

National Wastewater Surveillance Programme - COVID-19

Week 19 2022 (week ending 15 May 2022)

Report prepared on 19 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 Island of New Zealand. 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 hr 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) is converted to a viral load of **genome copies per day per person**. This calculation considers 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 & 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.
- 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.

Results from Week 19 2022

In week 19, 2022 (9 to 15 May 2022), 179 samples were collected from 113 locations in New Zealand. Analysis of six samples is in progress (as samples only arrived at ESR on 18 May 2022).

SARS-CoV-2 RNA was detected in all the samples tested to date except for samples from two sites – Waiku (Auckland) and Eketahuna (Manawatu-Wanganui) (Figure 1, Figure 2, Table 1).

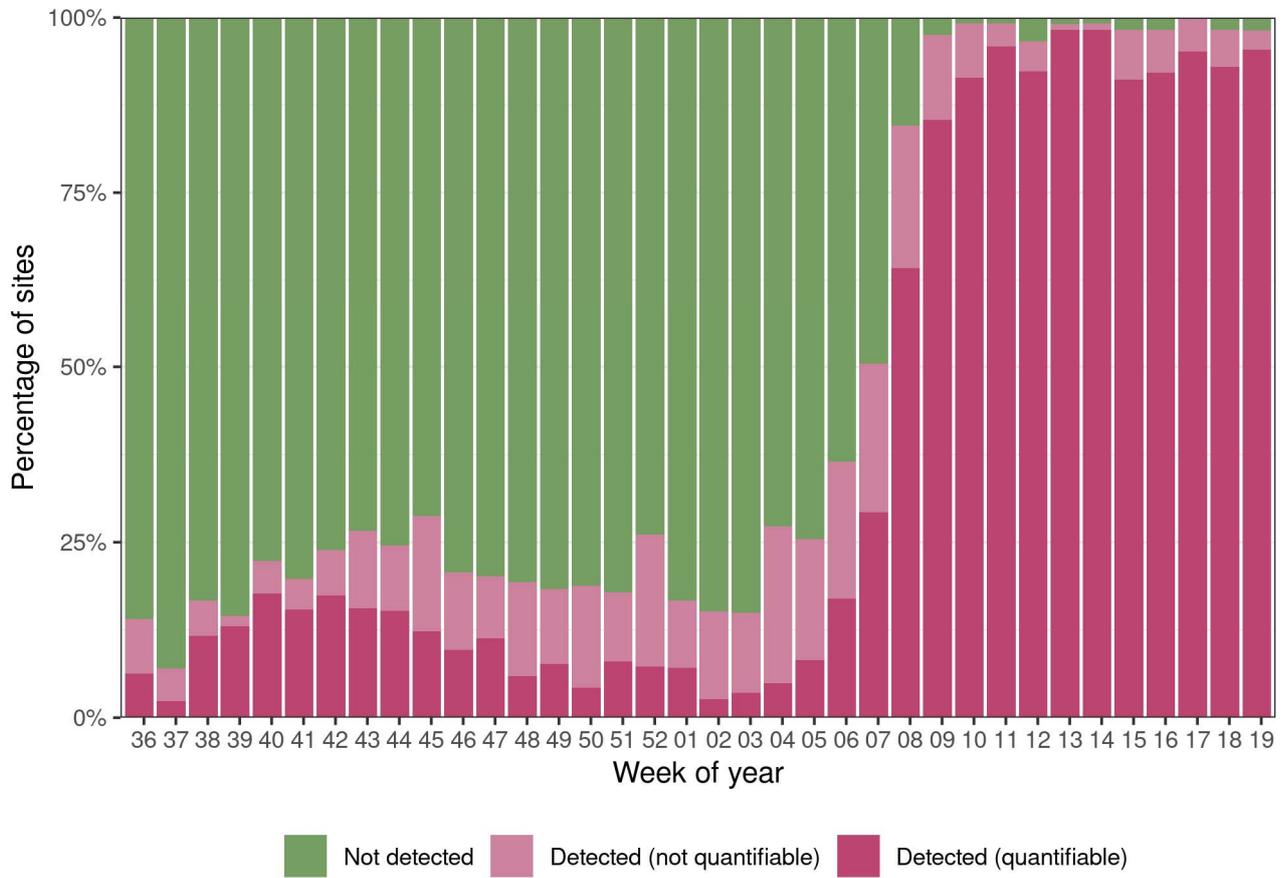
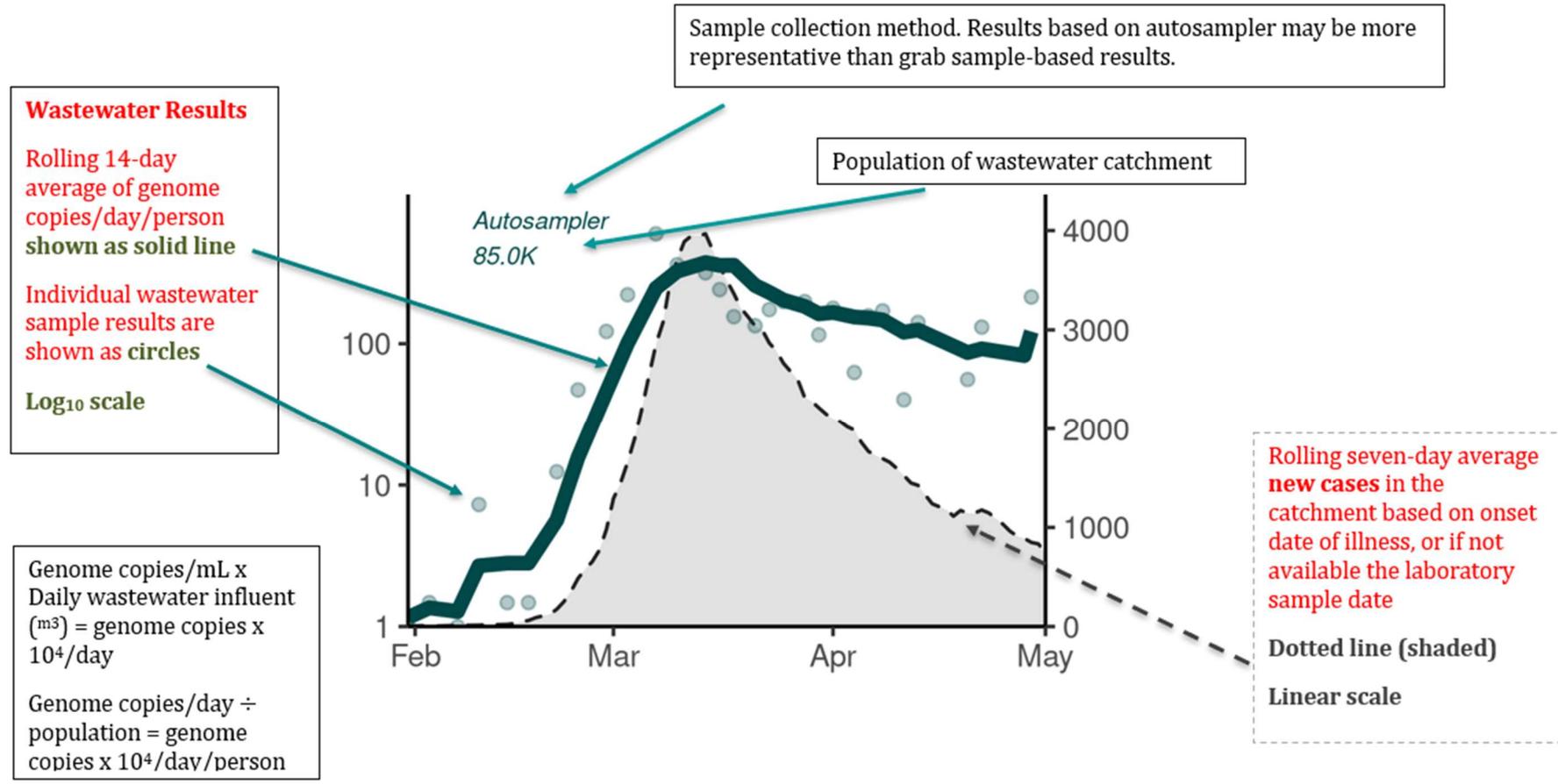


Figure 1: Results for SARS-CoV-2 RNA in wastewater collected across New Zealand.



Figure 2. Location of sampling sites and latest results in the two weeks ending 15 May, 2022. Interactive map of weekly results available publicly at <https://www.esr.cri.nz/our-expertise/covid-19-response/wastewater-testing-results>

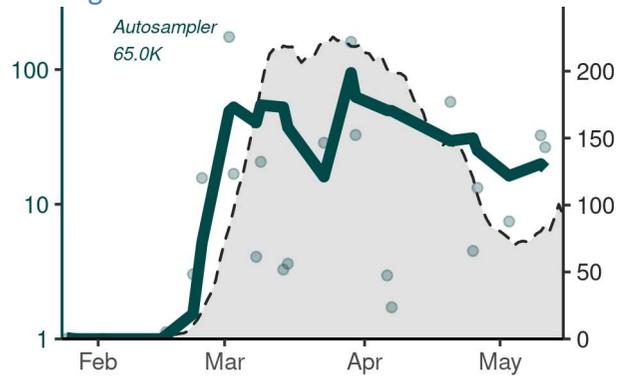
Interpreting site graphs



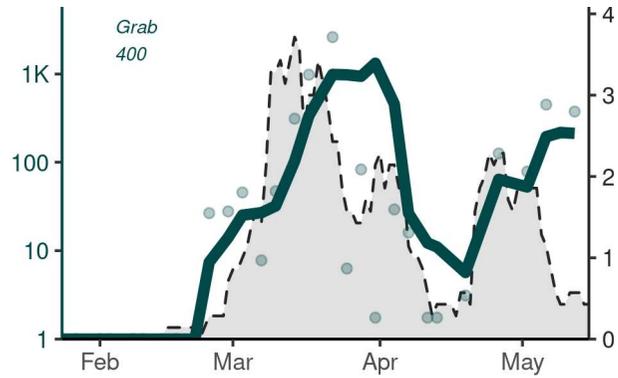
Note the scales may differ for each graph
 Wastewater results are on log₁₀ scale, while case data is on a linear scale.

Northland

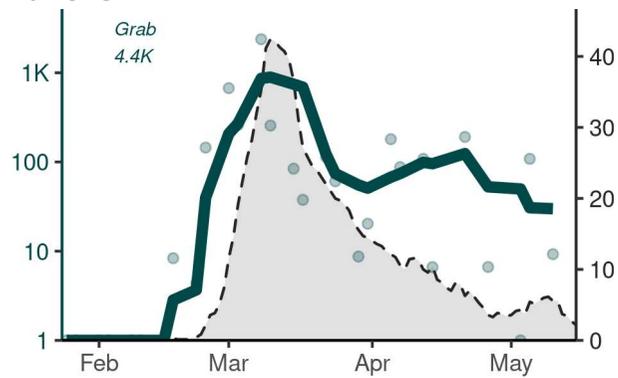
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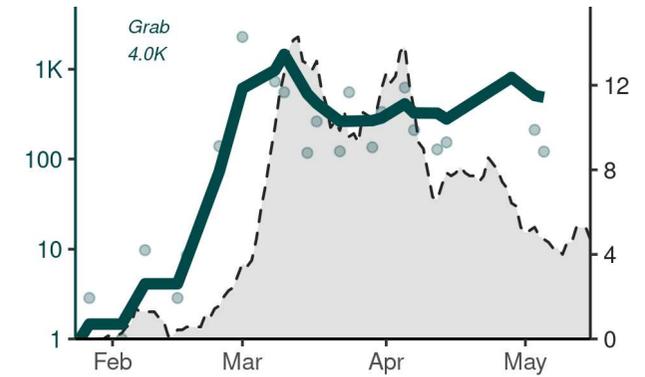
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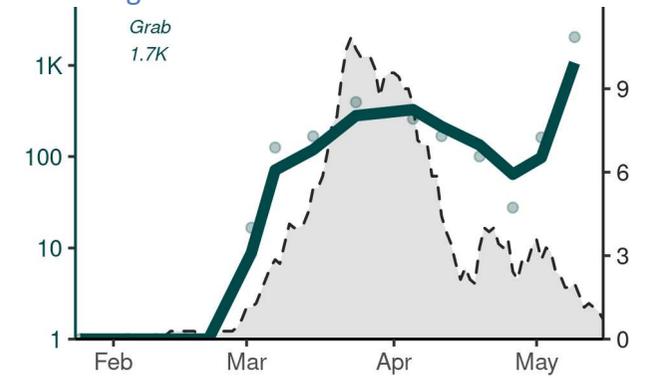
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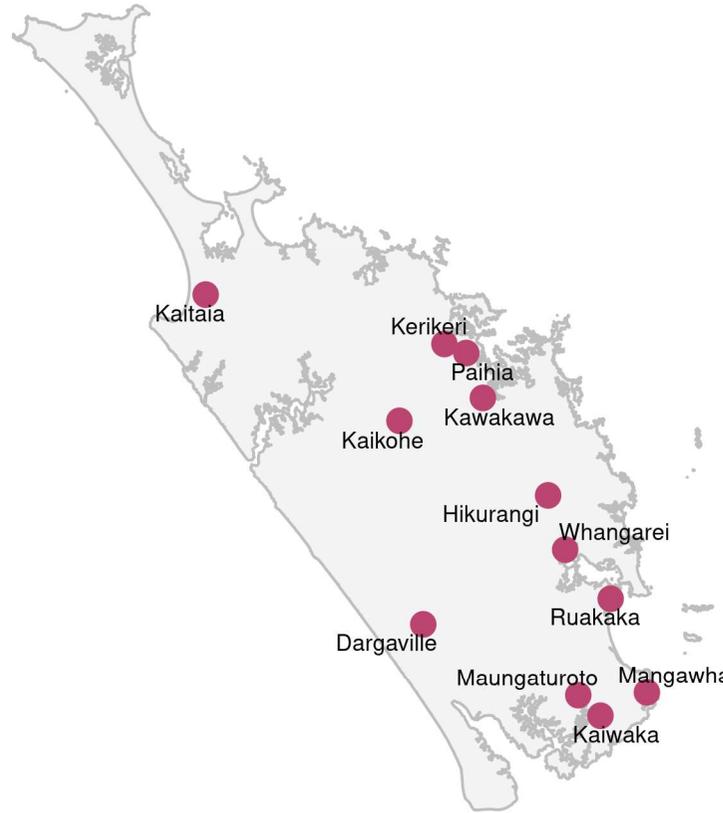
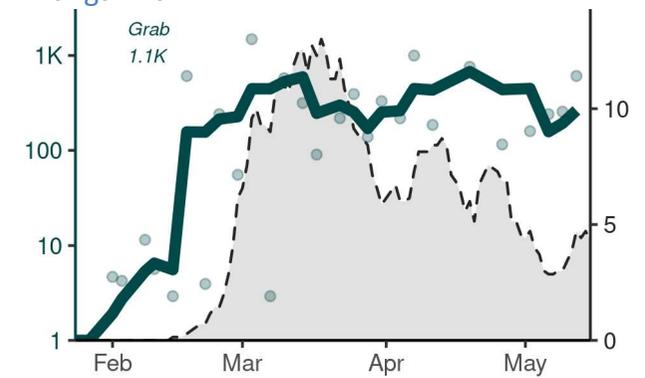
Paihia



Hikurangi

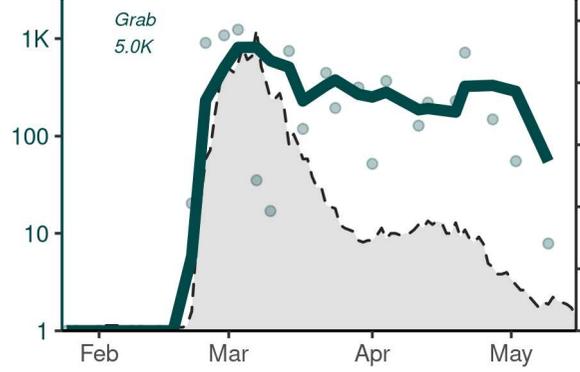


Mangawhai

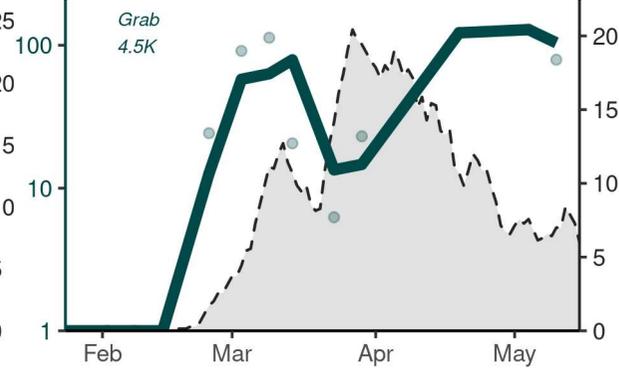


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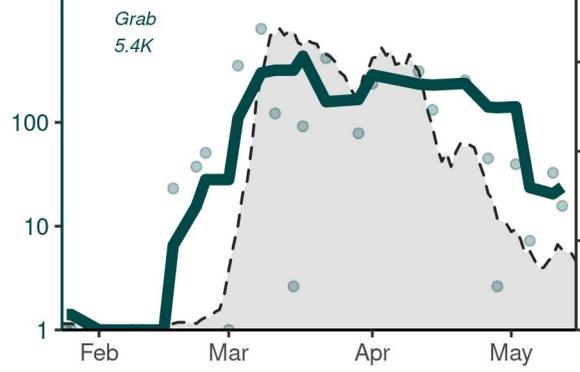
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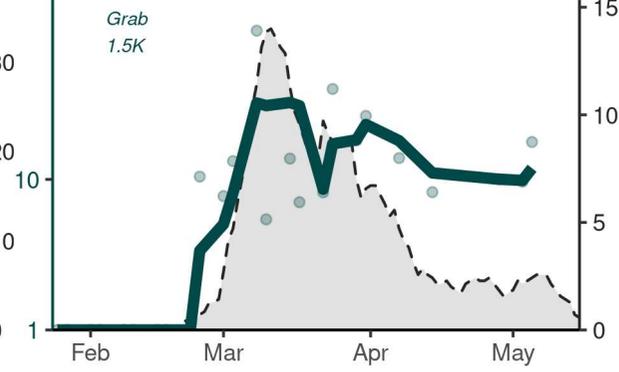
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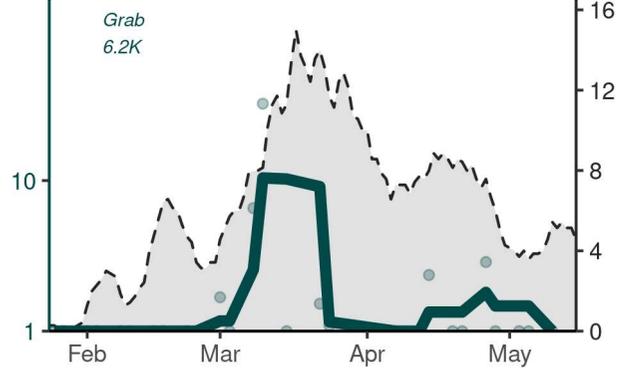
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Kawakawa

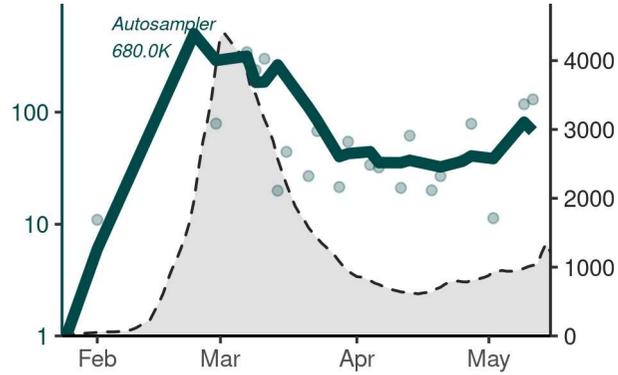


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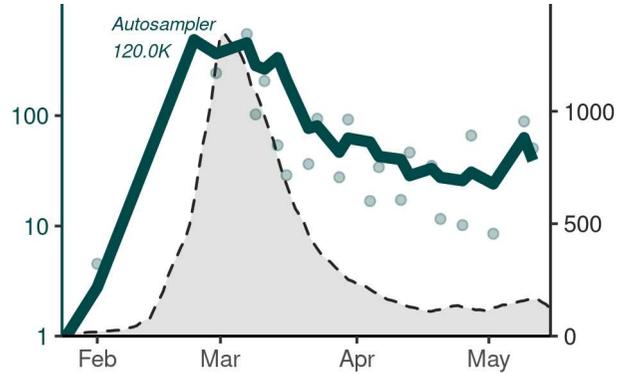


Auckland

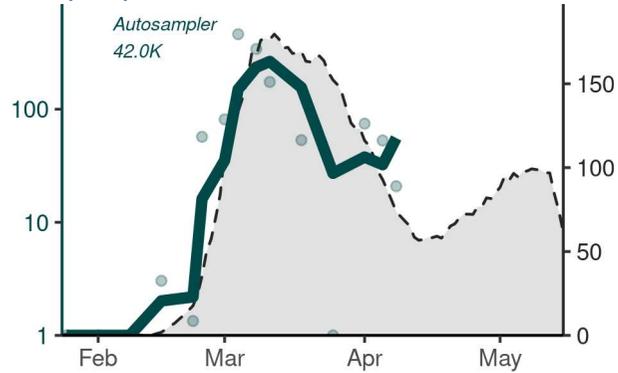
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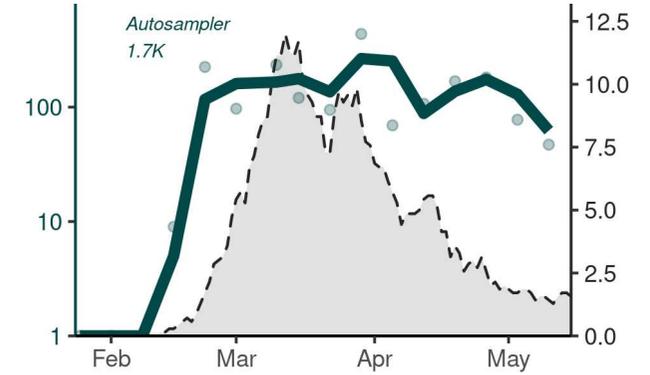
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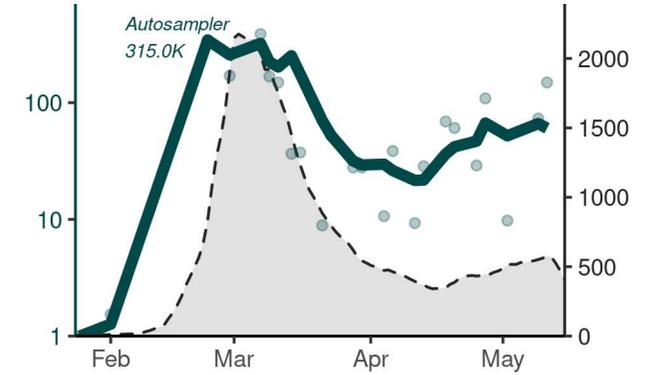
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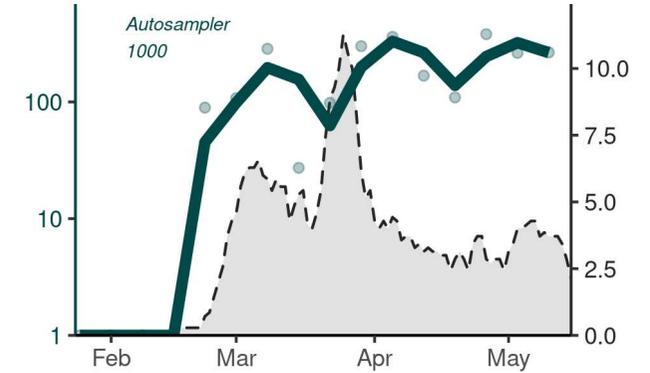
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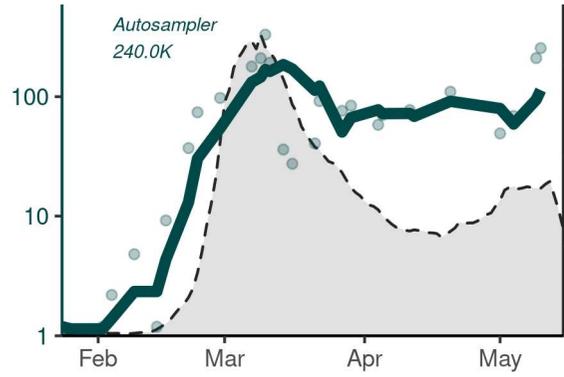
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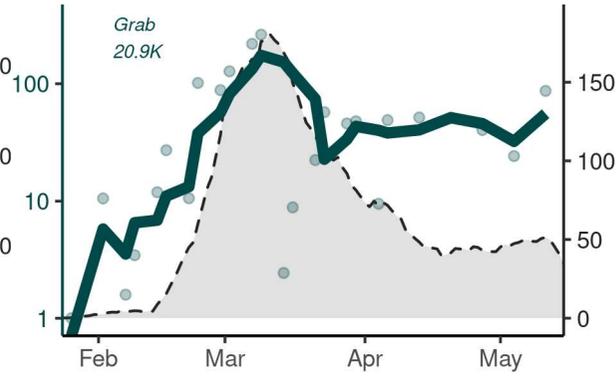
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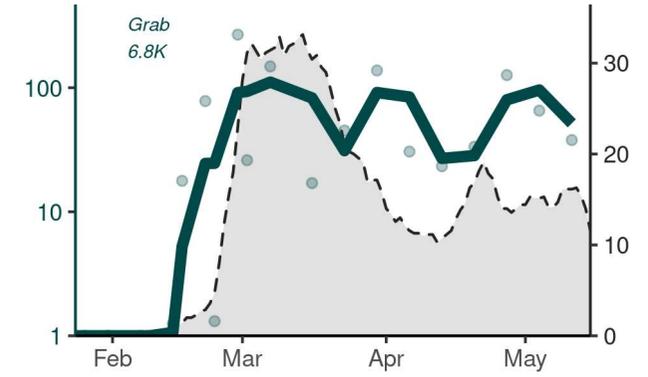
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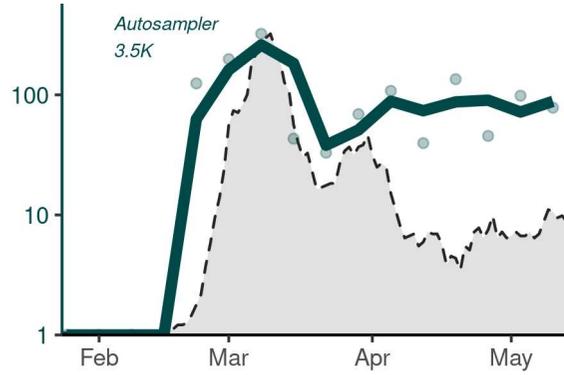
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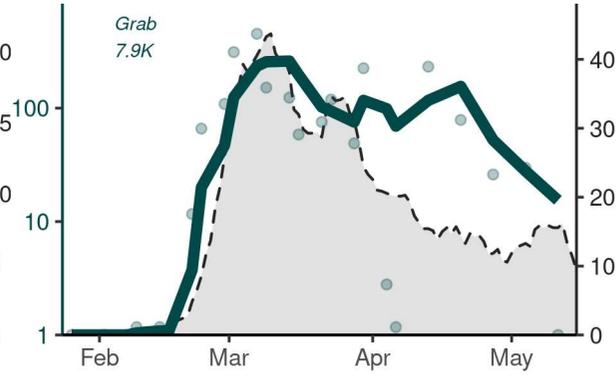
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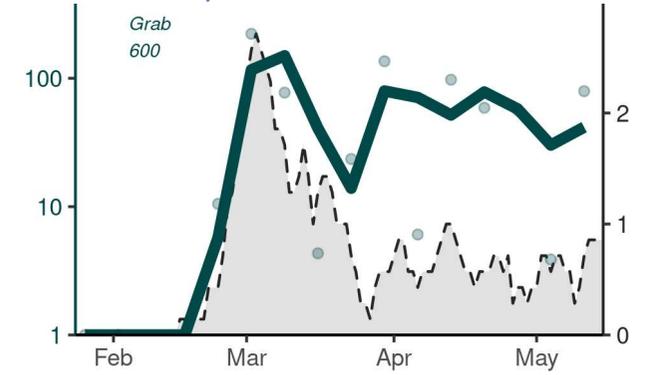
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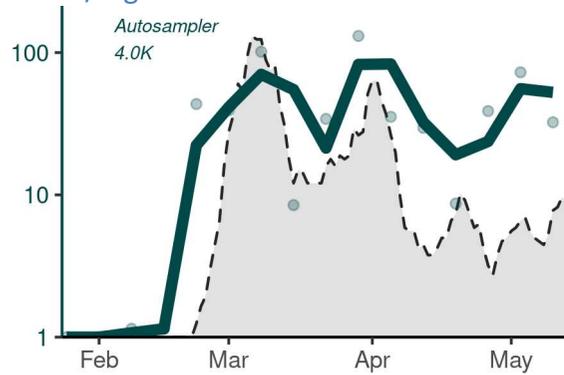
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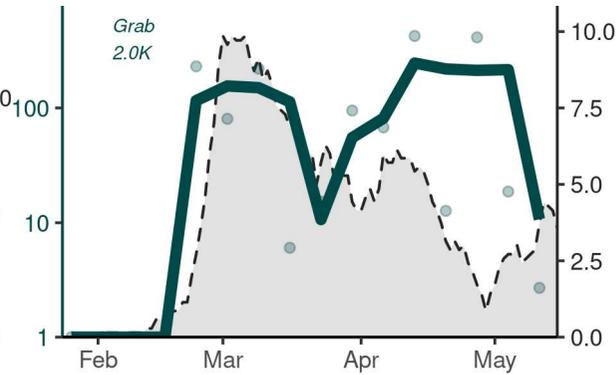
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Snells/Algies

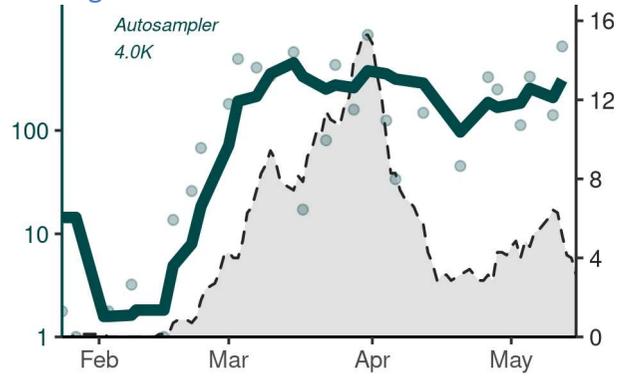


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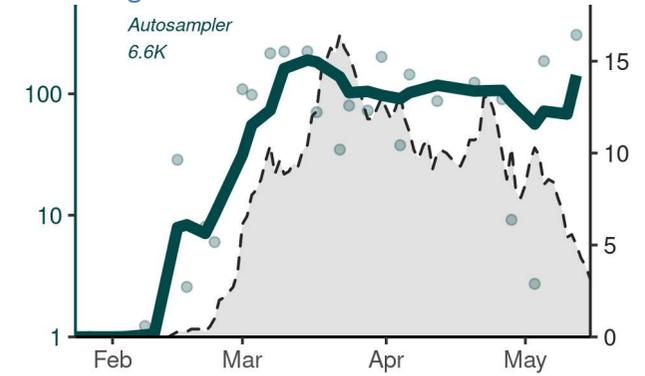


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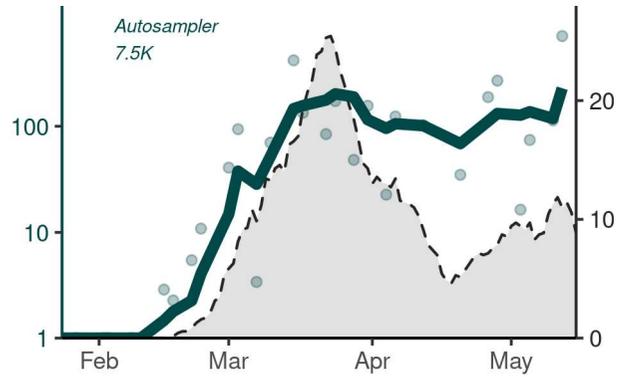
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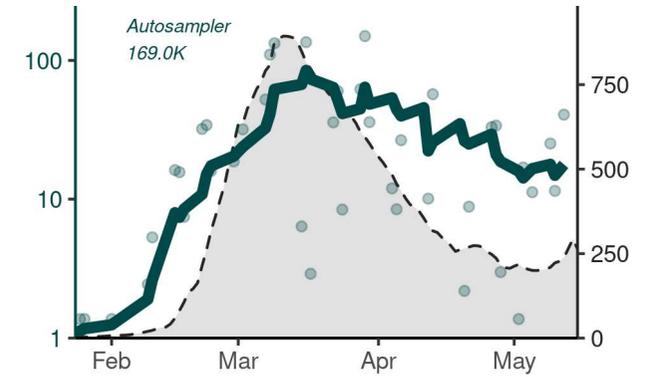
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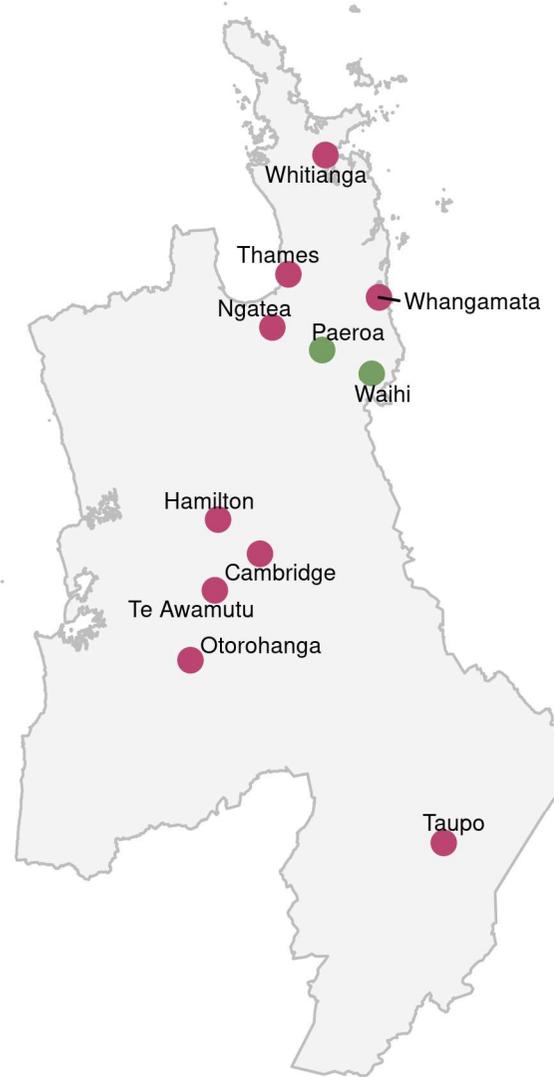
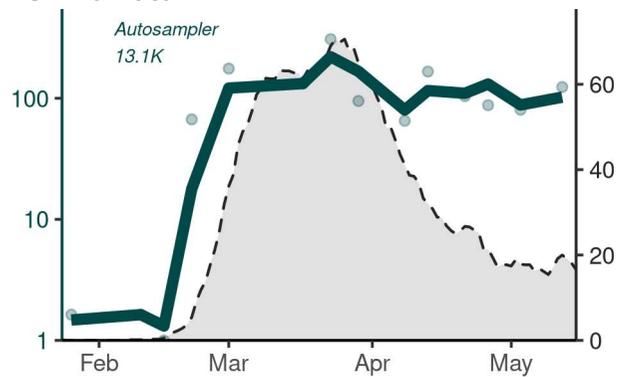
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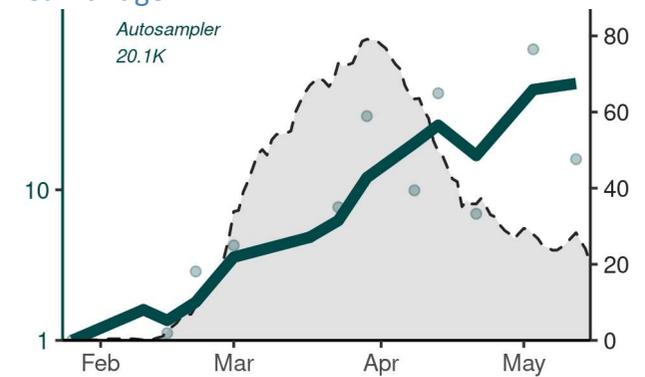


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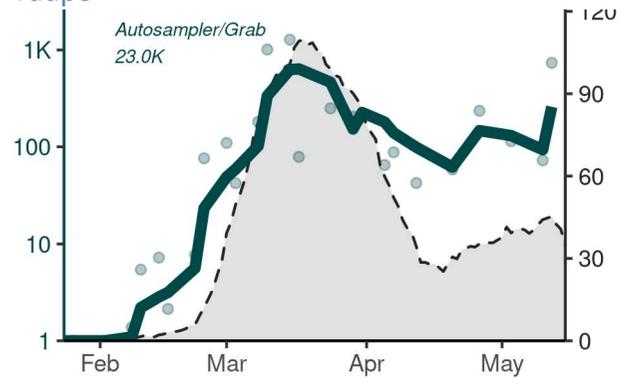


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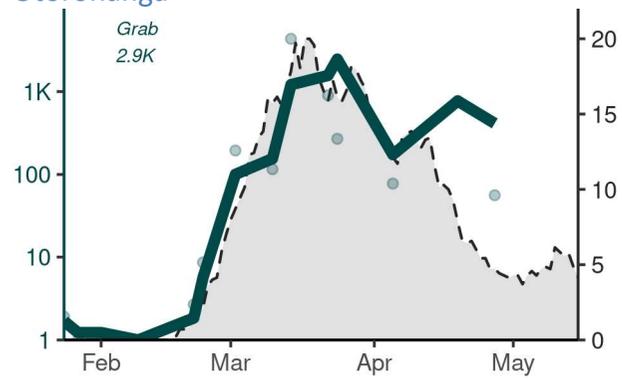
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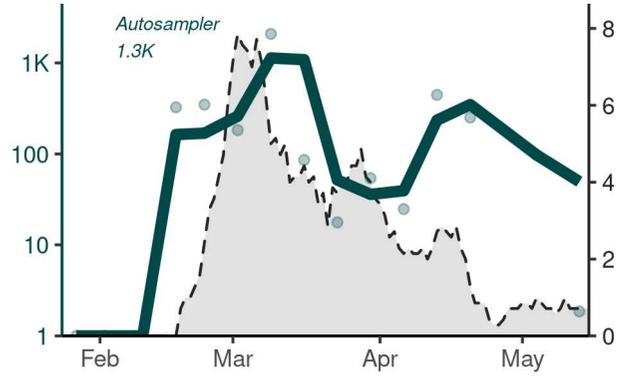


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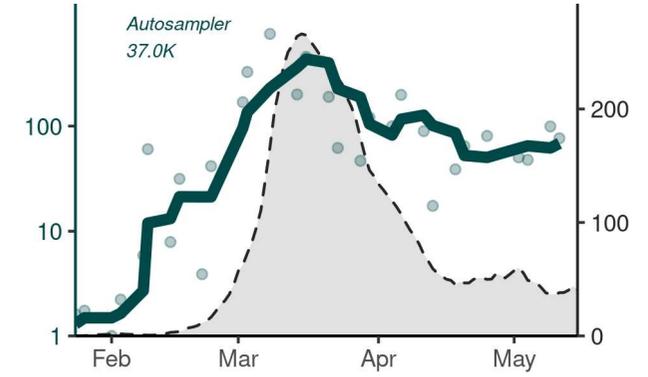


Bay of Plenty and Gisborne

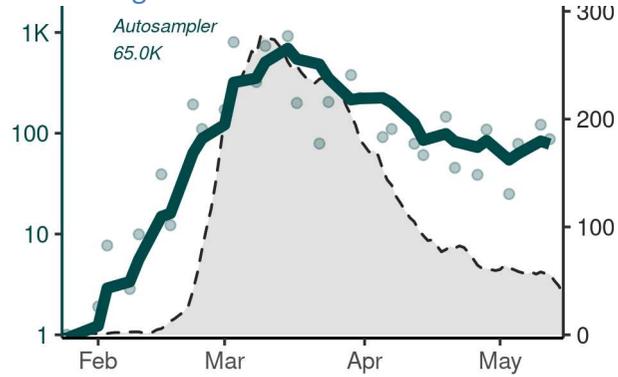
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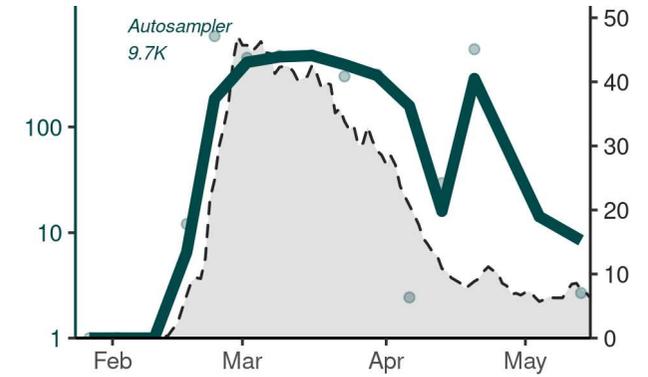
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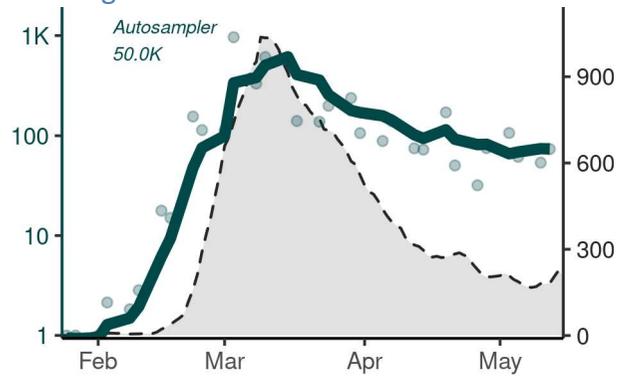
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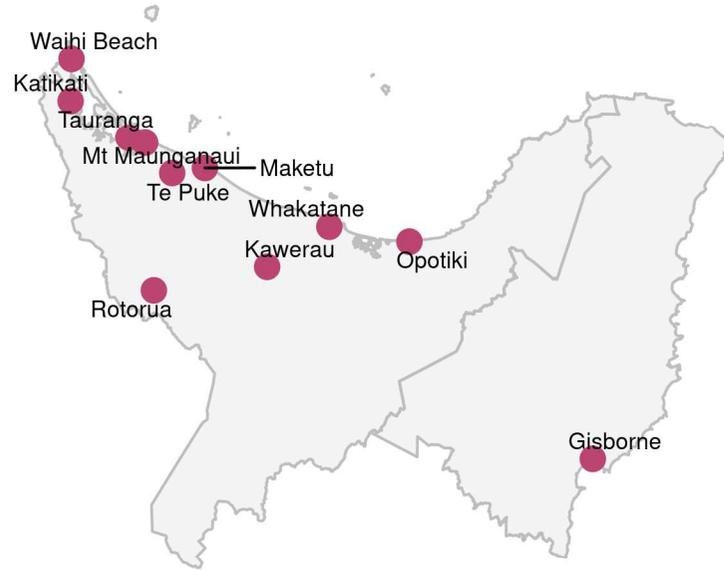
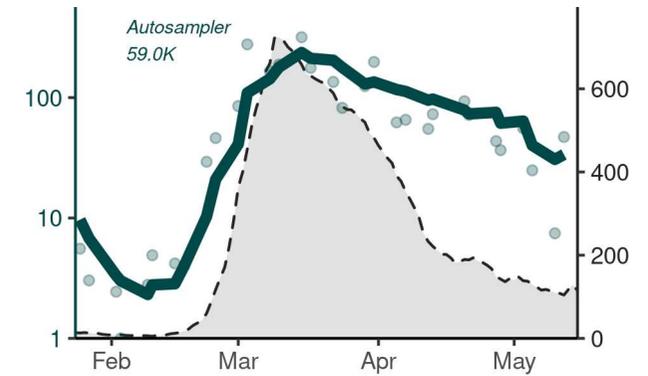
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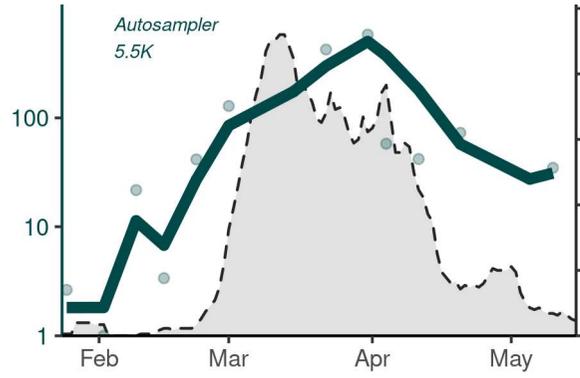


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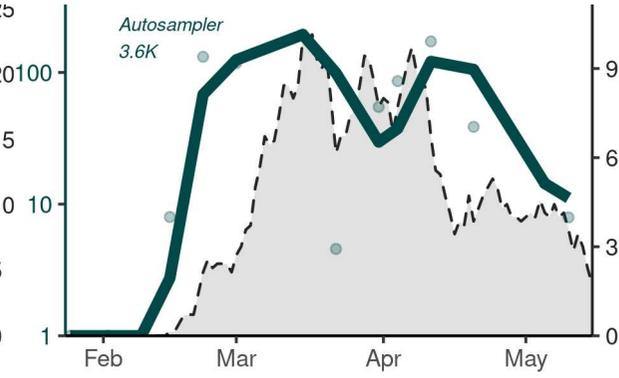


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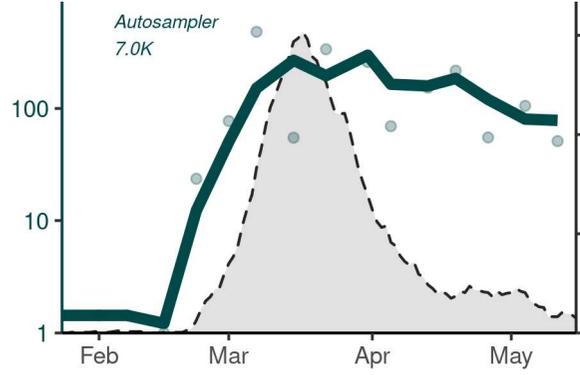
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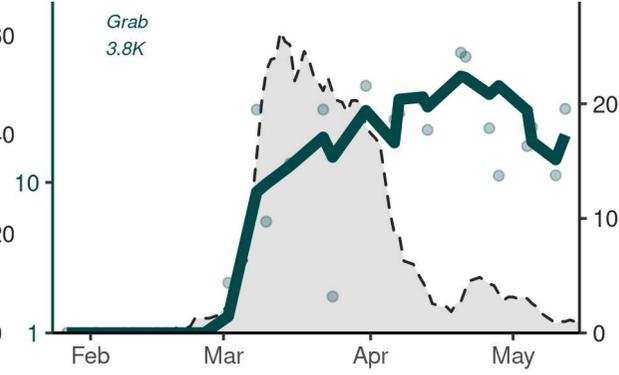
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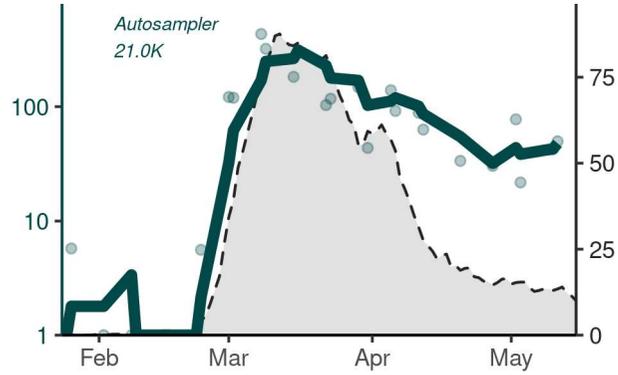
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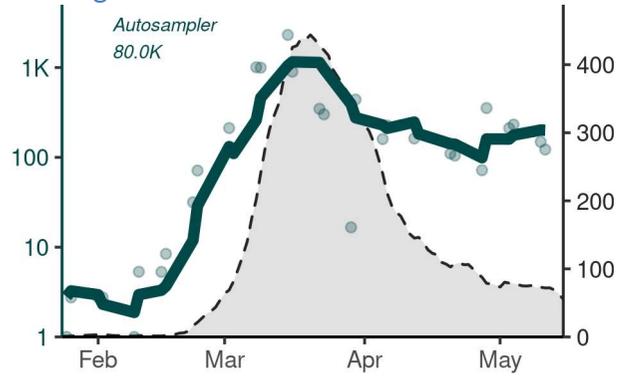


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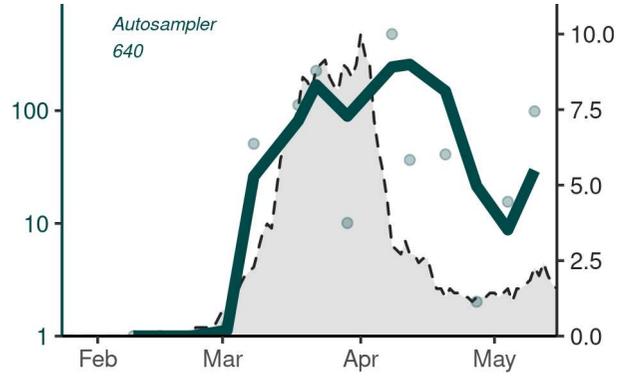


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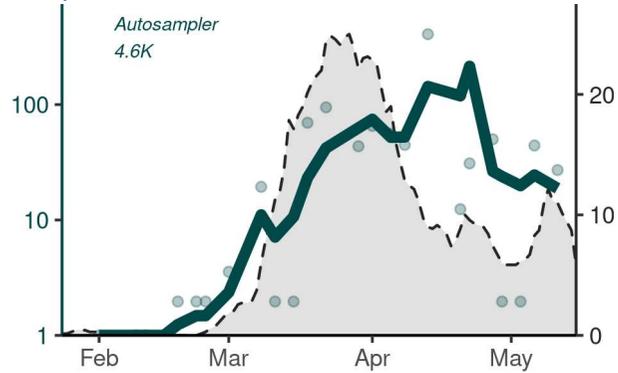
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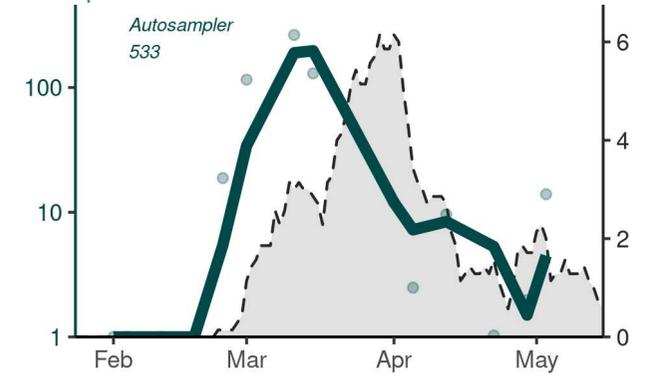
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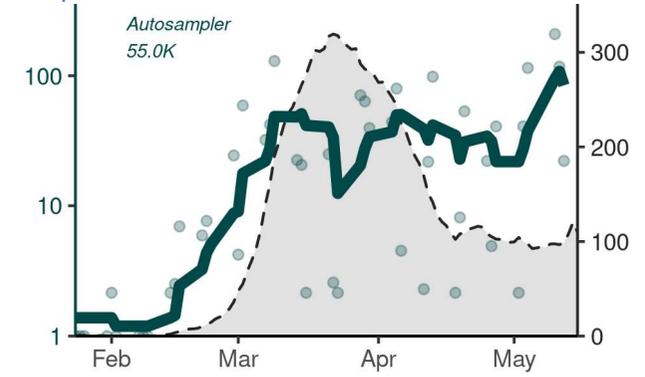
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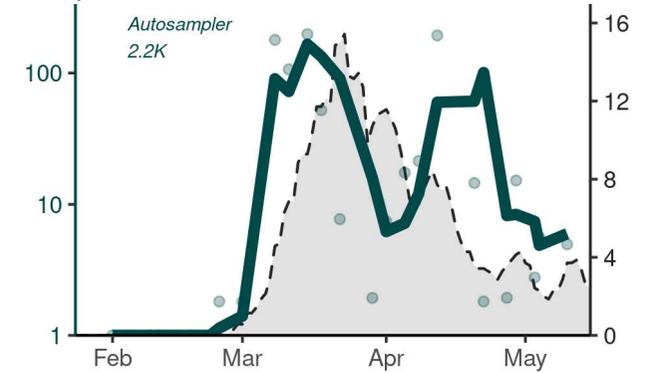
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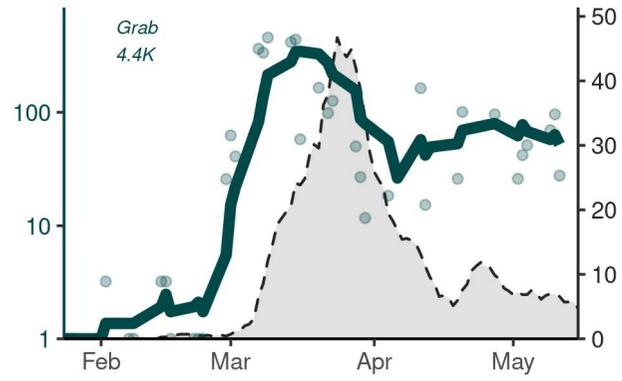


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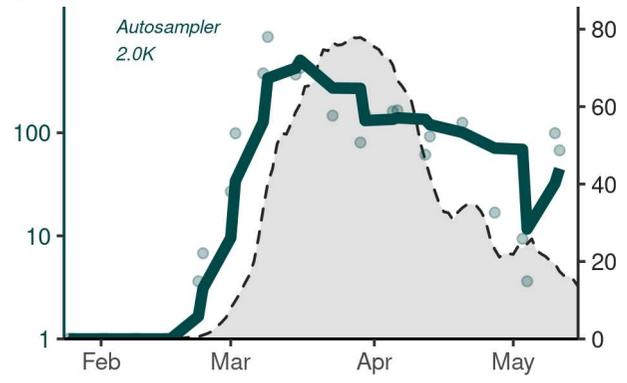
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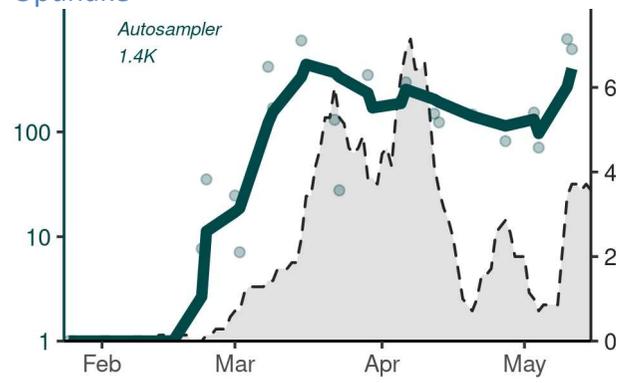


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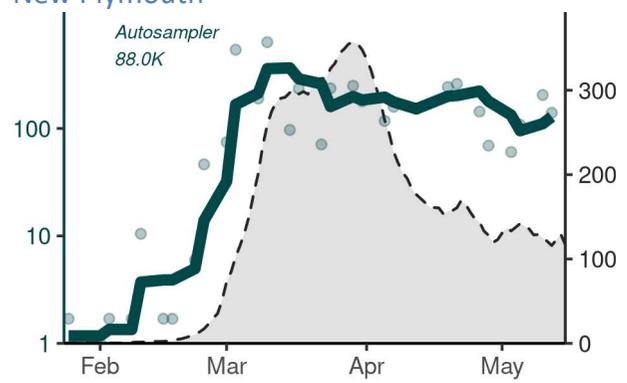
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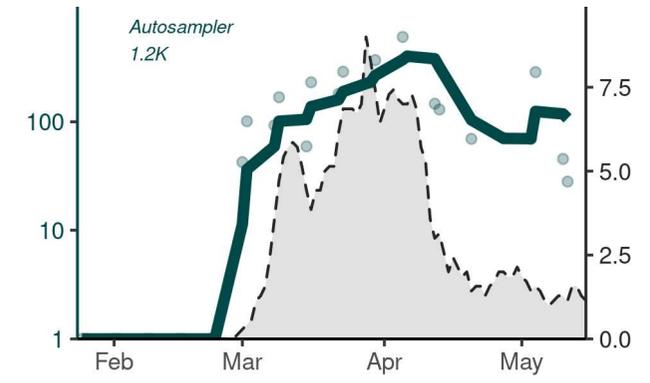
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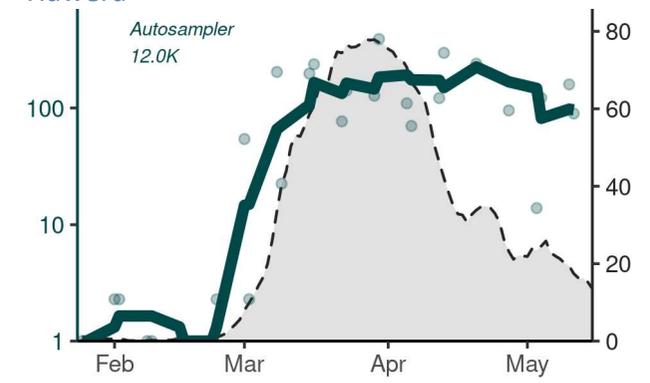
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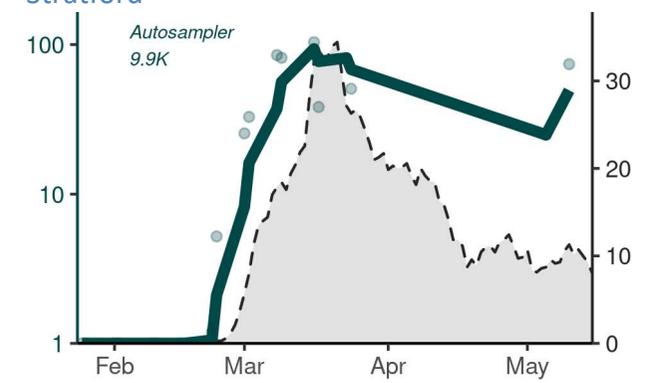
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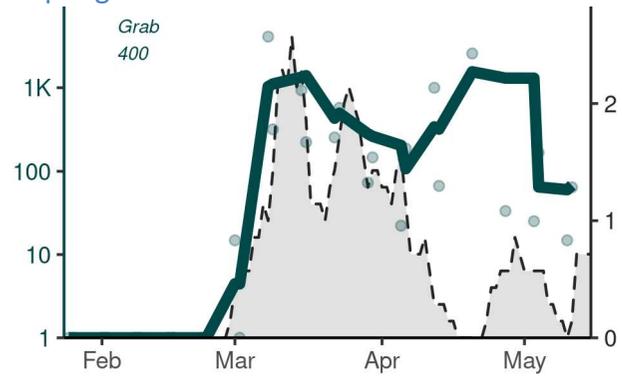


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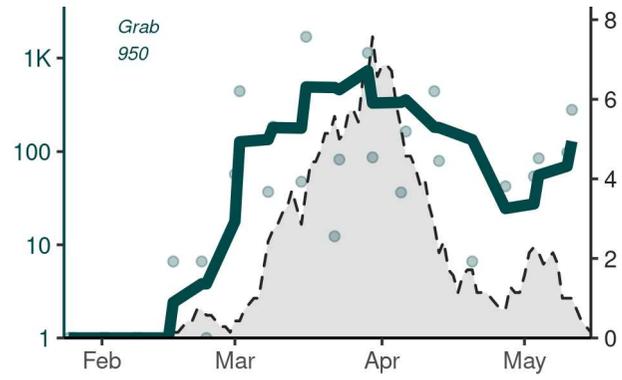


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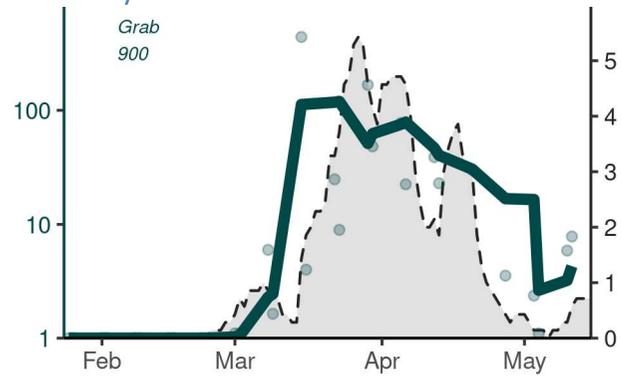
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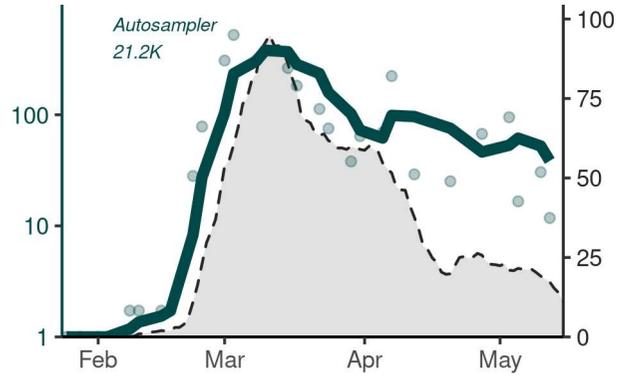


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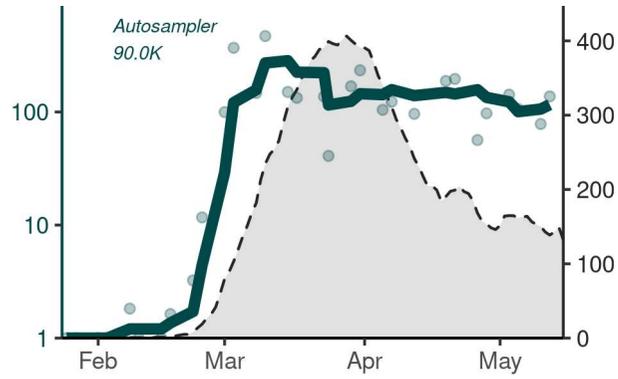


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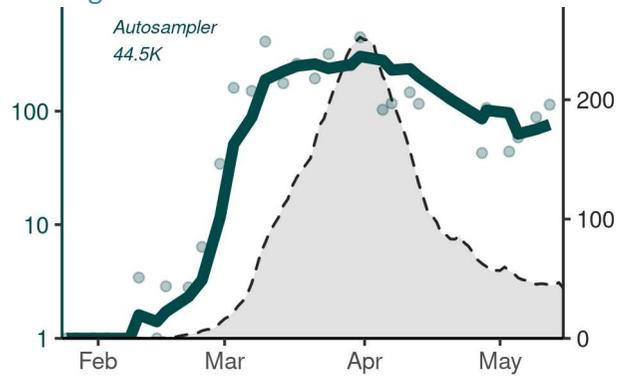
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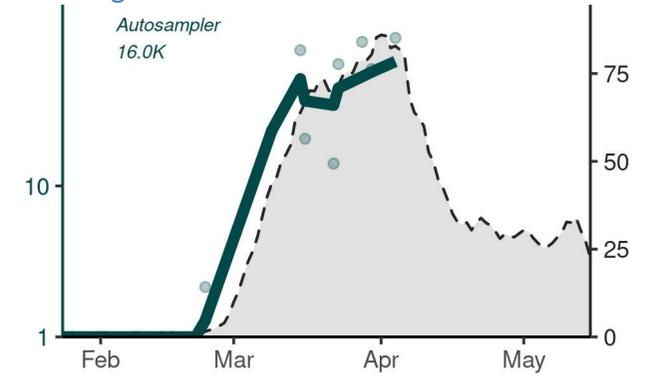
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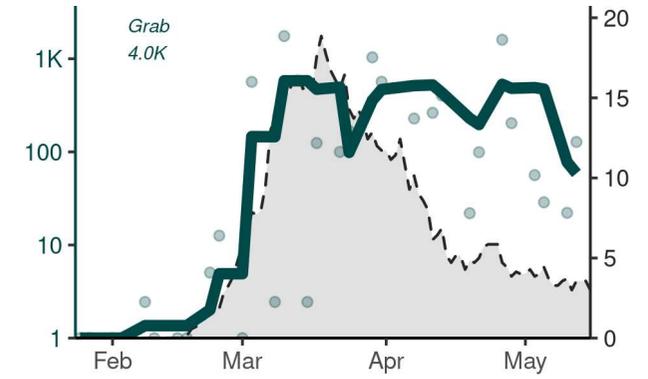
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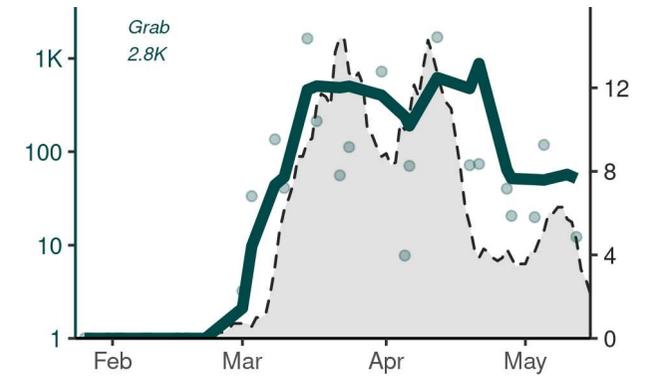
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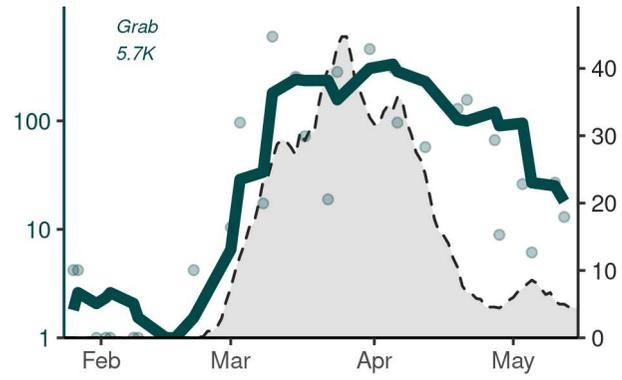
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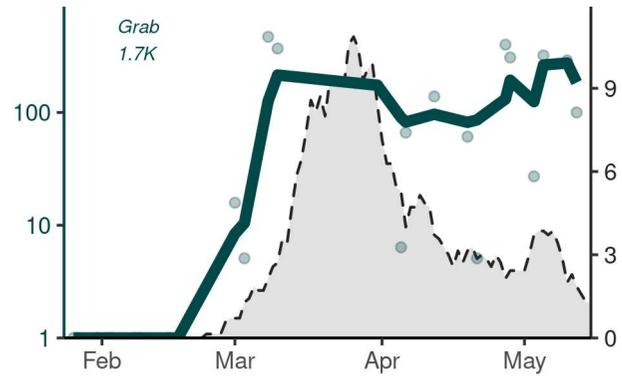
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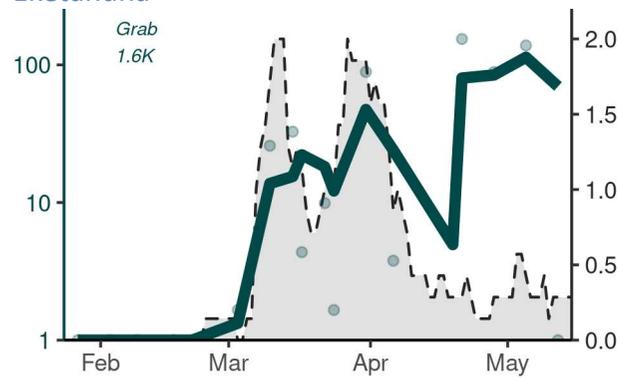
Dannevirke



Woodville

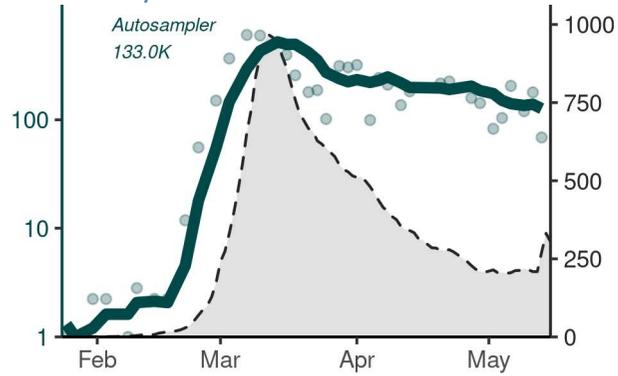


Eketahuna

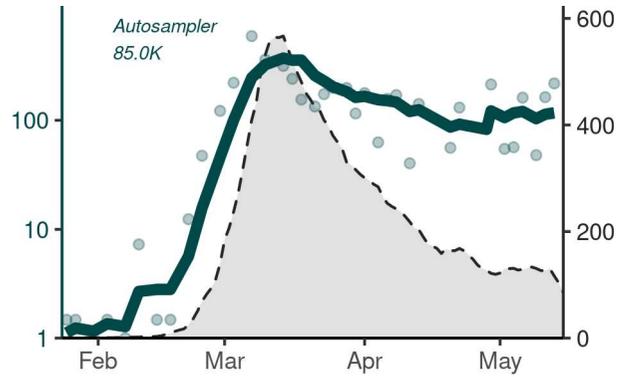


Wellington

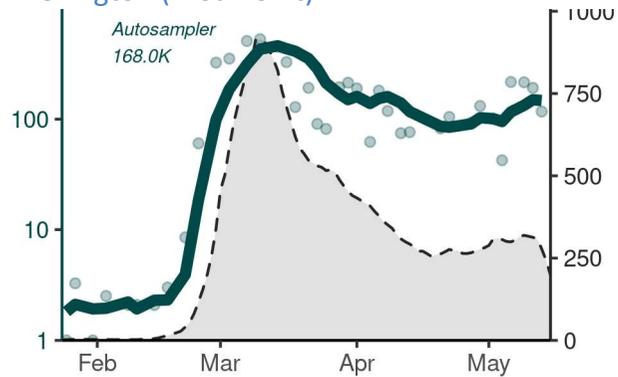
Hutt Valley



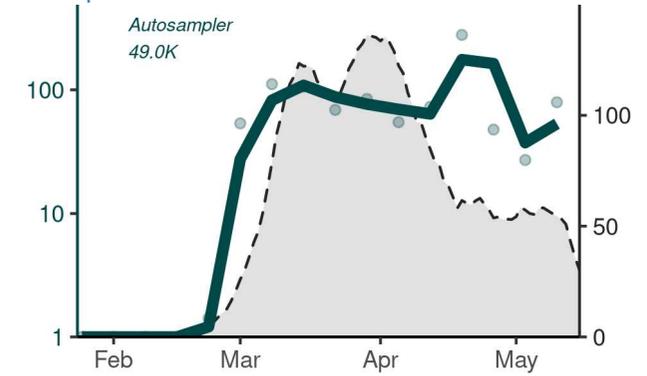
Porirua



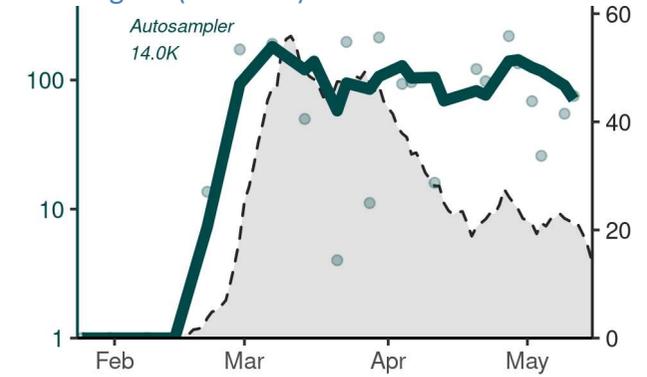
Wellington (Moa Point)



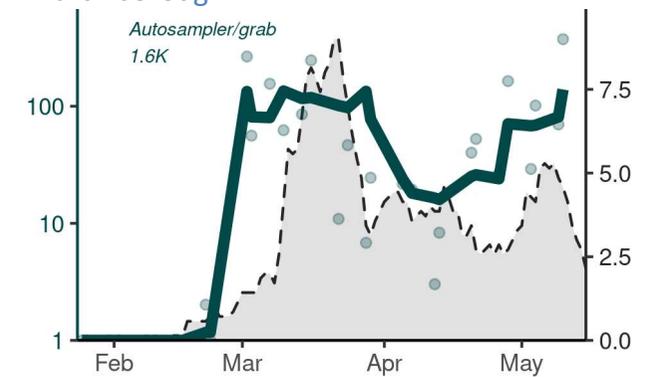
Paraparaumu



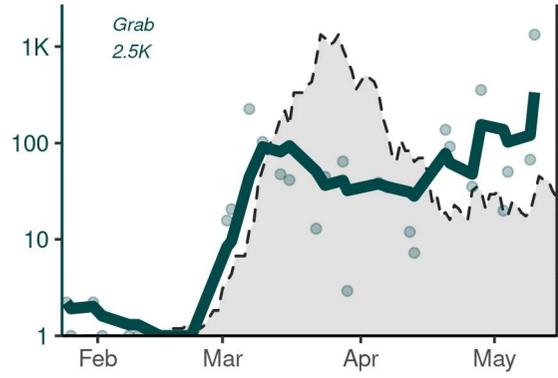
Wellington (Western)



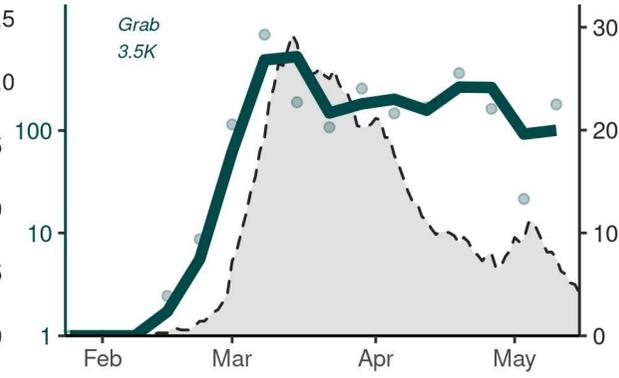
Martinborough



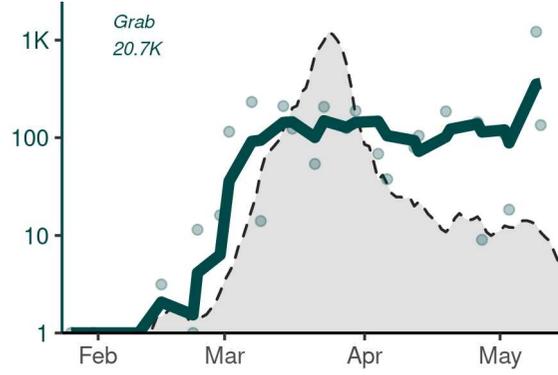
Featherston



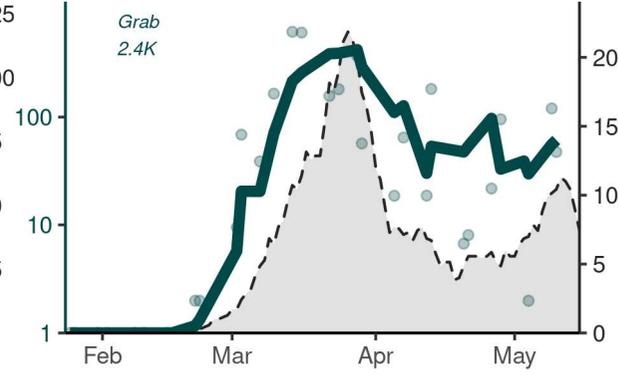
Otaki



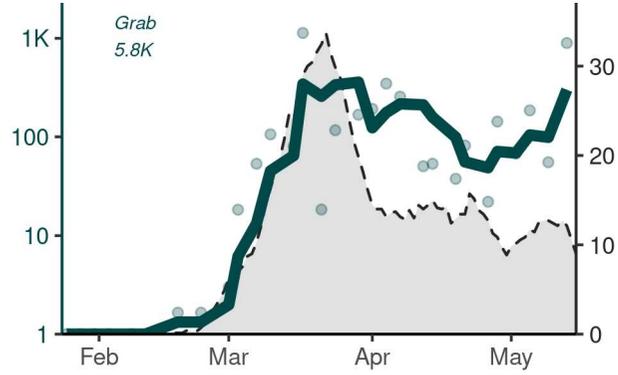
Masterton



Greytown

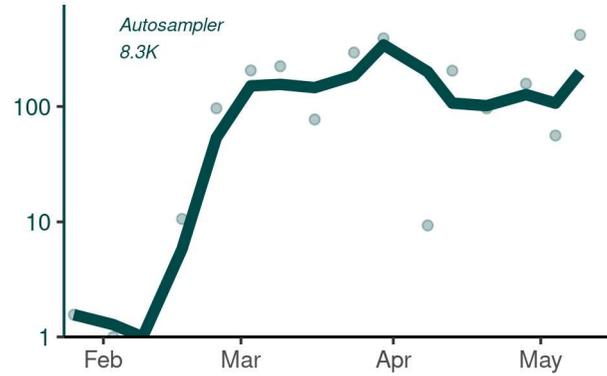


Carterton

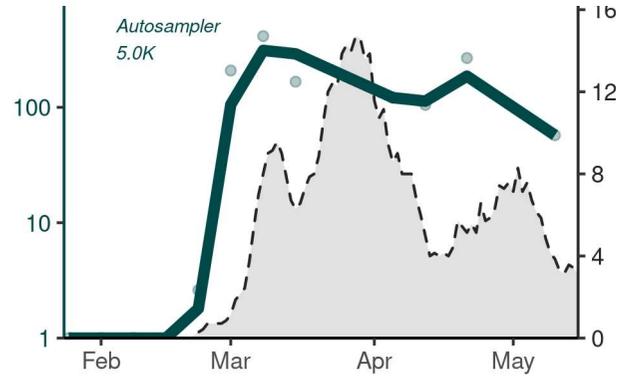


Tasman, Nelson, and Marlborough

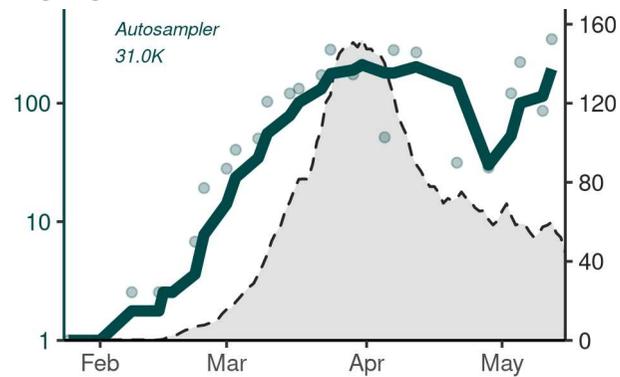
Motueka



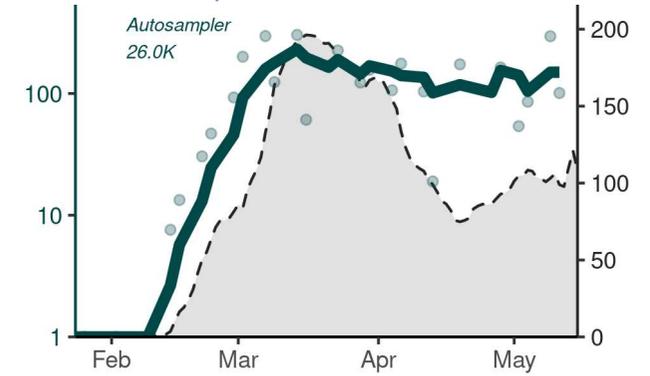
Picton



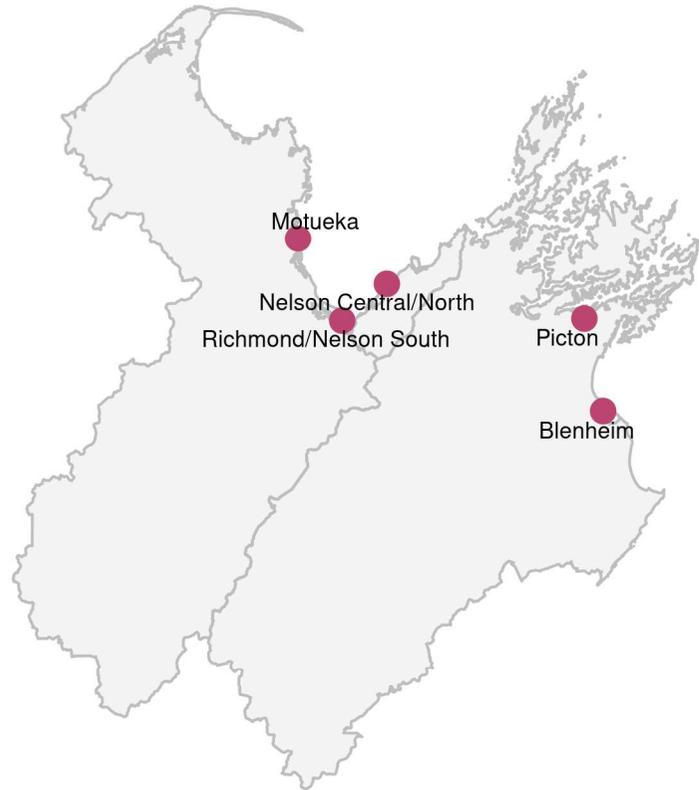
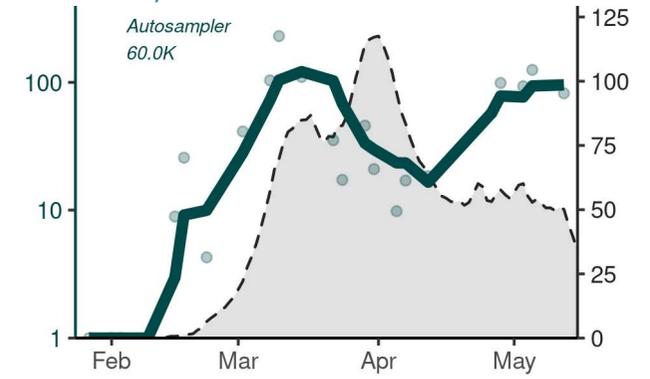
Blenheim



Nelson Central/North



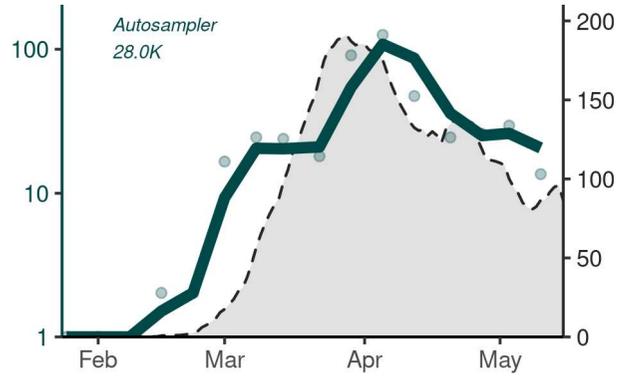
Richmond/Nelson South



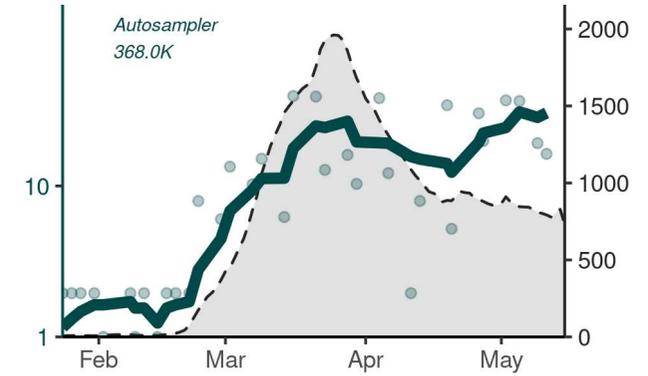
Status ● Detected ● Not detected

West Coast and Canterbury

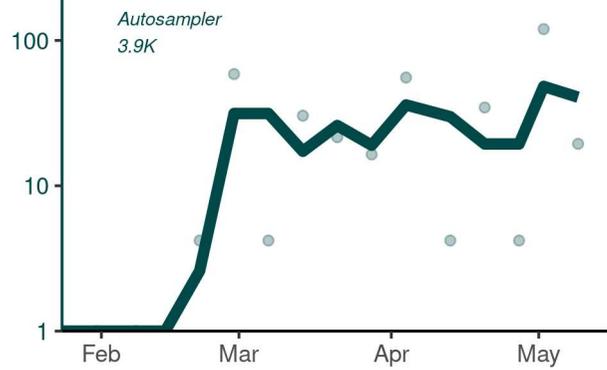
Timaru



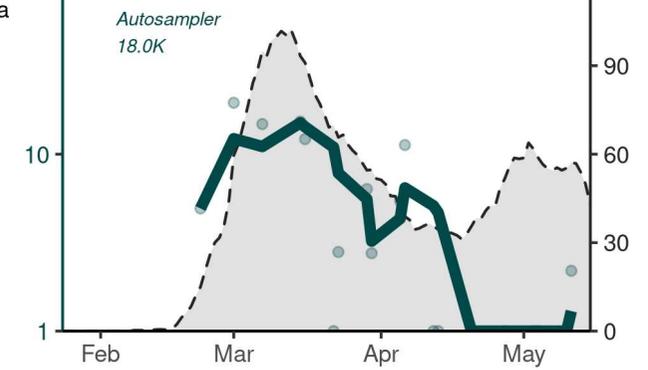
Christchurch



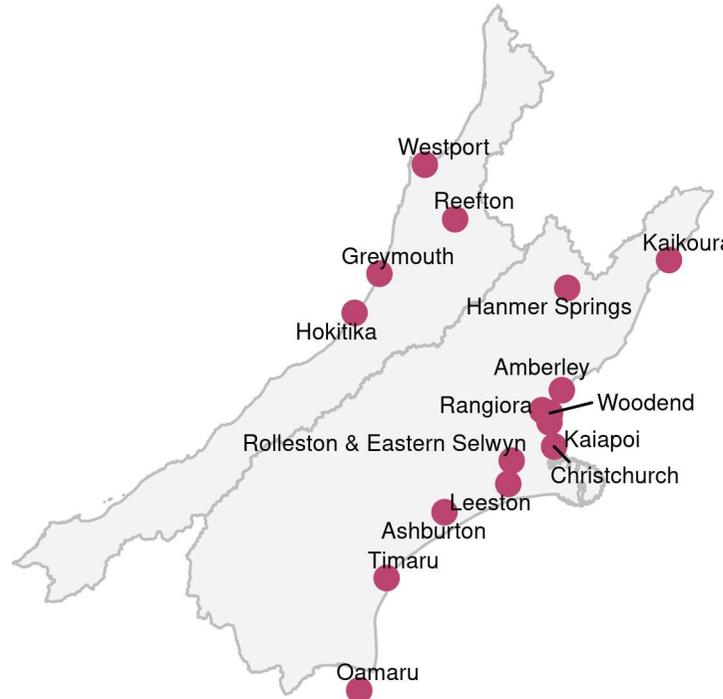
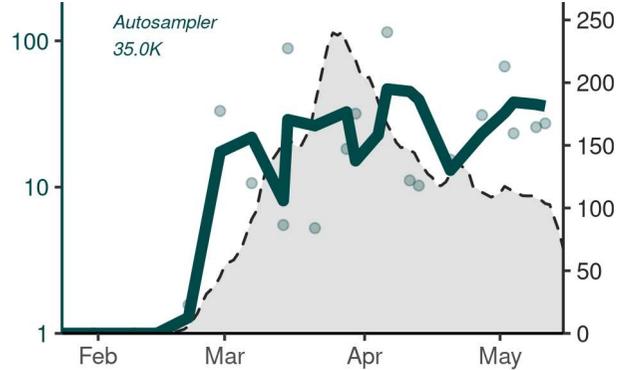
Leeston



Ashburton

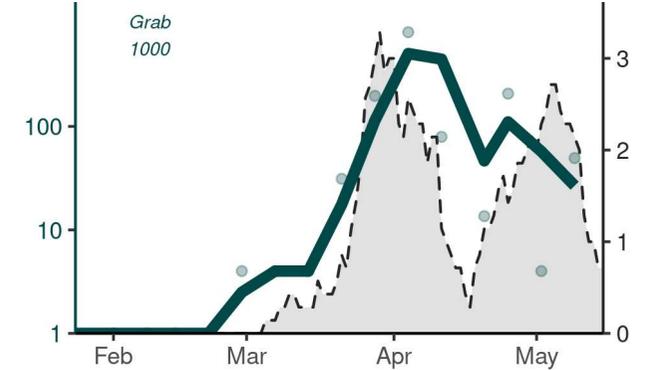


Rolleston & Eastern Selwyn

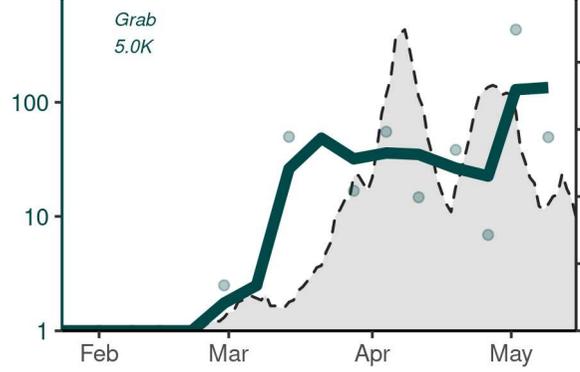


Status ● Detected ● Not detected

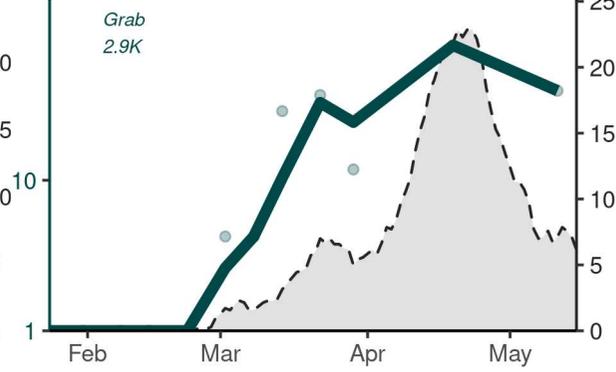
Reefton



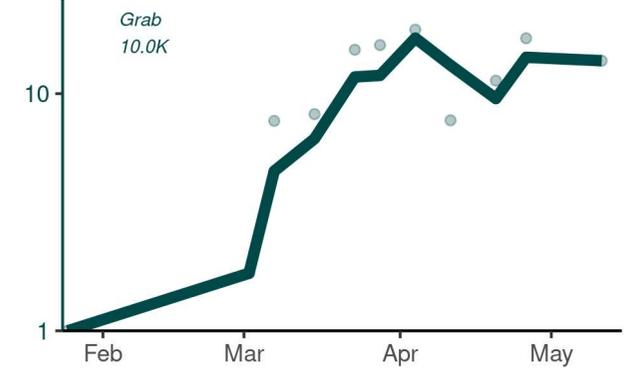
Westport



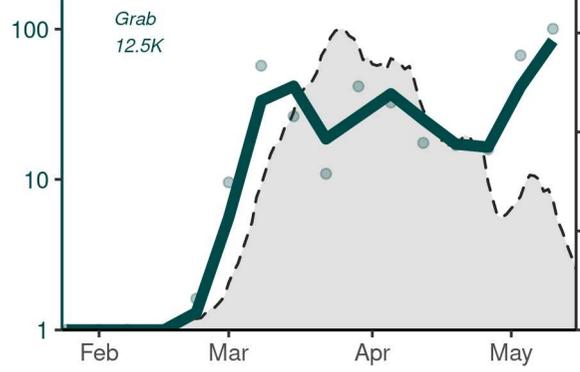
Hokitika



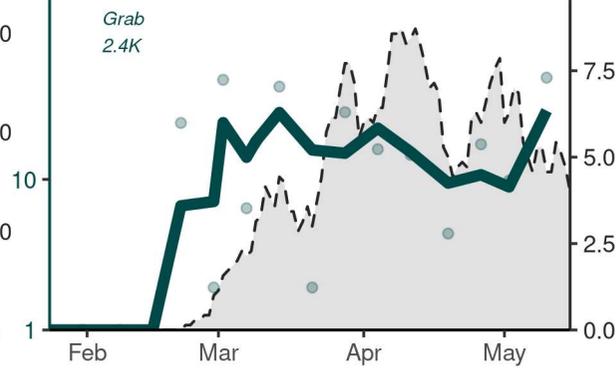
Greymouth



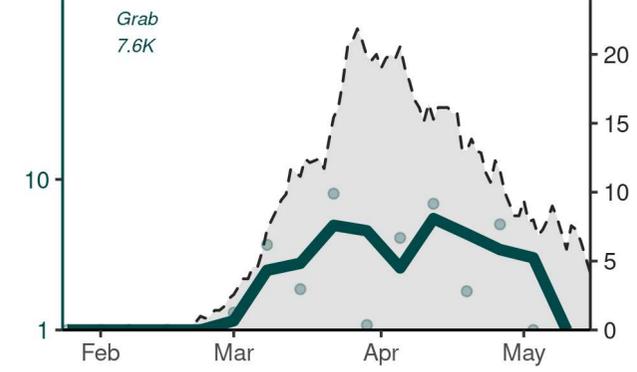
Kaiapoi



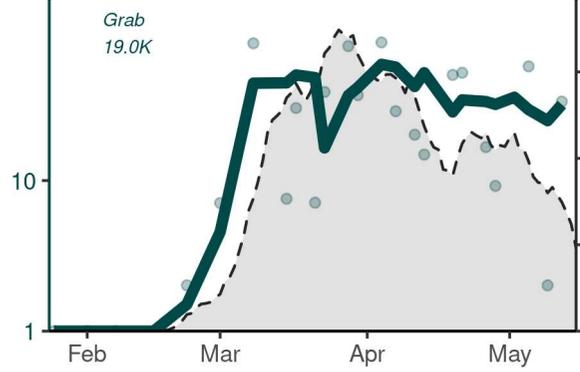
Kaikoura



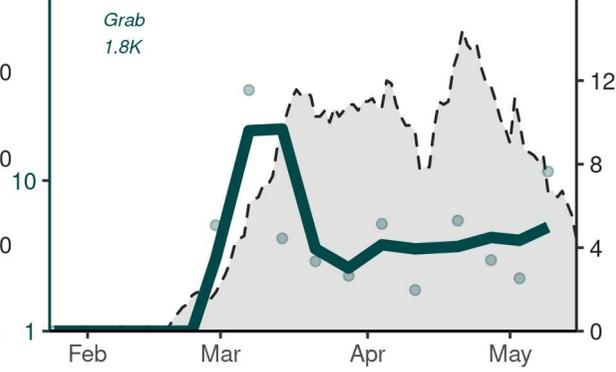
Woodend



Rangiora

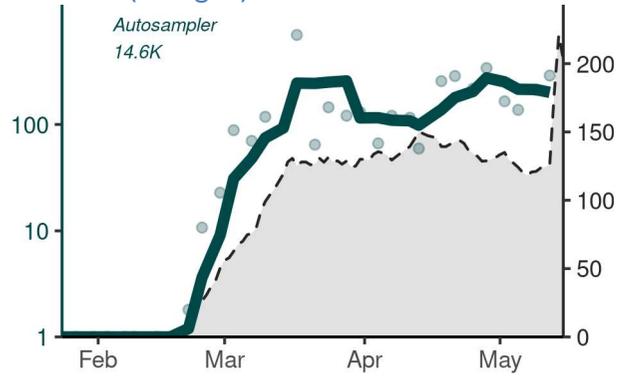


Amberley

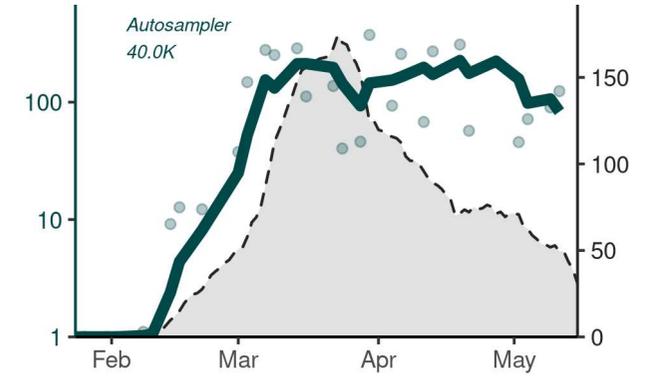


Otago and Southland

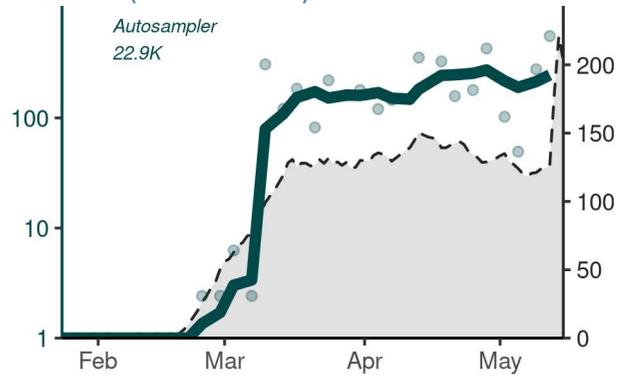
Dunedin (Mosgiel)



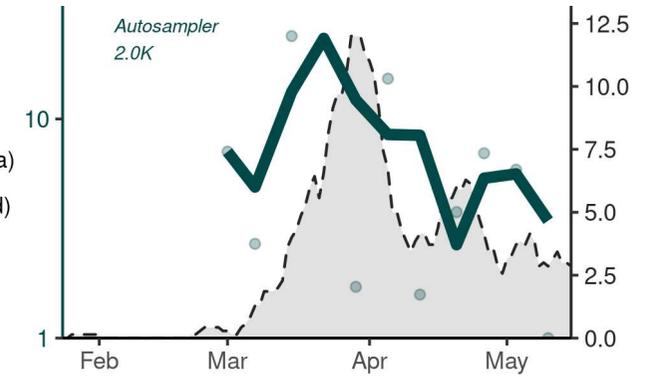
Queenstown



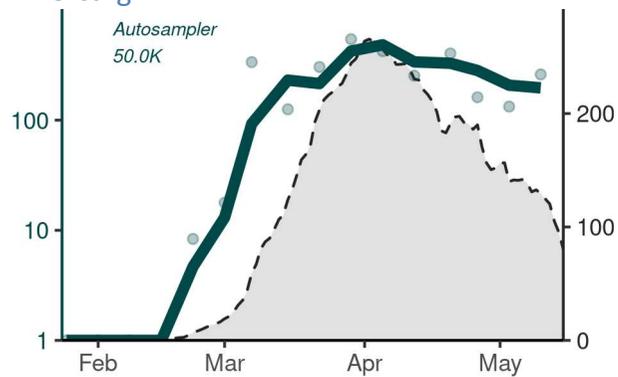
Dunedin (Green Island)



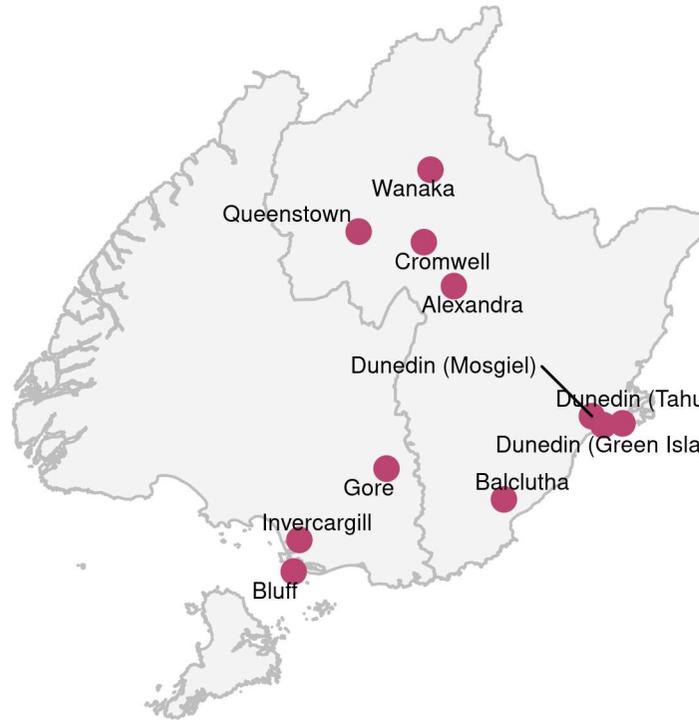
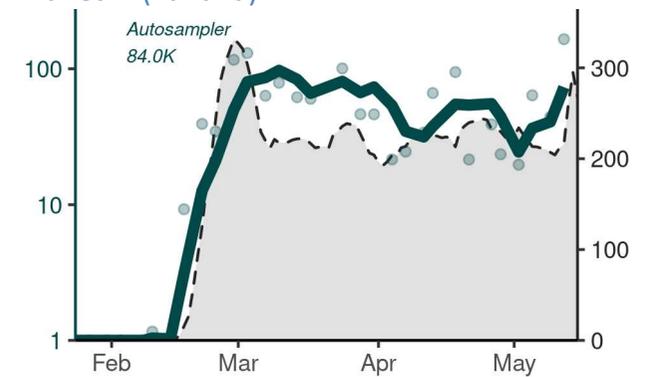
Bluff



Invercargill

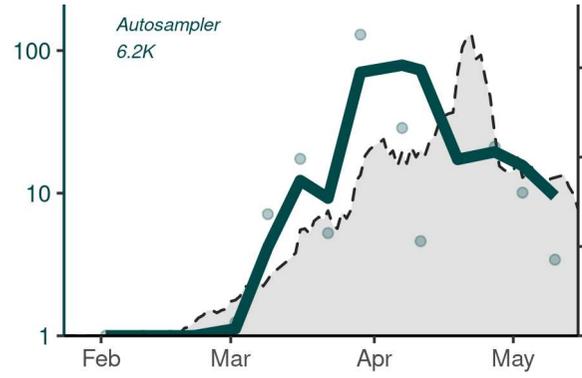


Dunedin (Tahuna)

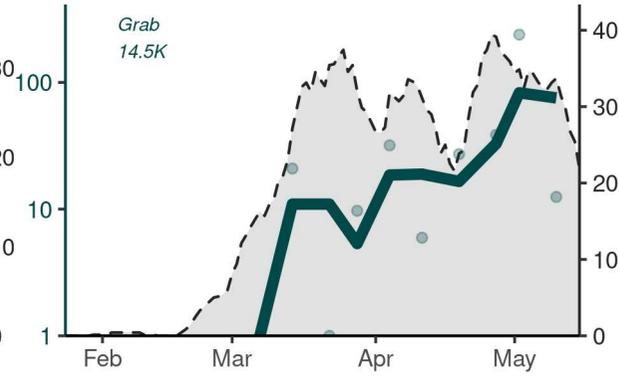


Status ● Detected ● Not detected

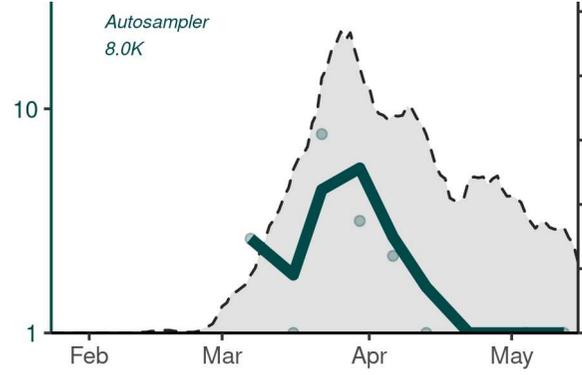
Alexandra



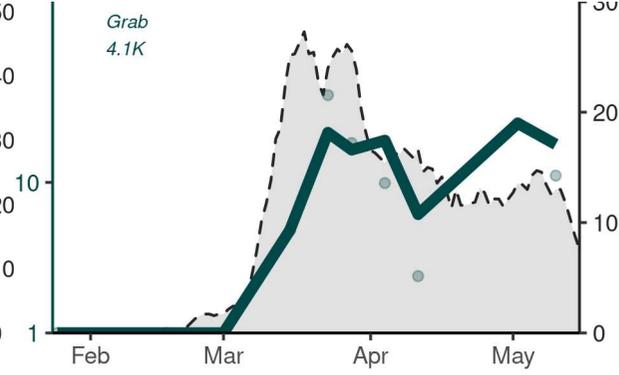
Wanaka



Gore



Balclutha



Cromwell

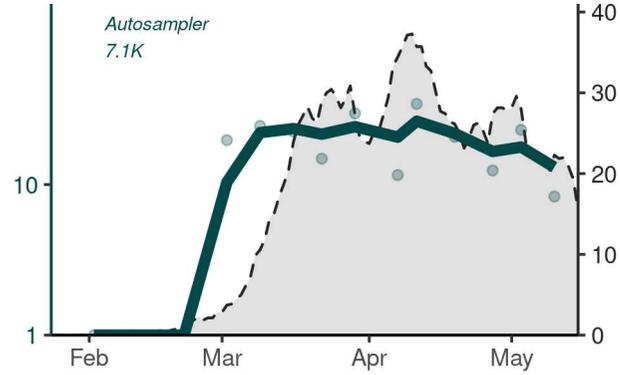


Table 1. Weekly summary

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	19
Northland																																				
Ahipara																																				
Awanui																																				
Dargaville																																				
Haruru																																				
Hihi																																				
Hikurangi																																				
Kaeo																																				
Kaikohe																																				
Kaitaia																																				
Kaiwaka																																				
Kawakawa																																				
Kerikeri																																				
Kohukohu																																				
Mangawhai																																				
Maungaturoto																																				
Opononi																																				
Paihia																																				
Rangiputa																																				
Rawene																																				
Ruakaka																																				
Russell																																				
Taipa																																				
Waipu																																				
Whangarei																																				
Whatuwhiwhi																																				
Auckland																																				
Army Bay																																				
Auckland (Combined)																																				
Auckland East																																				
Auckland Southwest																																				
Auckland West																																				
Beachlands																																				
Clarks Beach																																				
Helensville																																				
Kawakawa Bay																																				
Kingseat																																				
North Shore																																				
Omaha																																				
Pukekohe																																				
Snells/Algies																																				
Waiheke Island																																				
Waiuku																																				
Warkworth																																				
Wellsford																																				
Waikato																																				
Cambridge																																				
Coromandel																																				
Hamilton																																				
Huntly																																				
Kihikihi																																				
Kinloch																																				
Mangakino																																				
Maramarua																																				
Matamata																																				
Matangi																																				
Meremere																																				
Morrinsville																																				
Motuoapa																																				
Ngaruawahia																																				
Ngatea																																				
Omori																																				
Otorohanga																																				
Paeroa																																				
Pauanui																																				

END OF REPORT