



# Global COVID-19 Wastewater Monitoring Efforts: Development of the COVIDPoops19 Dashboard

Alvarado, A.G.F., Naughton, C.C., Roman, F.A. Jr., Tariqi, A., Deeming, M.A.,  
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UNIVERSITY OF CALIFORNIA  
**MERCED**



# COVIDPoops19 Global Wastewater Dashboard



COVIDPoops19 Summary of Global SARS-CoV-2 Wastewater Monitoring Efforts by UC Merced Researchers

Esri, HERE | Esri Powered by Esri

Please follow @COVIDPoops19 for wastewater SARS-CoV-2 updates. Funded by CITRIS. Country data from COVID-19 WBE Collaborative. Link to our pre-print for our methods. Want to be added to the Map? Fill out this form.

|  |
|--|
| <b>Dashboards</b><br>80<br><small>Last update: 14 minutes ago</small>    |
| <b>Universities</b><br>256<br><small>Last update: 14 minutes ago</small> |
| <b>Countries</b><br>54<br><small>Last update: 14 minutes ago</small>     |
| <b>Sites</b><br>2,216<br><small>Last update: 14 minutes ago</small>      |

COVIDPoops19  
12.9K Tweets

**80**  
Universities  
**256**  
Countries  
**54**

**COVIDPoops19**  
@COVIDPoops19

Tweeting/retweeting all things wastewater & SARS-CoV-2/#COVID19. Global dashboard. Aligned w/ @naughtoncc lab @citris\_ucmerced & @water\_pathogens Tweets=my own.

<https://t.co/Bd9KHdgrSK> Joined May 2020

1,080 Following 2,694 Followers

<https://arcg.is/1aummW>

<https://www.covid19wbec.org/>

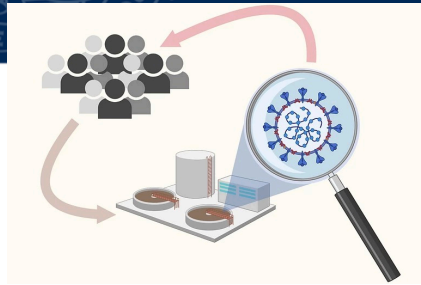
# Dashboard Data Flow



**ESRI**



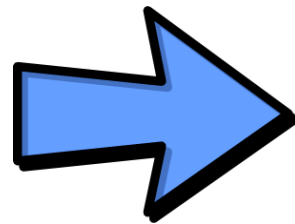
ArcGIS online dashboard



<https://www.covid19wbec.org/>



Daily key word searches



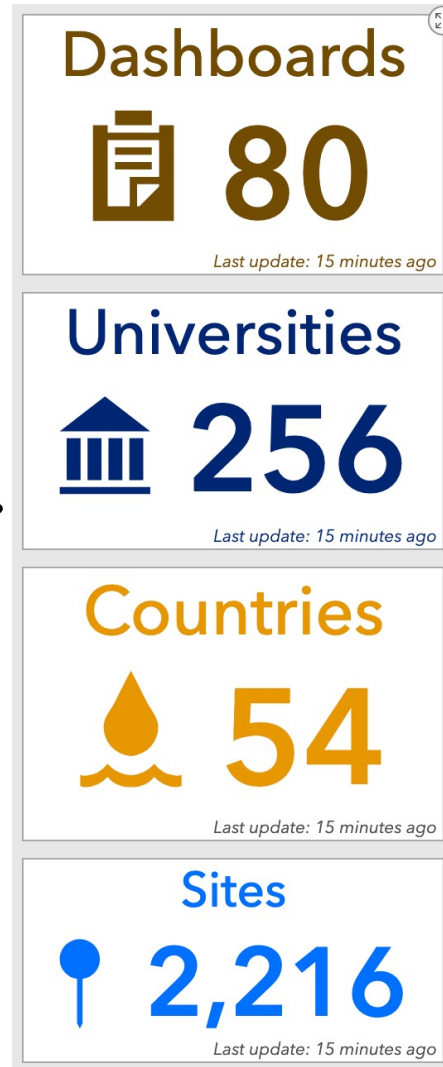
Category sort



Literature and internet searches

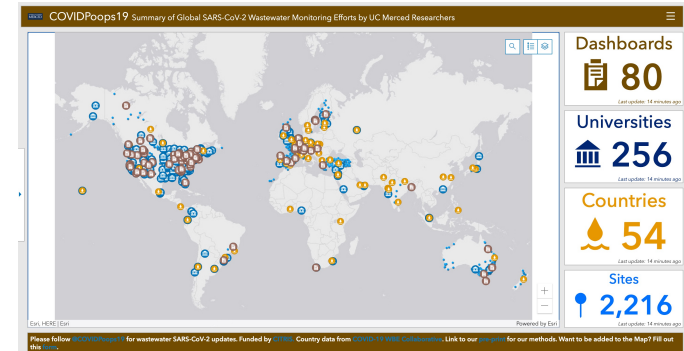


Google forms



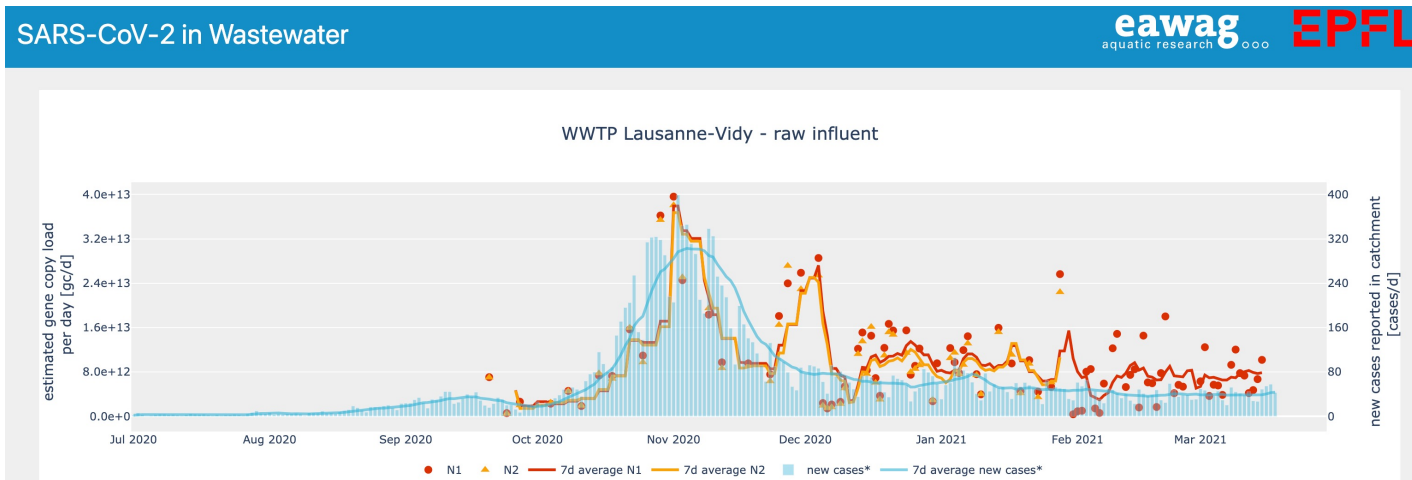
Continuously update

<https://www.medrxiv.org/content/10.1101/2021.03.14.21253564v1>



# Dashboard Review and Best Practices

- 59+ Dashboards
- Only 11 with downloadable data
- Lots of Variation
- Tips: Include videos, non-technical language, and downloadable data



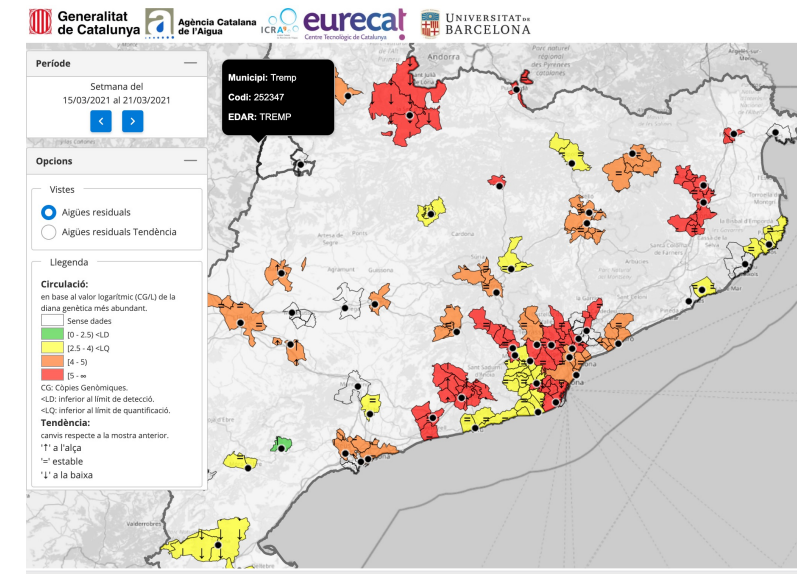
<https://www.medrxiv.org/content/10.1101/2021.03.14.21253564v1>

## Early Signals

### Sewage measurement

Average number of virus particles per 100,000 inhabitants

**230.9** ↑ Value of Mar 8 - Mar 14  
x100 billion

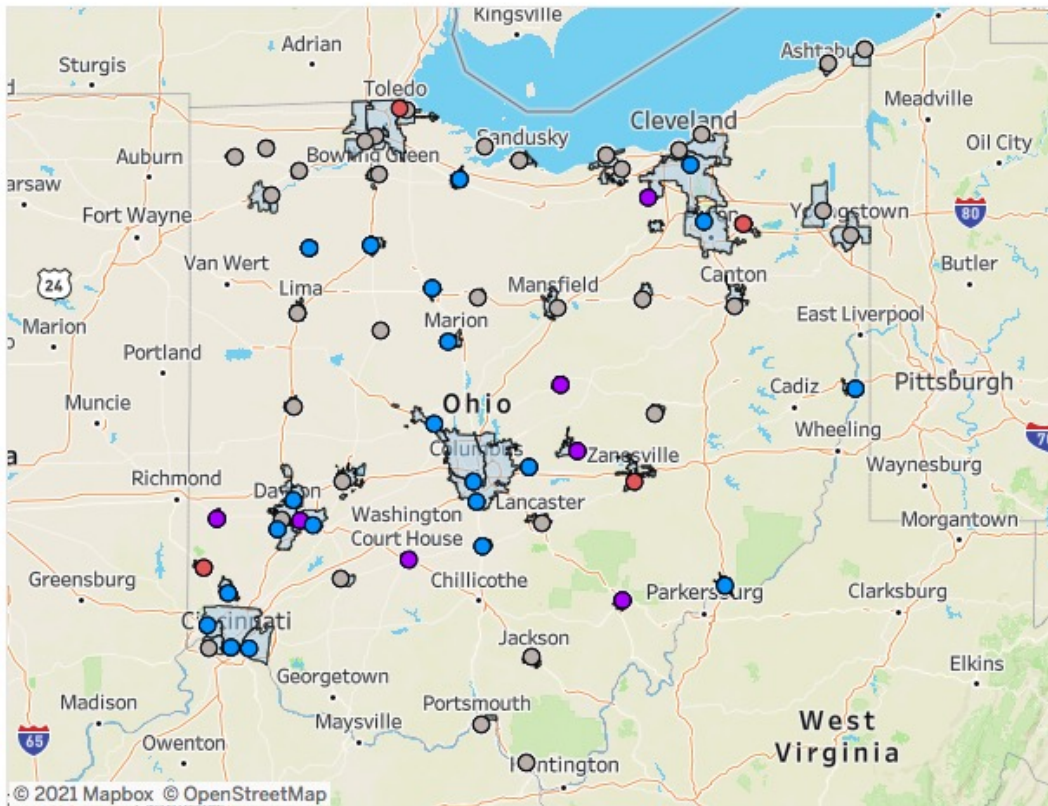




# Ohio-Example of Wastewater SARS-CoV-2 Dashboards

## Ohio

Wastewater Treatment Plant Locations and Boundaries



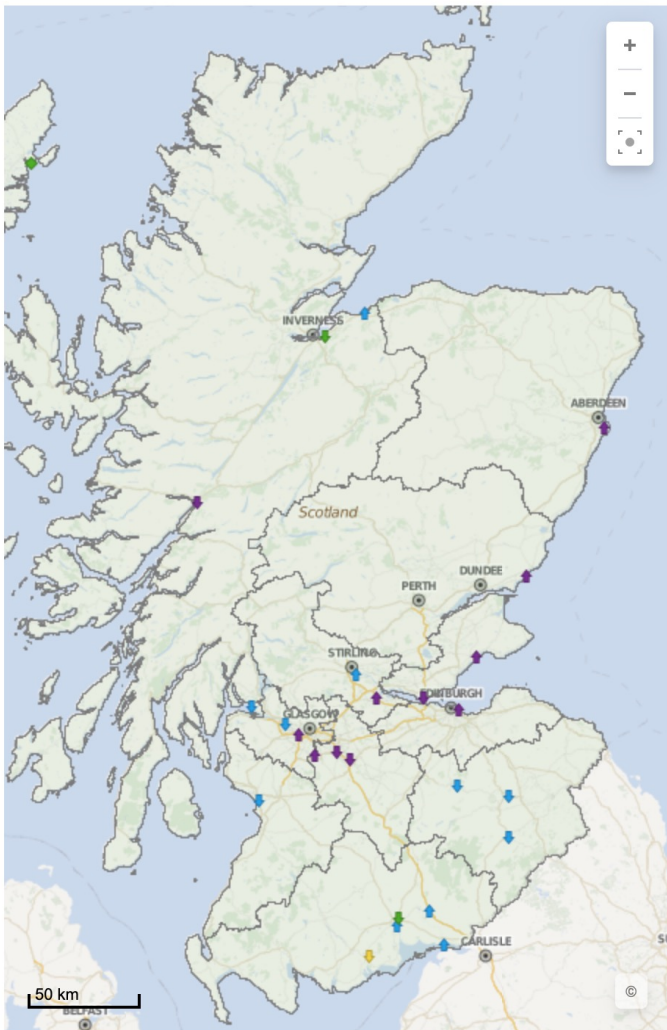
|                           |   |
|---------------------------|---|
| City of Eaton WWTP        | ↑ |
| Liverpool WWTP            | ↑ |
| Zanesville WWTP           | ↗ |
| Franklin Hills WWTP       | ↗ |
| Oxford WWTP               | ↗ |
| Toledo Bay View Park WWTP | ↗ |
| Dayton WWTP               | ↔ |
| Lancaster WPCF            | ↔ |
| Circleville WWTP          | ↘ |
| City of Marion WPC        | ↘ |



<https://coronavirus.ohio.gov/wps/portal/gov/covid-19/dashboards/wastewater>

# Scotland-Example of Wastewater SARS-CoV-2 Dashboards

## Current National Overview



- Positive
- Positive (DNQ)
- Weak Positive
- Negative
- ↑ Increasing
- ↓ Decreasing
- ◆ No Change

Use these buttons to navigate between pages.

- Project Overview
- Site Level Analysis
- National Level Results
- Data Export Page

Area covered by sewer network. The coloured icon represents the sewage works location.



Select a site from the map by clicking one of the coloured icons.

To clear all selections click on the map away from any of the individual icons.

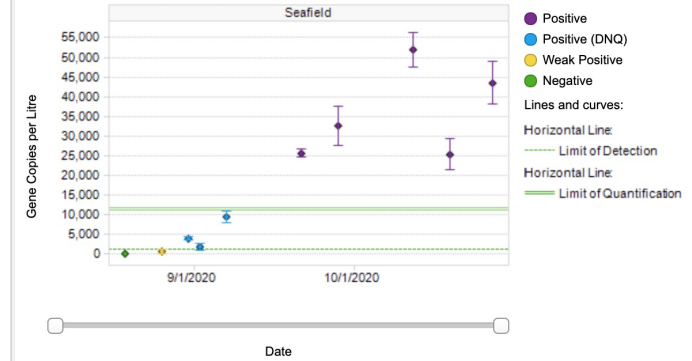


- Positive
- Positive (DNQ)
- Weak Positive
- Negative
- ↑ Increasing
- ↓ Decreasing
- ◆ No Change

This table displays the data collected for the sites selected via the map interface. These results are the data obtained from the laboratory equipment and do not account for external factors such as population or weather conditions which may have an impact when comparing values from different samples.

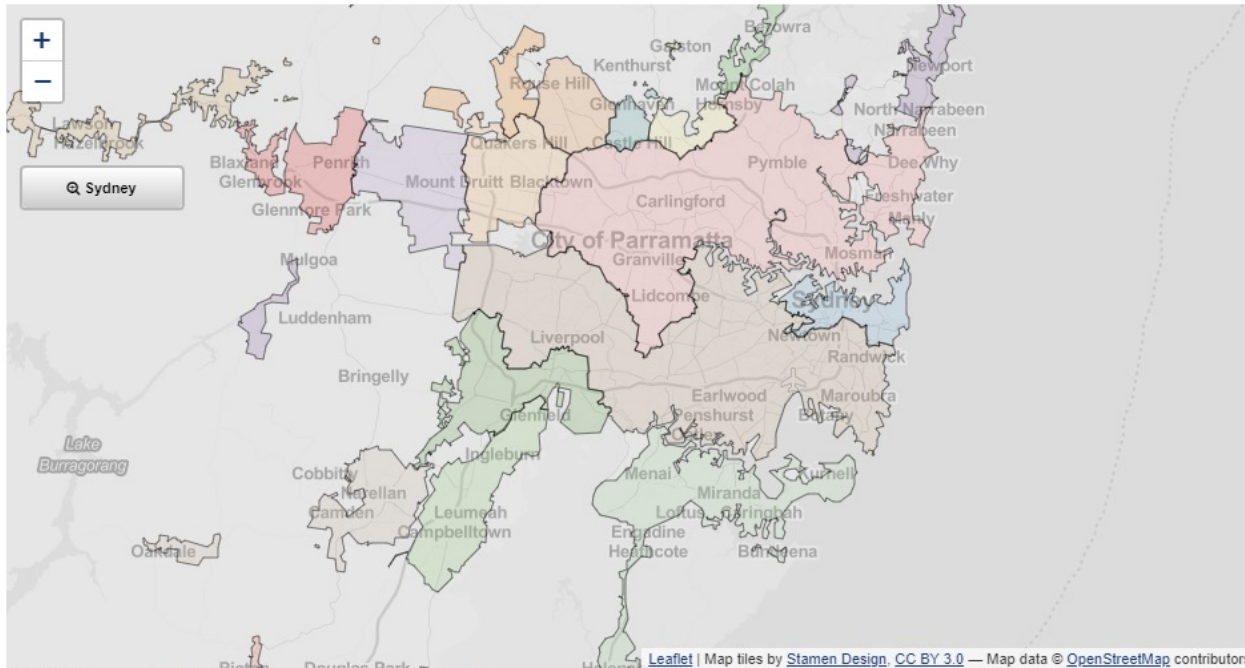
| Health Area | Site     | Population Served | Date       | N1 Gene Copies per Litre | Result Description |
|-------------|----------|-------------------|------------|--------------------------|--------------------|
| Lothian     | Seafield | 605,569           | 8/19/2020  | 0                        | Negative           |
|             |          |                   | 8/26/2020  | 658                      | Weak Positive      |
|             |          |                   | 8/31/2020  | 3866                     | Positive (DNQ)     |
|             |          |                   | 9/2/2020   | 1691                     | Positive (DNQ)     |
|             |          |                   | 9/7/2020   | 9357                     | Positive (DNQ)     |
|             |          |                   | 9/21/2020  | 25637                    | Positive           |
|             |          |                   | 9/28/2020  | 32581                    | Positive           |
|             |          |                   | 10/12/2020 | 51873                    | Positive           |
|             |          |                   | 10/19/2020 | 25334                    | Positive           |
|             |          |                   | 10/27/2020 | 43502                    | Positive           |

The results shown here are for the readings directly obtained from the laboratory equipment. They do not account for external factors such as population served by the sewage works or the weather conditions immediately preceding the sample being taken.





# Saskatchewan-Example of Wastewater SARS-CoV-2 Dashboards



The NSW Sewage Surveillance Program tests untreated sewage for fragments of the COVID-19 (SARSCoV-2) virus at sewage treatment plant locations across NSW. Testing sewage can help track infections in the community and provide early warning of an increase in infections. These tests provide data to support NSW Health's response to COVID-19. An infected person can shed virus in their faeces even if they do not have any symptoms, and shedding can continue for several weeks after they are no longer infectious. The NSW sewage surveillance for SARS-CoV-2 is in the preliminary stages of analysis and work is progressing to assess the significance of the results.

The Bondi and Malabar plants serve over 2 million people, including Sydney city and quarantine hotels. The Botany and Paddington sewage network sites within these catchments also serve areas including quarantine hotels.

This map has been produced with assistance from Sydney Water and is an approximation of the sewerage network. It is provided for **general information** and public health advice.

For more information and for regional NSW sewage tests visit [COVID-19 weekly surveillance reports](#)



## What is the Sewage Surveillance Program?

The NSW Sewage Surveillance Program tests untreated sewage for fragments of the COVID-19 (SARS-CoV-2) virus at more than 60 sewage treatment plants across NSW to provide data to support NSW Health's COVID-19 response.

## Why is sewage being tested?

Testing sewage can help provide early warning of an increase in infections in an area, and potentially give an estimate of undetected infections in the community. These tests provide data to support NSW Health's response to the COVID-19 pandemic.

## Where can I find more information about the Sewage Surveillance Program?

Data from the NSW Sewage Surveillance Program is included in the [COVID-19 surveillance reports](#) published weekly.

NSW is also participating in the [national ColoSSoS project](#) coordinated by Water Research Australia.

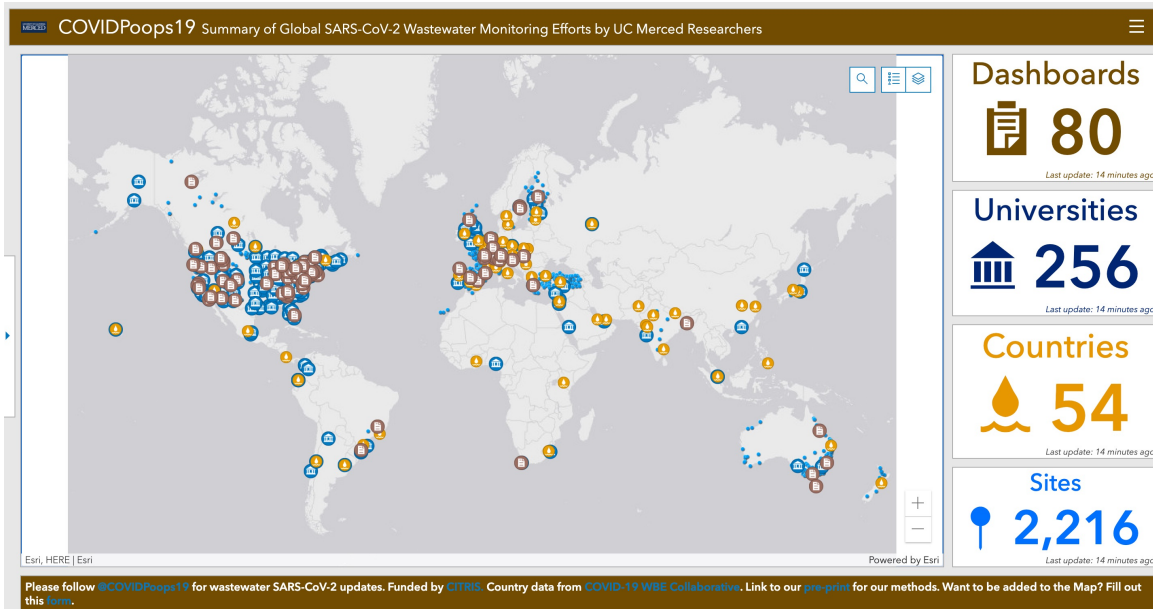
You can read about [Sewage Sleuths](#) and [expansion of sewage labs in NSW](#).

<https://water.usask.ca/covid-19/#MeasuringVirusIndicatorsinWastewaterasanEarlyWarningofCOVID19Outbreaks>

# Acknowledgements and Questions?



Follow @COVIDPoops19  
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[cnaughton2@ucmerced.edu](mailto:cnaughton2@ucmerced.edu)



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