

Understanding risks from Sanitary Sewage Overflows and Basement Backups

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Is coronavirus hiding in your sewage system? | COMMENTARY

By MARCCUS D. HENDRICKS
FOR THE BALTIMORE SUN | JUL 06, 2020



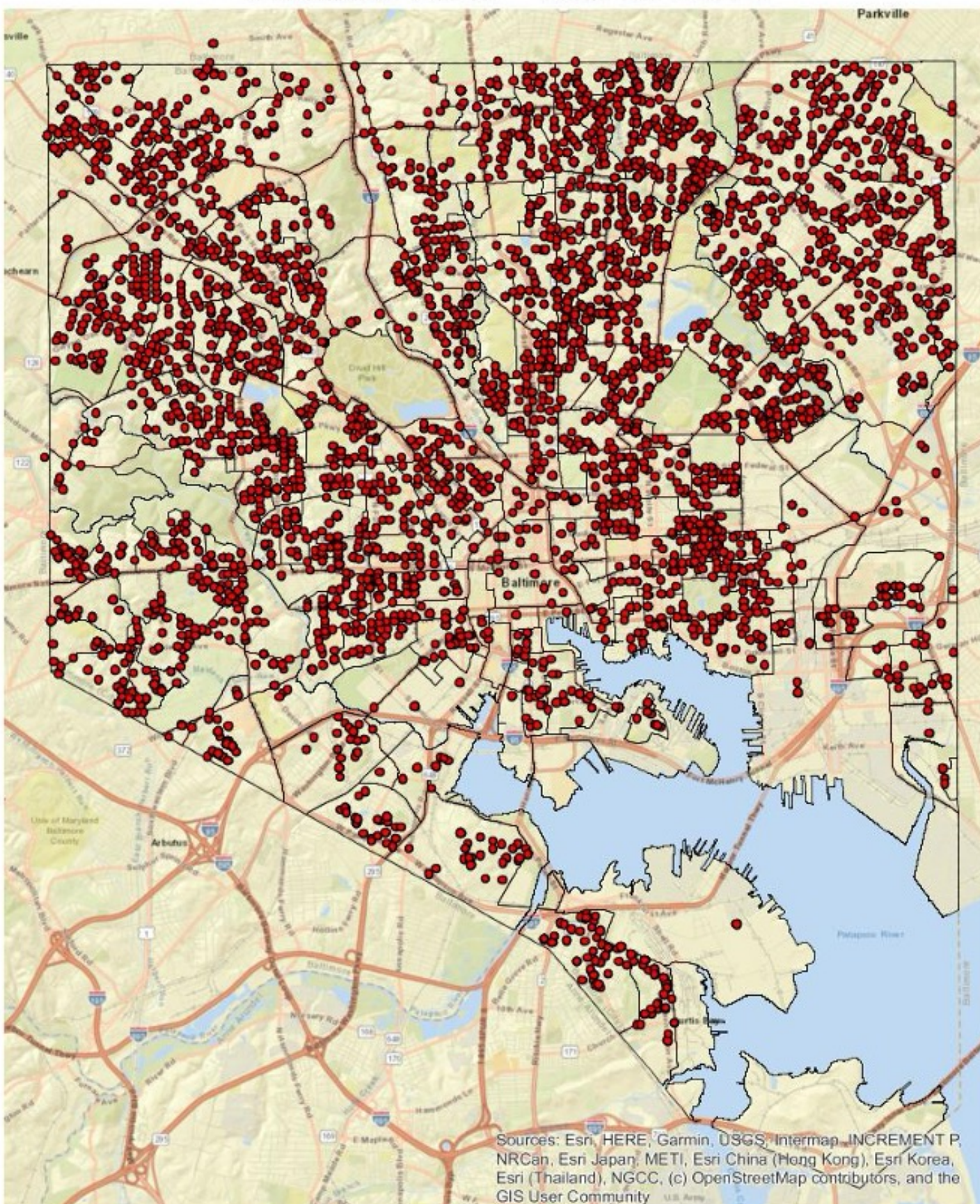
Aging infrastructure can result in sewage backups that can breed disease. (Barbara Haddock Taylor / Baltimore Sun)

Past studies in public health have demonstrated an association between disease and poor sanitation, such as illnesses from exposure to sewage-laden waters. Modern sanitary infrastructures were an innovation that transformed how we mitigate waterborne risks.

However, failure to maintain and rehabilitate these systems over the years, as well as changing environmental conditions, have created some pre-modern circumstances in cities across the world including Baltimore, which has frequent sanitary sewer overflows (SSOs) due to an aged and declining system and more frequent and intense rainfall events further overwhelming the system.



Basement Backups in Baltimore City October 2017 - March 2019



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

Legend

- Baltimore City Neighborhoods
- Basement Backup Locations



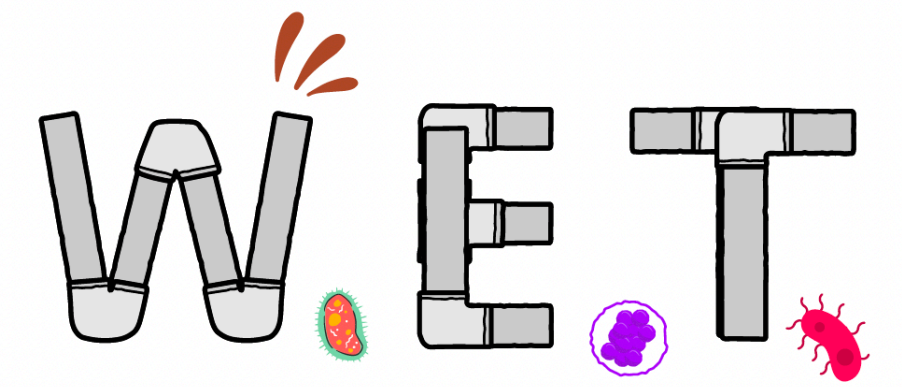
Megan Allison
Clean Water Action
Data Compiled From Modified Consent
Decree Calendar Quarterly Reports

Sanitary Sewage Overflows (SSOs) and Basement Backups

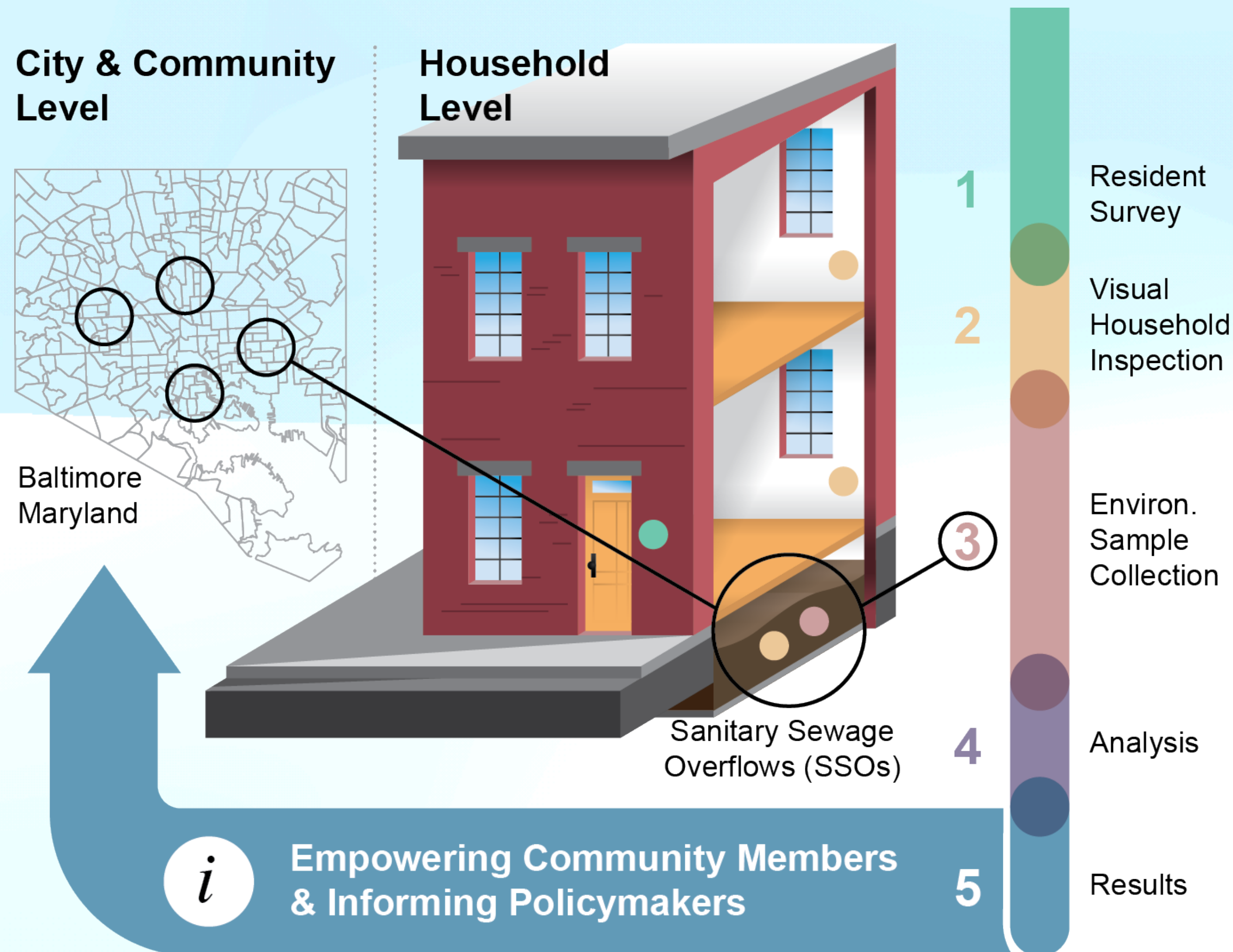
1. SSOs will release untreated or partially treated sewage from a municipal sanitary sewer into the environment **before** reaching sewage treatment facilities.
2. SSOs can contaminate our waters, causing serious water quality problems, and back-up into homes, **causing** property damage and **threatening** public health.

Water Emergency Team (WET)

Rationale & Objectives



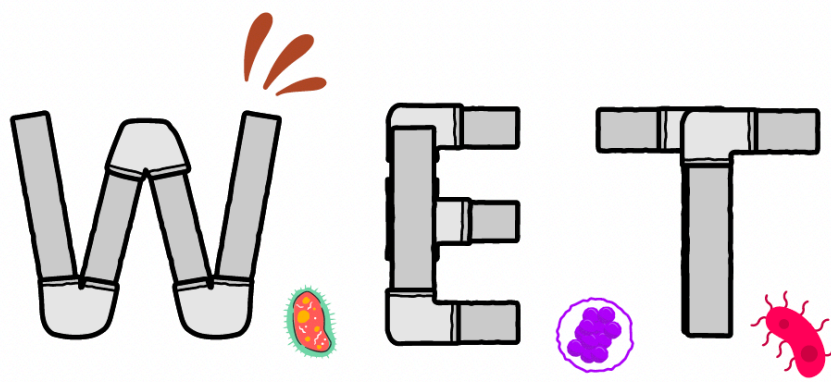
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1. Determine the presence of bacteria in standing water and surfaces from homes impacted with sewage overflows (SSOs) and basement backups.
2. Understand resident awareness of and experiences with SSOs and basement backups.
3. Share results with community members through written materials and events.

Figure 1: Rationale of this research. The approach considers city and community level scales, but especially at the household level. We are focusing on properties that have had sewage overflows in the past.

An Environmental & Community-Driven Methodology



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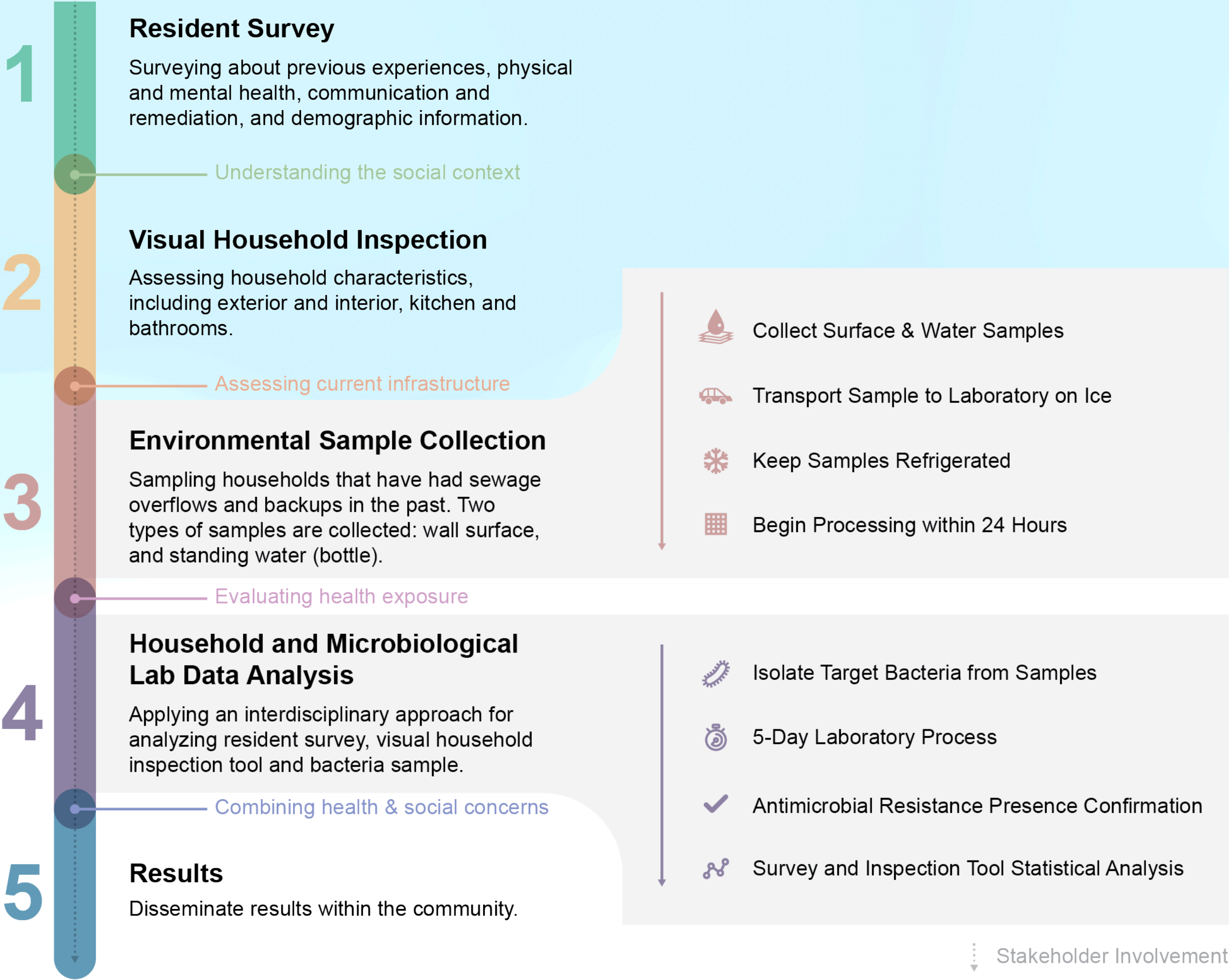
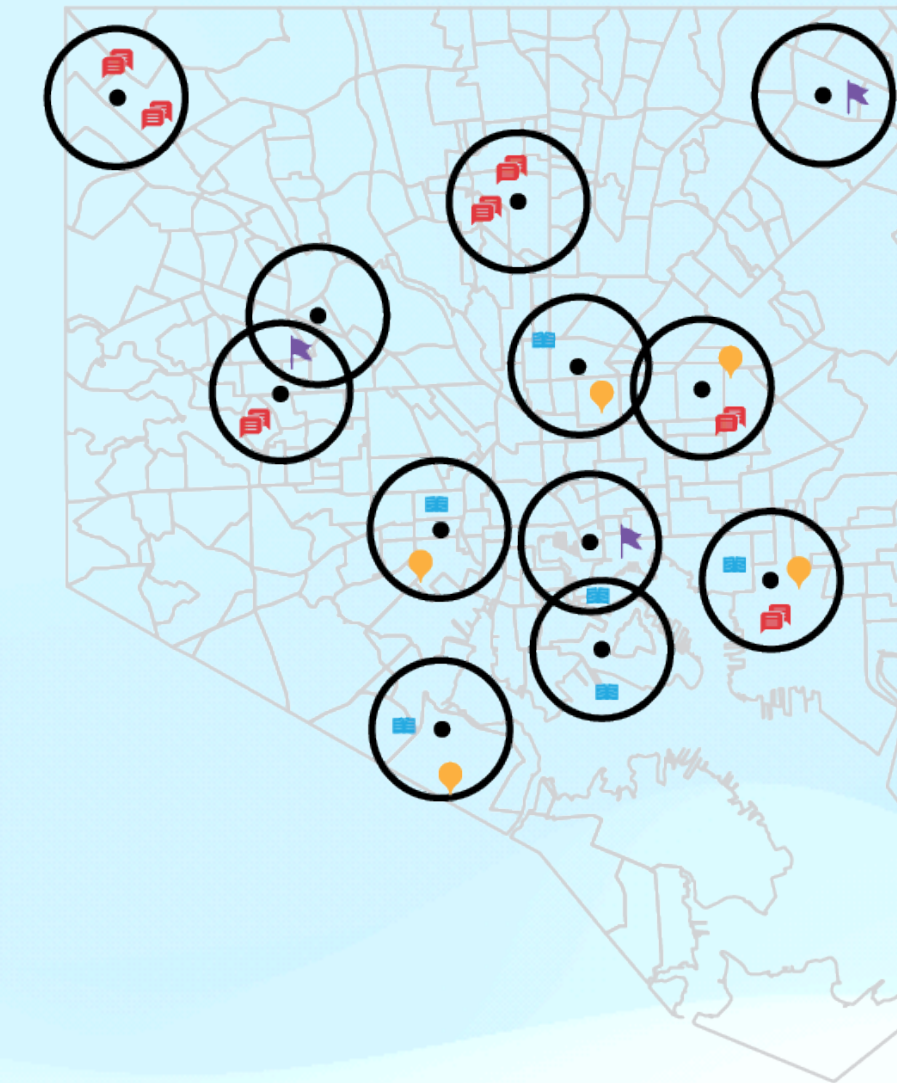


Figure 2: The environmental and community-driven framework. The approach is divided into five steps: (1) Resident Survey, (2) Visual Household Inspection Tool, (3) Microbial Sample collection, (4) Household and Microbiological Lab Data Analysis, and (5) Results.

Alves et al., Environmental and Community-Driven Methodology to Understand and Address Risks from Sanitary Sewer Overflows and Basement Backups. Flood Risk Management Journal (submitted)

Multi-tiered Engagement Model

1. Baltimore, MD had a population of 569k in 2022 (largest city in MD). Majority Black (61%)
2. Persons in poverty is 19.6% (almost twice the national average)
3. According to the Chesapeake Bay Foundation, since 2011, there have been more **3,900 individual SSOs in the city**, spilling more than 110 million gallons of sewage into the streets, homes, streams and rivers in Baltimore (and eventually the Chesapeake Bay)



- A Obtain Context-Specific Information**
- SSO Event
 - SSO Radius
- B Stakeholder Identification and Engagement**
- Meetings
 - 📄 Door-to-Door Recruitment
 - 🚩 Community Fairs & Events
 - 📖 Educational Sessions
- C Applying Strategies with Community Members**
- 1 Resident Survey
 - 2 Visual Household Inspection Tool
 - 3 Sample Collection
- D Reporting Back to Community Members**
- A+ Individual Report-cards Submission
 - 👥 Workshops

Household Sampling Kits, Equipment, and Protocol





ENGAGE WITH US!

Participate in a research study to learn how Sewer Overflow impacts your community!

\$

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What is Sewer Overflow?

Sewer overflow occurs when untreated wastewater from a sanitary sewer system is released into the environment, usually due to poor upkeep or heavy rainfall. This wastewater can accumulate in the basements of homes, otherwise known as a Basement Backup Event.

PPE

- Gloves
- Mask
- Shoe Covers

Survey

- Participant Compensation
- Electronic Tablet

Sample Collection Kit

	Insulated Storage Container		Sterile Bottle		Sterile Bag
	Ice Packs		Cloth		eSwab/Tube Holder
	Marker		Sampling Liquid		Sampling Squares

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Who qualifies?

Any community resident with a basement or lower level that experience backup events.

Why Participate?

Learn how sewer overflow can affect your home, your health, and your community.

How can you help?

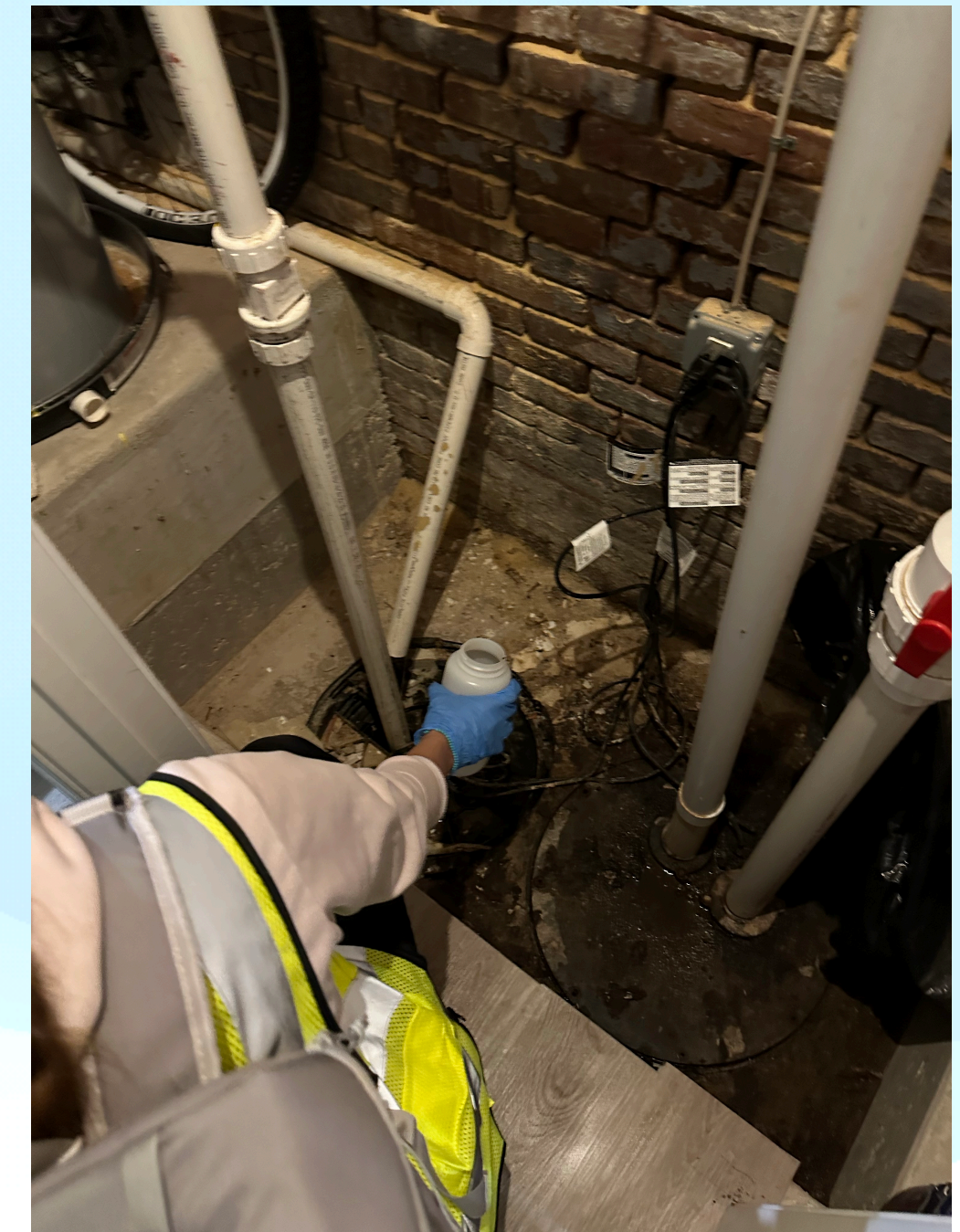
- Participate in a short series of surveys
- Participate in collecting water samples from areas in your home affected by overflow

CONTACT US TO SIGN UP!

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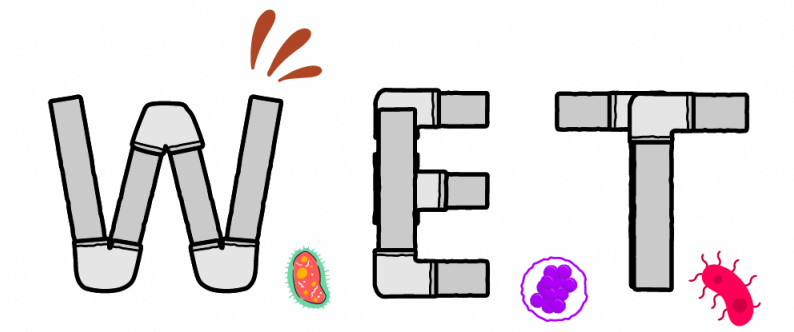
So far...

1. **88 houses sampled, 106 samples collected (pilot + current)**
 - A. 1 from Prince George's County
 - B. 8 neighborhoods of Baltimore
2. **10 Community Events attended**
 - A. More than 600 participants
 - B. Festivals, community meetings, school events, community organization events
 - C. 1 workshop sharing results
3. **21 students involved (PhD, Master and undergrads)**

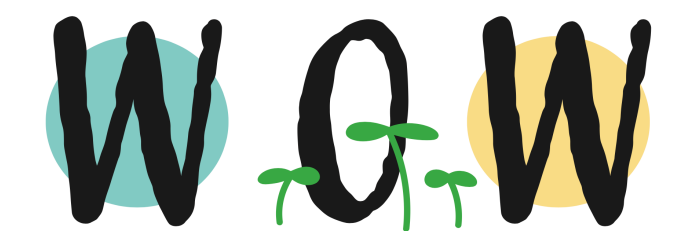


Main takeaways

1. An interdisciplinary approach is needed:
 - A. SSOs and backups will have direct implications for public health and infrastructure.
2. Considering context-specific conditions is key:
 - A. Location matters!
 - B. It is important to understand the nature of SSOs and backups.
3. Community collaboration and engagement should be encouraged:
 - A. Community matters!
 - B. People want to be heard! We can empower community with information and support.



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NIH Central Resource for Grants and Funding Information

Thank you!

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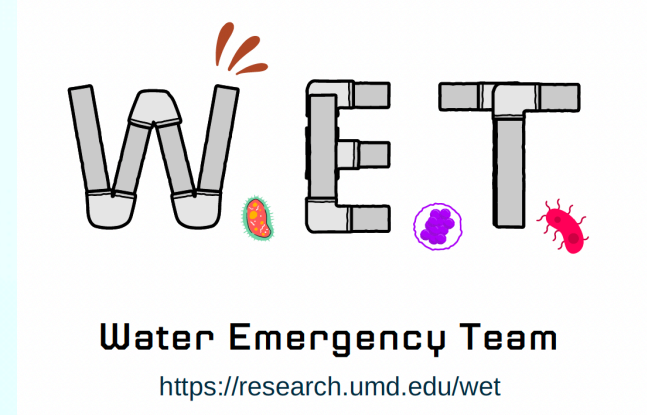


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