Virginia Wastewater Surveillance Program: Community of Practice

WWS Team
VDH | Office of Environmental Health Services
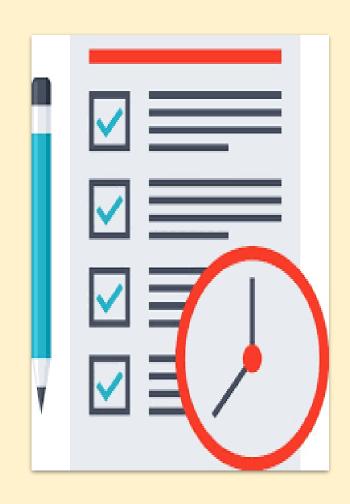**September 29, 2021**

Agenda

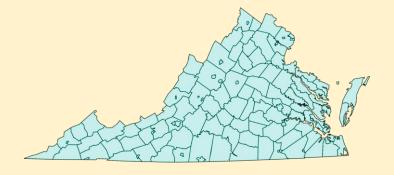**1. Updates & Funding Opportunities (5 mins)**

2. Topic(s) of Interest (15 mins):

Through the Looking Glass:
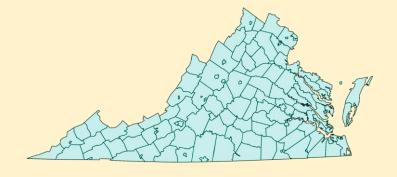*North Carolina's WWS Efforts*

3. Open Discussion (5-10 mins)

Updates: Sentinel Monitoring

SARS-CoV-2 monitoring at influent to 25 wastewater treatment plants statewide

❖ Influent to wastewater treatment plants

❖ Selected 25 sampling sites

❖ Selection Criteria:

○ <u>Primary criteria</u>: application received

○ <u>Secondary criteria</u>: geographic coverage, service size, 24-hour composite sampler, 24-hour access, community social factors (Social Vulnerability Index)

❖ Sampling start date: September 13, 2021

❖ Sampling end date: July 31, 2022
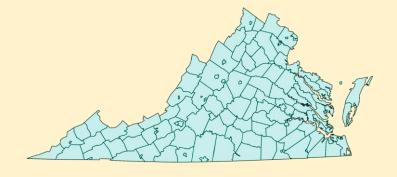
❖ Sampling Frequency: Once/week

General Updates

❖ **DCIPHER (weekly):**

   ○ Uploading of HRSD WWS data

   ○ Uploading patient case data (HRSD data in DCIPHER now)

   ○ Gathering & cleaning other sites' historical WWS data

❖ **Local Projects (on-going):**

   ○ Chesapeake

   ○ Roanoke

   ○ Accepting proposals soon!

Continued...

❖ **Round 2 Funding:**
  ○ **Sentinel Monitoring:** Kicked off this month!
  ○ Local Projects
  ○ Variant Testing

❖ **Developing**
  ○ Dashboard
  ○ Database

Through the Looking Glass: North Carolina's WWS Efforts

Ariel Christensen, MPH

Environmental Epidemiologist
Occupational and Environmental Epidemiology Branch
North Carolina Department of Health and Human Services

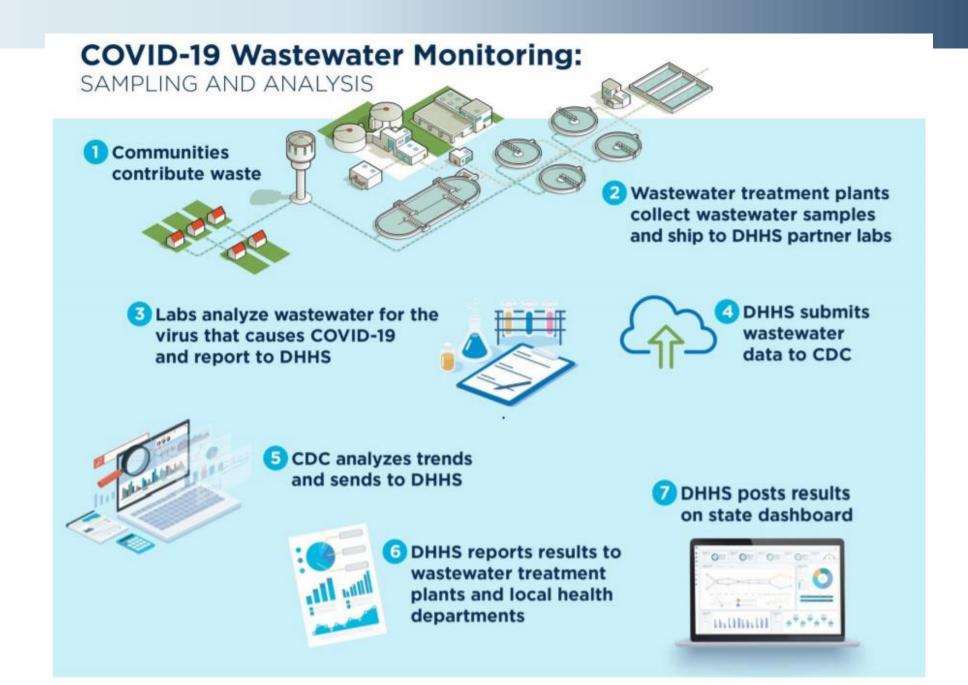# North Carolina Wastewater Monitoring Network

September 29, 2021
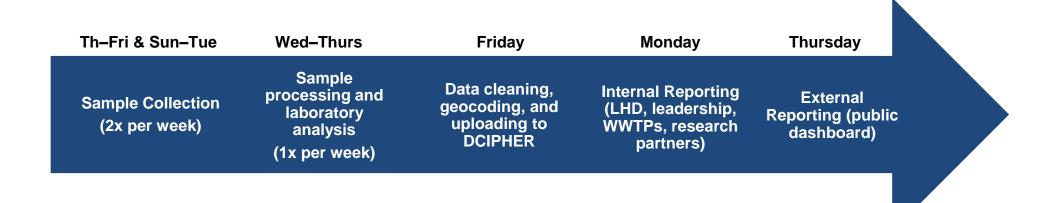
Ariel Christensen, MPH

Occupational and Environmental Epidemiology Branch
North Carolina Department of Health and Human Services

Current Status in NC

- Sampling began
  - January 2021: Phase I
  - June 2021: Phase II

- 18 sites, 2x per week:
  - Phase I: 11 sites (two sites dropped before Phase II)
  - Phase II: 9 new sites

- Laboratory Analysis: Digital droplet PCR analysis conducted by University of North Carolina Institute of Marine Sciences

- Geospatial Analysis: DHHS geocodes and matches cases to sewersheds

- Built on NC Wastewater Pathogen Research Network efforts (academic partnership) from May-Dec 2020
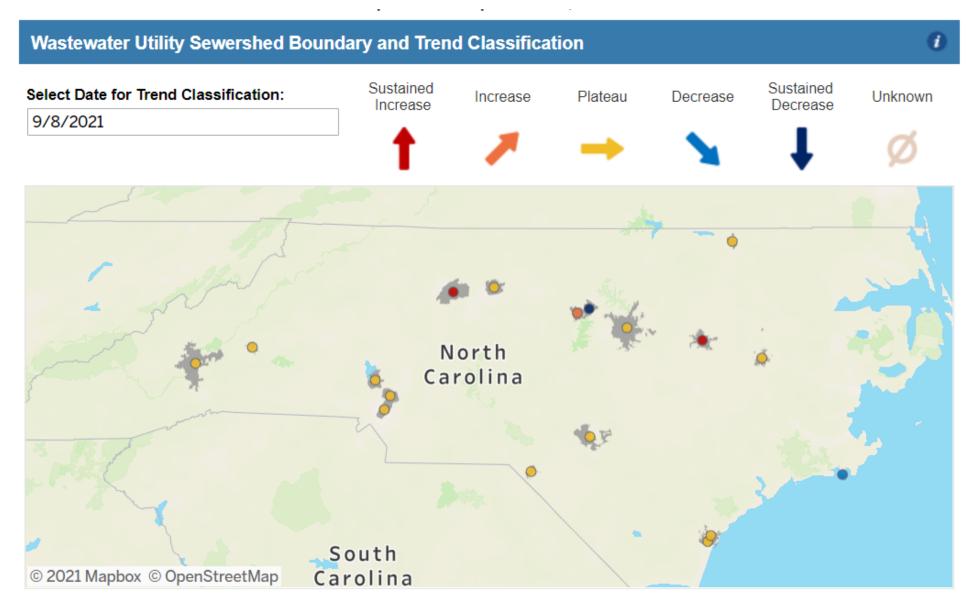
COVID-19 Wastewater Monitoring: Sampling and Analysis

1. Communities contribute waste
2. Wastewater treatment plants collect wastewater samples and ship to DHHS partner labs
3. Labs analyze wastewater for the virus that causes COVID-19 and report to DHHS
4. DHHS submits wastewater data to CDC
5. CDC analyzes trends and sends to DHHS
6. DHHS reports results to wastewater treatment plants and local health departments
7. DHHS posts results on state dashboard

Timing of sample collection to reporting

Th–Fri & Sun–Tue	Wed–Thurs	Friday	Monday	Thursday
Sample Collection (2x per week)	Sample processing and laboratory analysis (1x per week)	Data cleaning, geocoding, and uploading to DCIPHER	Internal Reporting (LHD, leadership, WWTPs, research partners)	External Reporting (public dashboard)

Challenges:

- **Laboratory capacity – only analyzing 1x/wk**

- **WWTPs mostly prefer to sample during the week**

- **Weekend lag for reporting**
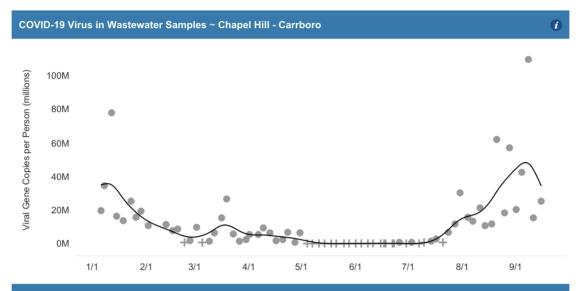
https://covid19.ncdhhs.gov/dashboard/wastewater-monitoring
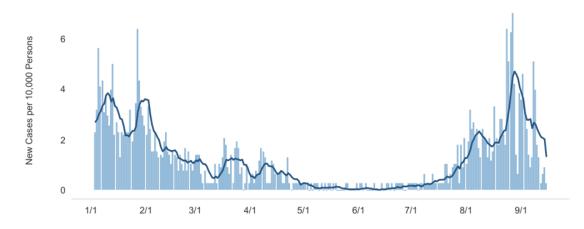
COVID-19 Wastewater Monitoring Data & Trends

Select Wastewater Treatment Plant:
Chapel Hill - Carrboro

COVID-19 Virus in Wastewater Samples ~ Chapel Hill - Carrboro

Reported COVID-19 Cases in the Sewershed ~ Chapel Hill - Carrboro

Hover over icons for information.

September 23, 2021

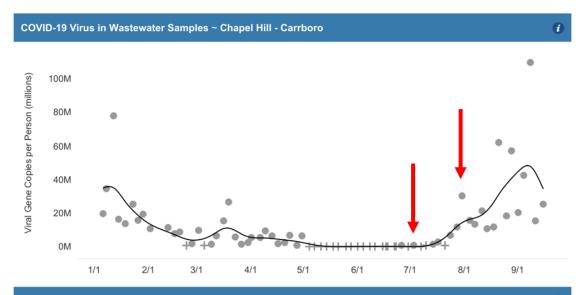# What public health actions can be taken?

1. **Increasing trend:**
   - Increase public health communication and outreach about how individuals can protect themselves from COVID-19
   - Mobilize additional testing resources
   - Alert hospitals, clinics, and local physicians that an increase in the virus that causes COVID-19 has been observed
   - Provide recommendations to community leaders or take direct actions on implementation of restrictions

2. **Decreasing trend or below detection:** confirm with a supplemental metric that infections are low in the community – independent of how much testing is being conducted

3. **Plateau:** sustain or increase public health recommendations depending on the level of virus being detected

COVID-19 Wastewater Monitoring Data & Trends

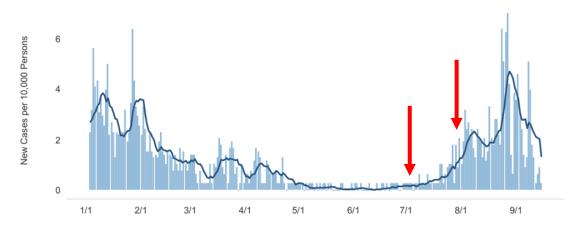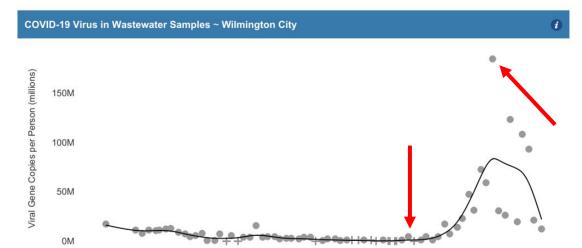**Select Wastewater Treatment Plant:**
Chapel Hill - Carrboro

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Hover over icons for information.
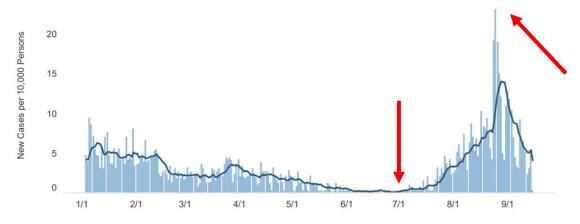
September 23, 2021

Greater Urgency to Get Vaccinated as COVID-19 Cases Increase

Raleigh

Jul 8, 2021

While the state's trends are far below where they were at the height of the pandemic, cases increased by 12% the week ending on July 3 compared to the previous seven days, and hospitalizations have increased by 8% over the past seven days. The state's sampling of [wastewater treatment plants](#) ⧉ also shows recent increasing of viral particles in four locations since June 24.
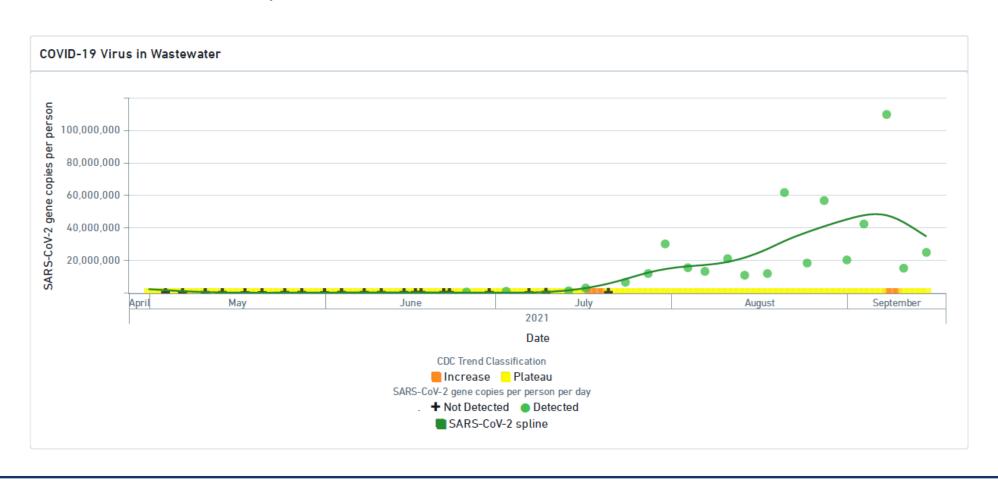
Chapel Hill, Carrboro Summary:

Date: 9/20/2021 (data current as of 9/14/2021)

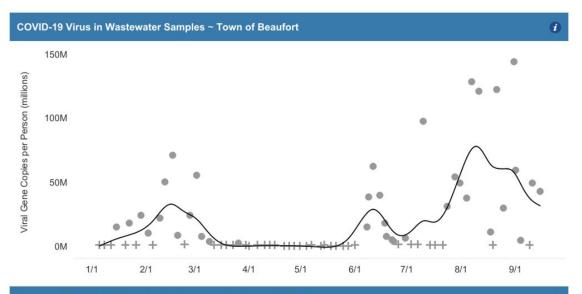- Alert in current week: No

- Current wastewater trend: plateau

- Previous wastewater trend: plateau

COVID-19 Wastewater Monitoring Data & Trends
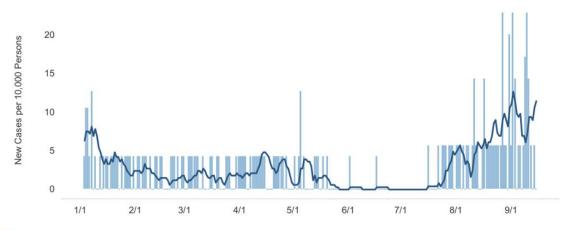
Select Wastewater Treatment Plant:
Town of Beaufort

COVID-19 Virus in Wastewater Samples ~ Town of Beaufort

Reported COVID-19 Cases in the Sewershed ~ Town of Beaufort

Hover over icons for information.

September 23, 2021

Joint News Release

COVID-19 Monitoring Detects Elevated Levels of COVID-19 in Wastewater

"As a proactive step in protecting our community, the Town agreed to participate in the statewide program," said Beaufort Mayor Everette Newton. "We are one of 10 communities in North Carolina participating in this early warning detection program."

This data serves as a reminder to stay vigilant as the virus is still a threat. The number of new COVID-19 cases reported in the Beaufort area has not increased recently, but fewer people are seeking testing statewide. The data is reflective of the population serviced by the Town of Beaufort's sewer system.

NEW! Downloadable Data

NC DEPARTMENT OF HEALTH AND HUMAN SERVICES

North Carolina Wastewater Monitoring Network

Select Metric:
- ○ New Cases Per 10,000 Persons
- ◉ Viral Gene Copies Per Person

Wastewater Treatment Plant	County	Date	Population Served	Viral Gene Copies Per Person	Viral Gene Copies/L
Chapel Hill - Carrboro	Orange	9/15/2021	78,141	25,019,599	23,157
Chapel Hill - Carrboro	Orange	9/11/2021	78,141	15,279,951	13,328
Chapel Hill - Carrboro	Orange	9/8/2021	78,141	109,895,472	109,287
Chapel Hill - Carrboro	Orange	9/4/2021	78,141	42,501,920	38,863
Chapel Hill - Carrboro	Orange	9/1/2021	78,141	20,358,782	18,200

SARS-CoV-2 in wastewater:
1. Raw (Viral gene copies/L)
2. Flow-based normalization (Viral gene copies per person)

NC DEPARTMENT OF HEALTH AND HUMAN SERVICES

North Carolina Wastewater Monitoring Network

Select Metric:
- ◉ New Cases Per 10,000 Persons
- ○ Viral Gene Copies Per Person

Wastewater Treatment Plant	County	Date	Population Served	New Cases Per 10,000 Persons
Chapel Hill - Carrboro	Orange	9/15/2021	78,141	0.26
Chapel Hill - Carrboro	Orange	9/14/2021	78,141	0.90
Chapel Hill - Carrboro	Orange	9/13/2021	78,141	0.64
Chapel Hill - Carrboro	Orange	9/12/2021	78,141	0.26
Chapel Hill - Carrboro	Orange	9/11/2021	78,141	1.28

Cases per 10,000 persons residing in the sewershed

https://covid19.ncdhhs.gov/dashboard/data-behind-dashboards

Next steps

- **Finalize LHD Toolkit (press release, social media posts, etc.)**

- **Coordination with State Lab of Public Health to build capacity for Phase III expansion (training by UNC Noble Lab)**

- **Adding at least 1 subsewershed site (Charlotte)**

- **Adding data from Jackson County site in coordination with Mathematica**

- **Adding NEW metrics from CDC (percent change and percentile classifications) to internal reporting**

- **Lead/lag analysis of wastewater compared to case data**

- **Sequencing efforts for detection of variants**

- **Working with Wake County to launch a county-level wastewater surveillance program to inform PH action**
  - **6 sites initially**
  - **Data will be added to DCIPHER**

Questions?

Ariel Christensen, MPH

Occupational and Environmental Epidemiology Branch

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https://covid19.ncdhhs.gov/dashboard/wastewater-monitoring

Thanks also to Virginia Guidry, Steven Berkowitz (pictured with samples), Stacie Reckling, Rachel Noble, Tom Clerkin, Deneen Blackwood, and other collaborators!

Questions & Open Discussion

See you next month!

Send inquiries / topics to:
rekha.singh@vdh.virginia.gov