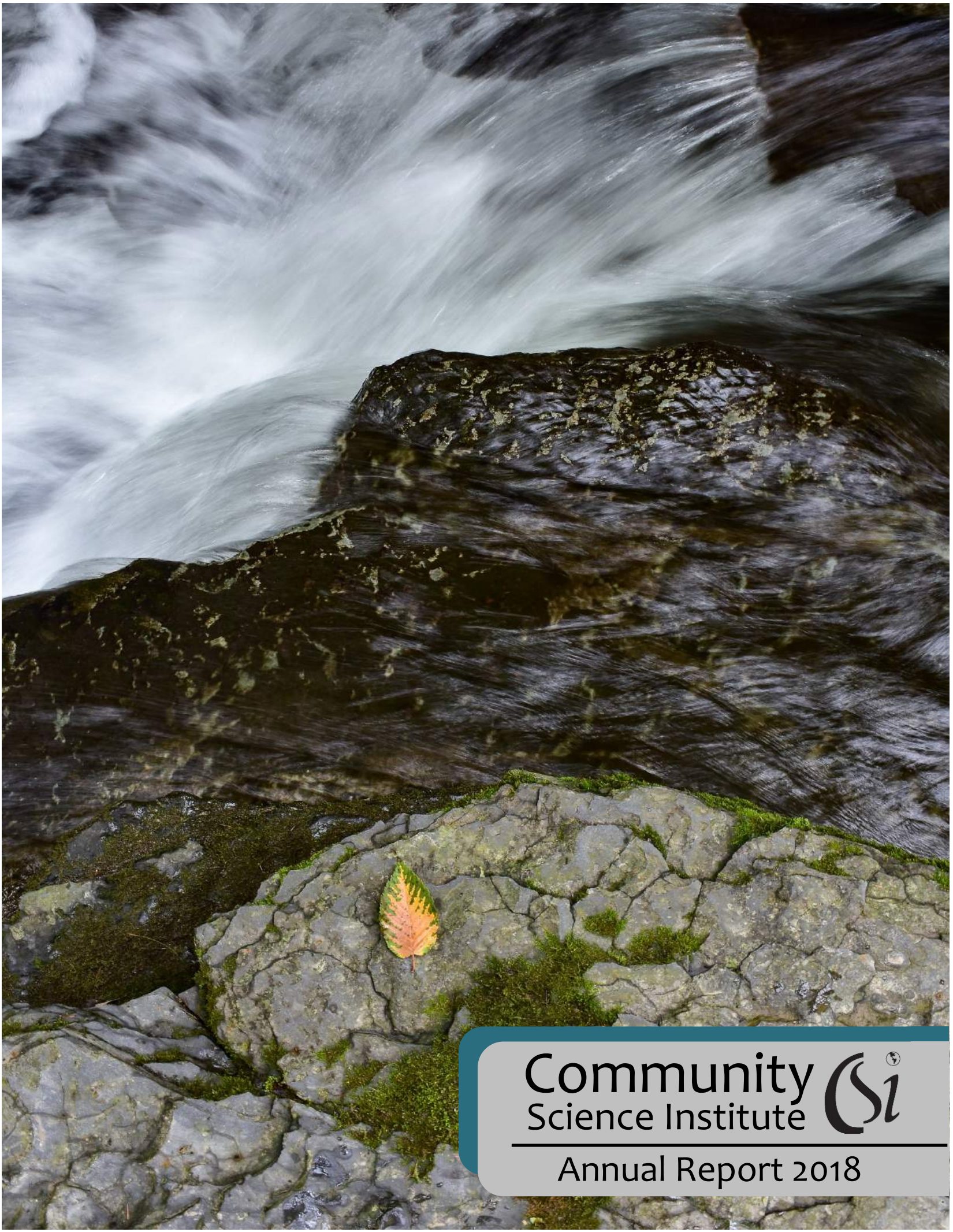


Community Science Institute

Annual Report 2018

Volunteer Monitoring Partnerships

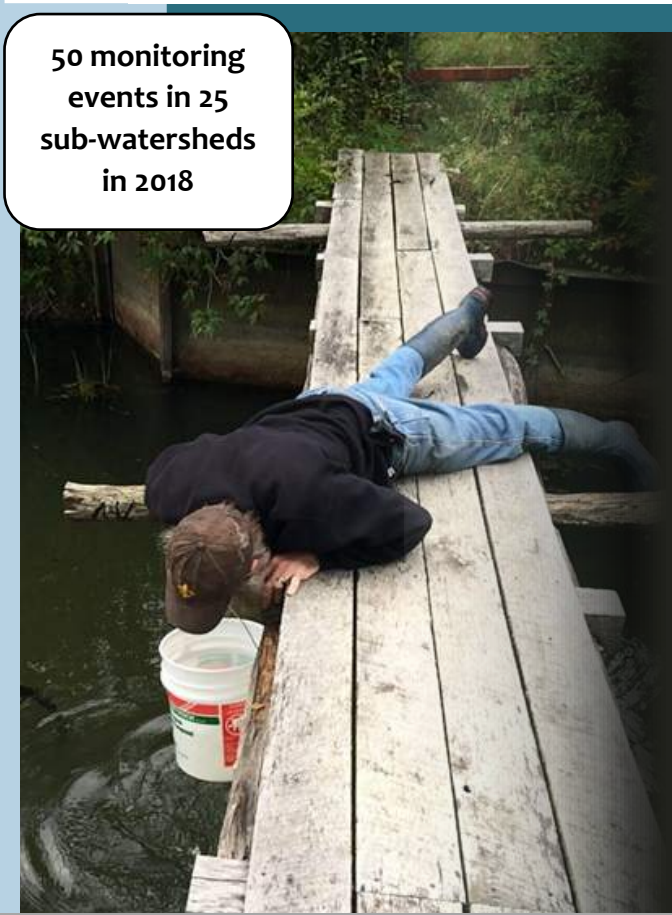
Partnering with Communities to Protect Water

Synoptic Stream Monitoring Partnerships

In 2018 the 12 dedicated volunteer groups of the Synoptic Stream Monitoring Program continued their invaluable work collecting water samples from over 20 sub-watersheds in the Finger Lakes region. It was the first year of sampling for a new group of volunteers that are monitoring the water quality of Milliken Creek. The water quality data they collect will be used to monitor for possible contamination from the nearby coal-ash landfills and contribute to the comprehensive water quality data sets for the Cayuga Lake watershed. This year the Cayuga County legislature generously approved $20,000 to support the sampling work of the Direct Streams, Yawger and Great Gully, and Salmon Creek volunteer groups, enabling CSI to continue monitoring water quality in these northern sub-watershed in 2018. CSI volunteer groups are building some of the most comprehensive long-term water quality data sets in New York. These data sets are helping paint a detailed picture of local water quality by revealing patterns of nutrient concentrations that differ across watersheds, helping identify where targeted remediation should be focused, and informing watershed management plans. As these data sets continue to expand, they serve as an invaluable resource for water quality managers, research scientists, local governments, and the community.

4,000 data points collected on 10 water quality indicators in 2018

50 monitoring events in 25 sub-watersheds in 2018



Red Flag Monitoring Program

Originally founded to set a baseline of water quality against the impacts of hydrofracking in New York, the Red Flag Program has gone far beyond its original intent. The program now consists of over 40 volunteers who continue to build comprehensive long-term data sets for over 25 sub-watersheds across Central New York, including the Upper Susquehanna and Finger Lakes regions. In April of 2018, the first ever Red Flag Symposium was organized by Outreach Coordinator Claire Weston. The symposium provided an important opportunity for Red Flag Monitors to come together and reflect on nearly a decade of monitoring and data collection. Claire discussed how the data collected by volunteers is helping to characterize water quality in smaller tributaries. Analyses reveal seasonal patterns in total hardness and conductivity and that nutrient levels tend to vary across watersheds and similar reaches of streams. These data sets are working to provide a uniquely comprehensive understanding of water quality on a large geographic scale and may be used to help inform management actions to protect water quality in the Chesapeake Bay watershed.

30% of Cayuga Lake shoreline monitored weekly by over 70 volunteers in 2018

Cayuga Lake HABs Monitoring Program

2018 was the first year for the Cayuga Lake Harmful Algal Bloom (HABs) Monitoring Program. Developing this new monitoring program is a huge accomplishment that has greatly expanded CSI's scope of work. The program was designed and implemented in partnership with the Cayuga Lake Watershed Network and Discover Cayuga Lake. By June of 2018, over 70 volunteers around Cayuga Lake had joined the program. Titled HABs Harriers, these volunteers monitored lake shore zones weekly and reported any blooms they observed. In 2018, the program documented 40 confirmed cyanobacteria blooms. Each bloom was analyzed to determine the type of cyanobacteria present in the bloom, the biomass of the bloom using Total Chlorophyll a, and the concentration of microcystin toxin. These results, along with the location of each bloom, were updated on CSI's online Cayuga Lake HABs Reporting page within hours to days of when blooms occurred. Receiving over 27,000 views in the summer of 2018, this reporting page and the program itself are invaluable for keeping the public alert to risks that the blooms may present.

View the locations and test results of harmful algal blooms occurring on Cayuga Lake at **www.communityscience.org**

Biomonitoring Program

In 2018, volunteers collected and analyzed benthic macroinvertebrate samples from 27 sites on nine different creeks, the largest number for any year of the program to date. Biomonitoring results, which include metrics that look at benthic macroinvertebrate (BMI) diversity, family-level tolerance to impaired conditions, and BMI composition as compared to an average NY healthy stream, give a good overall picture of water quality. CSI's 2018 results, along with over a decade of prior results, will ultimately be included in a new CSI Biomonitoring database. This year, the basic database structure was finished, though the user interface is still being developed. Attendance at Biomonitoring Open Labs on Thursday evenings was strong and steady. Volunteers did an amazing job of picking, sorting and identifying the stacks of samples from the summer. CSI also worked with Finger Lakes State Parks to collect and analyze a large number of samples on Fillmore Glen Creek and to offer Biomonitoring Family Picnics at Lower and Upper Buttermilk and Robert H. Treman State Parks. These fun-filled science activities remain one of our most popular educational events.

27 locations spanning 9 creeks sampled in 2018

All data collected by the partnership of volunteers and CSI's certified water testing lab can be easily viewed and downloaded on CSI's Public Online Water Quality Database at **www.database.communityscience.org**

Outreach and Education

Learning about water quality science on Cayuga Lake aboard Discover Cayuga Lakes's Floating Classroom

© Nathaniel Launer

As part of our mission to foster and support environmental stewardship, the Community Science Institute is dedicated to educating the community about local water quality and encouraging the next generation of water stewards. In 2018, CSI again offered a series of youth education events in partnership with the Tompkins County 4-H Program, including three Biomonitoring Picnics, two Getting to Know Harmful Algal Blooms programs, and three Water Quality Cruises aboard Discover Cayuga Lake's Floating Classroom. These events continue to be an important way that CSI connects with members of the community to spark an interest in water science. Empowering all generations with the skills and knowledge to understand and use water quality data is an essential part of enabling everyone to manage water resources sustainably.

Biomonitoring Picnic at Buttermilk Falls

To sign up for an event, or for more information, please email ***info@communityscience.org*** *or call (607) 257-6606*

Online Public Database

CSI maintains a one-of-a kind online public database of water quality. In 2018, nearly 8,000 measurements of water quality were added to the now over 90,000 measurements found in the database. These data are available for anyone to view and download for free at **database.communityscience.org.** CSI's web developer is currently working on a new updated version of the database that will include data collected through the Biomonitoring Program and the Cayuga Lake Harmful Algal Bloom Monitoring Program. Stay tuned for its release!

The Water Bulletin

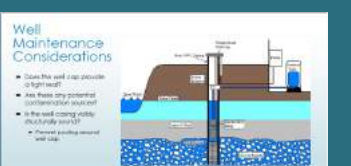
Written by CSI staff, the Water Bulletin is a yearly newsletter that highlights CSI's efforts to protect water by supporting community water quality monitoring partnerships, disseminating data through the CSI online public water quality database, and fostering environmental stewardship through education and outreach. The Fall 2018 Water Bulletin was a special edition featuring articles that detailed our findings from the first year of monitoring harmful algal blooms on Cayuga Lake. You can read this edition, as well as past issues, on CSI's website at: **www.communityscience.org**

Water and Community

In 2018 CSI hosted two Water and Community Events. Supported in part by a grant from the Park Foundation, these public forums were designed to educate the community on current water quality issues and provide a platform for people to discuss how these issues should be addressed. The first event, held in April, was titled *Harmful Algal Blooms and Non-point Source Pollution in the Finger Lakes: Strategies for Addressing the Threat.* It was well attended by people interested in learning about harmful algal blooms and what these blooms could mean for the future of Cayuga Lake. The second event was held in December and was titled *Harmful Algal Blooms on Cayuga Lake: Managing the Risk in 2018. It* offered an opportunity to discuss the results from the first year of monitoring and testing HABs on Cayuga Lake.

Drinking Water Wednesdays

In 2018 CSI held three Drinking Water Wednesday events in collaboration with the Tompkins County Health Department and with partial support from the Park Foundation. Drinking Water Wednesdays help inform residents about water quality testing and local water quality issues through presentations by staff from CSI and the Health Department. These events provide information about potential types and sources of contamination and tests that are available to help detect them.



Letter from the Director

In August we bade farewell to Michi Schulenberg, our accomplished Senior Lab Analyst and Quality Assurance Officer. Michi joined CSI in 2008 as a Microbiologist. Over the years she taught herself most of CSI's microbiological and chemical assays, in the process pioneering a team approach to lab work that has become a hallmark of CSI. We will also remember Michi as a certified BMI taxonomist, a talented educator and administrator, and an industrial designer who created and built shelving and mobile lab stands that serve as elegant extensions of CSI's limited lab space. We wish Michi well as she engages with new interests and challenges.

We also bade farewell to Claire Weston, who joined CSI as Outreach Coordinator in the fall of 2016 and left in the fall of 2018. In two short years Claire made substantial contributions to CSI including updating maps; creating and giving substantive and visually appealing Power Point presentations to a range of audiences; growing CSI's outreach programs for youth and their families; and taking a leadership role in organizing and implementing the first Cayuga Lake Volunteer HABs Monitoring Program in 2018. Claire landed a job with the Center for Creative Land Recycling. She has continued to share her talents with CSI as a part-time Outreach Support Specialist.

In May we welcomed Lab Analyst Alex Sopilniak Mints. Dr. Mints received his Ph.D. in water quality studies from Hebrew University in Jerusalem with a focus on nutrients, making him an outstanding addition to CSI's staff. A talented analyst who enjoys working at the lab bench, he and his wife, Noam, who is a post-doctoral fellow at Cornell University, celebrated the birth of their first child, a girl, in December. They named her Ray.

Finally, we welcomed Nathaniel Launer, Claire Weston's successor as Outreach Coordinator, in September. A wildlife biologist with a Bachelor's degree from the University of Vermont and a passion for the outdoors, Nate has picked up where Claire left off, managing the final weeks of the 2018 HABs Monitoring Program and analyzing the results for publication in the Fall 2018 special HABs issue of our Water Bulletin newsletter. Among his many talents, Nate is an amateur photographer, and several of his photos grace this Annual Report.

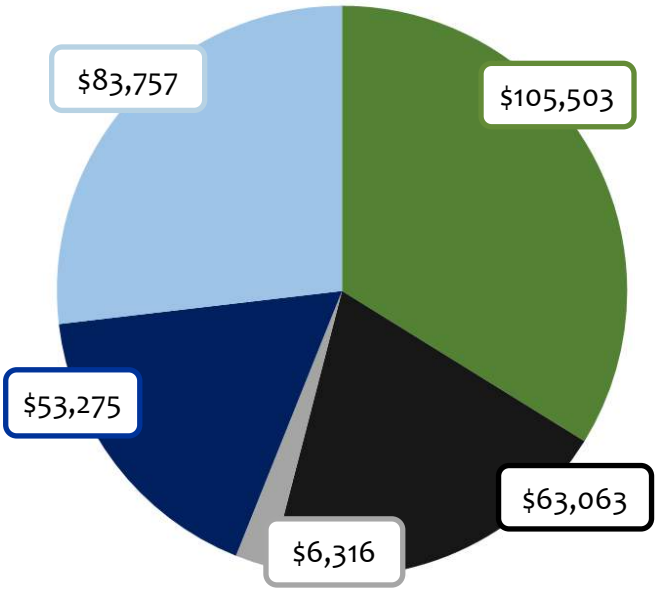
Staff changes in 2018 were substantial. CSI was fortunate to retain staff as well as hire new staff who were willing to go the extra mile to make sure that work got done. I believe that our team is stronger than ever and that, together with our dedicated volunteer groups, we are accomplishing CSI's mission of collecting and sharing actionable water quality data for use in developing and implementing sustainable watershed management strategies.

It is becoming more and more apparent that gaining an understanding of water quality and protecting water resources in our region are collective endeavors *par excellence*. They depend on the scientific contributions of hundreds of volunteers partnering with CSI (and other entities) to produce actionable data; on the involvement of members of the public and their willingness to engage with scientific findings; and on the existence of environmental laws that provide government with a framework to work with stakeholders and develop water resource management strategies that are both sustainable and fair. Communities cannot rely on government to produce the necessary science. Government lacks the resources to address the full range of environmental issues in their purview or to build the kinds of long-term data sets that are essential to assessing water quality trends. But perhaps that is not such a bad thing. Paucity of government resources at the local and regional levels creates an opening and an incentive for communities to come together and fill the great data voids. Citizen scientists partnering with CSI is one approach to generating essential data on water resources. A marquee example is the 2018 Cayuga Lake HABs Monitoring Program, which engaged over 70 volunteers, producing new data on cyanobacteria and microcystin toxin while increasing the scientific literacy of participating volunteers and, by extension, of members of their communities. While HABs surveillance attracts attention because of the health risks and potential impact of HABs on our regional economy, any community-based program with good science at its core can contribute to the spread of environmental citizenship. Environmental citizenship, which I would define as a collective engagement in managing, for the public good, irreplaceable natural resources, is sorely needed at all geographic scales, as documented by the sobering report issued recently by the United Nations' Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. I believe that more and more people are becoming environmental citizens in our region, and I am proud of the role that CSI and our dedicated volunteers are playing in their transformation.

Stephen R. Penningroth

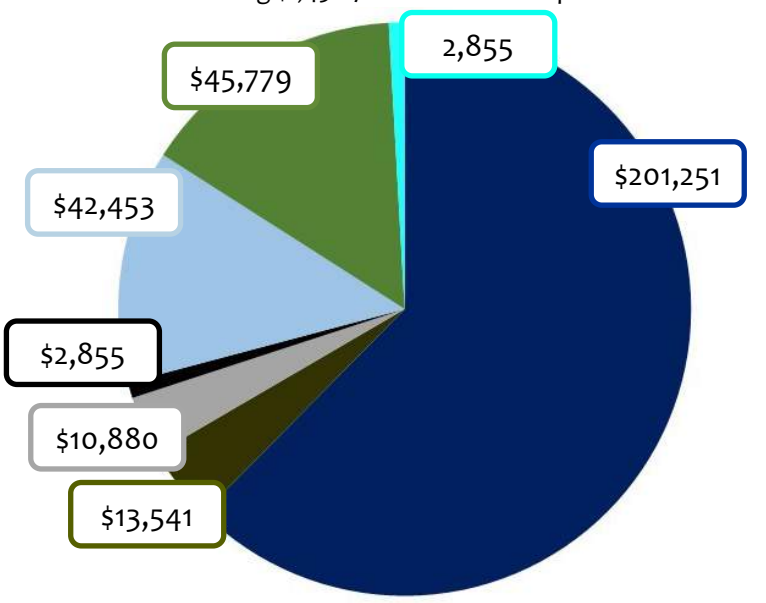
Financial Report

CSI 2018 Income
Total: 311,952
*Including $37.70 interest and dividends



- Local Government Support°
- Grants from Foundations & Not-for-Profits (NFPs)*
- Donations
- Fee-for-Service Contracts
- Fee-for-Service General Public

CSI 2018 Expenses
Total: 321,065
*Including $1,450.71 travel and transportation



- Fees and Miscellaneous Expenses
- Personnel
- Web Services
- Sub-Contract Lab Tests
- Contract Labor
- Lab and Office Supplies
- Total Indirect Costs

Thank You to Our Donors

Watershed
$1,000 +

David Weinstein

Lake
$250 +

Stephen Penningroth
Edwin and Roberta Przybylowicz
Curtis and Amanda Ufford
Grace W. Bates

River
$100 +

Leah Horwitz
Eric Evans
Stephen Coate
Trumansburg Rotary Club
Barbara Chase
Judith Abrams
John Rueckheim
Stephen Yale-Loehr
Donald Sargent and Shannon Barrett
Ezrya Oyer
Ellen Harrison
Christopher Riley
Oyer Family Enterprises

Stream
$50 +

Vicki Taylor Brous
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Martha Fischer
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Barbara DeWall
Deborah A. Jones
G. and Jean Walton Cottrell
Lynn Leopold
Social Ventures Inc.

Stream

Dan E. Karig
Kenneth Fogarty
Bruce Lewenstein

Creek

$25 +

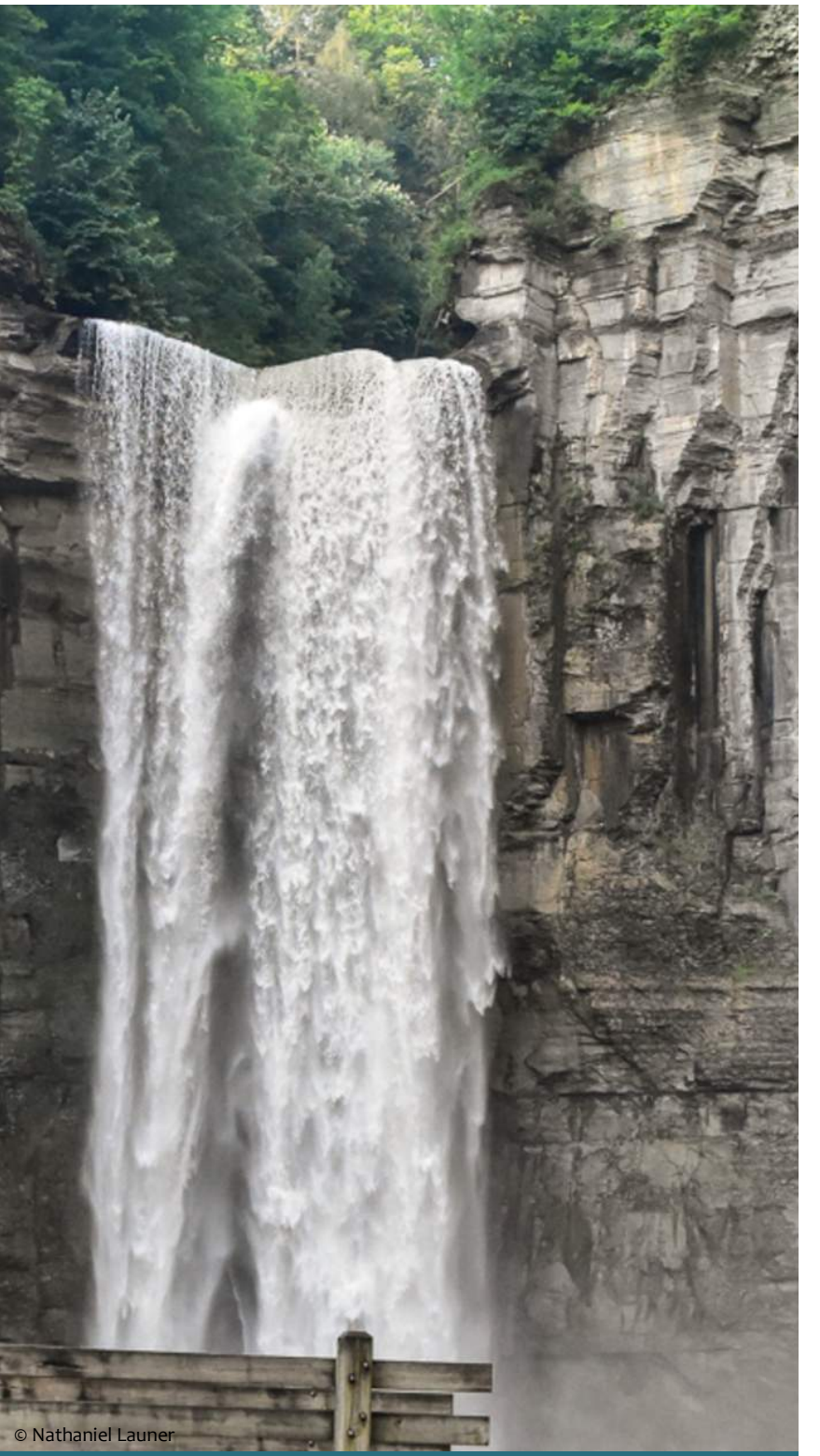
Caroline and William Beckenhaupt
Phillip Koons
Richard and Elizabeth Adams
Carol and Stephen Clendenin
David and Janet Pierce

Grants from Foundations and NFPs*

Seneca Lake Pure Waters Association - $24,080
Park Foundation - $12,500
Tompkins County Soil and Water - $11,784
Finger Lakes Institute - $1,928
Cornell University - $7,000
The Community Foundation of Tompkins County
- Taylor Peck Fund - $500
Cayuga Foundation - $3,000

Local Government Support°

Town of Dryden - $10,550
Town of Ithaca - $20,690
Tompkins County - $32,150
City of Ithaca - $10,379
Town of Ulysses - $6,067
Town of Danby - $3,964
Town of Hector - $1,000
Town of Newfield - $5,916
Town of Caroline - $3,109
Cayuga County - $11,678



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Staff

Stephen Penningroth, *Executive Director, Senior Scientist*
Noah Mark, *Technical Director*
Alex Sopilniak, *Senior Lab Analyst*
Diana Beckenhaupt, *Lab Analyst*
Nathaniel Launer, *Outreach Coordinator*
Adrianna Hirtler, *Biomonitoring Coordinator*

Supporting Services

William George, *Data Entry Specialist*
Abner Figueroa, *Web Development Services*
Claire Weston, *Outreach Support Services*

Board of Directors

Robert Barton, *President*
Angel Hinickle, *Vice-President*
Darby Kiley, *Secretary*
Stephen Penningroth, *Acting Treasurer*
Gerald Van Orden
Deborah Jones
William Coon
Sheila Dean
Marina Howarth

Partner Organizations

Cayuga Lake Watershed Network
Discover Cayuga Lake
Tompkins County 4-H

Community Science Institute
Annual Report

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Ithaca, NY 14850

Phone/ Fax: (607) 257-6606

info@communityscience.org

Send To:

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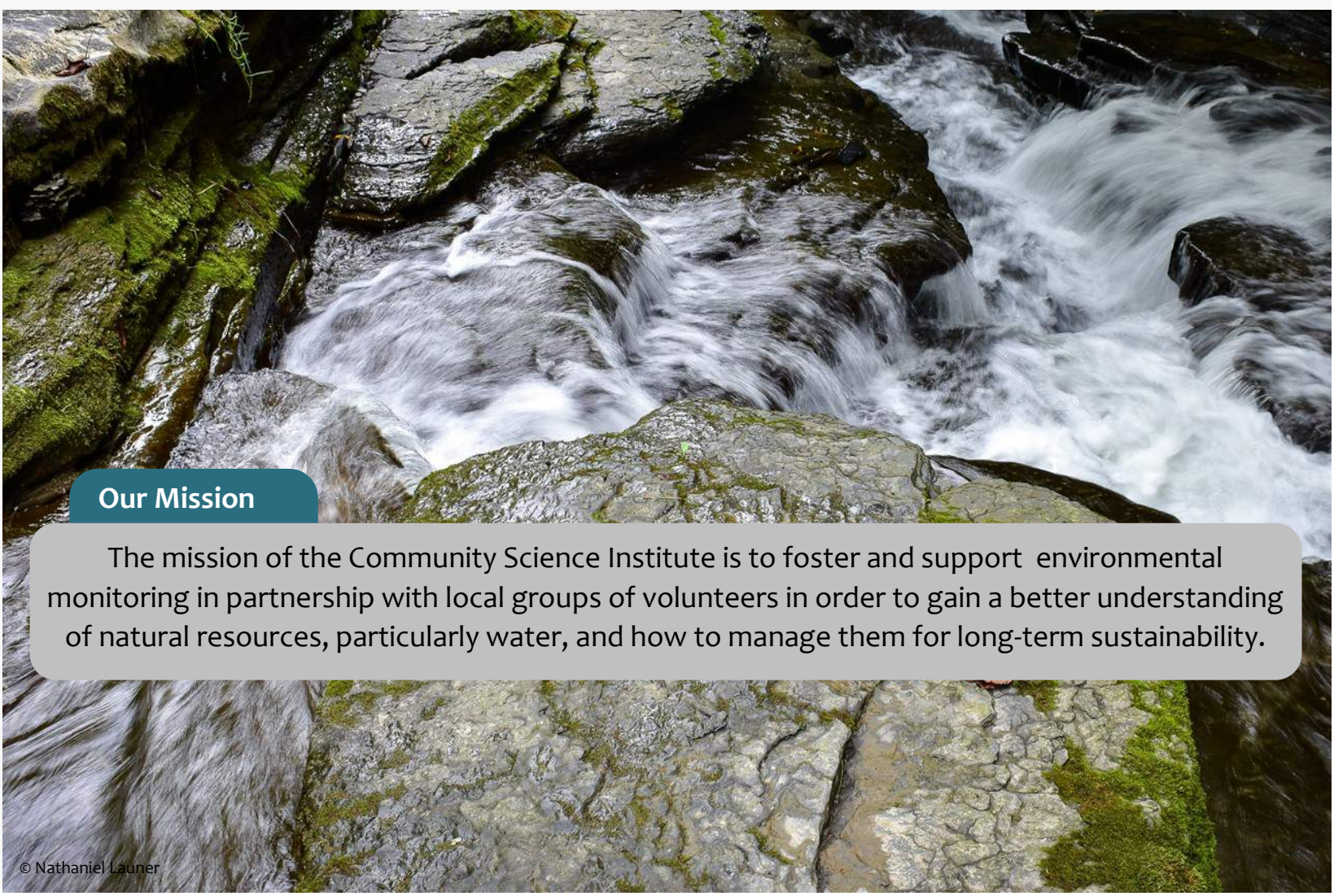
NYSDOH-ELAP #11790
EPA Lab Code NY01518



Our Mission

The mission of the Community Science Institute is to foster and support environmental monitoring in partnership with local groups of volunteers in order to gain a better understanding of natural resources, particularly water, and how to manage them for long-term sustainability.