2022 - 2023
Annual Report

Pittsburgh Collaboratory for WATER
Research, Education, Outreach

DECEMBER 2023

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A Message from our Director

Greetings,

What a whirlwind first year it's been at the Water Collaboratory. Navigating campus, meeting faculty and staff across the University, engaging with students, and representing our work at conferences and community events - there's been no end to new experiences. I am grateful to have found a place alongside so many passionate and talented staff, students and researchers, all working to better understand and respond to the water challenges of our region.

Addressing these issues requires an interdisciplinary and collaborative mindset, one that brings together expertise in all its forms. Successful partnerships, especially those between the University and the larger community we inhabit, require trust and respect. It is humbling to have our mission and work recognized, both nationally and within the University's engaged scholarship community, but the work is far from over.

This past year has resulted in a number of impactful projects and partnerships, with research on landslides, drinking water systems, water quality across our rivers and regional tributaries, and the impacts of industrial legacies. The Collaboratory continues to create meaningful opportunities for students to learn and hear from professional and advocates in the class and in the field. We've engaged and informed neighbors and legislators, and worked to develop local and regional networks that can collectively address our most pressing issues.

PWC Director Jonathan Burgess

The coming year should be an exciting and impactful one, full of growth and opportunity. On behalf of the whole team at the Water Collaboratory, I want to extend our thanks to our students, community partners and academic collaborators and extend the invitation to anyone interested in these issues to join us.

Thank you to our Supporters!

The Pittsburgh Collaboratory for Water Research, Education, and Outreach operates through the support of our funders and the University of Pittsburgh. We'd like to thank the Heinz Endowments, The Pittsburgh Foundation, The Hillman Foundation, and University of Pittsburgh for their generous contributions.

Mission

Elevate water resource sustainability and resilience by fostering research collaborations, communicating knowledge, innovating solutions, and improving the health of the Upper Ohio River basin.

Leadership

The leadership team is comprised of key staff (Director and Outreach Coordinator), Associate Directors (Chair, Vice Chair, and faculty board members). This year, we added two graduate student representatives to the leadership team. Their invaluable insights help make Collaboratory programming more impactful for students.

Jonathan Burgess
Director

Megan Guy
Outreach Coordinator

Emily Elliott
Chair
Faculty Board

Dan Bain
Vice Chair
Faculty Board

John Gardner
Faculty Board

Eitan Shelef
Faculty Board

Patrick Shirey
Faculty Board

Beth Ann Eberle
Graduate Student
Representative

Gabriella Zuccolotto
Graduate Student
Representative

2022-2023 By The Numbers

People

Research

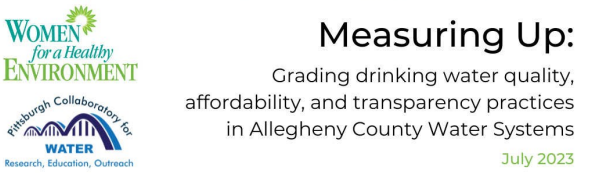
Education

Outreach

The Collaboratory continues to expand research, education, and outreach activities. We've come a long way since our start in 2018. We are thankful to all of our participants and supporters for another great year!

Research Highlights

Measuring Up



To advance equitable access to clean and affordable drinking water across all of Allegheny County's residents, the Pittsburgh Water Collaboratory and Women for a Healthy Environment created standardized metrics to rate the performance of 36 individual water systems with respect to affordability, transparency, and water quality. Ratings were based on new information solicited from Allegheny County water systems and prior data collected in 2020 as part of the "Somethings in the Water Report". This information and data were distilled into report cards for 36 individual community water systems with an environmental justice lens. The report documents that process, details the findings, and provides recommendations to move forward.

The Measuring Up project team was awarded the 2023 Pitt Partnership of Distinction for this work. Read the full report at bit.ly/WaterSystemReport2023

Research Highlights

Hillman Project

Pittsburgh Water Collaboratory, in collaboration with the Allegheny County Conservation District, organized a public sampling event to help better educate those interested about the quality of Pittsburgh's waterways. Data was translated into an interactive ESRI StoryMap created by Collaboratory Intern, Robert Murphy and released to the public in August 2023.

View the results at bit.ly/2023WatershedSamplingDay

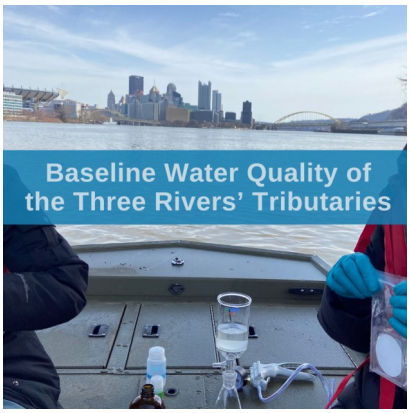
This work is an extension of a larger effort by the Gardner Lab, with support from the Hillman Foundations, to understand historical and ongoing water quality across the Ohio River Basin using remote sensing and machine learning analysis.

Partnering for Cleaner Rivers

In 2021 the Pittsburgh Water Collaboratory and 3 Rivers Water Keeper received funding from the University of Pittsburgh's Year of Engagement Grant to collect 100 samples from the tributaries that feed the Ohio, Monongahela, and Alleghany Rivers. Together this team sampled 25 locations over four quarters from August 2021 to May 2022. A special thanks to Graduate Student Kate Zidar and Riverkeeper Evan Clark (pictured on the left) for all of their hard work to get samples! Data was translated into an interactive ESRI StoryMap created by Collaboratory Intern, Emelia Sargent and released to the public in November of 2023.

View the report today at https://bit.ly/3RiversWaterQuality

Research Publications



Community Engaged Briefs and Reports

Southwest Pennsylvania Train Derailments 2011-2022

Measuring Up: Grading Drinking Water Quality, Affordability and Transparency Practices in Allegheny County Water Systems

Acid Mine Drainage in the Chalfant Run/Thompson Run Watersheds

Water Quality in Fern Hollow Creek During Bridge Construction

Baseline Water Quality in the Three Rivers' Tributaries

Selected Peer Reviewed Publications

BM Brewster, DJ Bain (2023) "Metal Accumulation Patterns in Pittsburgh, PA (USA) Green Infrastructure Soils: Road Connections and Legacy Soil Inputs" *Frontiers in Environmental Science* 10.3389/fenvs.2023.1155789

RG Forgrave, EM Elliott, DJ Bain (2023). "Sewer Subsidies from Overflows and Pipe Leaks Dominate Urban Stream Solute Loads in All Storm Events", *Frontiers in Environmental Science*. 10.1002/hyp.14584

M Hill, DJ Bain, MA Abbott, RJ Rossi (2023). "Pond Sediments Reveal the Increasing Importance of Road Runoff as a Source of Metal Contamination in Industrialized Urban Environments Downwind of Pittsburgh, Pennsylvania (USA)", *Environmental Science and Technology – Water, 3 650-658*. 10.1016/j.ecolind.2023.110616

J Gardner , T Pavelsky, X Yang, S Topp, M Ross, S Cohen (2023). "Human activities change suspended sediment concentration along river", *Environmental Research Letters.18(6)* 10.1088/1748-9326/acd8d8.

N Moragoda, Cohen S, J Gardner, D Munoz, A Narayanan, H Moftakhari, T Pavelsky (2023). "Modeling and Analysis of Sediment Trapping Efficiency of Large Dams using Remote Sensing", *Water Resources Research. e2022WR033296.* 10.1029/2022WR033296

P Shirey, SA Coleman (2022). "Endangered Species Act Expenditures for Fish Taxa Managed by The U.S. Fish and Wildlife Service Are Predicted by Lawsuits, Captive Propagation, and Region", *Fisheries Magazine*., 47(7) 299-303. 10.1002/fsh.10742

I Spencer-Williams, A Balangoda, EM Elliott, SJ Haig (2022). "Exploring the Impacts of Full-Scale Distribution System Orthophosphate Corrosion Control Implementation on the Microbial Ecology of Hydrologically Connected Urban Streams", *Microbiology Spectrum*, 10(6) e02158-22. 10.1128/spectrum.02158-22

C Welty, J Moore, DJ Bain, M Talebpour, JT Kemper, PM Groffman, JM Duncan (2022). "Spatial Heterogeneity and Temporal Stability of Baseflow Stream Chemistry in an Urban Watershed", *Water Resources Research. 21WR031804.* 10.1029/2021WR031804

Education Highlights

Water in a Changing World

This forum features topical presentations, project updates, and discussions for learning about water in a rapidly changing world. Each meeting, we highlight current water related projects in industry, academia, and government. Throughout fiscal year 2022, we hosted 30 Water in a Changing World meetings with 761 participants. Thank you to all of the presenters and individuals willing to lead these discussions!

Water Research Conversations

The Water Research Conversations meetings are meant to be a relaxed way to discuss relevant current events, research challenges, and data without the pressures of having it all figured out. They are also intended as a way for students and faculty from various disciplines to get to know each other better and engage in a respectful (and helpful) dialogue. We started to create this space in Summer 2023 and look forward to seeing it grow throughout the next school year.

Building Professional Skills

At the Collaboratory, we hope to train the next generation of water leaders. By having ample water related courses and extracurricular activities, we train students to solve real world challenges. Throughout this year, we hosted many professional trainings including a groundwater monitoring well installation (pictured on the right), ESRI StoryMap training, and much more! Many graduate and undergraduate students had opportunities to present at exciting conferences or community events to share their work and expertise.

Education Highlights

Water Scholars Community

Each year, the Collaboratory hosts multiple internships for University of Pittsburgh undergraduates. This fiscal year, we had 6 interns complete fantastic work in partnership with community partners with the support of the Frederick Honors College and Hillman Foundation. View some of their work below.

Intern	Community Partner	Project Description
Emma Stearsman (Summer '23)	Water Collaboratory	Digitizing Southwest Pennsylvania Landslide Records
Robert Murphy (Summer '23)	Water Collaboratory & Allegheny County Conservation District	2023 Allegheny County Watershed Sampling Day
Yasmine Florent (Summer '23)	Chalfant Run/Thompson Run Watershed Association	Develop a long-term streamflow monitoring system in the Churchill Valley Greenway by using cellular trail cameras
Emelia Sargent (Spring '23)	3 Rivers Waterkeeper	Pittsburgh's Three Rivers and Their Tributaries
Sumana Murugan (Spring '23)	Chalfant Run/Thompson Run Watershed Association	Churchill Valley Greenway: A Part of the Chalfant Run Watershed
Andrew Clark (Summer '22)	Chalfant Run/Thompson Run Watershed Association	Acid Mine Drainage and the Chalfant Run/ Thompson Run Watershed
Sumana Murugan (Summer '22)	Upstream Pittsburgh	Analysis of Water Quality at Fern Hollow Creek during construction of Fern Hollow Bridge from June 2022 to August 2022

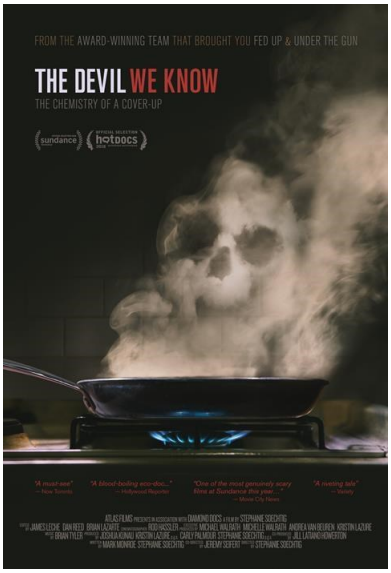
Outreach Highlights

Clean Water Act 50th Anniversary Celebration

ASCE Pittsburgh and Friends celebrated the Clean Water Act on October 15, 2022 at the Millvale Riverfront Park. This free festival had food trucks, exhibitors with educational water activities, artists, free commemorative t-shirt to the first 200 attendees, a festival river trail bike parade, free rowing lessons provided by Three Rivers Rowing Association, a free tree giveaway by Tree Pittsburgh, and presentations from water experts and water related activities for all ages. Collaboratory Director Emeritus, Dr. Emily Elliott, gave the keynote presentation for this milestone event.

The Devil We Know Movie Screening

PFAS (per- and polyfluoroalkyl substances) are common to many manufacturing and industrial processes and used in everything from fracking fluids to firefighting foams, non-stick pans, and takeout containers. This year, for the first time, Pennsylvania Department of Environmental Protection is implementing drinking water standards and mandated testing for several of these substances. In light of this, we hosted a documentary screening and panel discussion of the movie “The Devil We Know” to raise awareness around PFAS and examine how local communities may be impacted.



Community Presentations

A core part of the Collaboratory mission is to educate and connect with the larger community through outreach. Throughout the year, the Collaboratory was invited to present and table at numerous local events. In September 2022, our Outreach Coordinator presented and facilitated discussion at the Phipps Environmental Film Night where participants enjoyed and discussed the film “Reflection: A Walk With Water”. In honor of Native American Heritage month (November), our Director Emeritus moderated the panel discussion with film makers after watching “Lake of Betrayal” as a group. These opportunities allow us to connect with students, faculty, and staff at the university as well as the greater Pittsburgh community.

Outreach Highlights

Watershed Walks

To connect students with regional watershed organizations, we hosted 2 watershed walks in Panther Hollow and Fern Hollow. On these walks, we discussed past research projects and allowed opportunities for students, faculty, and staff to network with our local partners from Upstream Pittsburgh.

Legislative Engagement with Ohio River Basin Alliance

The Water Collaboratory is an active member of the Ohio River Basin Alliance (ORBA), a broad, multistate collective of institutions, agencies, nonprofits and communities that are working to inform the federal status and resources allocated to our region. This winter, the Alliance will release a Restoration Plan for the Ohio River.

This past June, the Collaboratory, alongside local partners and ORBA members from across 5 states, travelled to D.C. to sit down with members of the PA Congressional Delegation to discuss the research and efforts of the Pitt community to inform the collective understanding of our water resources and develop solutions for a sustainable, clean and abundant water future.

State and Local Policy Discussions

Local and PA officials are key to the sustainable management and restoration of our regional water resources, and the Water Collaboratory has continued to expand engagement and education alongside our partners. In additional to direct meetings, Dr. Emily Elliott was invited to speak at the State of PA Water session, organized by Rep. Dan Miller, in order to inform legislators about the water quality of our region. Additionally, Jonathan Burgess spoke alongside Pittsburgh City Councilwoman Erika Strassberger at a water-focused policy discussion organized by Pitt students.

Pittsburgh Collaboratory for WATER

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