

Empowering citizens to monitor and protect local water resources for sustainable management

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Partnerships

CSI's Mission:

CSI partners 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.





Small Nonprofit 501(c)3







NY State and EPA Certified Lab







Chemical Monitoring Partnerships

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Outreach and Education Initiatives



Small Nonprofit 501(c)3









Volunteer Water Monitoring Partnerships



Chemical Monitoring Partnerships



Biological Monitoring Partnerships

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Small Nonprofit 501(c)3











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Biological Monitoring Partnerships

The Story of CSI





Maintaining a Certified Lab - Benefits and Challenges



Maintaining a certified lab is a lot of work!

- The quality assurance and quality control measures are extensive.
- The amount of paperwork involved is sizable.
- Inspections are rigorous.

SO WHY MAKE THE EFFORT?

- Certified data can be used for regulatory purposes.
 - It is difficult for citizen science groups to ensure that their data is taken seriously. Certification is one way.
- Maintaining certification also allows CSI to address the community's potable water testing needs.







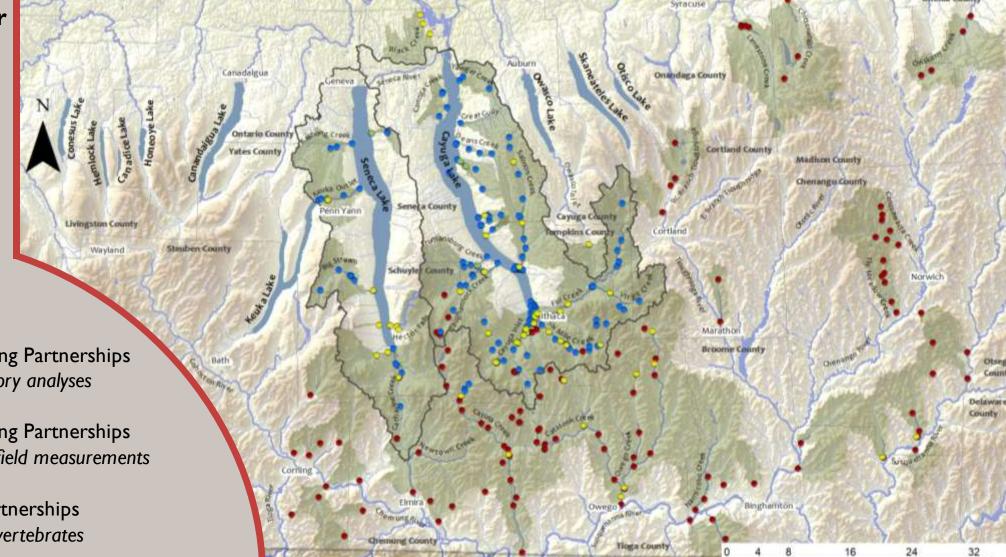


Volunteer Water Monitoring Partnerships



Three Volunteer Water Monitoring Programs

- Synoptic Sampling
- Red Flag Monitoring
- Biomonitoring



Synoptic Monitoring Partnerships

Certified laboratory analyses

Red Flag Monitoring Partnerships

Quality-assured field measurements

Biomonitoring Partnerships

Benthic macroinvertebrates

CSI Monitoring Programs - synoptic Sampling



Three Volunteer Water Monitoring Programs

- **Synoptic Sampling**
 - Certified Lab Analyses
 - Analytes include:
 - E. coli
 - Total Phosphorus
 - Soluble Reactive Phosphorus
 - Nitrate -+ Nitrite Nitrogen
 - Total Kjeldahl Nitrogen
 - Ammonia Nitrogen
 - **Turbidity**
 - Total Suspended Solids
 - Chloride
 - Chlorophyll a
 - And others
 - Primary focus of program is monitoring nutrients, sediment, and pathogenic bacteria

Synoptic Sampling Process



 Water samples are collected by teams of volunteers three to four times a year including once under storm water conditions. Sampling of a single stream occurs in a single day to get a "snapshot" of water quality.



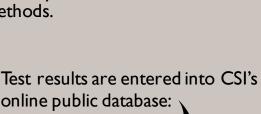
 Volunteers bring samples to CSI's certified lab and complete a chain of custody.



 Samples are analyzed by CSI staff using certified methods.



online public database:



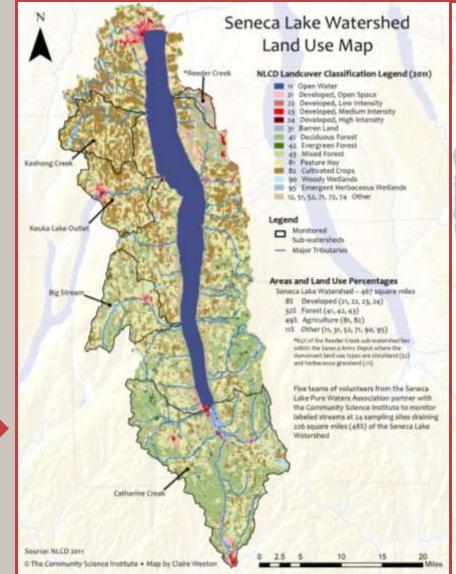
www.database.communityscience.org

CSI Monitoring Programs - synoptic Sampling



Three Volunteer Water Monitoring Programs

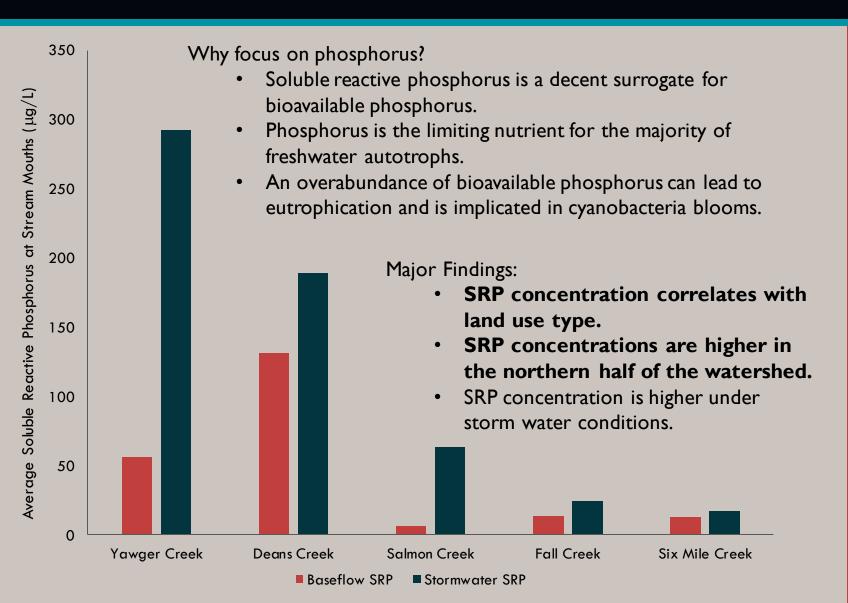
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Synoptic Sampling Results - Phosphorus

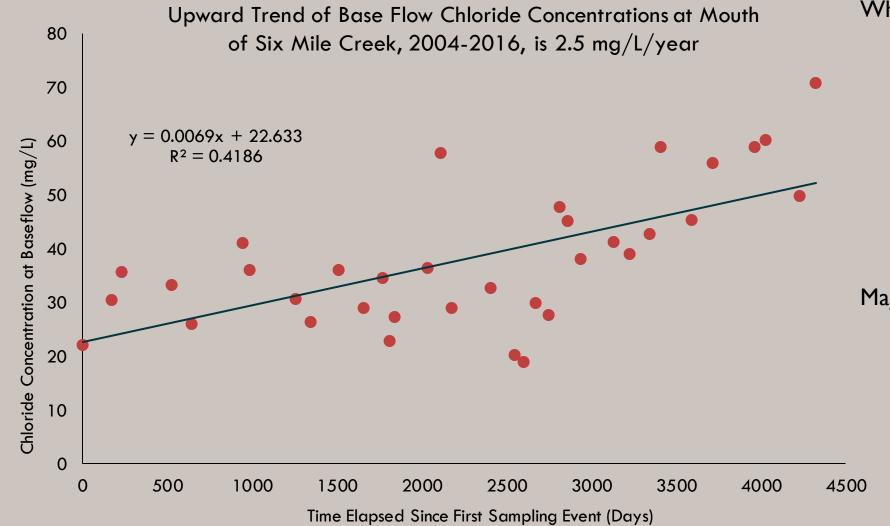






Synoptic Sampling Results - chloride





Why focus on chloride?

- The salinization of a water body can negatively affect aquatic life and reduce biodiversity.
- Increasing chloride concentrations have been observed throughout the Northeast and Midwest (Dugan et al, 2017)

Major Findings:

- Chloride concentration has increased in all southern streams
- Long term stream datasets yield insights into non-point source pollution.

CSI Monitoring Programs - Red Flag Monitoring



Three Volunteer Water Monitoring Programs

- Red Flag Monitoring
 - Stream samples are collected and tested in the field for five analytes monthly using portable kits and meters.
 - Temperature
 - pH
 - Conductivity
 - Total Hardness
 - Dissolved Oxygen
 - Goal is to establish baseline water quality and monitor for possible impacts including "hydrofracking."
 - Volunteers also collect nutrient samples twice a year and send them to the CSI lab for certified analyses of total phosphorus, NOx, and ammonia.
 - Most Red Flag sites lie within the Chesapeake Bay watershed.

Red Flag Monitoring Process

Sample

• Water samples are collected by teams of volunteers once a month.



 Volunteers analyze samples in the field and record results on field data sheets.



 Volunteers mail or deliver their field data sheets to the CSI lab where results and quality controls are reviewed by CSI staff.



After review, results are entered into CSI's online public database by CSI staff, provided data quality objectives are met.



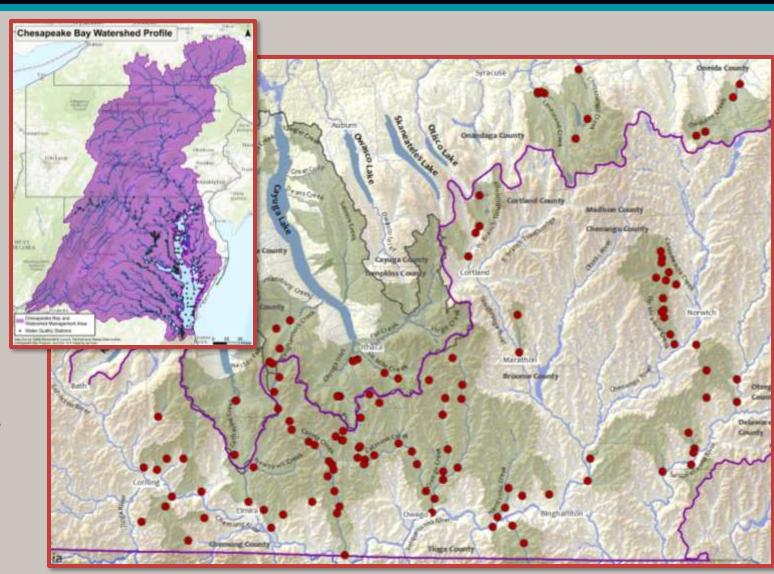
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Red Flag Monitoring - Long term datasets yield unexpected results

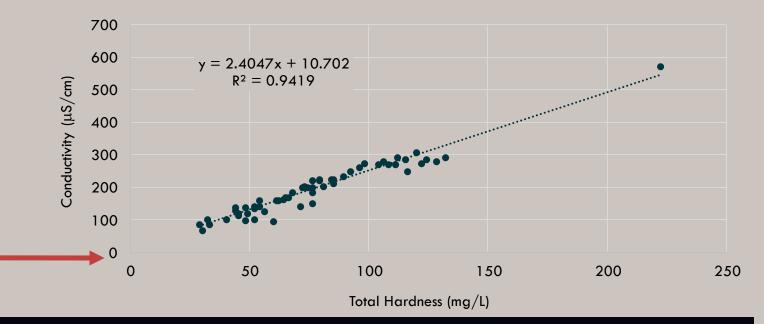


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Correlation

- Temperature
- pH
- Conductivity
- Total Hardness
- Dissolved Oxygen



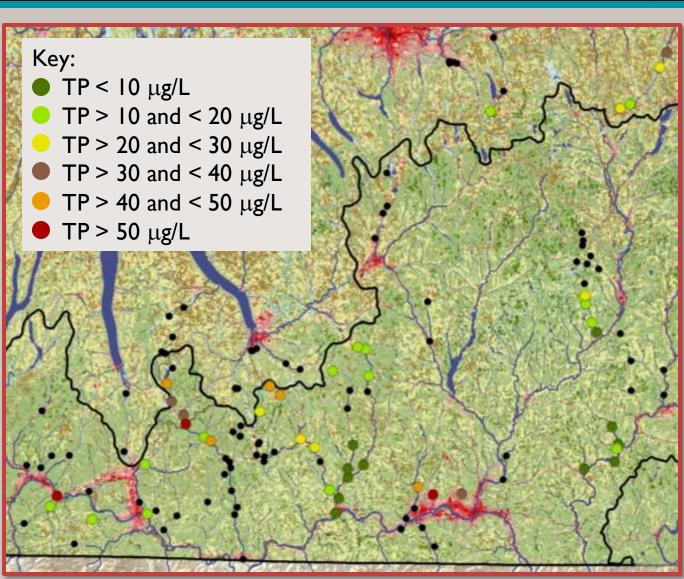


Red Flag Monitoring Results - Nutrients



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CSI Monitoring Programs - Biomonitoring



Three Volunteer Water Monitoring Programs

Biomonitoring

- Volunteers collect a sample of benthic macroinvertebrates and assess aquatic health based on the composition of the benthic community.
- Provides a "birds-eye view" of water quality and ecosystem health.





CSI Monitoring Programs - Biomonitoring



Three Volunteer Water Monitoring Programs

Biomonitoring Process and Results

Biomonitoring

- Volunteers collect a sample of benthic macroinvertebrates and assess aquatic health based on the biodiversity of the sample.
- Provides a "birds-eye view" of water quality and ecosystem health.





Fall Creek – Ithaca Falls 5/14/15 42.453137N, 76.493173W Upstream of Lake St bridge (downtown)		
Total Family Richness		12.5
EPT Richness		6.5
Family Biotic Index		4.66
Percent Model Affinity		75%
Density Orgs/sample		423
BAP Value Biological Assessment Profile		7.4
Non-impacted	Slightly impacted	
Moderately impacted	Severely impacted	

Outreach and Data Dissemination



CSI partners 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.



- Public
- User friendly
- Interactive and Searchable
- Downloadable Data
- database.communityscience.org



- Meetings
- Event Collaboration
- Collective thinking



- Summarize past year's activities
- Summarize insights
- Consider future endeavors



- Website
- Public education forums
- Newsletters
- 4-H2O Youth Program
- Social Media

Highlights in Outreach - Public Forums



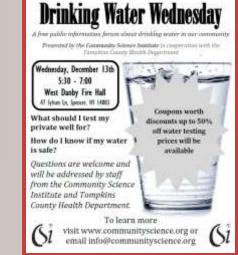






Purpose of Holding Public Forums

- Spread awareness and disseminate regional water quality data
- Encourage community engagement and productive dialogue concerning water quality and sustainability of regional water resources
- Foster environmental stewardship
- Inspire participation in the scientific process





Highlights in Outreach – 4-H20



4-H2O Youth Education Program

 Taking steps to nurture the next generation of scientists and environmental stewards



Highlights in Outreach - social Media









Follow us!

Looking Ahead - HABs Monitoring Program





2018 Cayuga Lake Volunteer HABs Monitoring Program

Weekly shoreline survey by "HABs Harriers"

HABs reporting Hotline system



- Volunteers are trained in HABs collection
- Volunteers survey assigned shoreline zones
- Collect samples of any observed SABs and transport to CSI lab for testing

- The general public can report suspicious algal blooms to habs@cayugalake.org
- Volunteers follow-up on report, collect sample, and bring sample to CSI lab for testing.

