



Community Science
Institute

Partnering with Communities to Protect Water

Annual Report 2022

Volunteers in CSI's synoptic stream monitoring and biomonitoring programs collect water quality data on Six Mile Creek, the drinking water source for the City of Ithaca. Photo taken by Nathaniel Launer.



Volunteer Monitoring Partnerships

Partnering with Communities to Protect Water

>250
Volunteer Partners

Synoptic Stream Monitoring Program

Community Science Institute's Synoptic Stream volunteers pulled off another successful year of monitoring water quality in 2022 despite dry, drought-like conditions throughout the Finger Lakes region. You can read more about the challenges that our volunteers faced while monitoring during a drought watch in our 2022 Water Bulletin Newsletter. Although the weather complicated monitoring efforts, over 100 dedicated volunteers collected 668 water samples from tributaries of Cayuga Lake, Seneca Lake, Keuka Lake, and Canandaigua Lake.

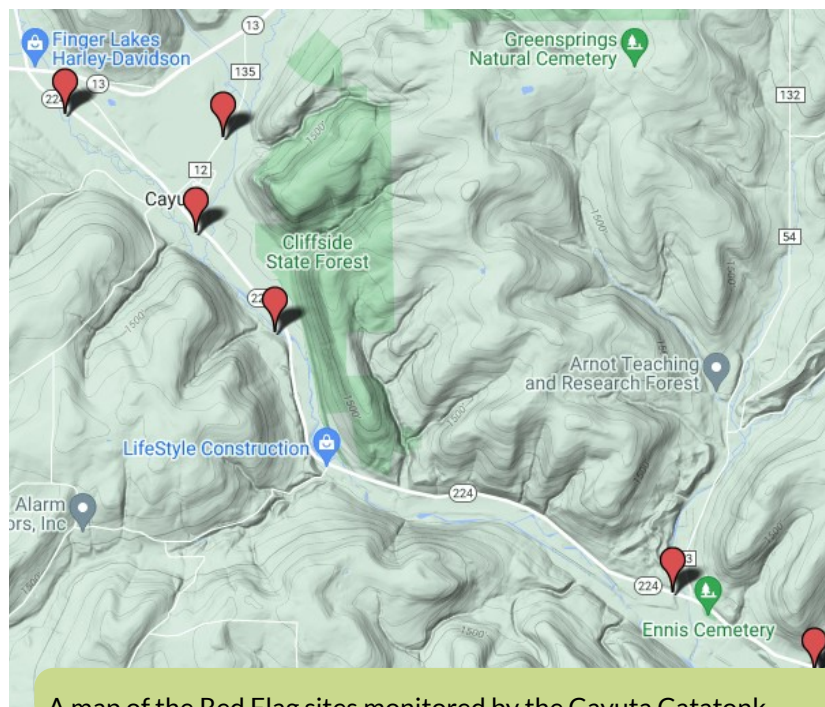
CSI celebrated two decades of monitoring water quality on Fall and Virgil Creek in 2022. Our Fall and Virgil Creek monitoring team, formed in 2002, was CSI's first volunteer monitoring group. Thanks to the efforts of those original volunteers (some of whom still monitor these creeks today!), you can find twenty years of water quality data for Fall and Virgil Creek on our public streams and lakes database (database.communityscience.org/monitoringregions/1). We look forward to building the next decade's worth of water quality data on Fall and Virgil Creek in 2023.

We also celebrated the approval of the Seneca-Keuka 9 Element (9E) Plan alongside our partners, Seneca Lake Pure Waters Association (SLPWA) and Keuka Lake Association (KLA), in 2022. Tributary samples collected by SLPWA and KLA volunteers and analyzed by CSI's state-certified laboratory were crucial to the formation of this Clean Water Plan for Seneca Lake and Keuka Lake. Clean Water Plans are useful tools for monitoring and improving water quality. This accomplishment shows the impact that is possible with CSI's Synoptic Monitoring Program. You can read more about CSI's involvement in the Seneca-Keuka 9E plan in our 2021 Water Bulletin Newsletter.



This photo shows a site from our Fall Creek monitoring set from November 14, 2022.

Red Flag Monitoring Program



A map of the Red Flag sites monitored by the Cayuta Catatonk Water Watch team, taken from CSI's public database.

The five volunteer teams that make up our Red Flag Monitoring Program remained vigilant in their monthly sampling for 2022. These volunteers collect five different water quality measurements at each site: water temperature, conductivity, pH, total hardness, and dissolved oxygen.

The Red Flag Program has its roots in the anti-fracking movement in New York State. Collecting data that reflect broad metrics of water quality, as our Red Flag volunteers do, generates a baseline understanding of water quality in each stream.

The Tompkins County History Center reached out to Community Science Institute and other organizations that were involved in the anti-fracking movement for an upcoming exhibition. We were proud to reflect on the important role our Red Flag Program and our groundwater sampling program played in that chapter of New York State's history. We look forward to seeing how this work is spotlighted through the History Center's exhibition.

Biomonitoring Program

In 2022, volunteers collected and analyzed benthic macroinvertebrate (BMI) samples from 21 locations on 11 different creeks. Biomonitoring results, which include 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 2022 results, along with over a decade of prior results, are ultimately destined for inclusion in a publicly accessible CSI Biomonitoring database.

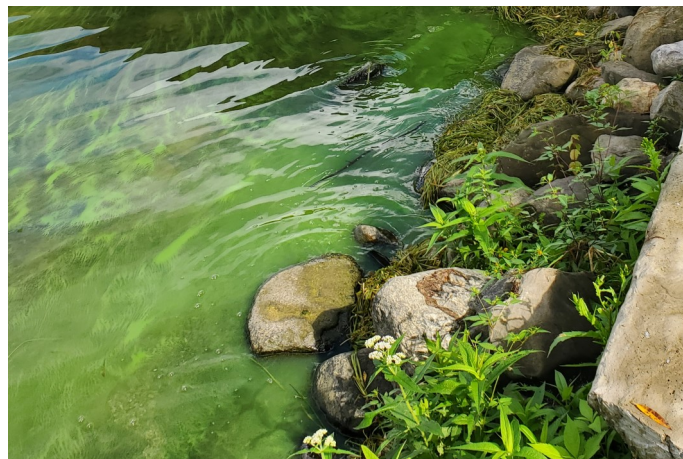
Over 30 different individual volunteers helped collect samples during the 2022 summer sampling season. Attendance at Biomonitoring Open Lab nights on Thursday evenings was strong and steady. Over the course of the fall and winter, volunteers did an amazing job of sorting and identifying samples collected during the summer. Thirteen different volunteers participated in Open Biomonitoring Labs over the course of the fall and winter. A handful of volunteers got especially good at identification of aquatic organisms by logging an impressive number of hours at these events.

In 2022, CSI collaborated with Finger Lakes State Parks and Tompkins County 4-H to offer Biomonitoring programs for youth at Buttermilk and Robert H. Treman State Parks. In 2022 these programs were part of our "Journey of Water" 4-H2O programming series for which we received support from the Park Foundation. We also collaborated with the Sciencenter Future Science Leader program and GIAC programming through the Sciencenter to offer training in stream biomonitoring in Cascadilla Creek. Through the Learning Web, we offered an educational program for youth interested in the work that different local not-for-profits are doing. At the end of the program, they selected CSI out of all of the programs they worked with to receive funds from their fundraising effort. We also offered a program on Biomonitoring entitled "How to Read a Stream" at the Lodi Whittier Library.



A stonefly found in Buttermilk Creek during one of CSI's 2022 biomonitoring events.

Harmful Algal Bloom (HABs) Monitoring Program



This bloom, reported on September 9, 2022, had the highest microcystin toxin concentration of the 2022 HABs season.

In 2022, CSI's Cayuga Lake Harmful Algal Bloom (HAB) Monitoring Program turned 5. We welcomed 8 new harriers to our program, giving us a total of 89 Harriers.

Fewer HABs were reported in 2022 than in 2021, marking the first year since the program's onset in which the number of reported HABs decreased! HABs are a complex phenomenon with multiple causes, so it is difficult to be certain why the number reported decreased in 2022. We can, however, discuss potential factors, such as a lack of rainfall, that may have contributed to this change. Community Science Institute's 2022 Water Bulletin contains a discussion of weather patterns on Cayuga Lake and the evidence for interactions between weather and HAB formation.

Overall, CSI HABs Harriers reported 73 HABs in 2022. Of these, 58% contained microcystin toxin levels that exceeded 4 µg/L, the contact recreation limit set by the New York State Department of Health (NYSDOH). In the 2021 HABs season, 108 HABs were reported. The percentage that exceeded the NYSDOH contact recreation limit in 2021, however, was comparable to that of 2022 at 56%. Across all years of CSI's Cayuga Lake HABs Monitoring Program, 55% of all blooms have exceeded the NYSDOH contact recreation limit. More years of data are necessary to investigate whether HABs on Cayuga Lake are becoming more frequent and/or more toxic. We look forward to learning more through HAB monitoring in 2023, and we will continue to keep the public informed of blooms on Cayuga Lake in near-real time.

Outreach and Education



Community Science Institute continued our tradition of offering community outreach and education opportunities throughout 2022.

In response to numerous requests, we gave presentations to municipal groups, other nonprofits, and community groups to share water quality data collected by our extensive volunteer networks. Some highlights included a presentation at Cayuga Lake Watershed Network's Lake Friendly Living educational series and multiple presentations on phosphorus loading in the Cayuga Lake watershed.

We also hosted multiple events. These included weekly Biomonitoring

Open Lab Nights, starting in the fall and lasting through the spring, and our annual free youth programming series (see "Journey of Water" below for additional details).

We are proud to have offered our first CSI database workshop in November of 2022. CSI's database holds over 20 years of publicly-accessible water quality data. Understanding how to navigate the database is critical to its utility as an educational tool. At our workshop, we walked attendees through the structure and features in CSI's database. This was done using a tour

Water Quality Database SCAVENGER HUNT

1. The guidance value for the analyte "total phosphorus" is _____ (don't forget units!)
2. The DEC recently (2020-2022) proposed that Lower Fall Creek be listed as impaired for high pH based on DEC-collected data. The EPA considers a pH of 9 to be high, while the DEC considers 8.5 to be high pH in Class A, B, and C waters. Lower Fall Creek is listed as class B. Do you think listing Lower Fall Creek as impaired for this reason is warranted?
Hint: try looking at data for Cayuga Street Bridge on Fall Creek
3. When is the last time CSI data demonstrated *E. coli* levels above the NYSDOH contact recreation limit of 235

Applying CSI Data
Did you know that CSI data are frequently applied to real-world issues?
As Question #3 suggests, CSI data led to necessary infrastructure

An excerpt from the scavenger hunt given to attendees of the CSI database workshop.

and a scavenger hunt. CSI staff were present to provide support and answer questions. Attendees of the workshop have reported greater ease in using the database since the workshop.

Journey of Water

Our long-standing free summer youth programming (called 4-H2O) took on a new theme in 2022. All our events were connected through the idea of following water through its natural and human-centric paths: "The Journey of Water."

In collaboration with the Tompkins County 4-H club and funded by the Park Foundation, Community Science Institute's 2022 4-H2O program brought water to life for attendees. Children attended tours of Ithaca's drinking water and wastewater treatment facilities, collected water samples aboard Discover Cayuga Lake's "the Teal," collected stream critters to learn about water quality, and even built their own water filters!

Water travelers who completed the series were awarded with their very own "Journey of Water" t-shirt.

To sign up for a summer program, or for more information, find us online at:

communityscience.org/4h2o
or give us a call at
(607) 257-6606



A Legacy of Environmental Education

At Community Science Institute, environmental education is a core part of our mission to empower residents to become stewards of their local water resources. Thanks to a generous gift from the Community Foundation of Tompkins County directed by the estate of Dr. Tapan Mitra, CSI will take that mission to new heights. Beyond being a world-renowned economic theorist and professor at Cornell University, Dr. Mitra was also a responsible and compassionate community member. His legacy lives on in the support of local causes upholding education, health, and wildlife. CSI is humbled and honored to be a part of that legacy thanks to a generous gift of \$50,000 directed by the Tapan Mitra Estate.

With this gift, CSI formed its first Agency Fund through the Community Foundation of Tompkins County titled, "Community Science Institute's Tapan Mitra Environmental Education Fund." Placing this gift into an Agency Fund ensures its longevity and sustainability, allowing us to provide engaging, water-focused education opportunities to our community for years to come. Part of the Tapan Mitra gift will fund our first strategic planning effort set to take place in 2023/2024. Investing in a strategic plan will allow CSI to ensure the sustainability of our mission while enabling us to have the greatest impact possible in our community.

The Water Bulletin

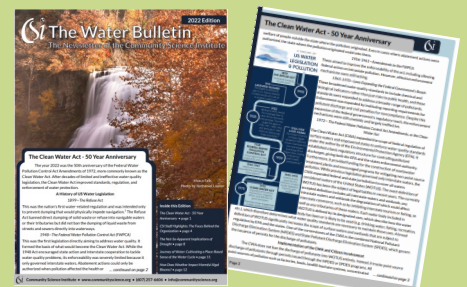
The year 2022 marked the 50 year anniversary of the passing of the Clean Water Act (CWA). In honor of this historic piece of environmental legislation, we dedicated our 2022 Water Bulletin to the CWA.

Our articles focus on the history of water legislation in the US, the impacts of drought and weather on CSI's Synoptic Stream Monitoring Program and Harmful Algal Bloom monitoring program.

We also detail our well-received "Journey of Water" youth programming and introduce you to our staff. As you may know, CSI changed a lot in 2022 with staff retiring and moving on to pursue higher education.

To get to know CSI's new staff and to learn more about climate change and the CWA, read the 2022 Water Bulletin Newsletter online at:

<http://www.communityscience.org/outreach-and-education/newsletters-annual-reports/>





Letter from the Director

2022 was a year full of exciting milestones and transitions for Community Science Institute. We commemorated 50 years since the passage of the Clean Water Act, key legislation that motivates and supports the work that we do to engage our local community in water quality monitoring. CSI also celebrated 20 years since our first monitoring partnership, the Fall and Virgil Creek monitoring team, was formed. I am humbled and endlessly impressed by the dedication shown by our volunteers, many of whom have been with us since the beginning.

CSI also experienced several significant “firsts” in 2022. We were honored to receive a generous gift directed by the estate of Tapan Mitra, our first legacy gift and the largest single contribution in CSI’s history. We have placed this gift into an agency fund through the Community Foundation of Tompkins County, titled “Community Science Institute’s Tapan Mitra Environmental Education Fund”. This fund will be used to support environmental education in our community for many years to come. Next, for the first time, CSI’s Harmful Algal Bloom (HAB) monitoring partnership was fully funded thanks to combined support from all three counties bordering Cayuga Lake: Cayuga, Seneca, and Tompkins Counties. This funding not only supports our volunteers’ continued collection of data on Cayuga Lake’s HABs, but it also demonstrates the powerful impact of a united watershed. Thank you to these three counties for coming together to support our community of HABs Harriers!

In 2022, CSI also experienced its first leadership transition. Our founder and CSI’s executive director for 22 years, Dr. Stephen Penningroth, handed the profound responsibility of managing CSI over to me. Steve is now enjoying a well-deserved retirement, but still graciously serves as a mentor to all of us at CSI in addition to his role as treasurer on our board of directors. I am grateful to now be leading the impactful organization that Steve built. It is an honor to carry on his legacy and start writing CSI’s next chapter.

Steve was not the only CSI staff member to start a new adventure this year. In June, we said goodbye to CSI’s Director of Outreach, Nathaniel (Nate) Launer. Nate dedicated four years to CSI and in that time, he built deep, meaningful relationships with many of you. Nate is now studying environmental law at Vermont Law School; Mother Nature is certainly lucky to have Nate on her side! In July, another CSI staff member was called to the mountains of Vermont. Our administrative and laboratory assistant, Aleah Young, is now studying environmental science at the University of Vermont (UVM) where she has put the skills she gained at CSI to good use by working as a watershed educator with UVM extension and Lake Champlain Sea Grant. Finally, our lab analyst, Kathryn Graham, left CSI in August to pursue her master’s degree in Environmental Science at Binghamton University (my alma mater!). As we said bittersweet goodbyes to our former staff members, CSI welcomed a top-notch new crew including outreach and programs coordinator, Grace Haynes, administrative and laboratory assistant, Charlene Mottler, and Water Quality Scientist, Seth Bingham. I have been so impressed by the way this new team transitioned seamlessly into CSI. Get ready to see some amazing work from this team in the coming years!

Despite the many changes that CSI experienced this year, together with our steadfast team of over 250 volunteers, we managed to accomplish some incredible work for our watershed. Synoptic Stream volunteers collected nearly 700 water samples despite drought watches throughout New York. Our HABs Harriers observed the first decrease in the number of HABs on Cayuga Lake since the start of our program in 2018, collecting and transporting 73 HABs samples to CSI’s lab for analysis. Our biomonitoring volunteers, led by our very knowledgeable biomonitoring coordinator, Adrianna Hirtler, collected samples of benthic macroinvertebrates from 11 streams, including sites on Six Mile Creek, marking over a decade of biomonitoring. Finally, in October, our skilled laboratory director, Noah Mark, successfully led CSI’s staff through our biannual Environmental Laboratory Approval Program (ELAP) inspection. This represents a significant amount of work and expertise; all of which is necessary to maintain our lab’s certification and produce certified data for our watershed.

2022 was my first year serving as CSI’s executive director. I can sum up my experience from the past year in one word: gratitude. I am so grateful for the opportunity to serve my local environment and neighbors in such a meaningful way through this position. I extend my warmest thanks to CSI’s immense community of friends and supporters: our volunteers who dedicate their time to our beautiful streams and lake, our partner organizations, the local municipalities, foundations, and private donors who put their money behind CSI’s mission, and finally, CSI’s steadfast board of directors and staff. The Finger Lakes region is a better place because of each of you.

Thank you all for welcoming me into your community. I can’t wait to see what we will achieve together in 2023. With gratitude,

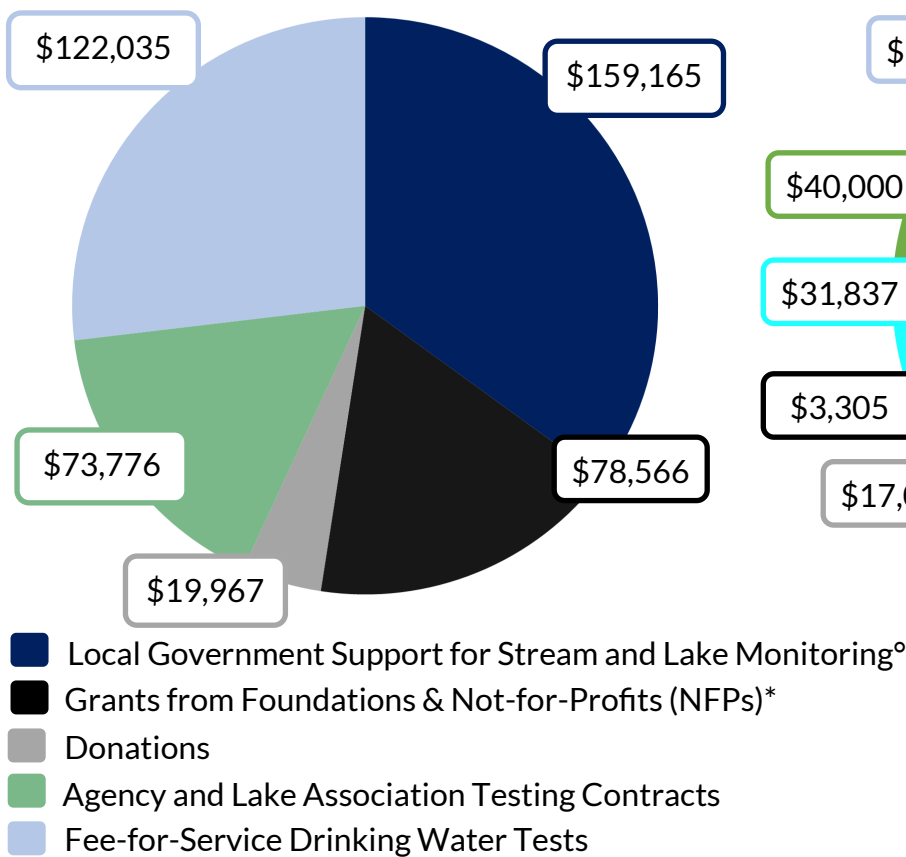
Grascen Shidemantle, Ph.D.
Executive Director

Financial Report



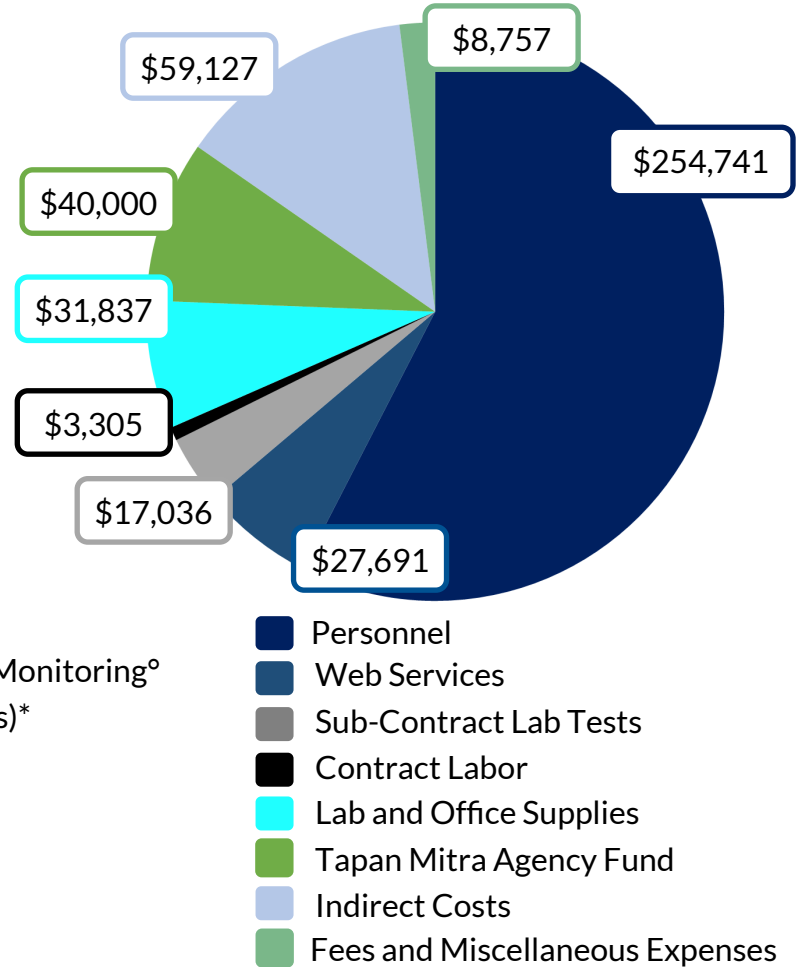
CSI 2022 Income Total: \$453,552.03

*Including \$43.45 interest and dividends



CSI 2022 Expenses Total: \$443,262.60

*Including \$769.04 travel and transportation



Thank You to Our Donors!

Watershed

\$1,000 +

Lei and Kevin Mark
David Weinstein and Christina Stark
Village of Aurora (Blessing of the Boats)

Estuary

\$500 +

Eric Evans
Sue and Steve Ruoff
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Ezra and Mary Ellen Oyer
Robert and Shirley Barton
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Ithaca Reggae Fest
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River

\$100 +

Stephen and Amy Yale-Loehr
Curtis and Amanda Ufford
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Grace Bates
The Learning Web
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Cayuga Lake Watershed Network
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Stephen Weiter
Samantha Kelly
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Regi Teasley
Karen Comstock
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Roxanne Marino

Stream

\$50 +

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Creek

\$25 +

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Jeffner M. Allen
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Linda and Cory Byard
Miriam Larson-Koester
Norm Trigoboff
Tony Del Plato
Diana Beckenhaupt
Sandra Pollack

Local Government Support for Stream and Lake Monitoring °

Tompkins County - \$53,500
Cayuga County - \$24,447
Town of Ithaca - \$22,396
Town of Dryden - \$11,196
City of Ithaca - \$10,579
Town of Lansing - \$7,000
Town of Ulysses - \$6,438
Town of Newfield - \$6,404
Seneca County - \$6,000
Town of Danby - \$4,290
Town of Caroline - \$3,365
Town of Enfield - \$2,550
Town of Hector - \$1,000

Grants from Foundations and NFPs*

Tapan Mitra Education Fund of Community Foundation of Tompkins County - \$50,000
Cornell University - \$14,000
Park Foundation - \$7,560
Sciencenter - \$2,500
Cayuga Foundation - \$2,000
Legacy Foundation - \$1,702
The Community Foundation of Tompkins County
- Taylor Peck Fund - \$500
Lodi Whittier Library Association - \$304

We give our sincere thanks to the dedicated volunteers of our Synoptic Stream Monitoring Program, HABs Monitoring Program, Red Flag Monitoring Program, and Biomonitoring Program. Their work to monitor the health of our shared water resources is an investment that will help guide the sustainable management and protection of our streams and lakes for decades.

Staff

Grascen Shidemantle, *Executive Director*
Noah Mark, *Technical Director*
Seth Bingham, *Water Quality Scientist*
Grace Haynes, *Outreach and Programs Coordinator,*
Cayuga Lake HABs Monitoring Program Coordinator
Adrianna Hirtler, *Biomonitoring Coordinator*
Charlene Mottler, *Administrative and Laboratory Assistant*

Supporting Services

Abner Figueroa, *Web and Database Developer*
William George, *Data Entry Specialist*

Board of Directors

Robert Barton, *President*
Angel Hinickle, *Vice-President*
Darby Kiley, *Secretary*
Stephen Penningroth, *Treasurer*
Gerald Van Orden
Deborah Jones
Sheila Dean
Robert Thomas

Partners

Cayuga Lake Watershed Network
Discover Cayuga Lake

Cayuga Lake Watershed Intermunicipal Organization
Tompkins County 4-H
Tompkins County Soil and Water Conservation District
Sciencenter
New York State Parks, Recreation and Historic Preservation
West Shore Neighborhood Association
Cayuga Lake Environmental Action Now
Seneca Lake Pure Waters Association
Keuka Lake Association
Seneca Lake Guardian
Canandaigua Lake Watershed Association



Partnering with Communities to Protect Water

Annual Report - 2022

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Ithaca, NY 14850

Phone/ Fax: (607) 257-6606

Email: info@communityscience.org

Website: www.communityscience.org

Certified Water Quality Testing Lab

NYSDOH-ELAP #11790

EPA Lab Code NY01518

Send To:



Our Mission

Our mission is to empower communities to protect water quality through volunteer stream and lake monitoring. Support our mission by becoming a 2023 CSI Member! You can donate on our website at communityscience.org/donate or by mailing a check to us at the address listed above.

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