

# The Stream Line



Greene County Soil & Water Conservation District Newsletter

Summer 2024

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## 2024 Summit Offers Suite of Learning Opportunities

On April 6, 2024, the Schoharie Watershed Summit returned to the Hunter-Tannersville Jr-Sr High School. Organized by the Schoharie Watershed Stream Management Program (SWSMP) at Greene County Soil and Water Conservation District (GCSWCD), in partnership with the New York City Department of Environmental Protection (DEP), the event aimed to foster collaboration, learning, and community engagement.

The Summit, first held in 2007, has become a vital forum for sharing knowledge and strategies related to watershed management. This year's event attracted local officials, community members, and environmental professionals, all eager to discuss the pressing issues facing the Schoharie basin. With a history of addressing critical topics like turbidity and flood management, the Summit continues to be a significant platform for advancing the region's environmental health.

The day's activities began with a series of informative morning presentations, offering insights into various aspects of watershed management. Dr. Junhong (June) Wang of UAlbany kicked off the session with a presentation on the New York State Mesonet and its role in supporting water-related research. Dr. Wang highlighted the Mesonet's ability to provide high-quality, high-resolution hydrometeorological data, crucial for understanding trends in precipitation, snowfall, soil moisture, and temperature. This data is invaluable in helping to predict and mitigate the impacts of weather events.

Following Dr. Wang, Mark Carabetta of SLR Consulting discussed local flood analysis in the Catskills region. His presentation covered the challenges and lessons learned from SLR's flood studies, showcasing examples of hydraulic analyses and recommended flood mitigation strategies. Carabetta's talk emphasized the importance of resilience in the face of flooding, offering practical solutions and success stories from implemented projects.

The final morning presentation was delivered by John Thompson and Dan Snider-Nerp of the Catskill Regional Invasive Species Partnership (CRISP), who focused on the management of Japanese knotweed. This invasive plant spreads rapidly, displaces native vegetation, and poses a significant threat to streamside and roadside areas. Together, they shared best management practices and ended the morning session with a lively discussion on the topic.



Schoharie Watershed Summit attendees participating in the Q&A session at the end of morning presentations.

After enjoying a catered lunch from the Pantry on Main, attendees participated in various workshops designed to provide practical training and knowledge. Sessions included an introduction to the National Flood Insurance Program, guidance on completing the Short Environmental Assessment Form (SEQR), training on using the Greene County Web Map, and insights into post-disaster floodplain administration. These workshops aimed to equip local officials and community members with the tools and information needed to manage their environments effectively.

The Schoharie Watershed Summit remains GCSWCD's capstone event, offering a unique opportunity for networking, learning, and collaboration. By bringing together environmental professionals and community members, the Summit helps to ensure that the Schoharie basin continues to thrive, addressing challenges head-on and fostering a resilient and informed community.



Participants in the Introduction to the Greene County Web Map class.



## Harnessing SfM Technology to Monitor Streambanks



Telemak Olsen (SUNY Ulster/DEP Stream Program) and Emily Polinsky (NYCDEP) sharing the SfM set up with GCSWCD's Chris Langorthy and Rich Andreassen.



Telemak Olsen demonstrating how the pole-mounted camera is used to capture photographs across the study site.



Emily Polinsky capturing location data of SfM targets using a Leica Robotic Total Station.

In today's world, where the evolution of technology is rapid and dynamic in nature, it can be difficult to parse out which of these advancements have any relevance to our own lives and the communities we live in. The Schoharie Watershed Stream Management Program (SWSMP) at GCSWCD has worked in partnership with the New York City Department of Environmental Protection (DEP) since 1996, with the primary goals of managing, protecting, and restoring stream corridors, floodplains, ecosystems, and riparian buffers, while helping communities protect public safety and infrastructure near stream systems. Among the tasks related to these efforts are the stream assessments that are designed to characterize and monitor the extent of streambank erosion and restoration project success throughout the Schoharie Reservoir watershed. Traditionally, these assessments rely on point-based measurements and visual inspections – sometimes requiring extensive fieldwork.

Enter Structure from Motion (SfM) technology! SfM is an approach that uses photogrammetry (the science of using photographs to obtain reliable measurements) to extract 3D information from 2D images. The concept was initially explored in the Artificial Intelligence Laboratory at the Massachusetts Institute of Technology in 1979 as a computational interpretation: how 3D structure and motion of objects can be inferred from the 2D when no 3D information is being conveyed. In 2012, following numerous advancements, the technology was introduced as a low-cost and effective approach to obtaining high-resolution spatial data for use in topographic surveying (Westoby, et al., 2012). And so, the technology becomes relevant to the efforts of the SWSMP. By capturing multiple overlapping photographs of a streambank from various angles, SfM software can reconstruct a highly detailed and accurate 3D model of the landscape in a relatively short period of time.

In the 2023 field season, GCSWCD staff were introduced to the concept of Structure from Motion technology by SUNY Oneonta's Dr. Les Hasbargen, and the Catskill Science Collaborative's Research Fellow, Adrian Maleszewski. Their project, *Pole-Mounted SfM Surveys of Erosion Sites in the Catskills Watershed*, was supported by DEP's Stream Studies Coordinator/Geologist, Dany Davis, and led them to one of the sites assessed in last year's Bank Erosion Monitoring Study.

In May of this year, GCSWCD staff joined SUNY Ulster/DEP Stream Program's Watershed Conservation Corps (WCC) Coordinator, Telemak Olsen, to test out their program's newly acquired SfM equipment: a DSLR camera attached to a telescoping pole. While the crew is working to learn the technology and develop a routine for conducting the data collection (tapping into existing control points in order to give the photographs a position in space, collecting GPS data for several targets that act as anchors, and taking many overlapping photos throughout the study area) the day flowed smoothly and the 150 foot long site was assessed in approximately 30 minutes.

Structure from Motion provides a repeatable method for capturing consistent, high-resolution data over time, making it easier to identify trends and assess the effectiveness of erosion control measures. SfM is an exciting advancement and a promising addition to the stream studies toolbox! Throughout the 2024 field season, GCSWCD will continue to work with WCC to collect data at sites around the Schoharie basin.

A presentation on Dr. Les Hasbargen and Adrian Maleszewski's 2023 study can be viewed at: <https://www.caryinstitute.org/news-insights/video/catskill-science-collaborative-research-fellowship-presentations-2023>

## Delineating Wetlands Ahead of Construction



Pin flags are used to mark out the perimeter of the area that has been identified as a wetland. The locations are captured using GPS and later used in map development.

On May 3, 2024, GCSWCD and C.T. Male Associates Engineering, Surveying, Architecture, Landscape Architecture & Geology, D.P.C. (C.T. Male) conducted a field delineation of wetlands and waterbodies on the Manor Kill in Conesville, NY. This reach (section of stream throughout which similar hydrologic conditions exist) is the site of a stream restoration project where construction is planned to begin in the coming years.

The Manor Kill was first assessed between 2007 and 2008, and a wide range of management recommendations were developed as a result of those assessments. This site – located upstream of the Pangman Rd. bridge – includes approximately 300 linear feet of eroding and unstable stream bank and was further evaluated during a Local Flood Analysis (LFA) in 2017.

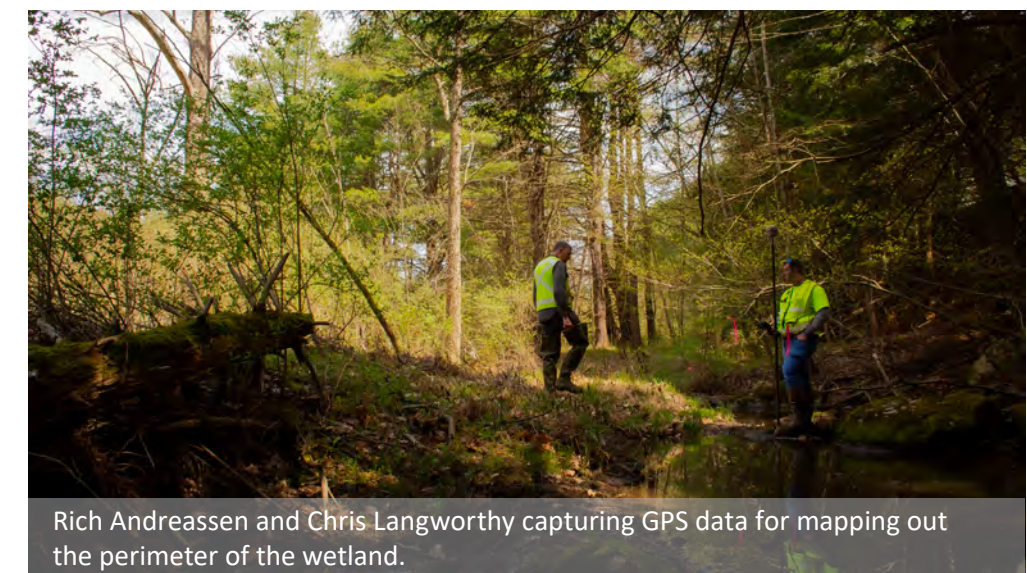
The LFA program was developed in response to the flooding caused by Tropical Storm Irene in 2011 to help communities within the New York City water supply watersheds identify long-term, cost-effective projects to mitigate flood hazards. During Tropical Storm Irene, stream flows in the Manor Kill peaked at 6,590 cubic feet per second (cfs), as measured at the Pangman Road United States Geological Survey (USGS) gage, causing severe channel erosion and washout of the Pangman Rd. bridge abutments. The bridge abutments have since

been replaced, but the channel erosion initiated by the flood event has led to stream bank instability and continued failure of the left stream bank approximately 80 feet upstream of the bridge. In the 2017 LFA, Milone & MacBroom, Inc. (MMI) recommended monitoring the bank failure and proceeding with repairs if the erosion threatened nearby infrastructure. Due to continued instability of the bank and new erosion caused by a flood event in December 2020, project partners (project landowners, NYC Department of Environmental Protection (DEP), Schoharie County Soil & Water Conservation District (SCSWCD), and GCSWCD) are working to advance the design.

Wetlands are areas where excess water covers the soil, or is present either at or near the surface of the soil on a prolonged regular basis.

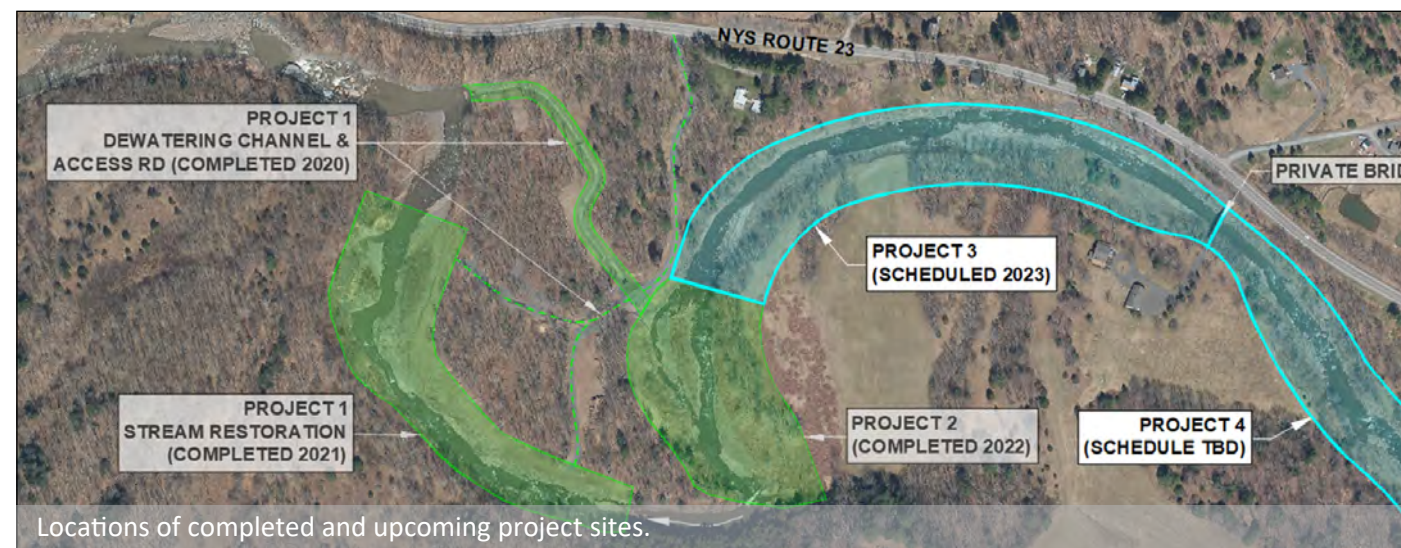
They can support a variety of aquatic and terrestrial species and provide important water quality functions. Wetlands next to traditional navigable waters can be regulated as "waters of the United States" because they are closely connected to these waters and generally have significant impacts on water quality and the aquatic ecosystem.

This wetland delineation is a crucial step in project planning and the development of the project design. This step is performed in order to identify environmentally sensitive areas and determine which waters on a project property qualify as "waters of the United States" (WOTUS). WOTUS are subject to permitting programs established under Section 404 of the Clean Water Act (CWA 404) which regulates the discharge of dredged or fill materials through the US Army Corps of Engineers (USACE). Additionally, the NYS Department of Environmental Conservation (NYSDEC) regulates activities in and around water resources. To obtain the CWA 404 certification and obtain all necessary permits, the delineation report will be submitted along with project plans that show that steps will be taken to avoid impacts to wetlands, streams and other aquatic resources; and that compensation (restoration) will be provided for all remaining unavoidable impacts.



Rich Andreassen and Chris Langworthy capturing GPS data for mapping out the perimeter of the wetland.





## An Update on the Red Falls Project

As we continue our efforts to restore natural stability and ecological integrity along unstable streams around the Schoharie Reservoir watershed, we are excited to share the latest developments in the ongoing Red Falls stream restoration project on the Batavia Kill in the towns of Ashland and Prattsville. This initiative, spearheaded by the Schoharie Watershed Stream Management Program (a collaborative partnership between GCSWCD and the New York City Department of Environmental Protection), aims to address the significant challenges of stream instability and erosion that can negatively impact the local ecosystems, infrastructure, and the quality of New York City's drinking water supply. Red Falls is the largest, most complex restoration project in the history of the Stream Management Program to date – exceeding 6,000 feet in length and including multiple large hillslope failures. Due to this size and complexity, the project was divided into four manageable project reaches to facilitate construction in the relatively short annual construction permit window of June 15th to Sept 30th.

With Project 1 and Project 2 completed in 2021 and 2022, respectively, Project 3 was slated for construction in 2023. However, the 2023 construction season was notably “wet”, with multiple storms and higher than average base flows. In order to work in the streambed, the flowing water must be diverted. This dewatering of the stream channel is done to allow for “working in the dry” (a permit requirement) and is accomplished by installing a pump and long pipe for the water to flow through until it is released downstream of the reach that is being treated. To address the unusually high stream flows of 2023, a second bypass pump and pipeline were installed to bring the bypass capacity to over 70 cubic feet per second (to visualize this, one cubic foot is approximately 7.5 gallons, so imagine 525 gallons flowing across one point in one second). Unfortunately, with the continued rains, this attempt proved to be insufficient, and we were only able to complete 10 instream workdays. The permits for project construction were extended to the 2024 construction season.

In addition to construction of Project 3, the GCSWCD team is actively working on the design of, and permitting process, for Project 4. To guide the development of the design, we have completed a Level 3 Assessment (a protocol developed by Dave Rosgen) of a stream reach located just upstream of the Red Falls project area that has been

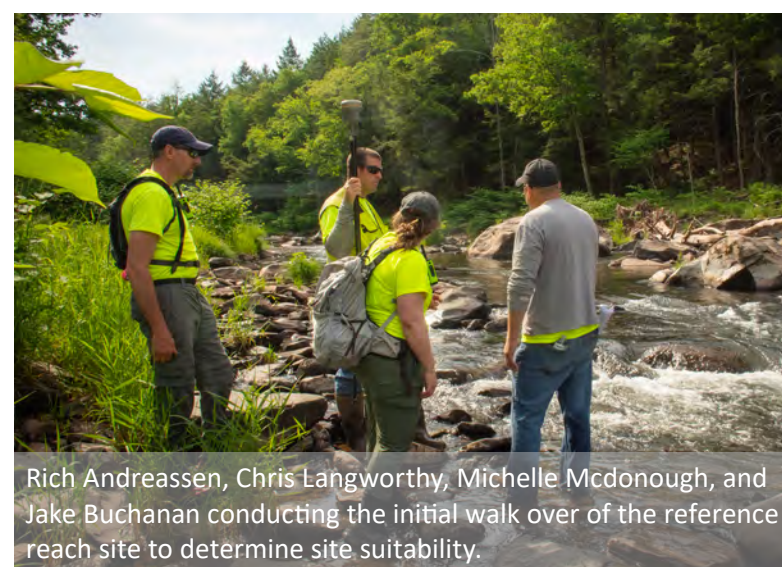


identified as a stable reach and will be used as a reference reach. Conducting a Level 3 Rosgen assessment of a reference reach before completing a design is crucial because it provides an integrative approach to understanding stable channel morphology (shape, size, and characteristics of a channel) for a section of stream in a similar valley type. This assessment allows for the collection of morphological measurements that are characteristic of a stable stream, which can then be extrapolated to other streams with similar characteristics. A stable stream, as defined by Rosgen (1996), is one that can transport flows and sediment produced by its watershed without aggrading or degrading over time. The reference reach serves as a benchmark for stable morphology, allowing designers to ensure that their projects maintain the dimension, pattern, and profile necessary for long-term stability – ensuring the designed stream can withstand high flows similar to high flows that the reference reach has experienced.

A week prior to the Level 3 Assessment, Frank Parisio and Frank Beres of the DEP Natural Resources team revisited Red Falls for an important round of biomonitoring. This initiative focuses on assessing the health of the stream ecosystem through the study of macroinvertebrates—small aquatic organisms that serve as indicators of water quality. On Monday, June 3rd, the team collected samples from the same location that was monitored over a decade ago – a site that falls within the extents of Project 3 – as well as at the reference reach that will be used in designing Project 4.

The timing of this biomonitoring effort is strategic, as it allows for the gathering of pre-construction data, while the reference site provides a baseline for comparison. The immediate goal is to capture the pre- and post-construction conditions at Red Falls, providing a clear picture of the impacts of restoration activities. By maintaining a regular monitoring schedule, we aim to ensure that the stream ecosystem recovers and thrives, supporting water quality and biodiversity.

*The Winter 2022 edition of The Stream Line provides a brief history of the Red Falls stream restoration project. You can find all archived newsletters on our website: [gcswcd.com/media-archive/newsletter](http://gcswcd.com/media-archive/newsletter)*





## District Highlights

~ a selection of notable happenings from the first half of 2024~



1



2

**The Bare Root Sale**



3



9 (above) 10 (below)



4



5



6



nature observation collection project on iNaturalist for the month of May. The month ended with a total of 244 different species logged through 385 observations from 57 observers.

7. We continued the Wednesdays Webinar Series in May – featuring presentations from Dr. Andrew Kozlowski (NYS Museum), Dr. Ellen Wohl (Colorado State University), Jess Kuonen (NY Sea Grant), and Dan Snider-Nerp (Catskill Regional Invasive Species Partnership). Recordings of the presentations can be viewed at: [youtube.com/@GCSWCD](https://youtube.com/@GCSWCD)

1. On January 20, we braved the cold for our first-ever Streamside Snowshoe Stroll at Bearpen Mountain Sports! We walked along the Little West Kill, and encountered a beaver dam and lodge, a small waterfall, and signs of erosion from past storm events.

2. We have upgraded our ordering system for the annual bare root sale. Now, you can place your orders online via Square and pay conveniently using a credit card. This eliminates the need to print out the order form and mail in a check! Sales for the 2024 sale rose to 3,930 plants, up from 3,040 plants sold in 2023.

3. We visited 8 classrooms in the 2024-2025 school year – continuing our efforts to bring watershed education to local schools.

4. Just ahead of the opening of spring

trout season, we partnered with West Kill Brewery and Todd Spire (Esopus Creel) to offer an educational film screening and fly-tying event. Attendees enjoyed the award-winning documentary RiverWeb, gaining insights into stream ecosystems, followed by an engaging fly-tying demonstration that highlighted the intricate life cycles of aquatic insects.

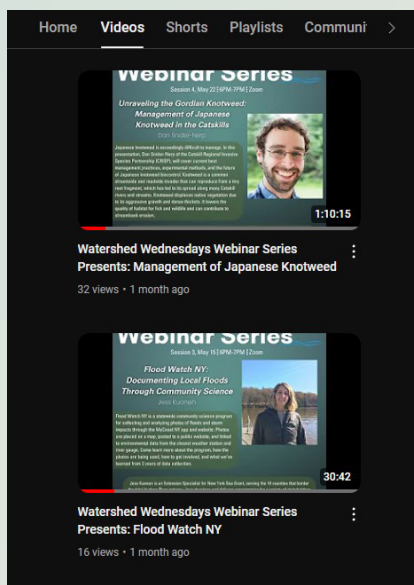
5. In celebration of Earth Day 2024, GCSWCD's Stream Stewardship Assistant, Amelia Sherman, invited 14 fellow members of the Student Conservation Association's Hudson Valley Corps to join our crew in a full day of potting up ~2,000 young bare root plants and preparing ~1,000 willow stakes for future riparian buffer planting projects!

6. As part of the Schoharie Watershed Month (SWM) activities, we opened a

8. Kicking off this year's in-person SWM events, Robert and Johanna Titus presented The Hudson River Schools of Art and Their Ice Age Origins at the opening of the Flowing Impressions Art Show at the Main Street Community Center in Windham.

9. On May 18, we partnered with Screaming Eagle Outdoor Adventure and Rip Van Winkle Adventure Guides to offer our first kayaking paddle day on the Schoharie Reservoir! Steam cleaned kayaks were provided.

10. SWM concluded with the Mountain Top BioBlitz at the Mountain Top Arboretum in Tannersville, featuring informative walks led by local environmental professionals, a popular craft station, and a performance by Arm-of-the-Sea Theater, providing a fun and educational experience for all.



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# The Stream Line



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**For this and past issues on the web,  
scan below:**



## District Reminders

### •Agricultural Assistance•

GCSWCD's Agriculture program is available to support farmers who are interested in enrolling in the Agricultural Environmental Management Program (AEM)! GCSWCD staff are available to assess farms, link farmers to potential funding sources to make improvements, and assist in navigating the enrollment process. More information about the program can be found here: [agriculture.ny.gov/soil-and-water/agricultural-environmental-management](https://agriculture.ny.gov/soil-and-water/agricultural-environmental-management)

To schedule a visit or if you have any questions, please call (518) 589-6871 or email [alex@gcswcd.com](mailto:alex@gcswcd.com)

### •Classroom Visits•

GCSWCD is committed to providing educational programs that raise awareness about our local watersheds. To that end, GCSWCD staff are available to provide free classroom or after-school visits to schools within Greene County and the Schoharie Reservoir watershed.

We have three scientific models available for demonstration: the Augmented Reality Sandbox, EnviroScape Watershed, and Ward's Science Stormwater Floodplain models. Programs can be designed to suit class needs and can be adapted for all students, grades K-12.

To schedule a visit, please call (518) 622-3620 or email [amanda@gcswcd.com](mailto:amanda@gcswcd.com)

### •Funding Opportunity•

GCSWCD and the Schoharie Watershed Advisory Committee (SWAC), in conjunction with the NYC DEP, are seeking qualified applications for the Stream Management Implementation Program (SMIP). The SMIP is a reimbursement-based grant opportunity that offers funding to implement projects and programs that serve to protect water quality within the Schoharie Reservoir watershed.

All applicants are encouraged to contact SWSMP staff to discuss project ideas prior to submission. For more information visit: [gcswcd.com/schoharie-reservoir-watershed/swsmp/smip](https://gcswcd.com/schoharie-reservoir-watershed/swsmp/smip) or email [smip@gcswcd.com](mailto:smip@gcswcd.com)

### •Restored Buffers•

Landowners with streamside property located within the Schoharie Reservoir watershed can request a site visit to have a streamside assessment and learn more about restoration opportunities through the Catskill Streams Buffer Initiative (CSBI). Participants of this program work with GCSWCD to develop a planting plan to enhance or restore their riparian buffer with native trees and flowering shrubs along the stream to improve wildlife habitat and help protect streambanks from erosion during future storm events. For more information visit: [gcswcd.com/schoharie-reservoir-watershed/swsmp/csbi](https://gcswcd.com/schoharie-reservoir-watershed/swsmp/csbi)