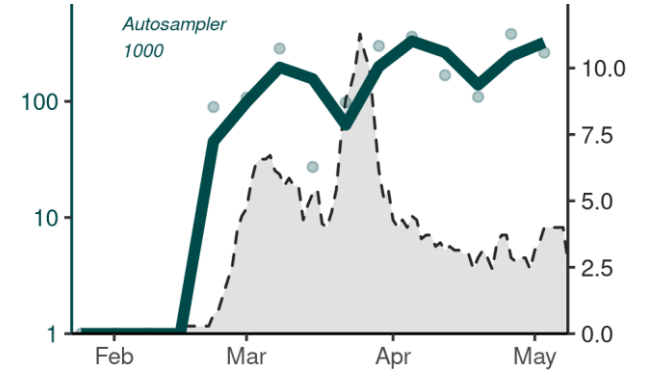
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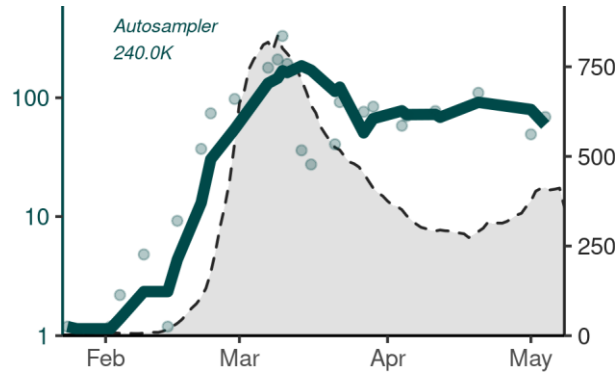
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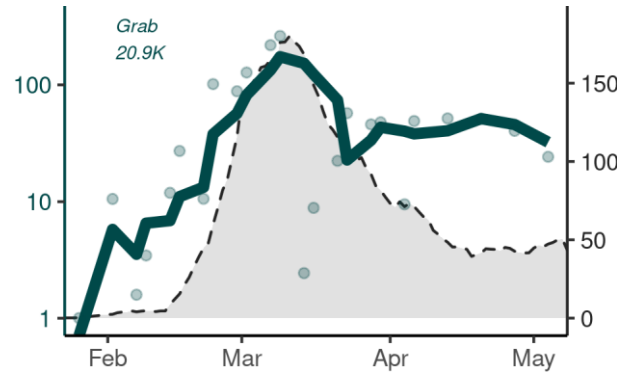
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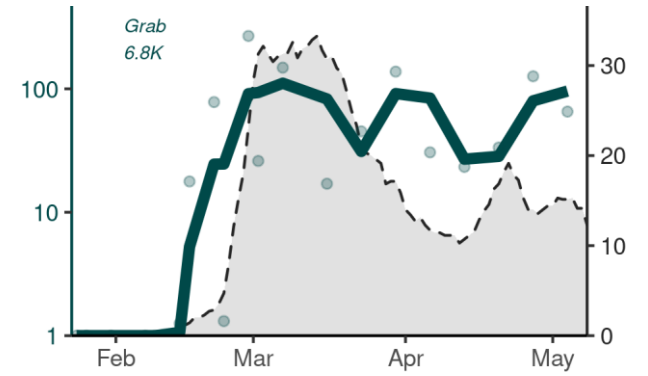
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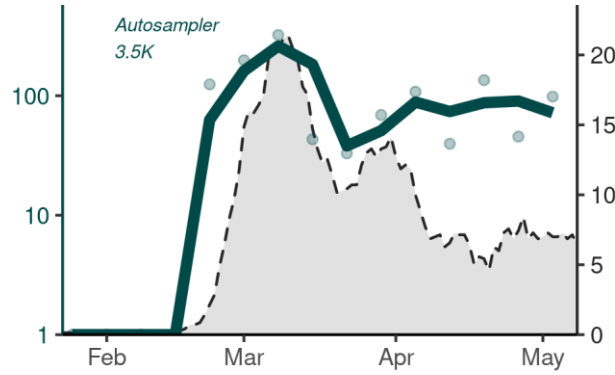
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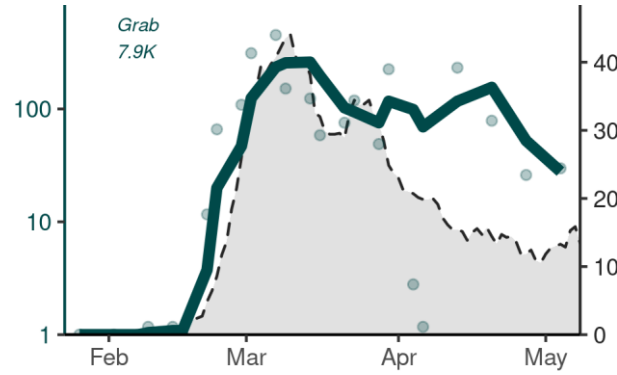
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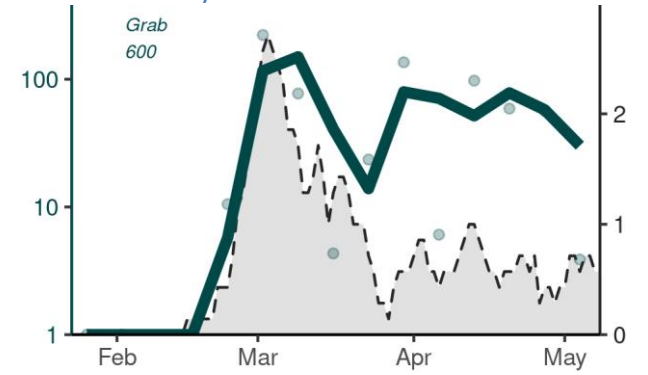
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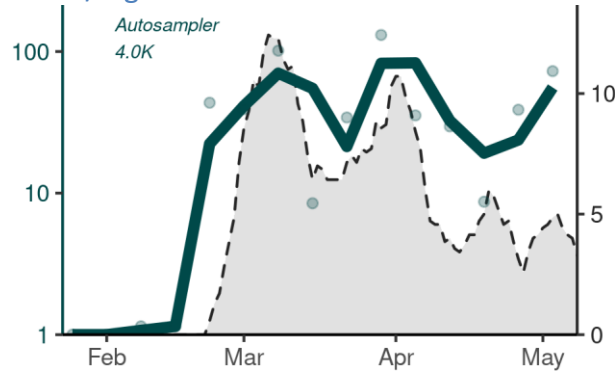
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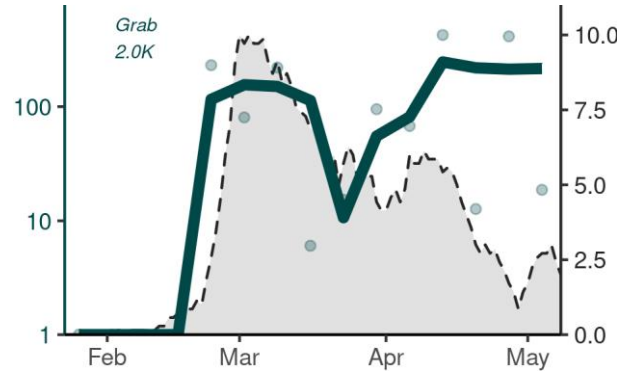
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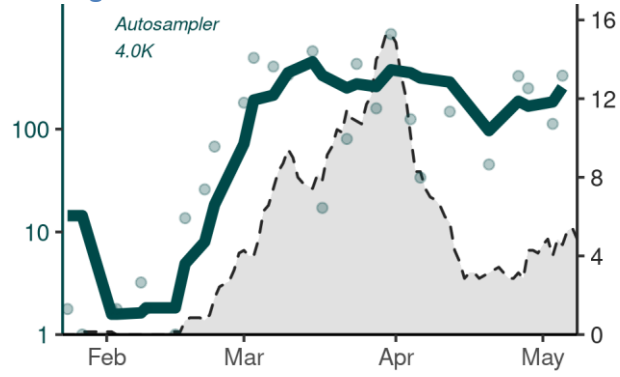


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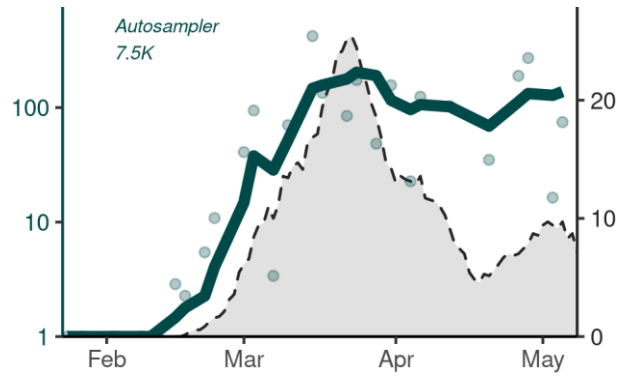


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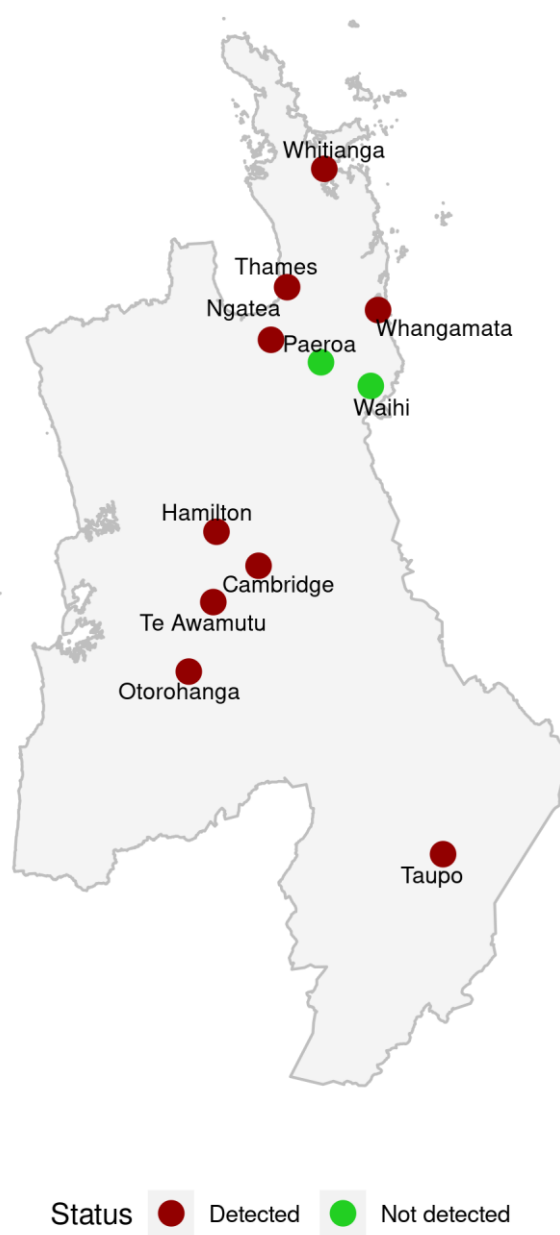
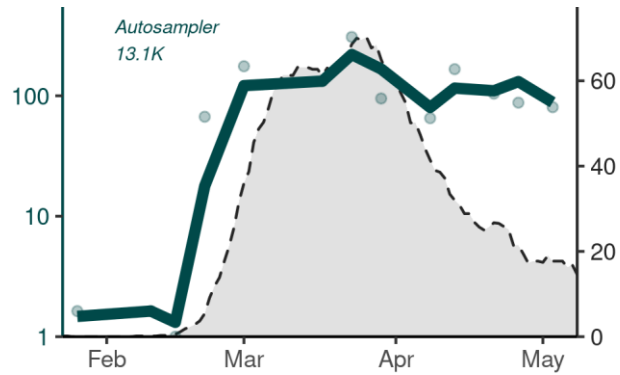
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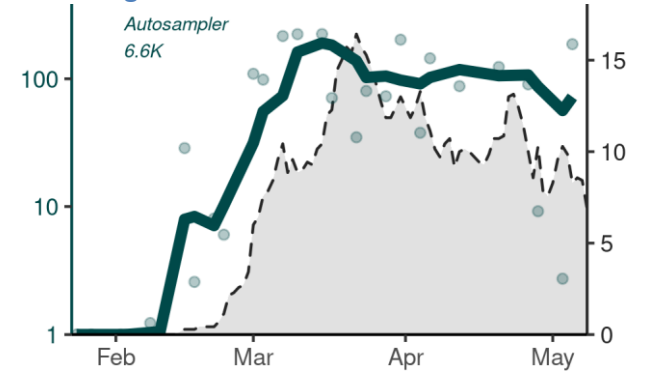
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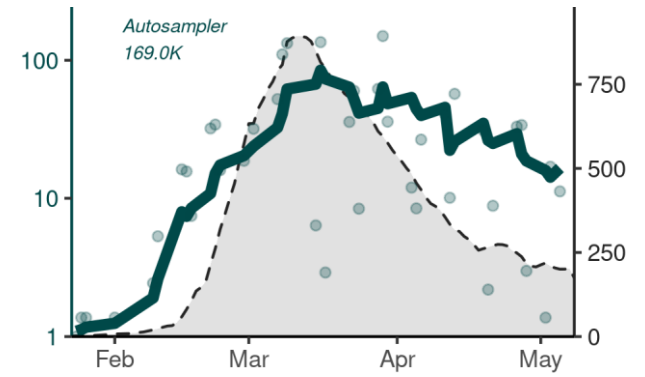
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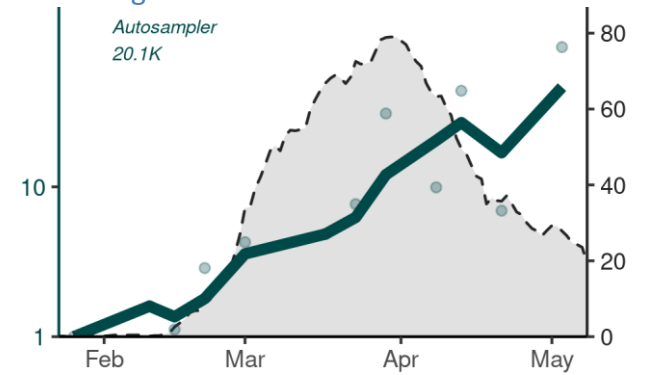
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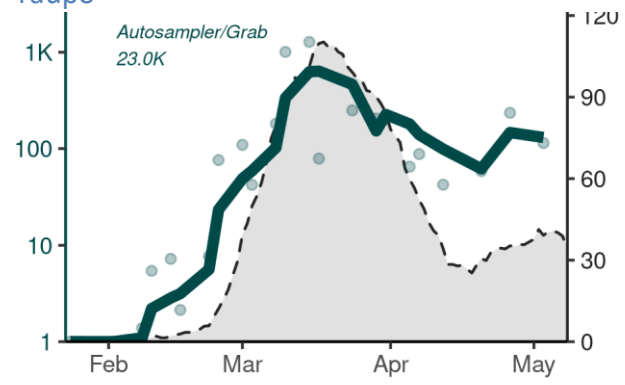
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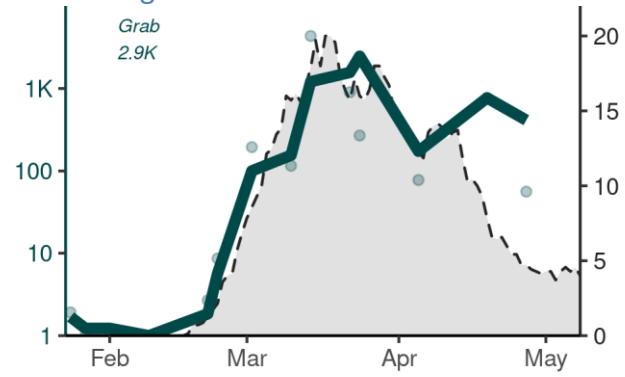
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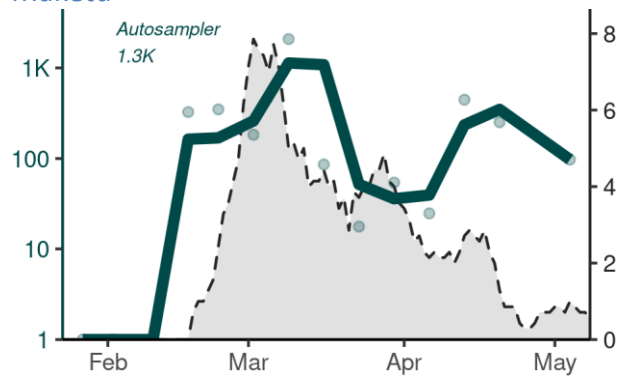


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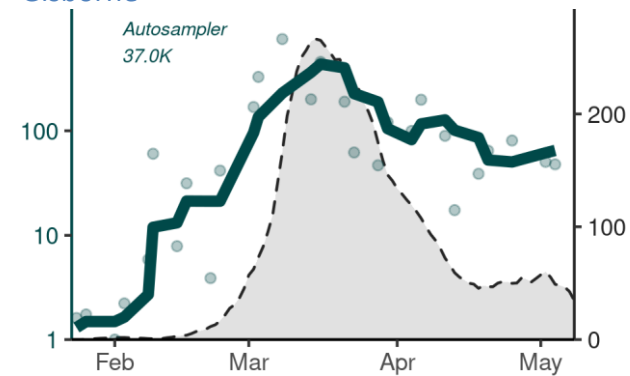


Bay of Plenty and Gisborne

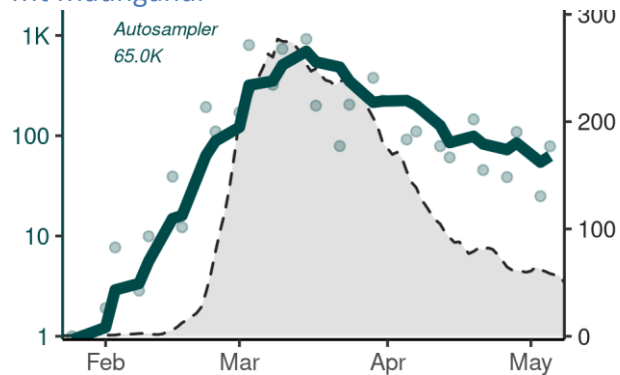
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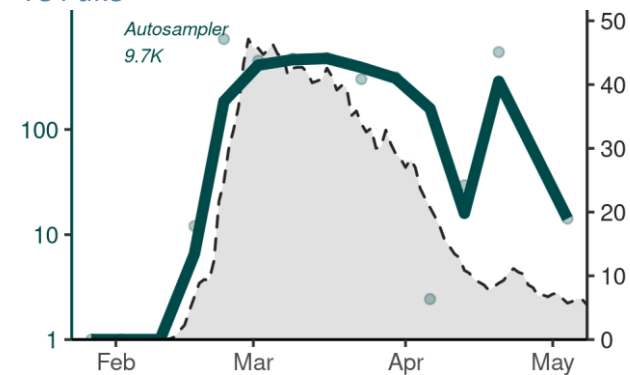
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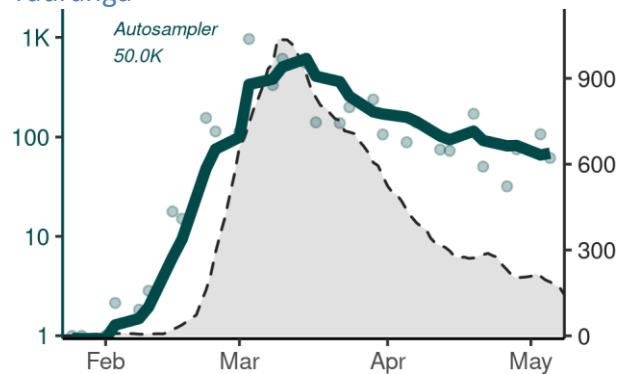
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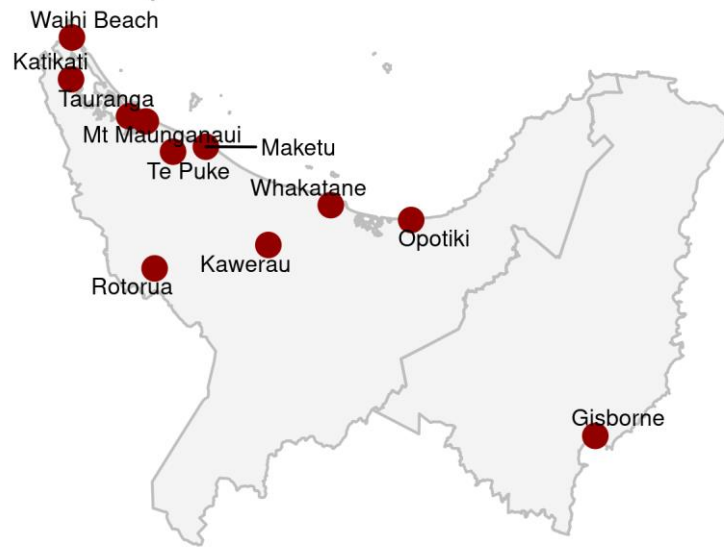
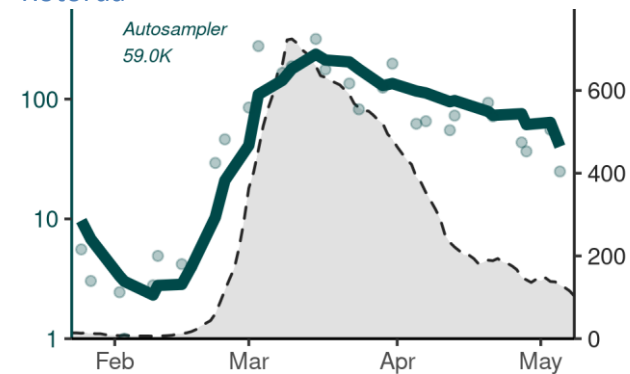
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Tauranga

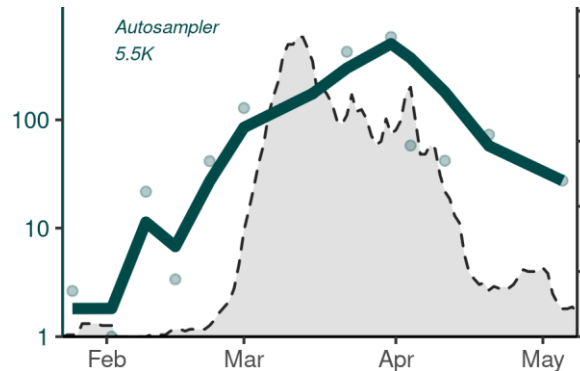


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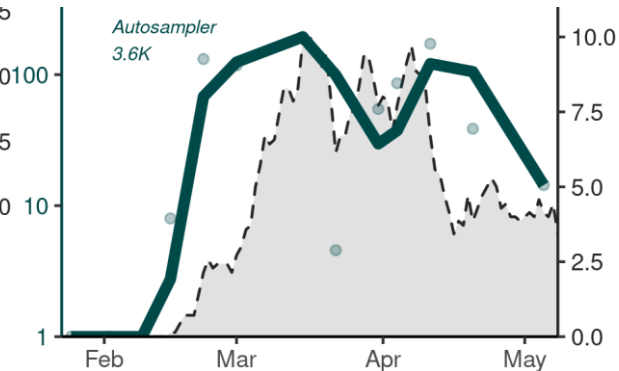


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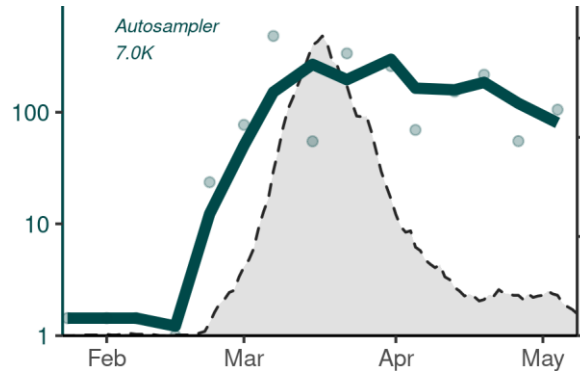
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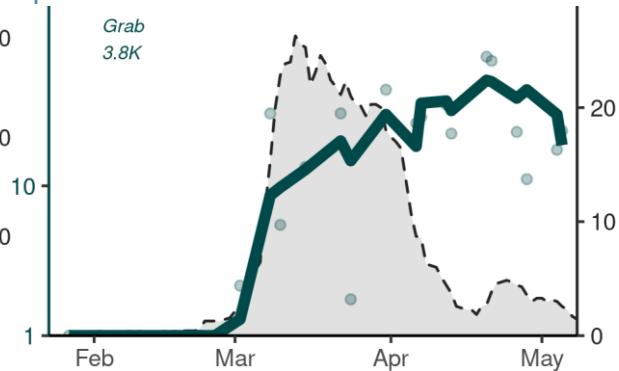
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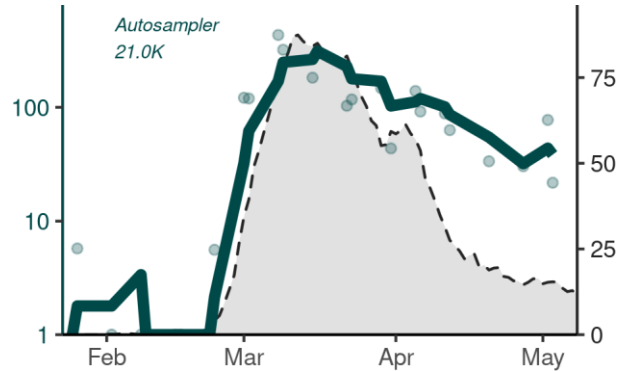
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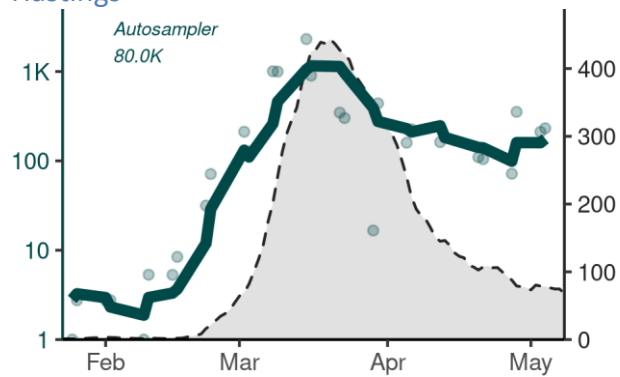


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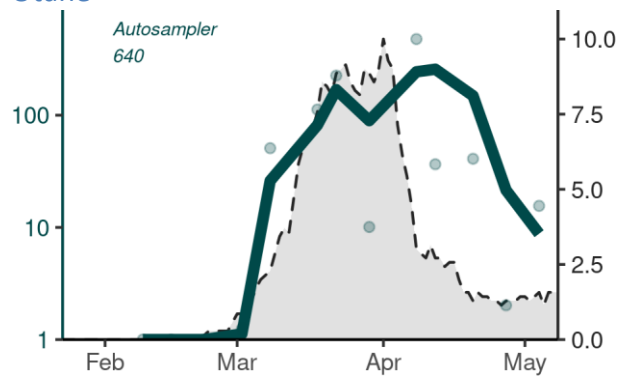


Hawke's Bay

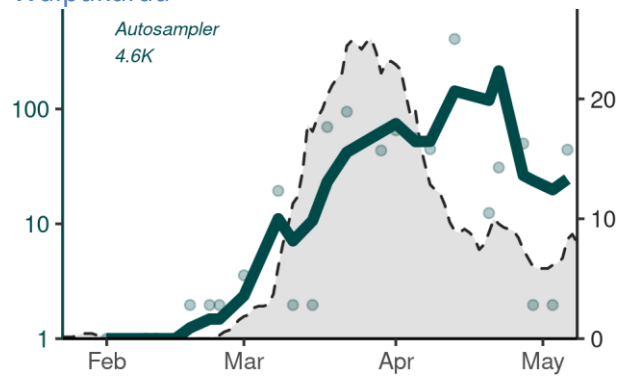
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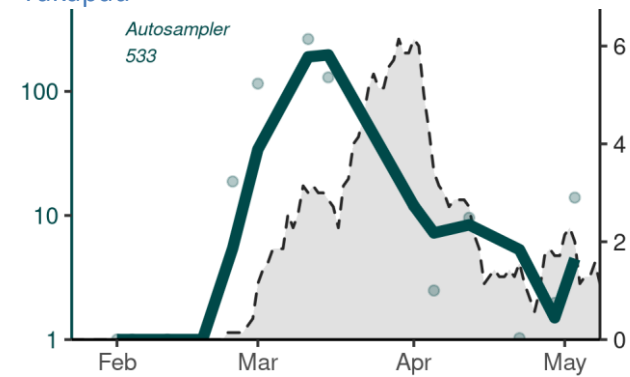
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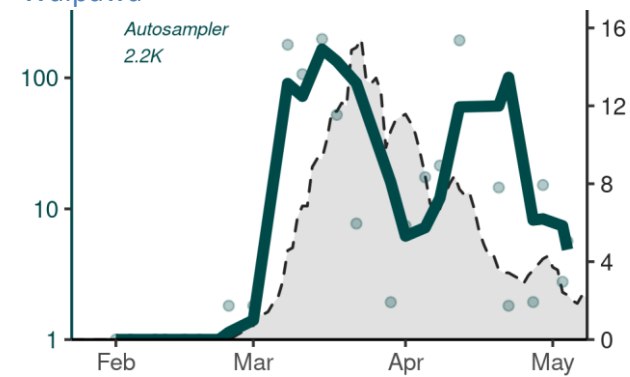
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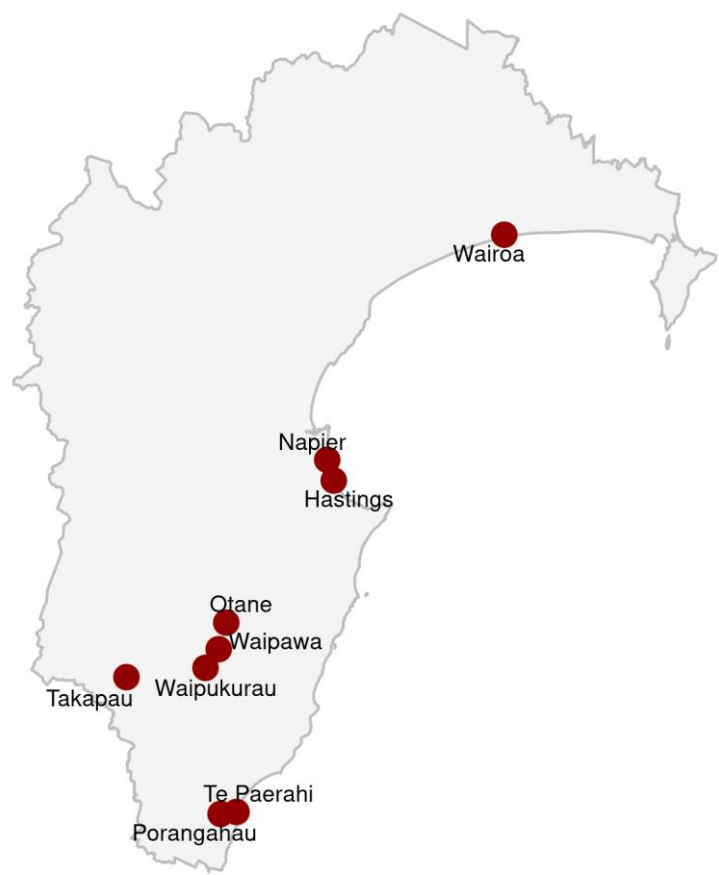
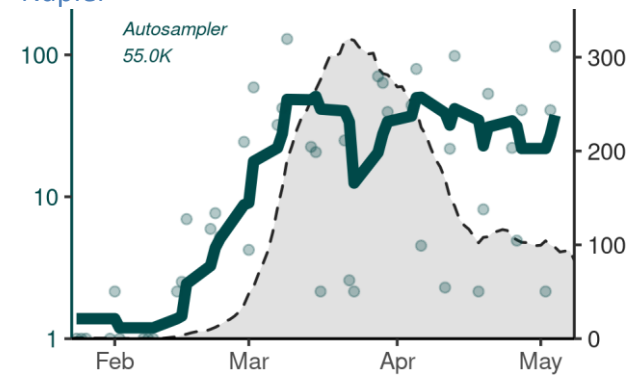
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Waipawa

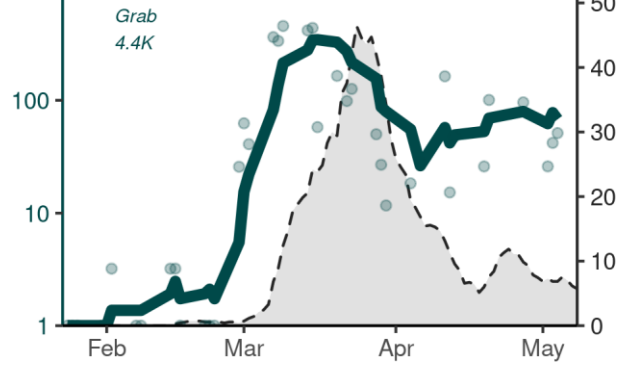


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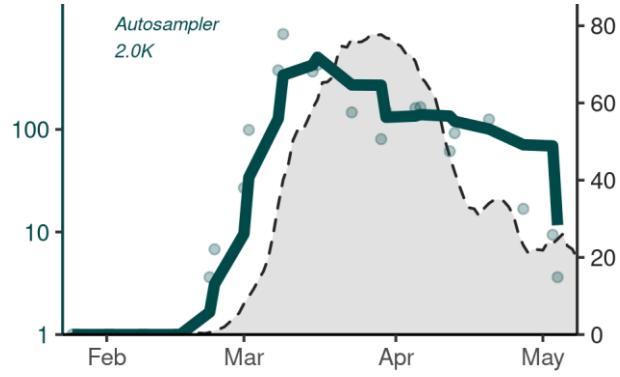
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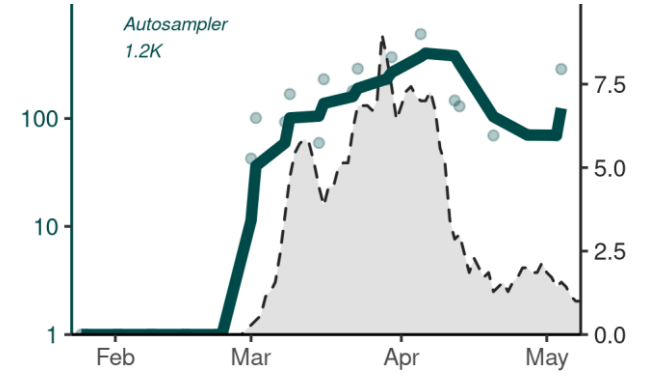


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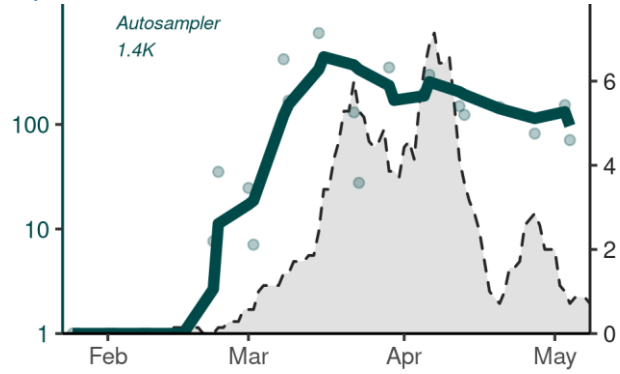
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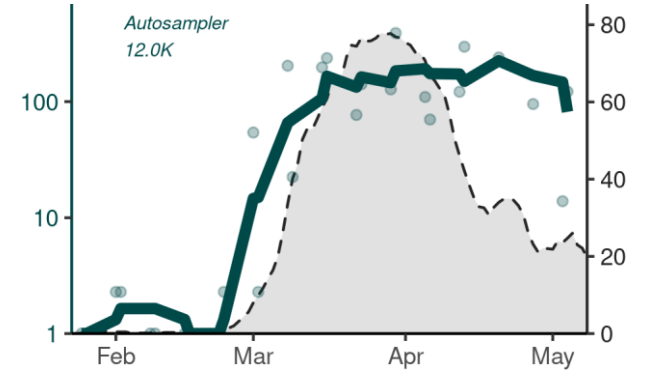
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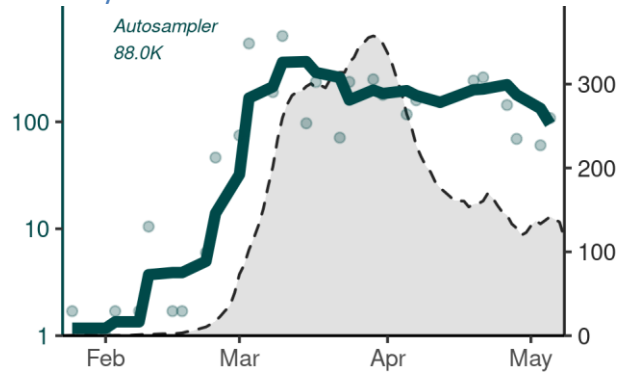
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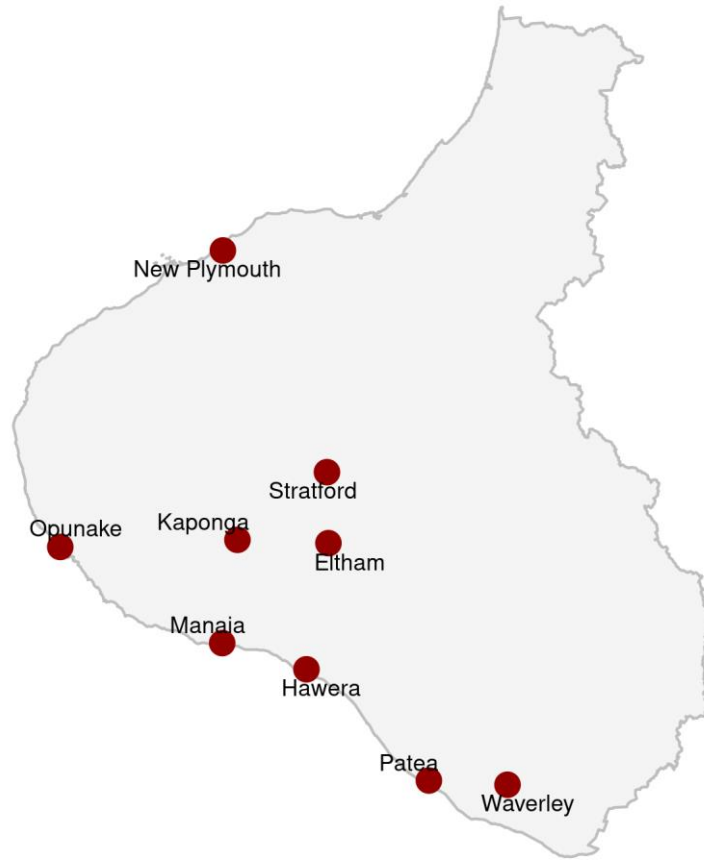
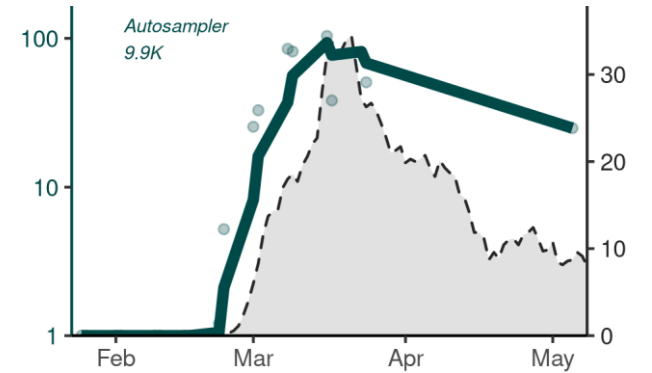
Hawera



New Plymouth

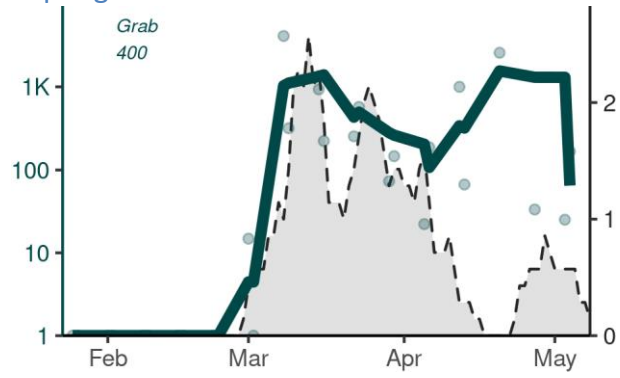


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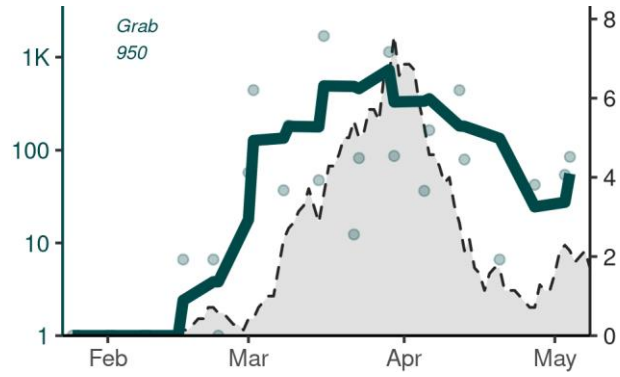


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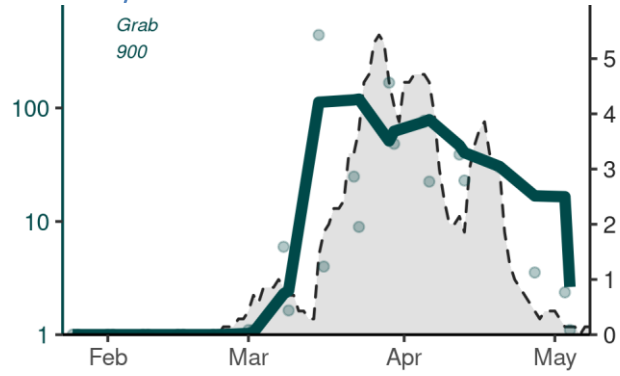
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Manaia

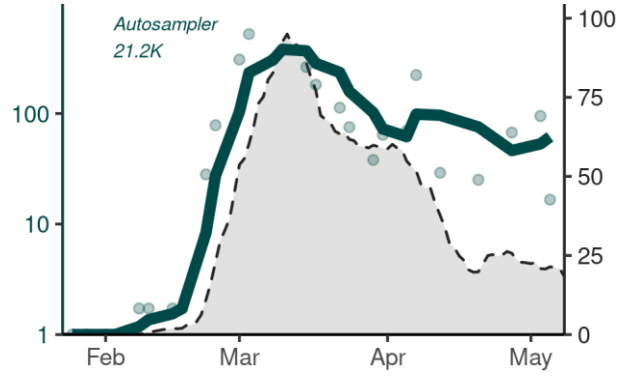


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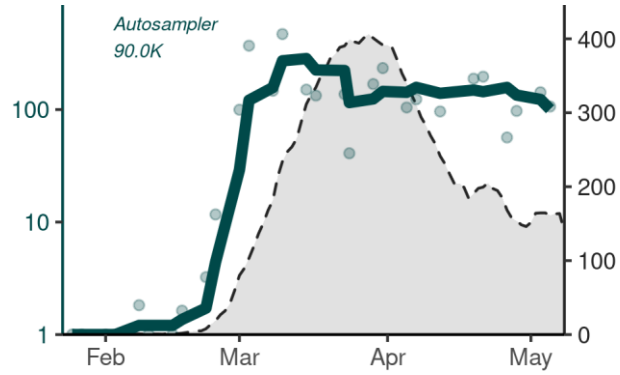


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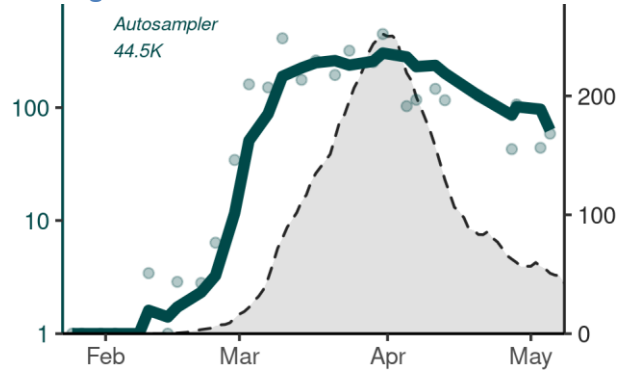
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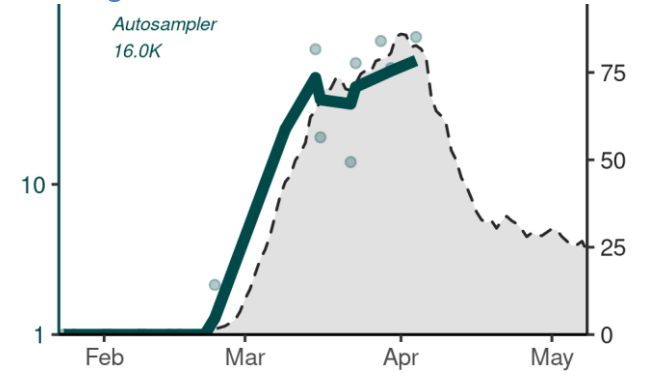
Palmerston North



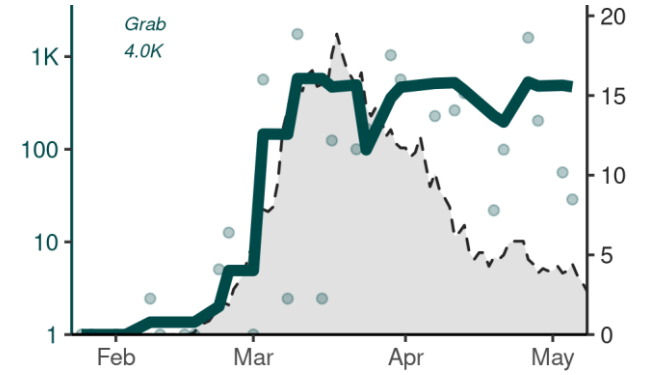
Whanganui Urban



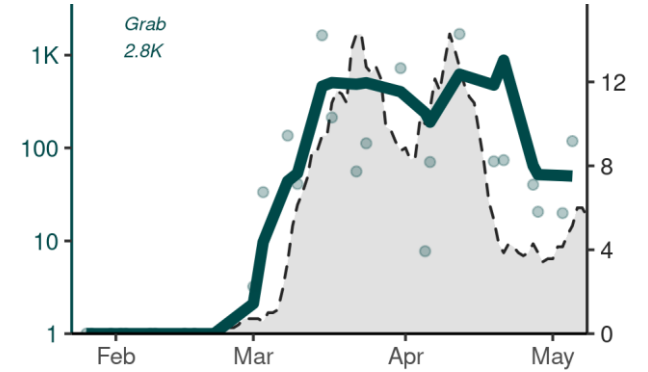
Feilding



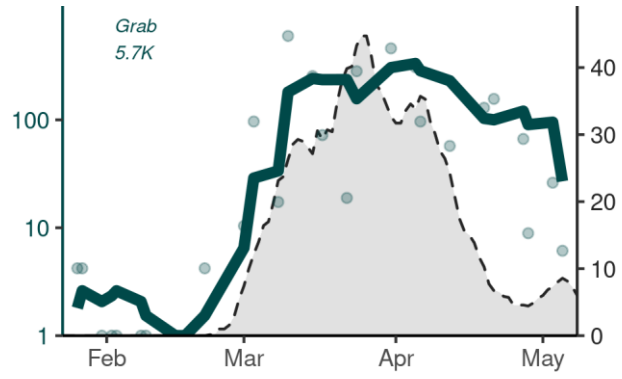
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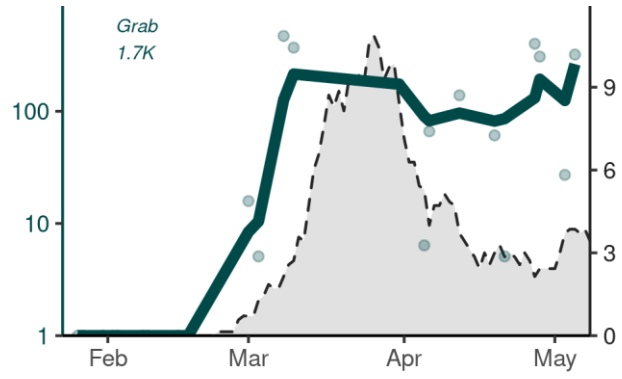
Pahiatua



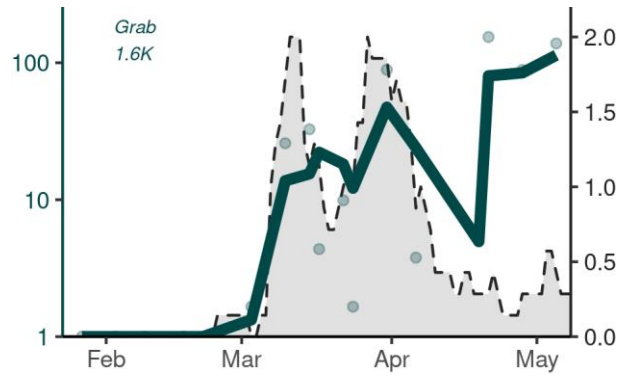
Dannevirke



Woodville

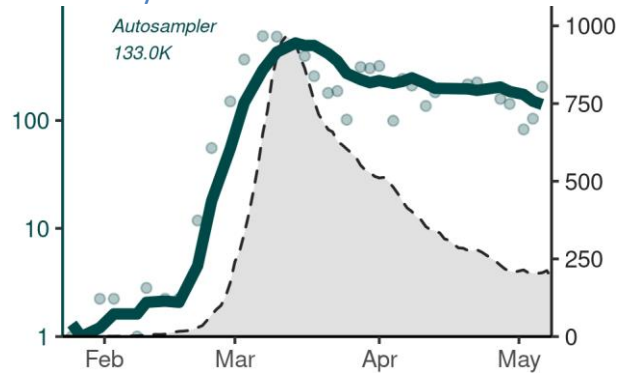


Eketahuna

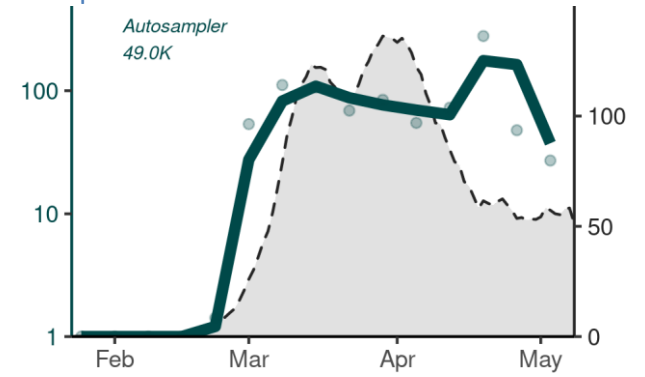


Wellington

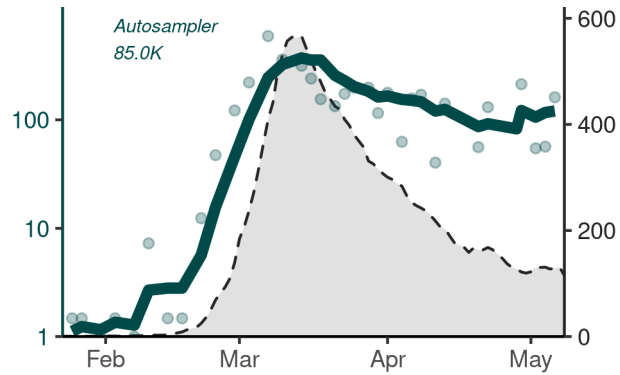
Hutt Valley



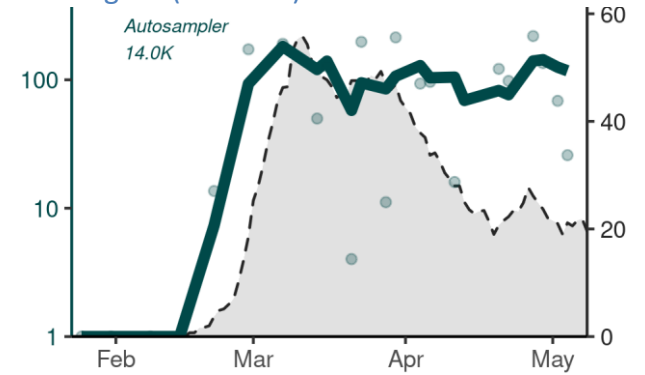
Paraparaumu



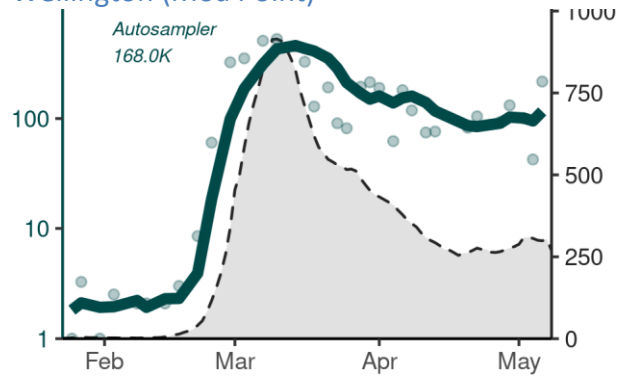
Porirua



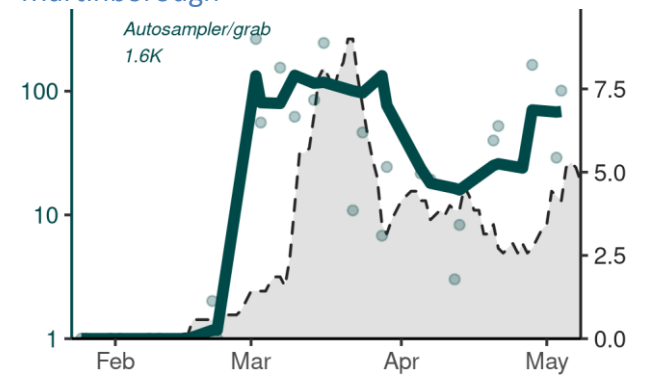
Wellington (Western)



Wellington (Moa Point)

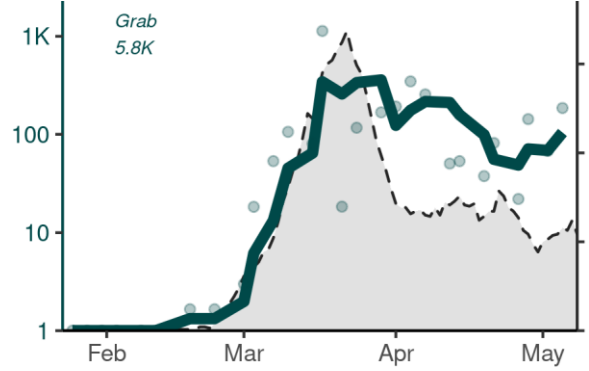


Martinborough

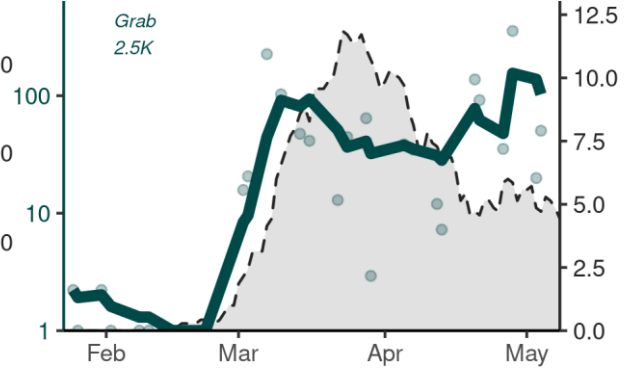


Status ● Detected ● Not detected

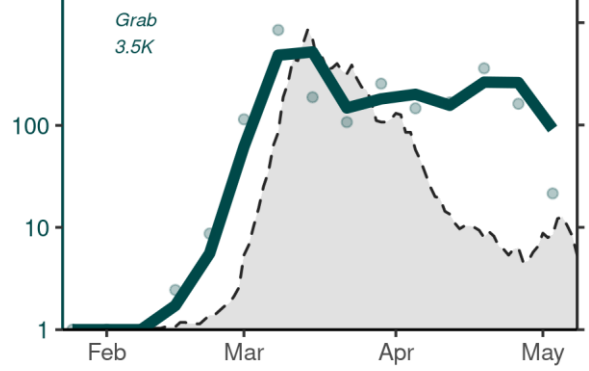
Carterton



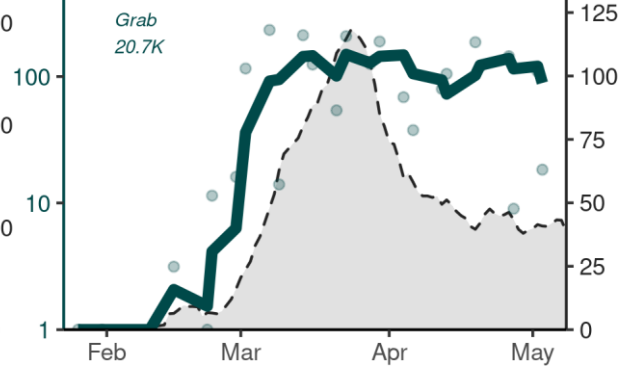
Featherston



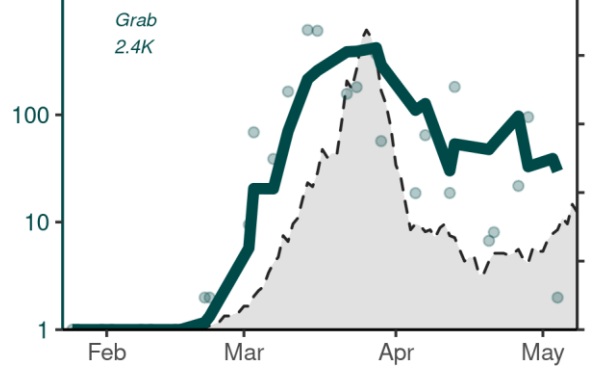
Otaki



Masterton

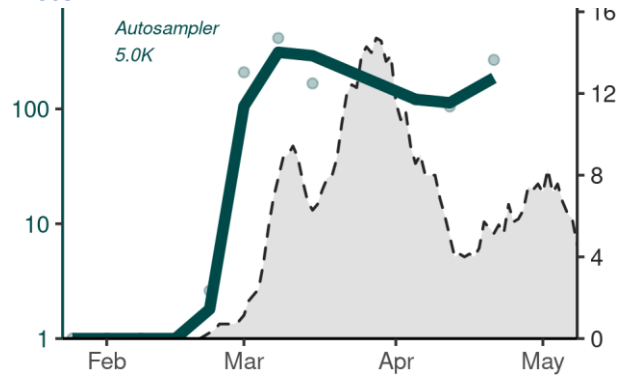


Greytown

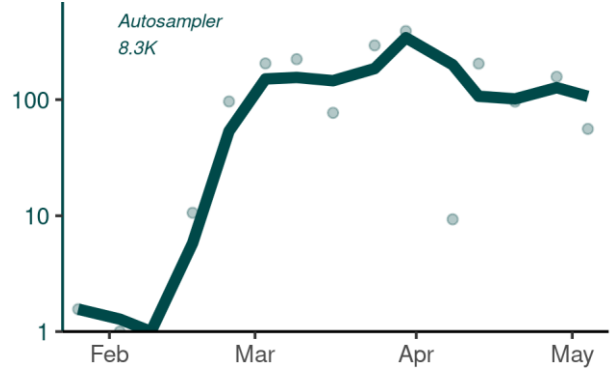


Tasman, Nelson, and Marlborough

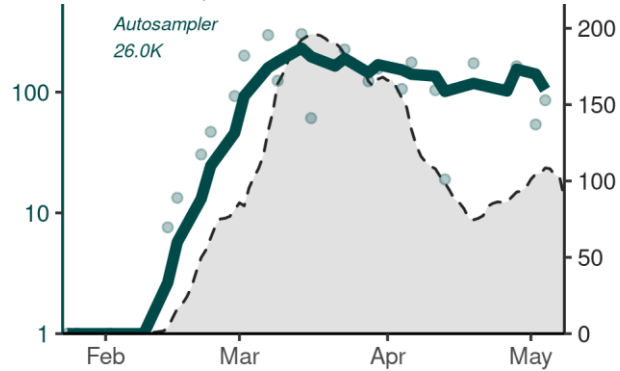
Picton



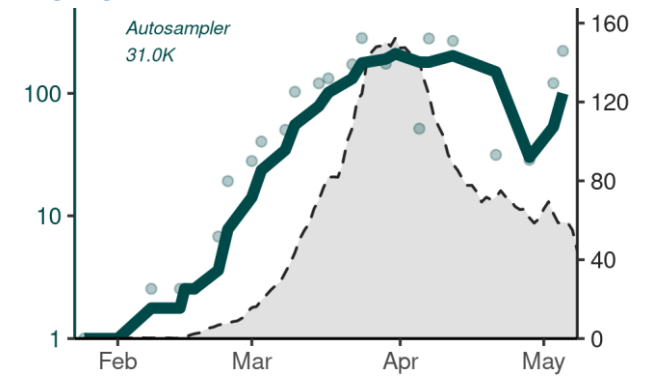
Motueka



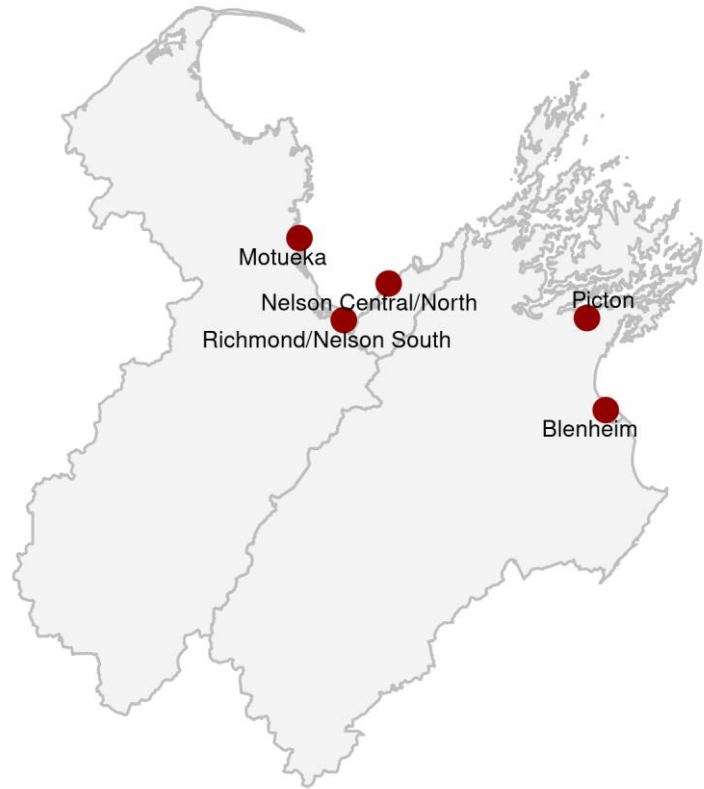
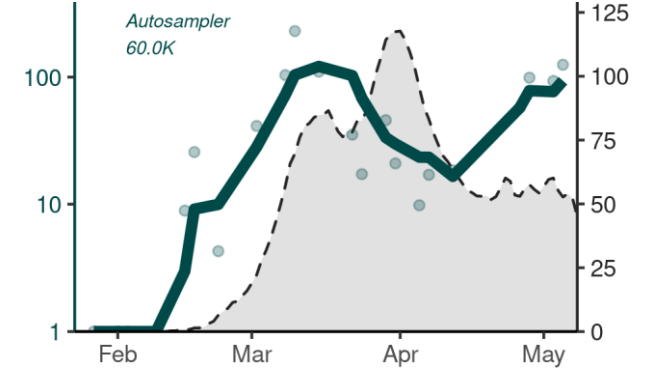
Nelson Central/North



Blenheim



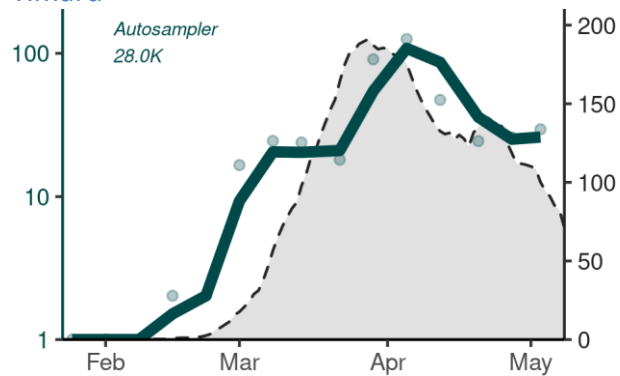
Richmond/Nelson South



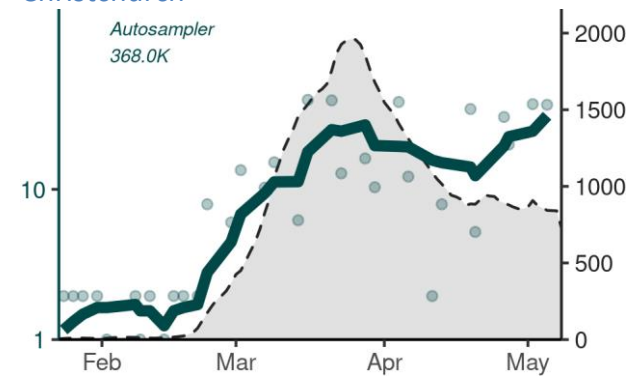
Status ● Detected ● Not detected

West Coast and Canterbury

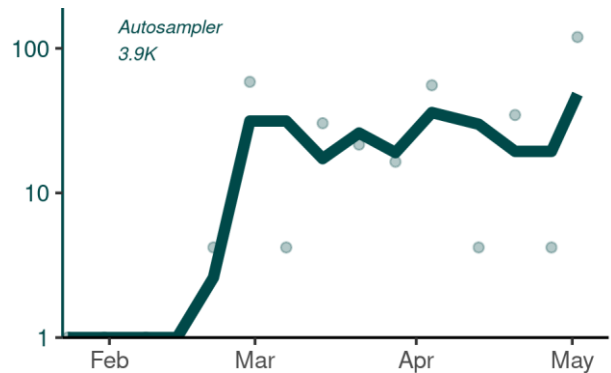
Timaru



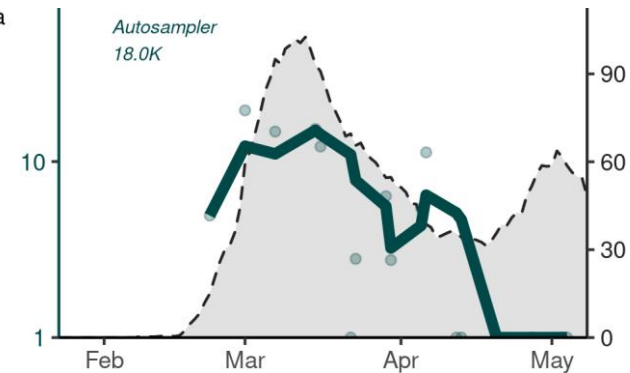
Christchurch



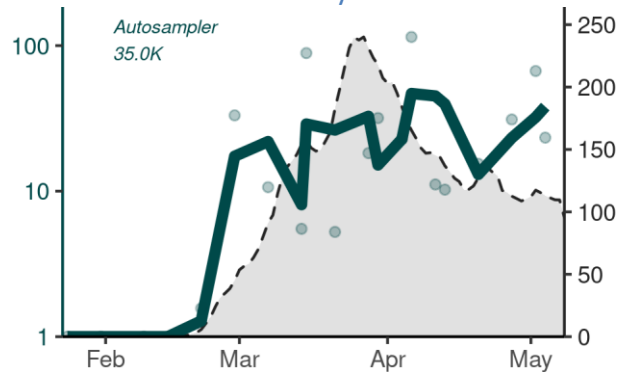
Leeston



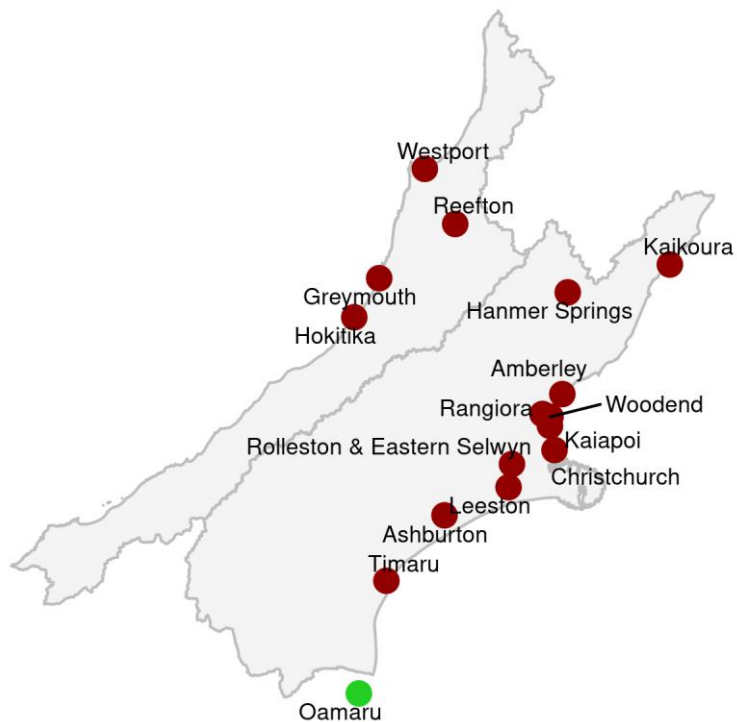
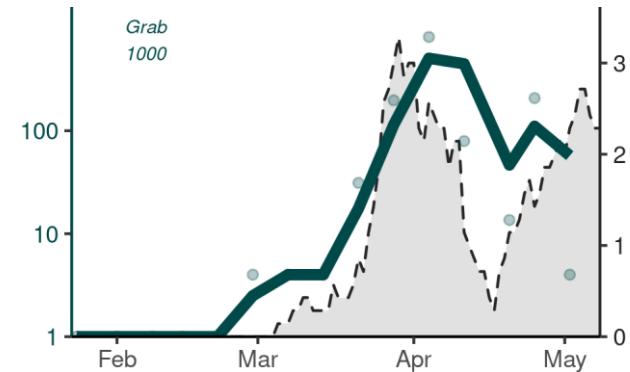
Ashburton



Rolleston & Eastern Selwyn

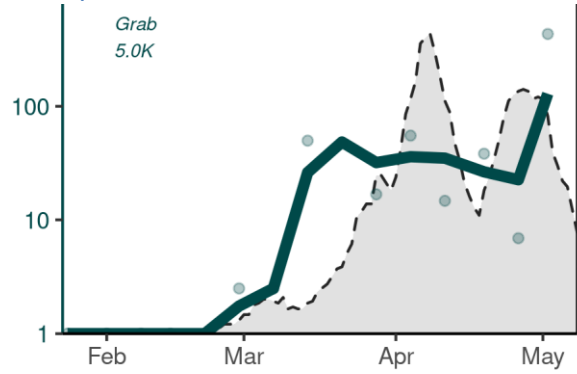


Reefton

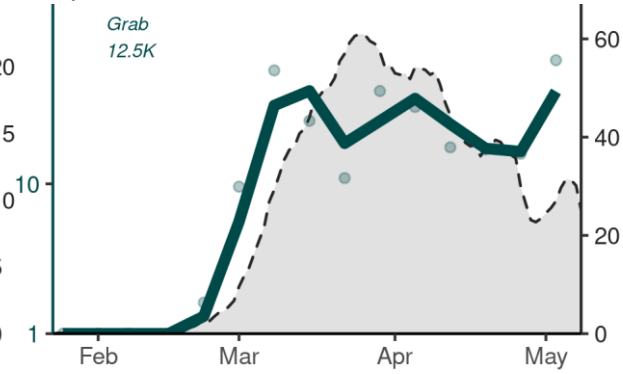


Status ● Detected ● Not detected

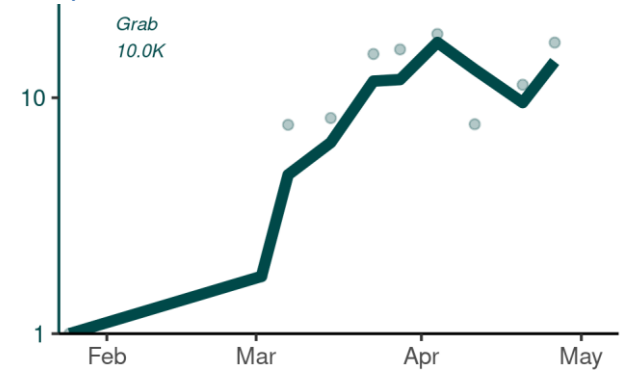
Westport



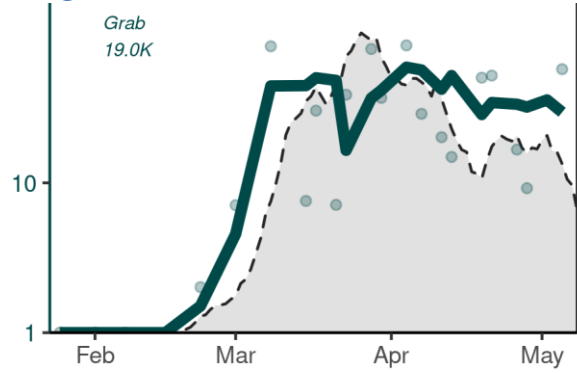
Kaipoi



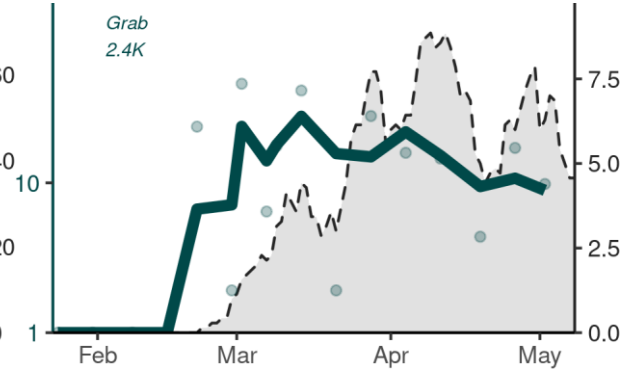
Greymouth



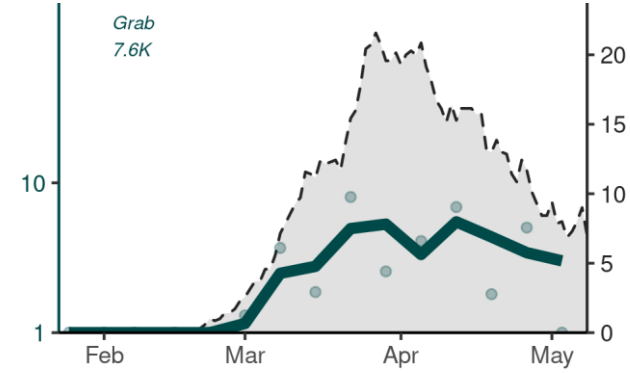
Rangiora



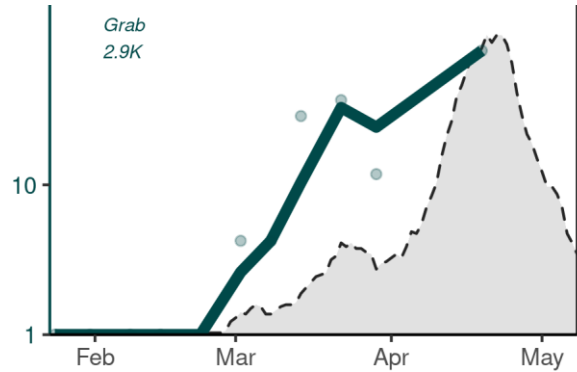
Kaikoura



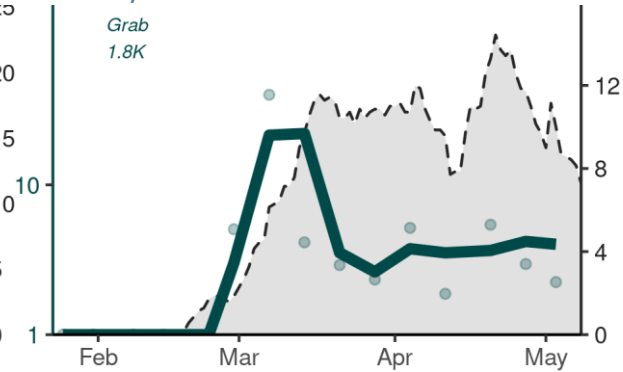
Woodend



Hokitika

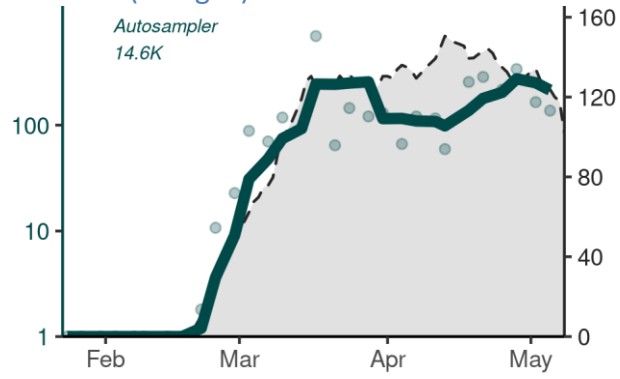


Amberley

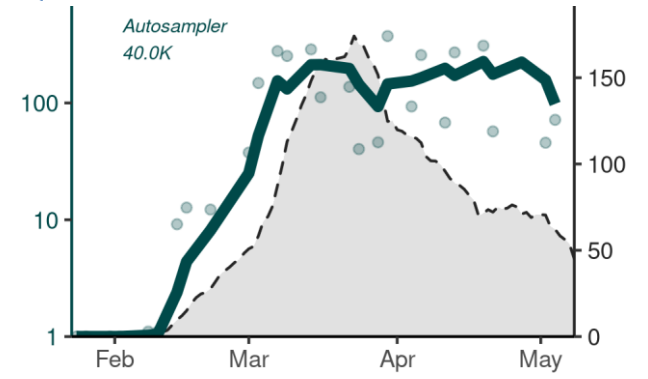


Otago and Southland

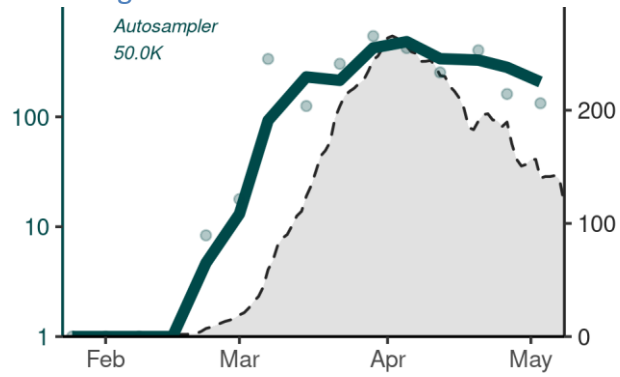
Dunedin (Mosgiel)



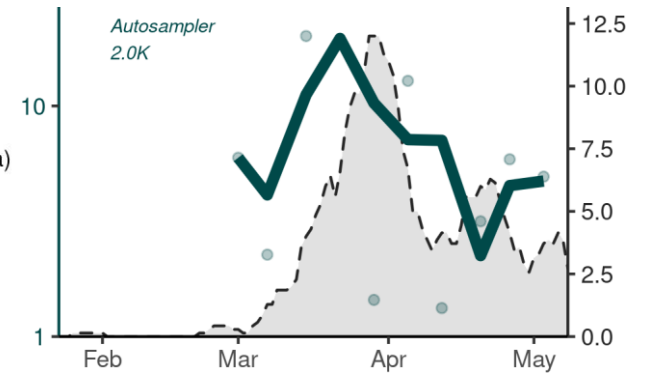
Queenstown



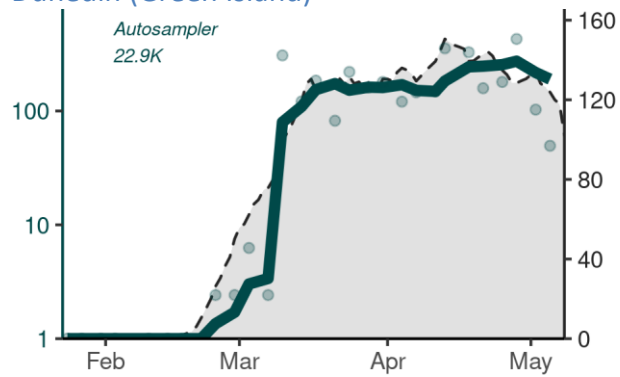
Invercargill



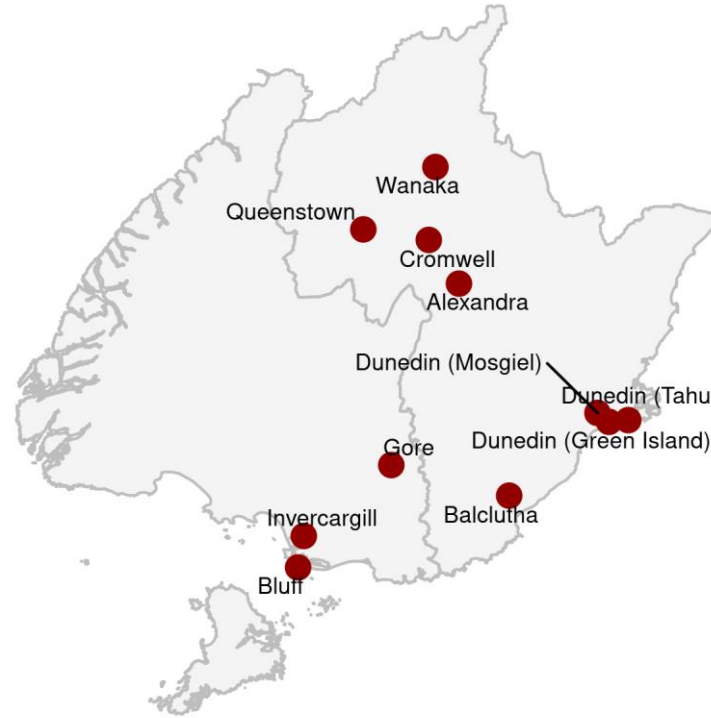
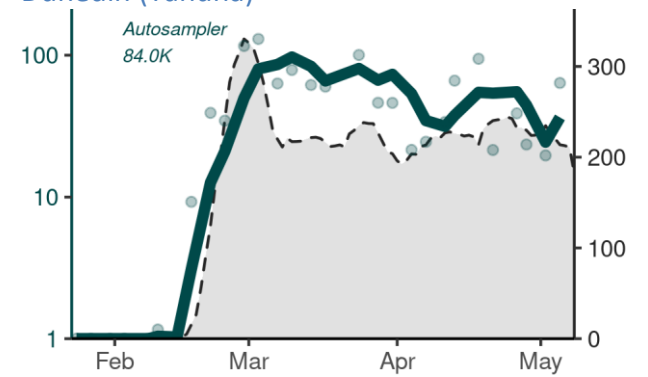
Bluff



Dunedin (Green Island)

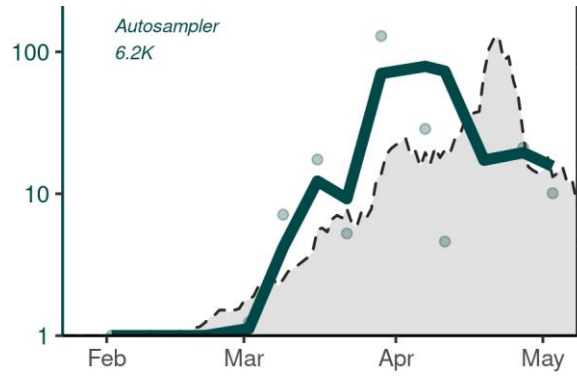


Dunedin (Tahuna)

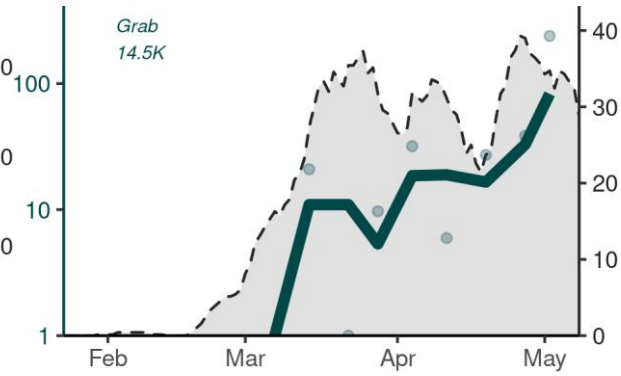


Status ● Detected ● Not detected

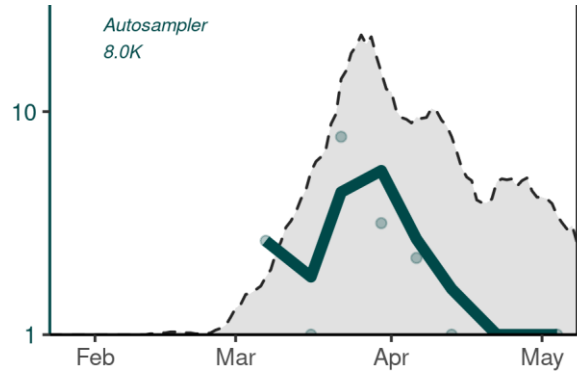
Alexandra



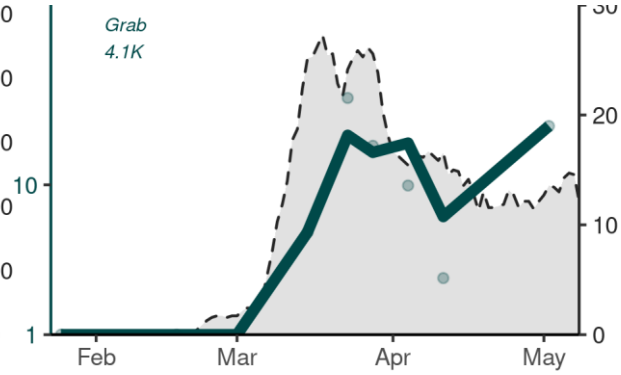
Wanaka



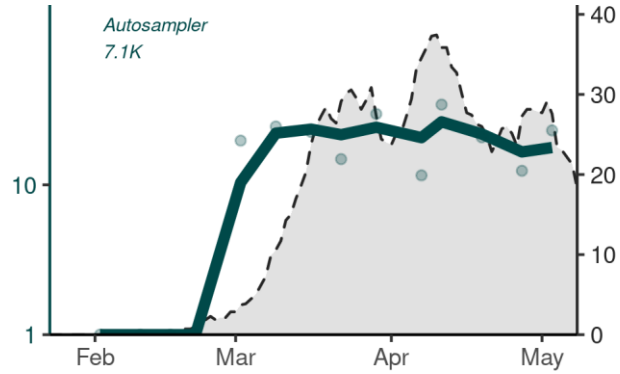
Gore



Balclutha



Cromwell



Weekly summary

Key: Not Detected Detected (below limit of quantification) Detected (quantifiable). White squares – not sampled.

Site	2021																	2022																		
	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	
Northland																																				
Ahipara																																				
Awanui																																				
Dargaville																																				
Haruru																																				
Hihi																																				
Hikurangi																																				
Kaeo																																				
Kaikohe																																				
Kaitia																																				
Kaiwaka																																				
Kawakawa																																				
Kerikeri																																				
Kohukohu																																				
Mangawhai																																				
Maungaturoto																																				
Opononi																																				
Paihia																																				
Rangiputa																																				
Rawene																																				
Ruakaka																																				
Russell																																				
Taipa																																				
Waipu																																				
Whangarei																																				
Whatuwhiwhi																																				
Auckland																																				
Army Bay																																				
Auckland (Combined)																																				
Auckland East																																				

Site	2021																	2022																				
	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18			
Pauanui		Green																																				
Putaruru					Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green			Green	Green	Green	Green		Red													
Raglan					Red	Red		Orange	Green	Orange	Orange																											
Taupo	Green	Green	Green	Green																																		
Tauwhare																																						
Te Awamutu	Green		Green	Green	Green		Red	Red	Red	Orange	Orange	Green	Orange	Green	Red	Green	Green			Green	Orange	Orange		Orange	Green	Red	Red											
Te Kauwhata																																						
Te Kowhai																																						
Te Kuiti	Green	Green	Green	Green	Green	Green	Green	Green	Orange	Orange	Red	Red	Red	Red	Orange					Orange																		
Thames		Green	Green	Green																					Orange													
Tokoroa	Green	Green																							Red													
Turangi		Green																						Green														
Waihi																																						
Waitakaruru			Green	Green	Green																																	
Whangamata		Green																																				
Whitianga	Green																																					
Bay of Plenty																																						
Edgecumbe		Green																																				
Katikati																																						
Kawerau	Green	Green																																				
Maketu	Green	Green																																				
Mt Maunganui	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Orange	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red		
Murupara		Green																																				
Ohope																																						
Opotiki																																						
Rotorua	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green		
Taneatua																																						
Tauranga	Green	Green	Orange	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green		
Te Puke	Green																																					
Waihi Beach		Green																																				
Whakatane		Green																																				
Gisborne																																						
Gisborne	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green		
Hawke's Bay																																						

Site	2021																2022																													
	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18											
Greytown																																														
Hutt Valley																																														
Martinborough																																														
Masterton																																														
Otaki																																														
Paraparaumu																																														
Porirua																																														
Wellington (Moa Point)																																														
Wellington (Western)																																														
Tasman																																														
Motueka																																														
Nelson																																														
Nelson Central/North																																														
Richmond/Nelson South																																														
Marlborough																																														
Blenheim																																														
Picton																																														
West Coast																																														
Greymouth																																														
Hokitika																																														
Reefton																																														
Westport																																														
Canterbury																																														
Amberley																																														
Ashburton																																														
Christchurch																																														
Hanmer Springs																																														
Kaiapoi																																														
Kaikoura																																														
Leeston																																														
Methven																																														
Oamaru																																														
Oxford																																														
Rangiora																																														

Site	2021																	2022																				
	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18			
Rolleston & Eastern Selwyn	█	█		█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█		
Timaru	█	█														█		█		█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█		
Waimate	█	█																																				
Woodend		█						█	█		█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█		
Otago																																						
Alexandra		█																				█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	
Balclutha		█			█			█		█		█	█	█					█		█			█		█									█		█	
Cromwell		█																				█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	
Dunedin (Green Island)	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	
Dunedin (Mosgiel)		█		█																																		
Dunedin (Tahuna)	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Milton		█																																				
Queenstown	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Wanaka		█																										█		█								
Southland																																						
Bluff		█																																				
Gore	█	█																																				
Invercargill	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█