Wastewater Monitoring in Vermont: Looking Beyond COVID-19

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Infectious Disease Epidemiology

May 21, 2025

VERMONT

DEPARTMENT OF HEALTH

Vermont Immunization & Infectious Disease Conference
Hotel Champlain, Burlington, VT
May 21, 2025
Session I – Tracking Trouble: Innovations in Infectious Disease Surveillance from Sewers to Syndemics
Speakers: Yvonne Boire, BSN, RN, Lynn Blevins, MD, MPH, and Daniel Daltry, MSW

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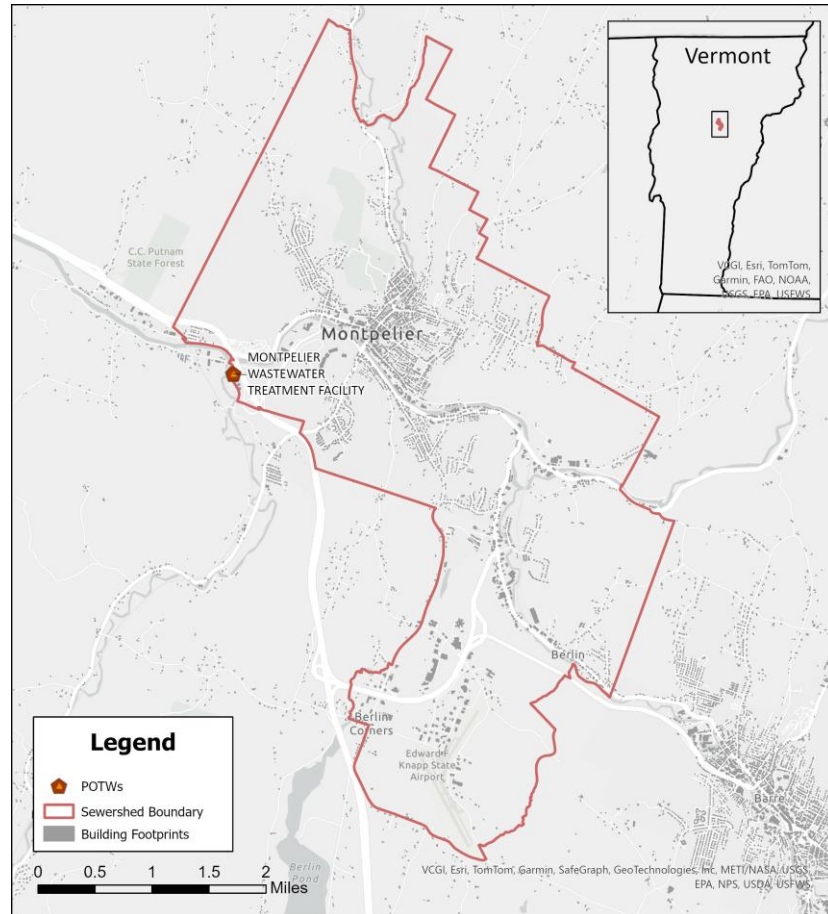
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This activity was planned by and for the healthcare team, and learners will receive 5.0 Interprofessional Continuing Education (IPCE) credit for learning and change.

Wastewater disease surveillance has multiple steps.

Pathogens

People

Wastewater Treatment Plant

Laboratory

Data Scientists and Epidemiologists

A sewershed is an area with all sewers flowing to one facility.

- Often includes sewage from more than one town
- Represents people who live, work, recreate, or travel through
- Does not include septic systems
- May receive stormwater during heavy precipitation or snowmelt

Wastewater surveillance has upsides and downsides.

Upsides

- Not dependent on access to medical care
- Non-invasive
- Population-based
- Pathogen may be shed regardless of whether someone is symptomatic
- May provide an earlier indicator than clinical testing

Downsides

- Low levels may not be detected
- Does not capture people on septic systems
- Can fluctuate in response to population changes (tourism, events), weather or environmental inputs
- Requires consistent sampling to establish and interpret trends

Weekly monitoring of community infection levels by City Area

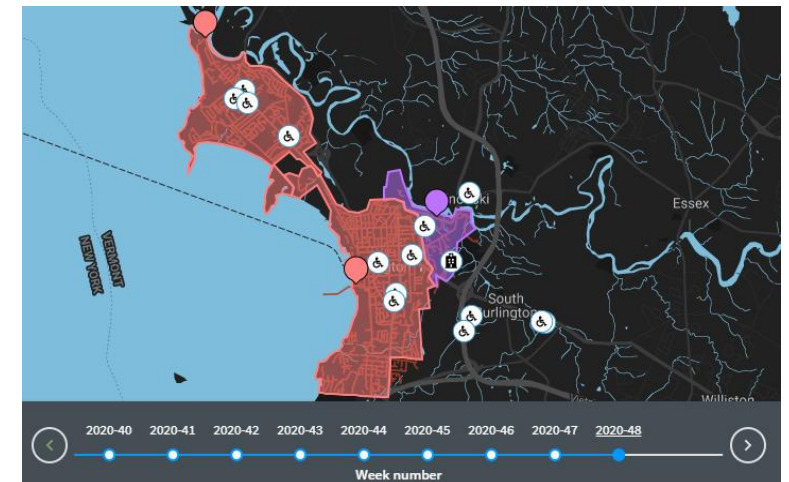
Week of 10/05/20
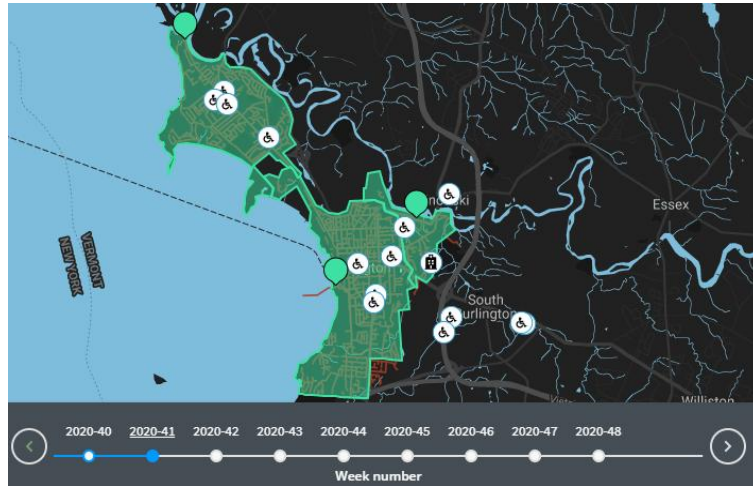
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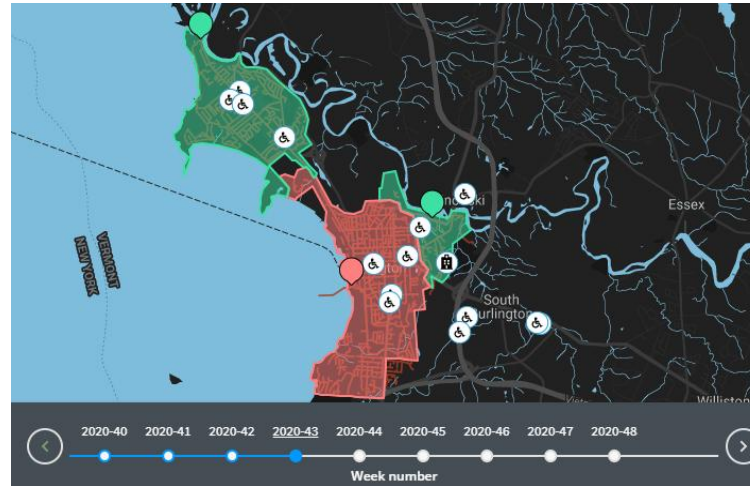
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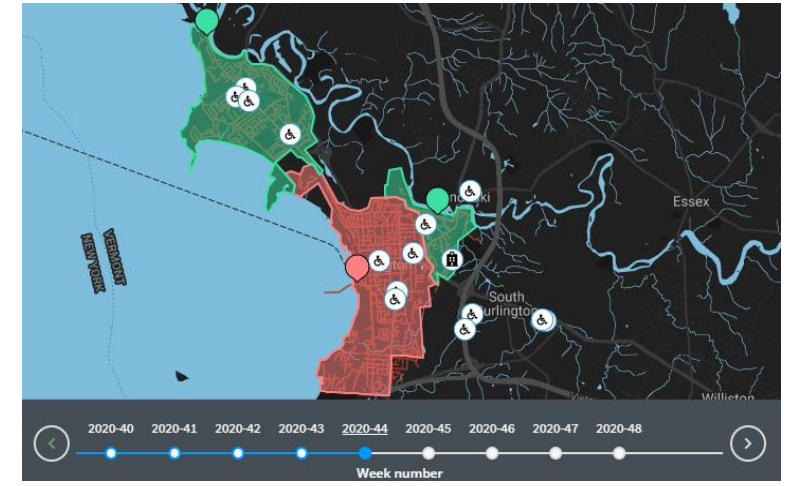
Week of 11/02/20
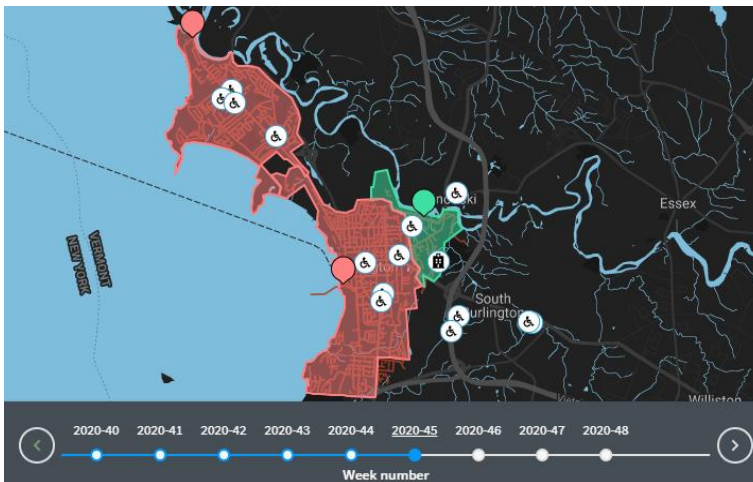
Week of 11/16/20

Week of 11/23/20

Vermont wastewater flows to many labs.

| Sewershed	Lab / Program	Pathogens
South Burlington (includes Colchester	wastewaterSCAN	10 pathogens + influenza subtyping
Essex Junction (includes Williston and Essex)	wastewaterSCAN	10 pathogens + influenza subtyping
Montpelier (includes Berlin)	wastewaterSCAN	10 pathogens + influenza subtyping
Ludlow	Verily	COVID, RSV, flu (with subtyping), mpox
Middlebury	Verily	COVID, RSV, flu (with subtyping), mpox
Burlington - Main	Biobot	COVID, RSV, flu
St. Albans	Biobot	COVID, RSV, flu

Let's look at some data!

Data reflect the three WastewaterSCAN sites, available at wastewaterscan.org

SARS–CoV–2, Vermont
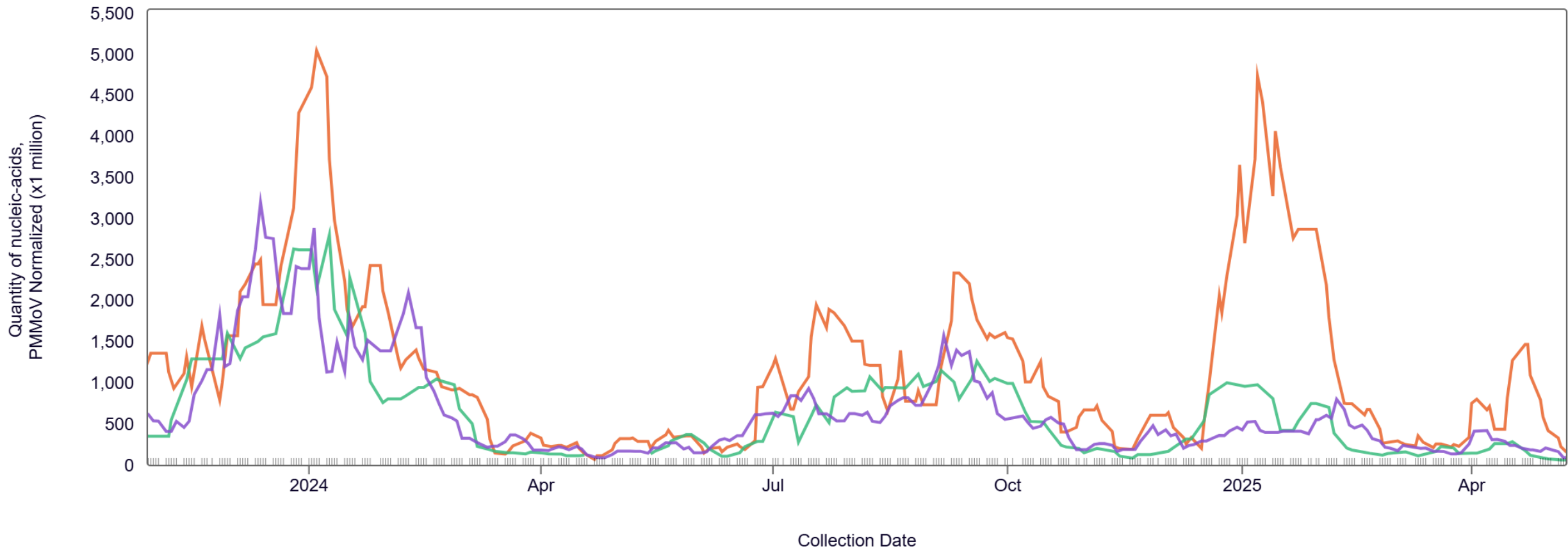
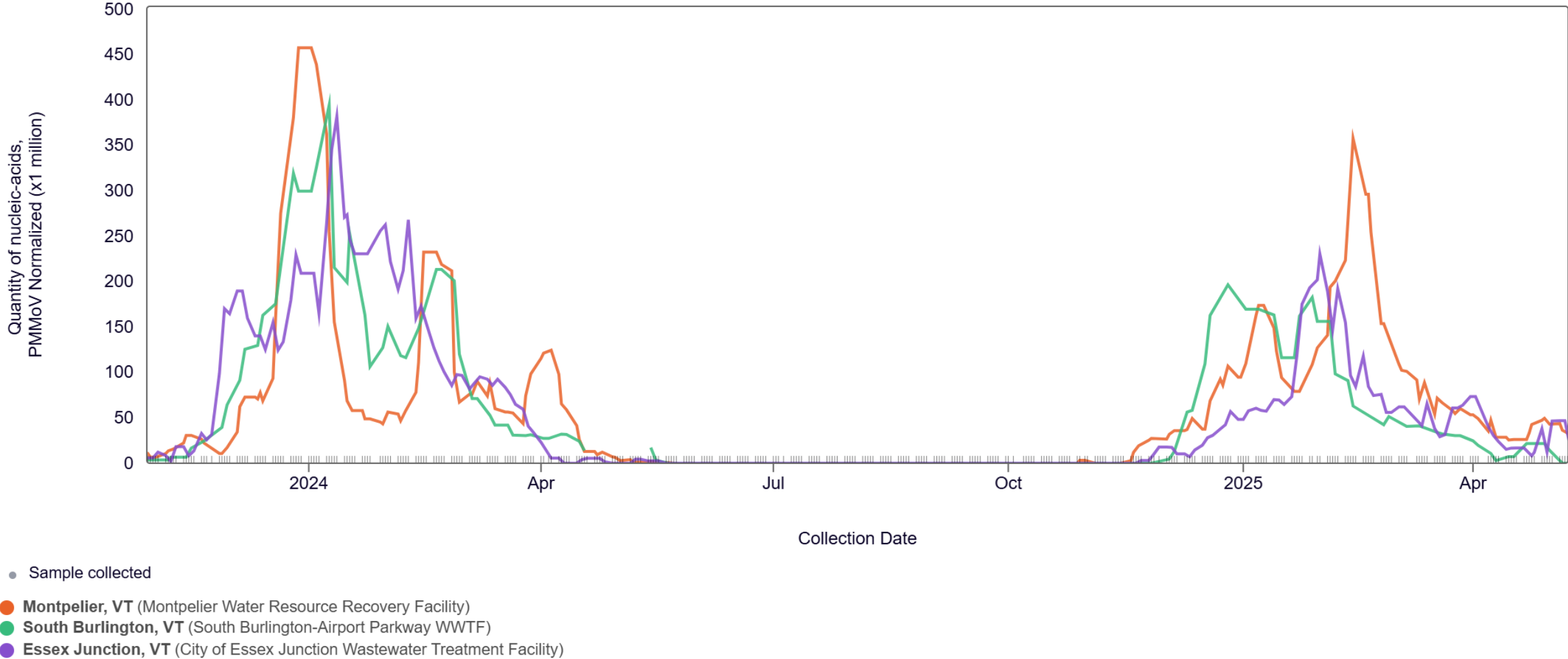# Influenza A, Vermont

RSV, Vermont

- ● Sample collected
- ● **Montpelier, VT** (Montpelier Water Resource Recovery Facility)
- ● **South Burlington, VT** (South Burlington-Airport Parkway WWTF)
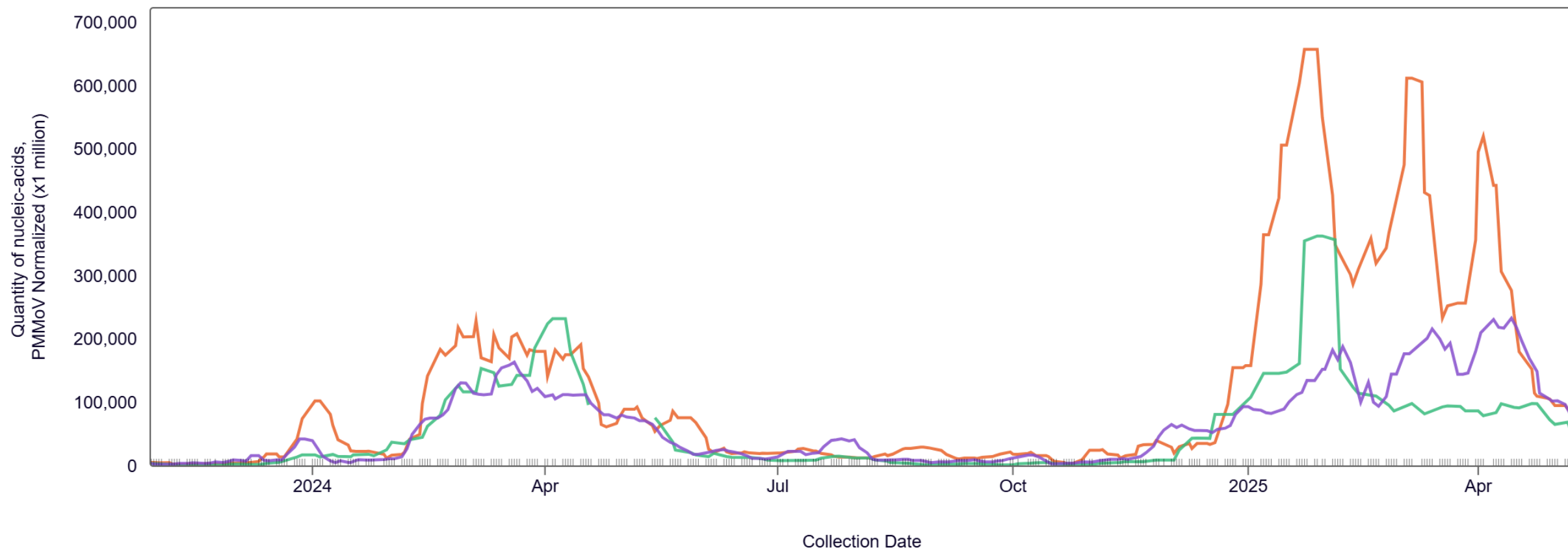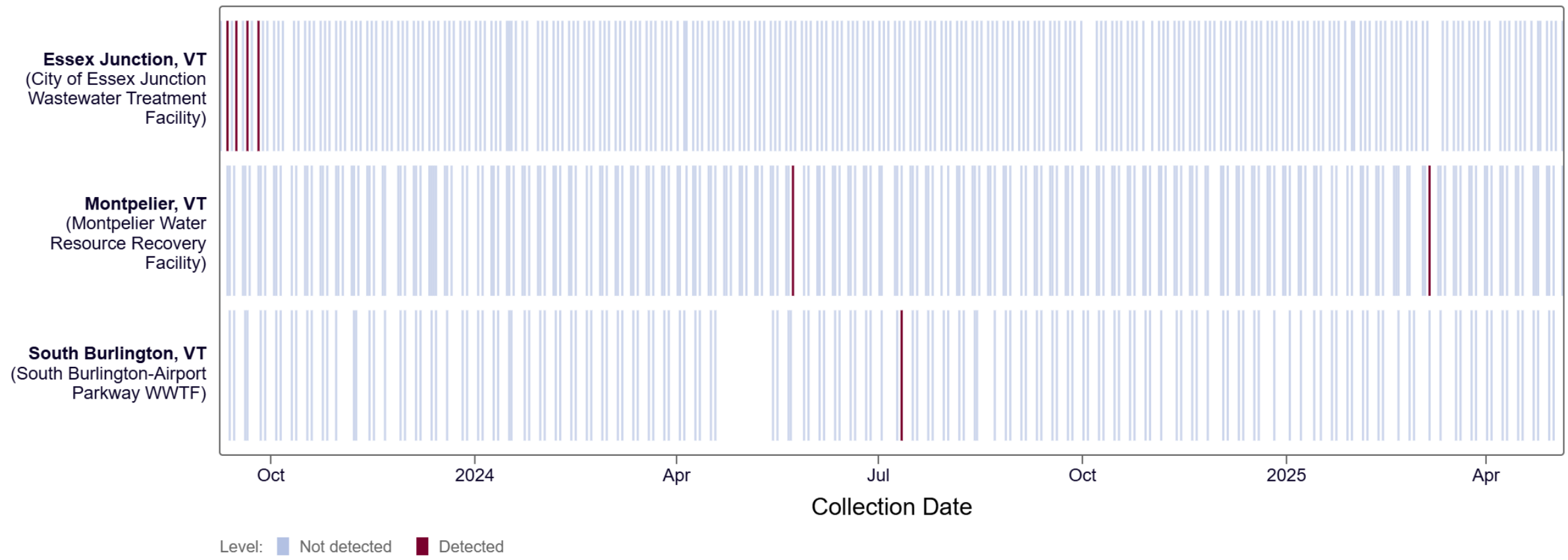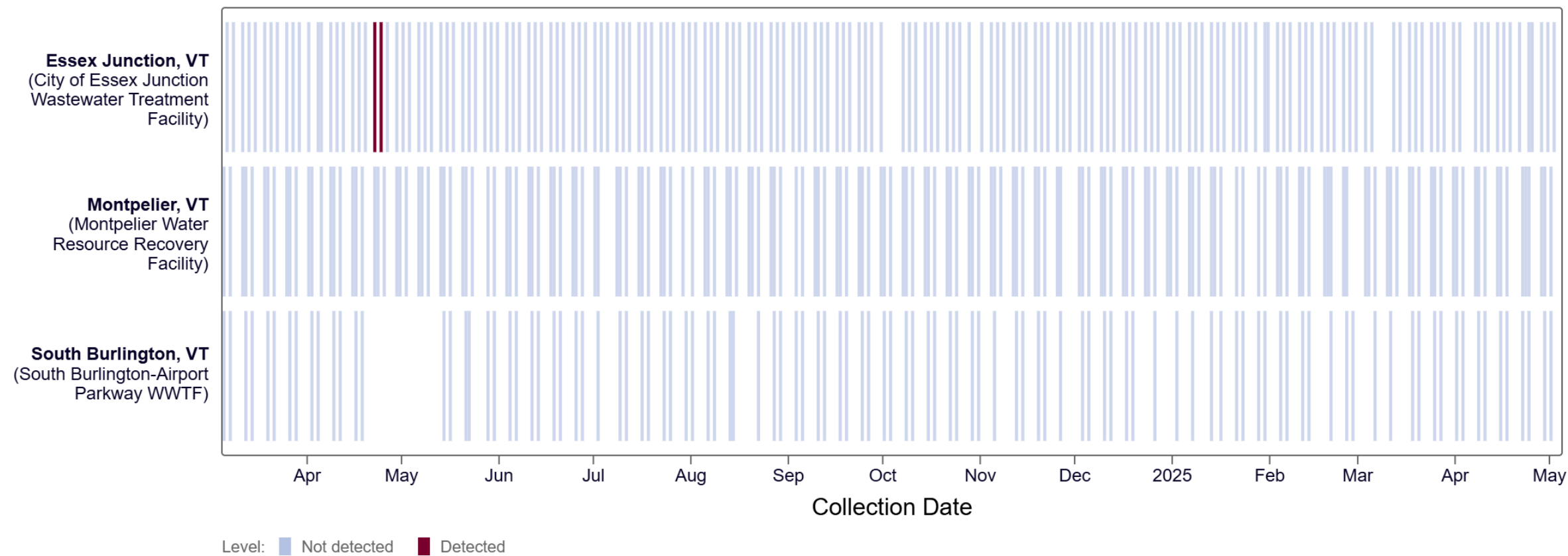- ● **Essex Junction, VT** (City of Essex Junction Wastewater Treatment Facility)
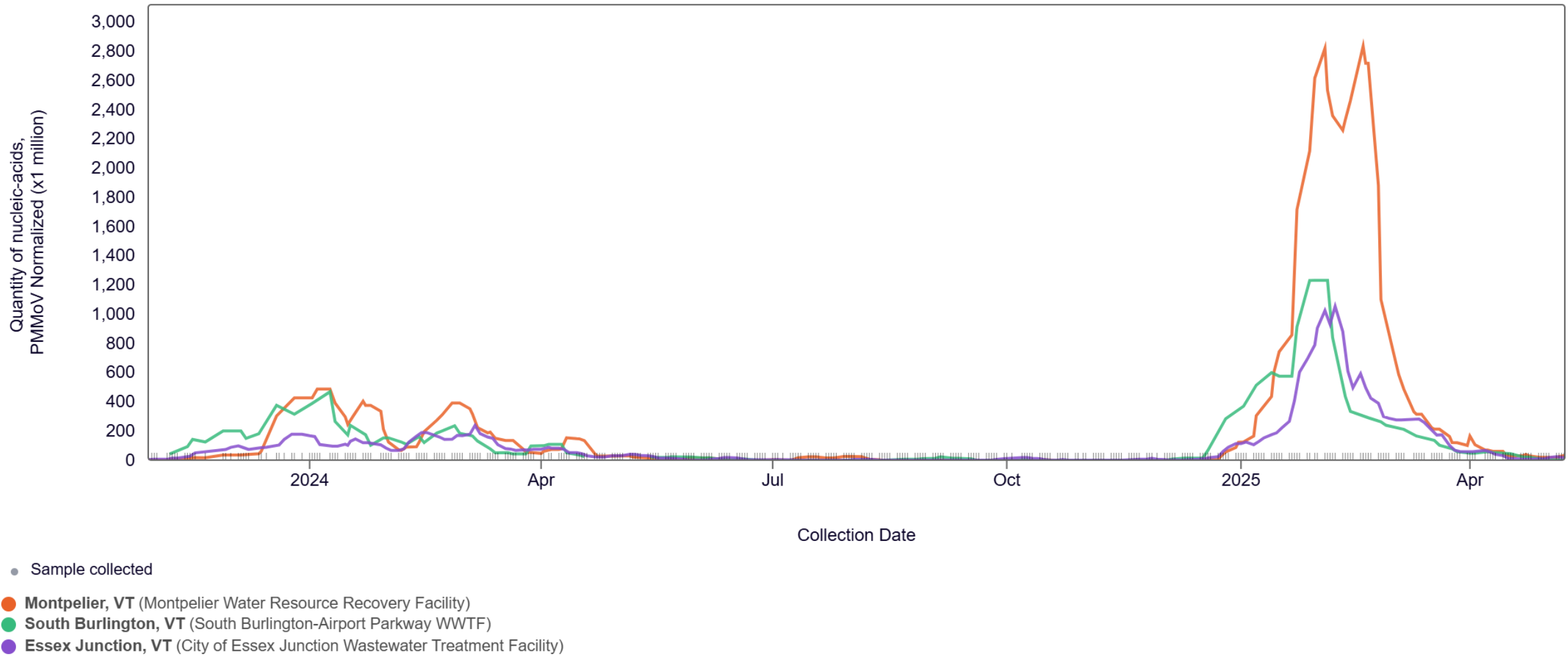
Norovirus, Vermont

- Sample collected
- **Montpelier, VT** (Montpelier Water Resource Recovery Facility)
- **South Burlington, VT** (South Burlington-Airport Parkway WWTF)
- **Essex Junction, VT** (City of Essex Junction Wastewater Treatment Facility)
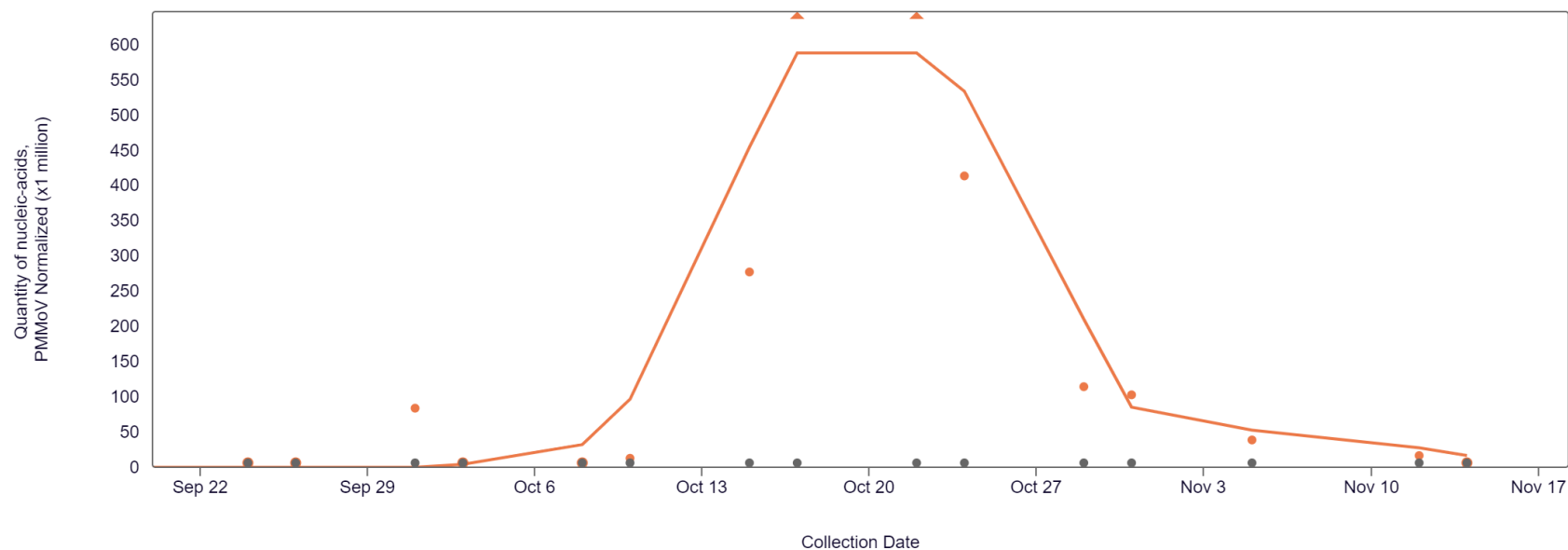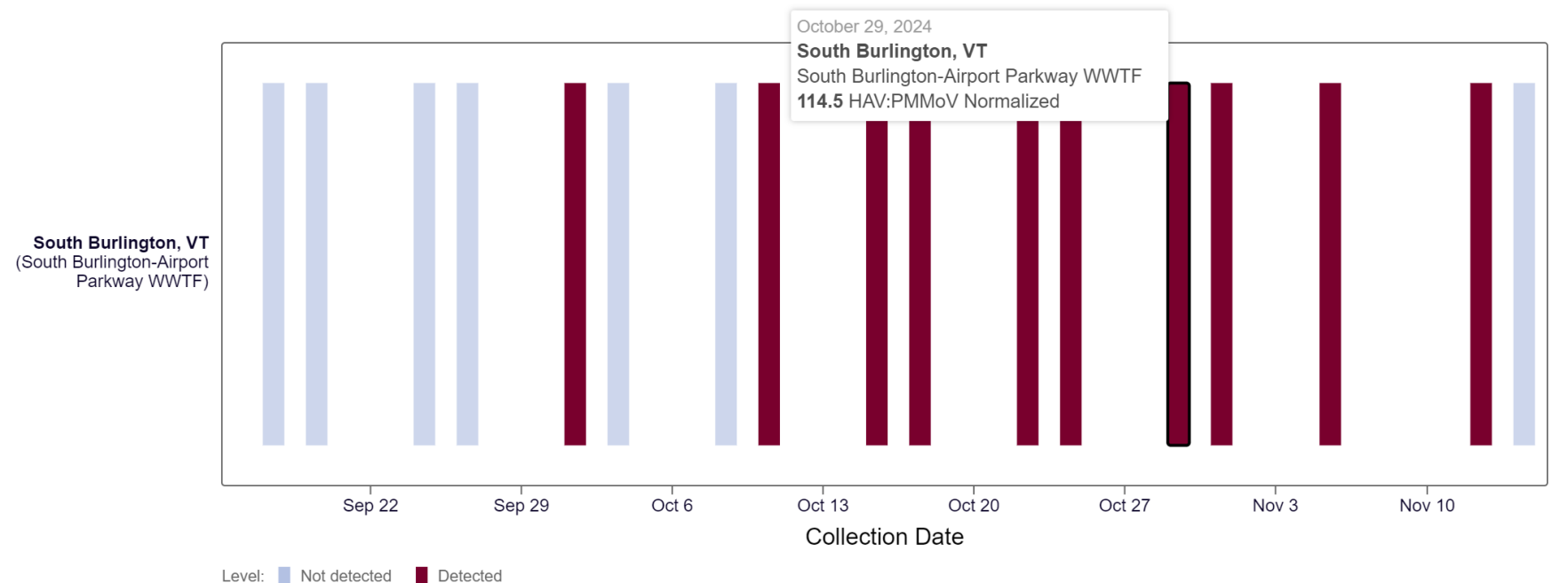
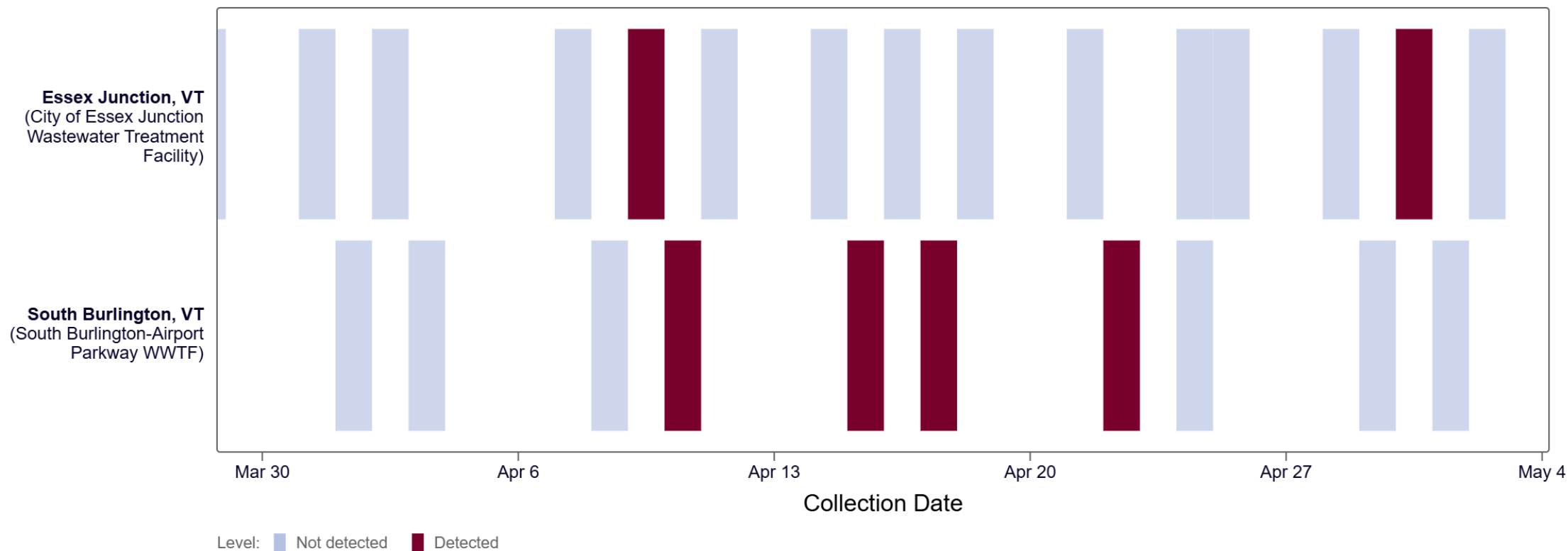# Candida auris, Vermont
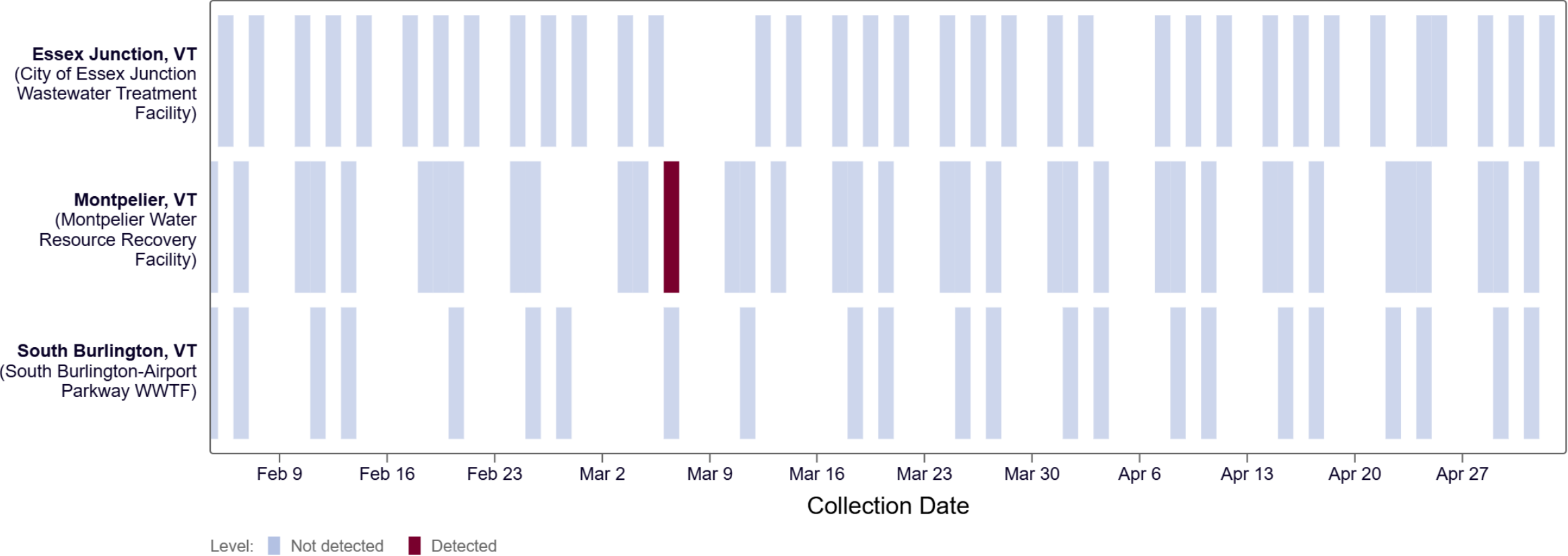
Mpox clade II, Vermont

Hepatitis A, South Burlington, VT

Detected in wastewater about one month prior to report of clinical case.

Vermont Department of Health

Hepatitis A, Chittenden, VT

Collection Date

Level: ▮ Not detected ▮ Detected

H5, Vermont


Collection Date

Level: ▢ Not detected   ▮ Detected

Wastewater surveillance is headed to VDH Laboratory

New sites will begin sending samples in June starting with COVID, RSV, and flu with subtyping

Criteria for site selection

- Geographic distribution
- Size
- Population served
- Special features
    - Airport
    - Hospitals
    - Universities
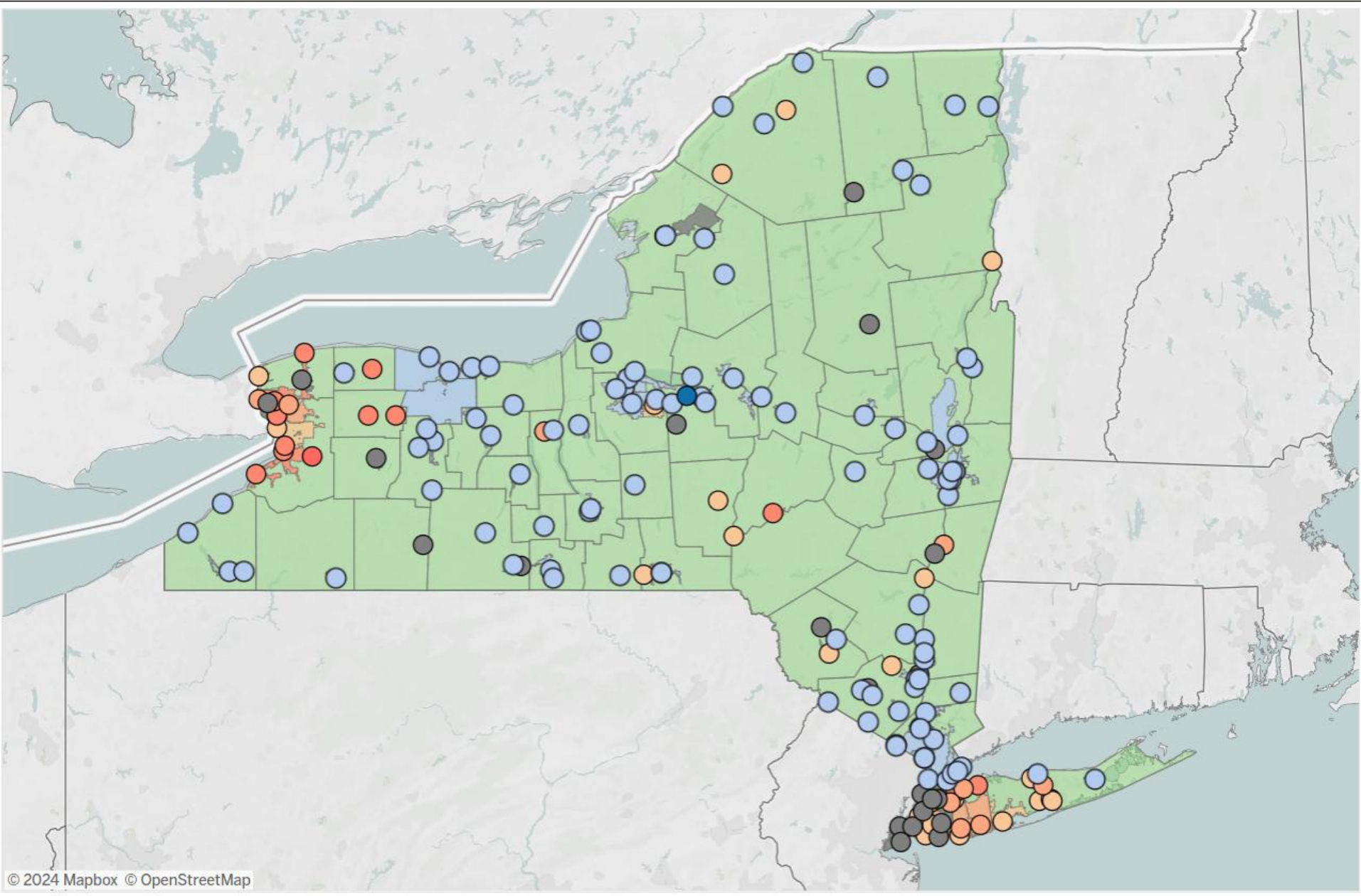   - Milk processing facilities
- Site enthusiasm!
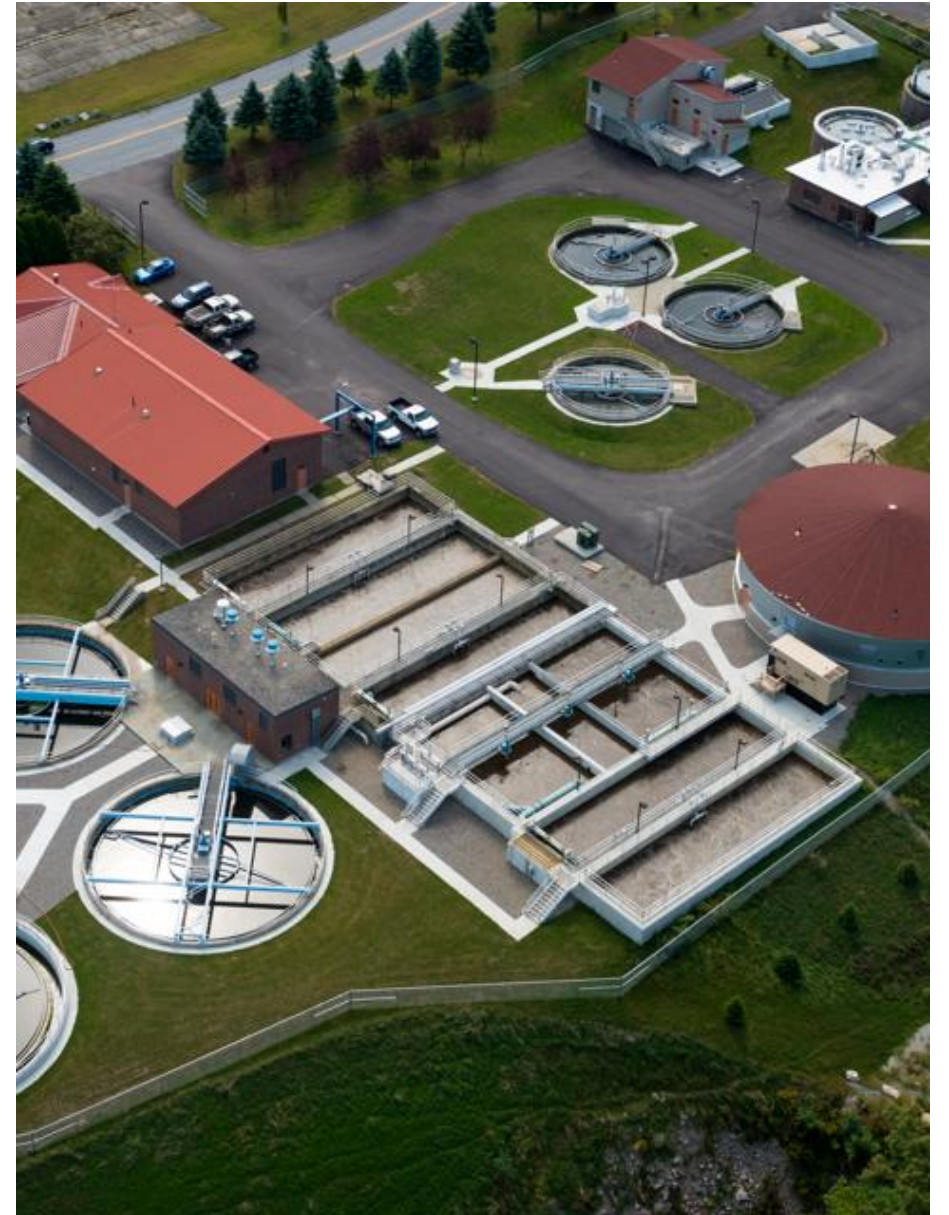
Wastewater Metric
- ⦿ SARS-CoV2-Detection Level
- ○ Changes Over Time

County

(All) ▼

Detection Level

High Percentile

75% - 100%	1
50% - 75%	12
25% - 50%	10
0% - 25%	24

Moderate	102
Low	1
NA	23
Total Sewersheds	**173**

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A quick review of wastewater surveillance

1   Wastewater surveillance can compliment other forms of disease surveillance data

2   We need more experience with disease targets to determine their public health utility

3   Wastewater surveillance in Vermont is coming to a sewershed near you!

Thank you!

Let's stay in touch.

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