

# Using Community Science to Monitor Water Quality in the Cayuga Lake Watershed

Town of Dryden Conservation Board  
3/28/23, 7 PM

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Executive Director



# Community Science Institute

Nonprofit  
501(c)3  
Organization

NYSDOH and  
EPA Certified  
Lab

Lake &  
Stream  
Chemistry

Volunteer  
Water  
Monitoring  
Partnerships

HABs

BMI  
Monitoring

Public Water  
Quality Database

Outreach and  
Education

## CSI's Mission

To partner with community-based volunteer groups to better understand and protect local streams and lakes by collecting and disseminating scientifically credible, regulatory-quality data that inform long-term, sustainable management strategies.



# Water Quality Monitoring Partnerships

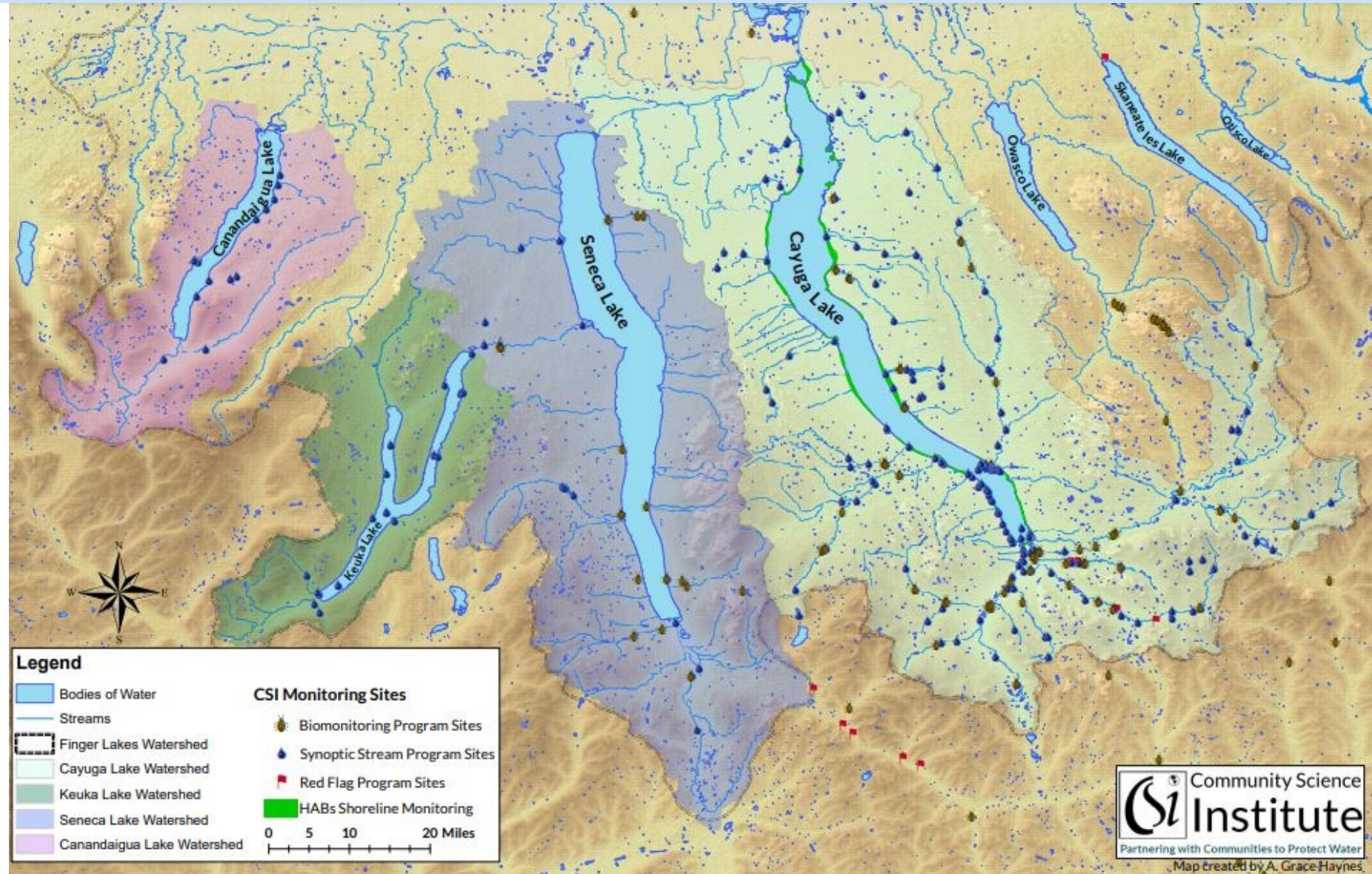
CSI recruits, trains, and coordinates over 250 community scientists who participate in our four volunteer water monitoring partnerships.

Synoptic Stream and Lake  
Chemistry Monitoring

Harmful Algal Bloom (HAB)  
Monitoring

Biomonitoring  
(Benthic Macroinvertebrate  
Monitoring)

Red Flag Monthly Stream  
Monitoring



# Synoptic Stream and Lake Monitoring Partnership



David has been monitoring water quality on Fall Creek with us since 2002!

**Purpose:** Produce regulatory-quality stream and lake water chemistry data that can inform water resource management decisions as well as keep the public informed on the state of their local water resources.

## Monitor streams and lakes for:

- Nutrients
- Sediment
- Bacteria
- Salt

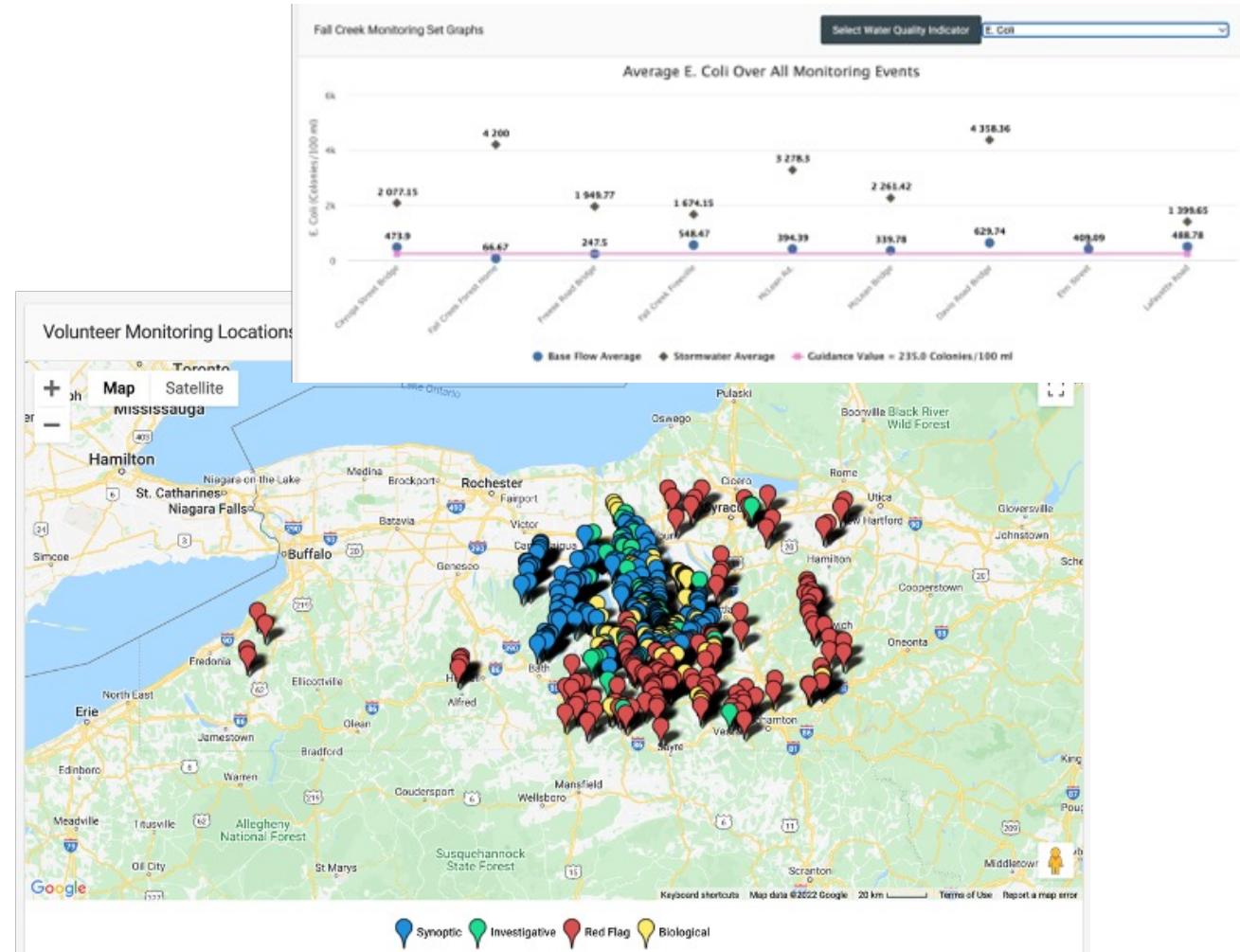
Volunteers collect samples from their designated stream 3-4 times each year

Samples are analyzed in CSI's state-certified water testing laboratory



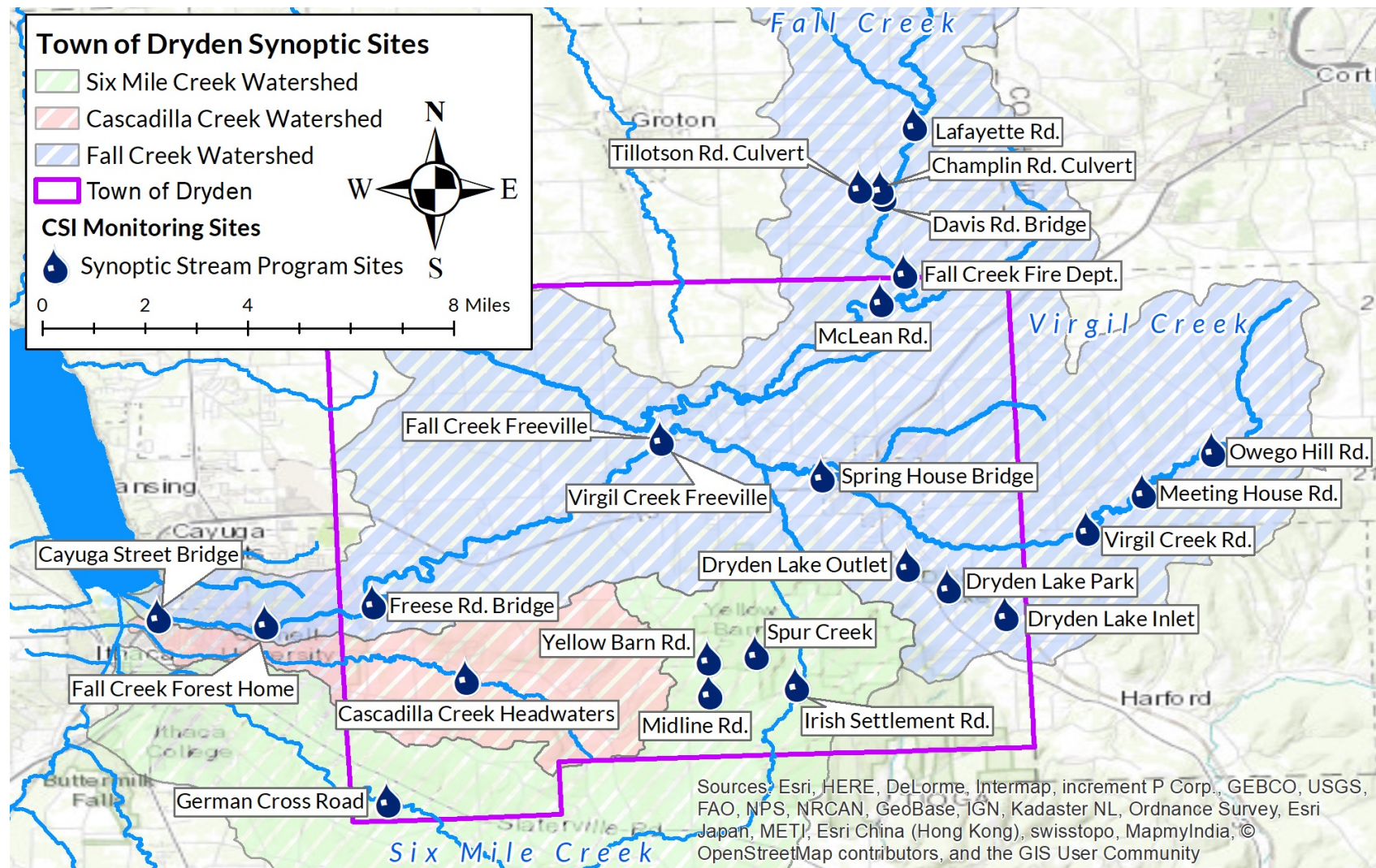
# Online Public Database

Our database houses  
over 100,000  
regulatory-quality  
measurements of  
water quality!



[www.database.communityscience.org](http://www.database.communityscience.org)

# CSI Town of Dryden Water Quality Data – Synoptic Stream Chemistry



CSI's synoptic stream volunteers monitor the following streams in the Town of Dryden:

1. [Fall Creek](#)
2. [Virgil Creek](#)
3. [Cascadilla Creek](#) (tributary of Cayuga Inlet)
4. [Six Mile Creek](#)

These volunteers sample 14 locations in the Town of Dryden

The Fall Creek watershed has the largest drainage area of any of the Cayuga Lake tributaries (129 mi<sup>2</sup>)

# Biomonitoring Partnership

**Purpose:** Determine the ecological and long term health of streams while educating community members about local aquatic biodiversity

Collect and identify samples of benthic macroinvertebrates (BMI) to calculate:

- Total Family Richness
- EPT Richness
  - Ephemeroptera = mayflies, Plecoptera = stoneflies, Trichoptera = caddisflies
- Family Biotic Index
- Percent Model Affinity
- Biological Assessment Profile

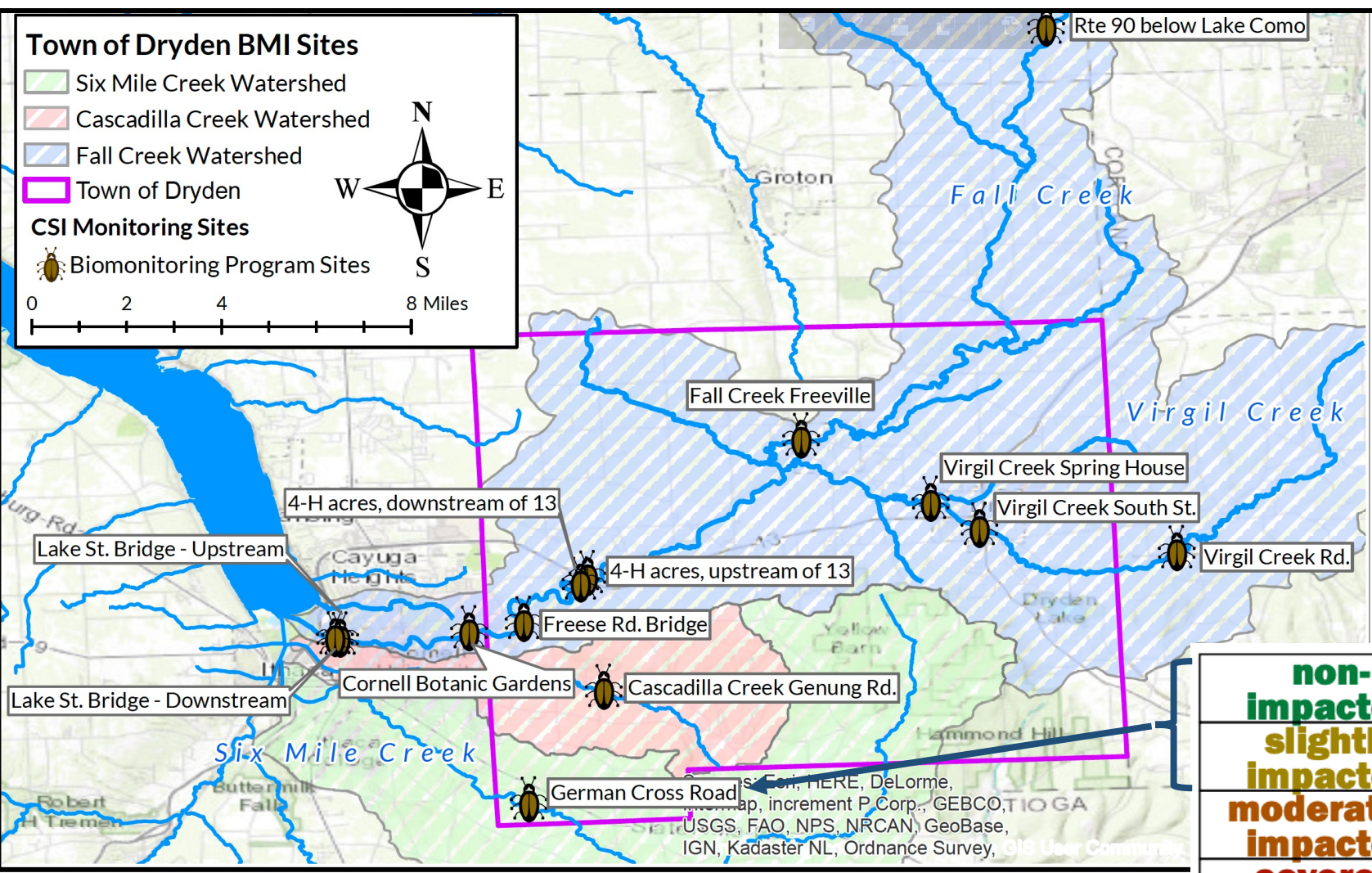
non-impacted
slightly impacted
moderately impacted
severely impacted



Volunteers collect samples in the field then sort and identify organisms in the lab

[Biological Monitoring Results](#) – Database coming soon!

# CSITown of Dryden Water Quality Data - Biomonitoring



CSI's biomonitoring volunteers monitor the following streams in the Town of Dryden:

1. Fall Creek
2. Virgil Creek
3. Cascadilla Creek (tributary of Cayuga Inlet)
4. Six Mile Creek

Our German Cross Road site on Six Mile Creek has been monitored every year since the start of our biomonitoring program in 2011!

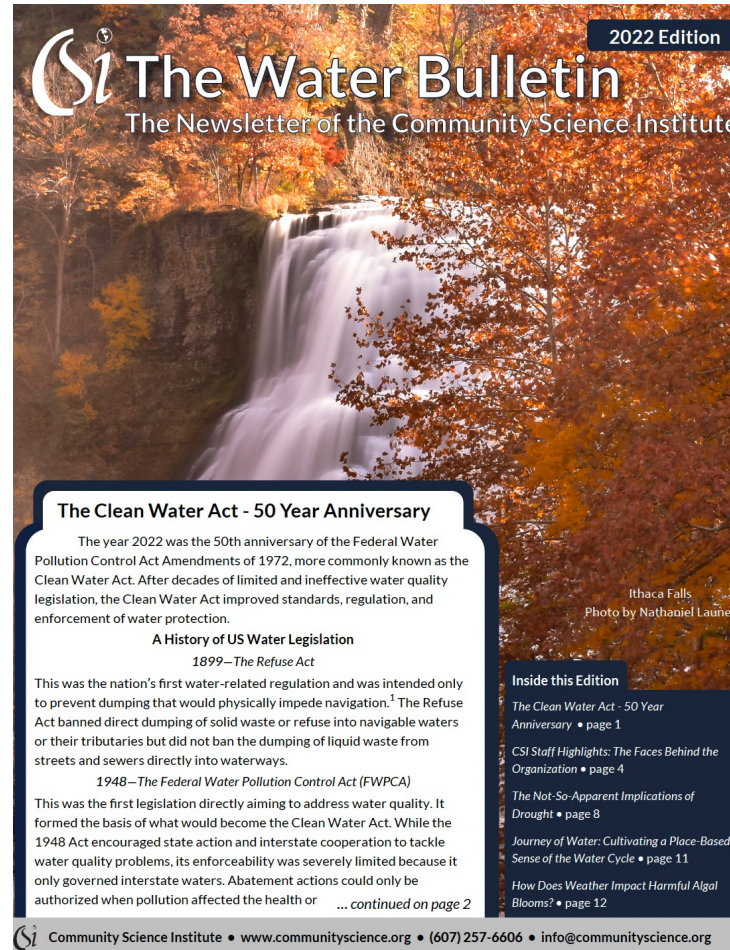
non-impacted
slightly impacted
moderately impacted
severely impacted

← This site's Biological Assessment Profile (BAP) tends to fluctuate between "non-impacted" and "slightly impacted".

# CSI Outreach and Education



4-H2O Summer Youth Education Program



Annual Water Bulletin Newsletter

## CHLORIDE

Community Science Institute  
Partnering with Communities to Protect Water

Chlorine + electron = chloride

### WHAT IS CHLORIDE?

Chloride is a naturally-occurring ion formed when chlorine *gains* an electron. It most frequently occurs in salt compounds like **sodium chloride**.

In small amounts, chloride is essential for our cells to function.

### WHY DO WE MEASURE CHLORIDE?

Brackish or marine ecosystems naturally have a much higher concentration of chloride than freshwater. We test chloride concentrations in streams and lakes to see if they fall within the normal range for these ecosystems.

Typical chloride concentrations

Freshwater:	<50 mg/L
Brackish water:	~300 mg/L
Seawater:	~20,000 mg/L

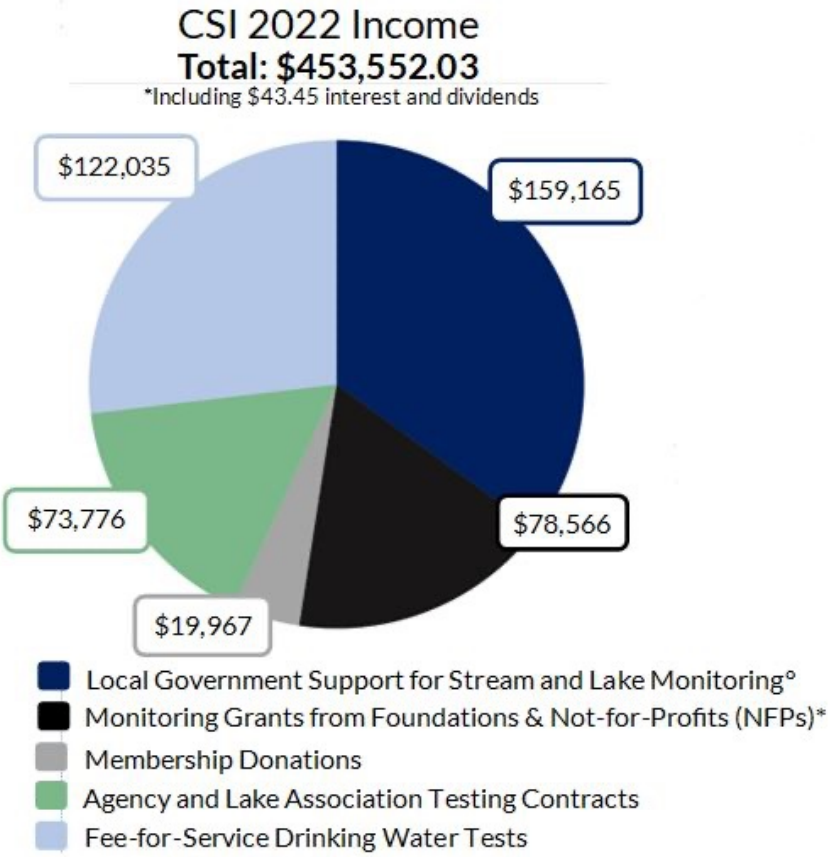
Chloride is often the active ingredient in road salts. It can also be introduced to waterways via irrigation runoff or salt mines.

In the environment, chloride can trigger the mobilization of heavy metals like lead and mercury from soil particles into water. Within an organism, some chloride is normal or even beneficial. However, in large amounts, chloride can interfere with healthy cell function. The following organisms start to see sublethal effects at:

 Daphnia sp. (water fleas) 372 mg/L chloride	 Rainbow trout 922.7 mg/L chloride	 Fathead minnows 433.1 mg/L chloride
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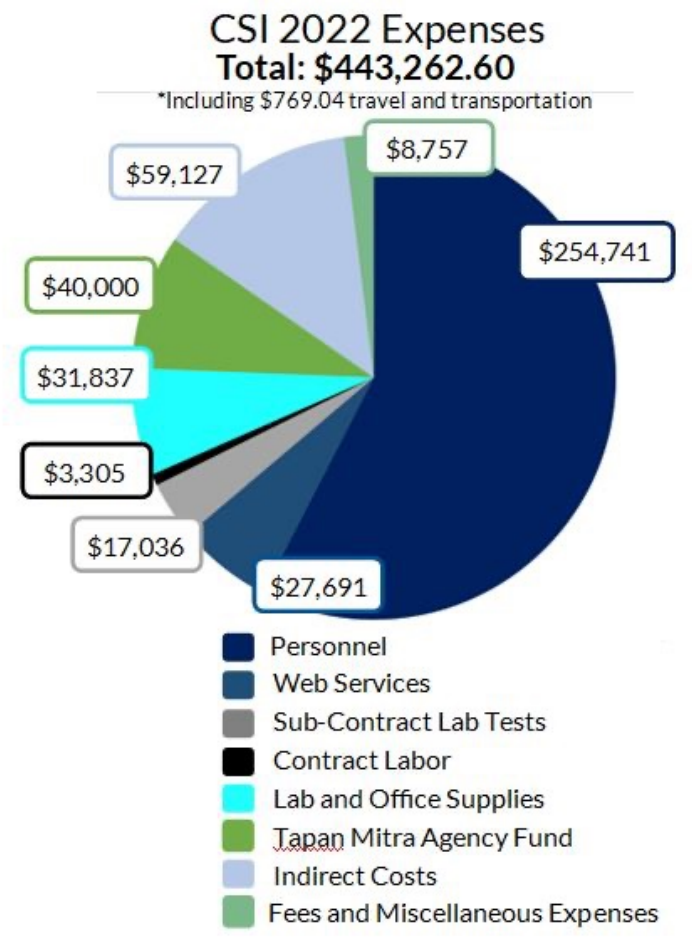
Free Learning Materials

# CSI's 2022 Finances



**Thank you to the  
 Town of Dryden  
 for supporting CSI  
 since 2009!**

Town of Enfield	\$2,550
Town of Lansing	\$7,000
Town of Hector	\$1,000.00
Town of Caroline	\$3,365.00
Town of Danby	\$4,290.00
Town of Ulysses	\$6,438.00
City of Ithaca	\$10,579.00
<b>Town of Dryden</b>	<b>\$11,196.00</b>
Town of Ithaca	\$22,396.00
Town of Newfield	\$6,404.00
Cayuga County	\$24,447
Seneca County	\$6,000.00
Tompkins County	\$53,500.00





# Thank you!

Stay in Touch!

Sign up for our email list or join us  
as a volunteer

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[www.communityscience.org](http://www.communityscience.org)



@communityscienceinstitute



@CSlwater

