

2024 Annual Report

Greene County Soil & Water Conservation District



In 2024, the Greene County Soil & Water Conservation District (GCSWCD) remained committed to assisting landowners, municipalities, and local organizations in achieving their natural resource management goals. Through innovative, multi-benefit programs, the District continues to strike a balance between community development and environmental conservation. Over the years, GCSWCD has established itself as a trusted leader in addressing complex natural resource challenges.

With an ongoing focus on expanding technical expertise, the District continues to enhance its ability to serve constituents across Greene County. While increasing its role in natural resource planning, GCSWCD remains grounded in its longstanding commitment to implementing effective, on-the-ground conservation efforts.

This report highlights the diverse projects and initiatives undertaken in 2024, showcasing our dedication to sustainable resource management and community resilience.

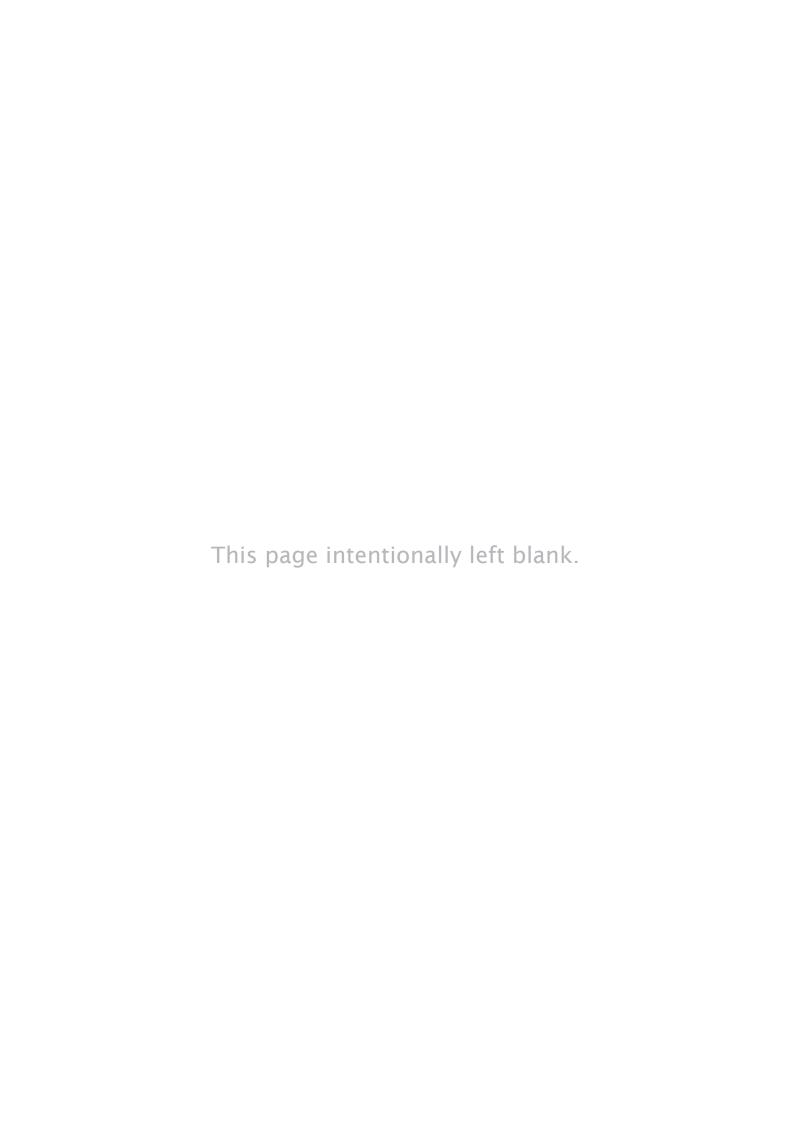


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Stream Restoration Projects

West Kill Streambank Stabilization below Wolff Rd- 2024 Repair

The West Kill Streambank Stabilization below Wolff Rd project was completed in November 2023. A significant rain-on-snow event in December 2023 led to high stream flows expanding onto both recently constructed floodplain benches causing the loss of topsoil, seed, plantings and other bioengineering measures. An assessment of the in-channel sediment deposition caused by the storm showed impacted conveyance of water and sediment, and an increased potential for channel avulsion during future storm events.

To repair the storm damage and improve conveyance of water and sediment within the reach, **295 feet of stream**



channel and floodplain benches were repaired. The repair included excavation of the accumulated sediment, addition of topsoil and riparian seed mix, planting of 279 potted trees and shrubs, and installation of 531 live willow stakes and 1,143 linear feet of willow fascines. Fortunately, the construction contract was still open and all costs for repair were covered under the original contract budget.





Manor Kill Streambank Restoration at Pangman Rd

During the regulatory review process in 2024, the Pangman Rd project site was found to be within 2.24 miles from the nearest hibernacula of the endangered Northern Long-Eared Bat (NLEB) and within the 5-mile Spring Staging/Fall Swarming buffer. GCSWCD is currently working with the US Fish and Wildlife Service and NYC Dept. of Environmental Protection Wildlife Studies Section to conduct surveys to confirm the presence or absence of NLEBs. In the meantime, GCSWCD is preparing final design drawings and contract documents and working with landowner legal councils to secure agreements for project construction tentatively scheduled for the 2025 season.

riparian and wetland seed mixes.

The Manor Kill Streambank Restoration at Pangman Road project will rehabilitate 300 linear feet of the Manor Kill.



Red Falls

Significant progress continues to be made in stabilizing the Batavia Kill and improving water quality at the Red Falls project site. The multi-phase project is the largest to be implemented in the New York City drinking water supply and aims to reduce turbidity by mitigating excessive erosion that has historically impacted this portion of the Watershed. Due to its size and complexity, the Red Falls site has been divided into four manageable projects. 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, and the permits for project construction were extended.

In 2024, Red Falls Project 3 reached a major milestone with construction being successfully completed along 1,705 linear feet of the Batavia Kill. Following construction, 16 acres of soil disturbance were stabilized, 14 acres were seeded with native riparian, steep slope, and wetland seed mixes, and 1,243 trees, 1,200 shrubs, and 79 balled-and-burlapped trees (more mature trees that are grown at a nursery and delivered with their root balls wrapped in burlap material) were planted. The aforementioned portion of the project was successfully completed in collaboration with Evergreen Mountain Contracting, which was contracted through a sealed bidding process. GCSWCD then worked to install protective tubes on 1,470 of the plants. These protective tree and shrub tubes will provide protection from browsing and grazing animals, create a favorable climate by holding heat and moisture, and support vertical growth. Many of these tubes were recovered from previous sites where trees had outgrown their need for protection. To close out the season, an as-built survey (a survey that serves as a record of the final location of a construction project, including any changes made to the original design) covering approximately 14 acres was completed.

The second phase of the Red Falls Project 3 planting will include planting 342 trees, 330 shrubs, and 51 balled and burlapped trees in Spring 2025. A constructed roadway has been left open to allow truck access for the planting, after which it will be backfilled with additional trees and shrubs.

In addition to the construction of Project 3 in 2024, the District worked on the design of – and permitting process – for Project 4. To guide the development of the design, the District completed a Level 3 Assessment (a protocol developed by Dave Rosgen) of a stream reach that will be used as a reference reach because it has been identified as being a stable section of stream. Conducting a Level 3 Rosgen assessment of a reference reach before completing a design is crucial because it provides 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.

Coupled with the District's efforts, staff from the NYC DEP Natural Resources team revisited Red Falls in 2024 to complete another year 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. The immediate goal of this assessment was 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.

Looking ahead, Red Falls Project 4 is in the design and permitting phase, with several key developments slated for the upcoming construction season.



Bank Erosion Monitoring Studies

2024 marked the second year of data collection for the comprehensive Bank Erosion Monitoring Study (BEMS). The study – conducted by Schoharie Watershed Stream Management Program (SWSMP) staff at GCSWCD, the Watershed Conservation Corps (WCC), and other program partners – covers 5,640 feet of stream across 16 sites around Greene County and the larger Schoharie Reservoir watershed. The 2024 field season built on the previous year's work, completing cross-section and longitudinal profile surveys along 1,368 feet of stream, photo monitoring along 5,340 feet, and Structure from Motion (SfM) photogrammetry along 2,580 feet.



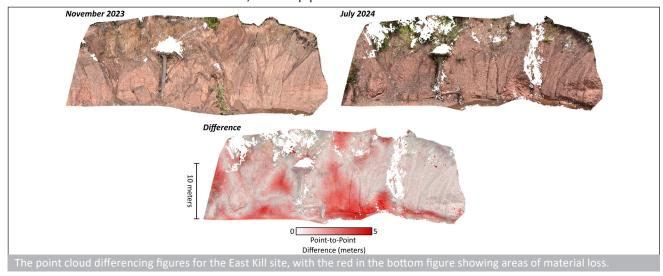
Structure from Motion (SfM) photogrammetry has become the newest addition to the stream surveying toolbox here at GCSWCD. SfM allows for the construction of a highly-detailed 3D model of a landscape using a series of photographs and GPS data points. This relatively low-cost and effective approach to monitoring streambank erosion was first introduced to the Schoharie Reservoir watershed 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 NYC DEP's Stream Studies Coordinator/Geologist, Dany Davis, and led them to a monitoring site on the East Kill.

During the 2024 field season, GCSWCD and the DEP Stream Program's Watershed Conservation Corps (WCC) used SfM to study five sites throughout the Watershed, including the East Kill site. With this being the second year of data collection at the East Kill site, the monitoring team was able to analyze the data to estimate how much material, if any, had eroded from the land surface.

This analysis, conducted by WCC Coordinator, Telemak Olsen, used the "Compute 2.5D Volume" tool of the free, open-source 3D point cloud processing software, CloudCompare. The tool creates a detailed grid of the land surface, breaking it into small sections based on a chosen cell size. For each section, CloudCompare calculates the average height from survey data, then compares it to previous surveys to measure any changes. By summing these differences across the entire area, the program estimates the total volume of material lost or gained over time. The East Kill analysis resulted in a conservative estimate of approximately 100 cubic meters of material lost between November 2023 and July 2024. If a standard bathtub can hold 0.3 cubic meters of soil, that would be 333 bathtubs full of earth material!

The two notable sources of this material loss were large knobs that had formed in the cliff face breaking off at the bank. The areas where these knobs had been located were undercut (worn away at the base) by hydraulic forces between surveys. These findings contribute to our understanding of short-term bank failure mechanics, provide valuable insight into how this stretch of stream is changing over time, and highlight the importance of continued monitoring. It is important to note that these results are estimates, and the method used is just one of many tools that inform site selection for monitoring and restoration.

The evaluations completed at BEMS sites are part the SWSMP's continued planning and implementation efforts in the Watershed. The information gathered at each site will be used to assign severity ratings to the observed conditions, characterize the streambank erosion hazards, and help prioritize stream restoration efforts in the future.



Buffer Plantings, Critical Area Seeding, and Nursery Upgrades

There were three riparian buffer projects completed in the Spring of 2024 through the District's Catskill Stream Buffer Initiative program. These projects covered 1.2 acres along 920 feet of stream and included the planting of 617 trees and installation of 650 willow stakes. A willow bed was created at one of the project sites with the goal of establishing a productive source of willow stakes that could be harvested from for future projects. District staff also completed vegetation monitoring at 26 sites and project maintenance at three past project sites.

Critical area seeding was completed on eight sites, covering a total of **1.4 acres**.



PMC Improvement Projects

GCSWCD is proposing improvements to the existing irrigation system at the Plant Material Center (PMC). The PMC houses many different species of potted native Catskill Mountain trees and shrubs. The plant materials are maintained by GCSWCD staff and used in stream restoration and Catskill Streams Buffer Initiative projects. These plant materials are critical to the long-term success of these projects and must be available both in sufficient quantities and at the appropriate times. Proposed improvements will replace existing irrigation lines and sprinkler system with a new automated system that will improve water efficiency, enhance plant health and increase productivity. Improvements include alternate water supply source, above-ground water holding tank, automated zoned sprinkler system, drip irrigation, and misting zones within the greenhouses. The system improvements will ensure all plants receive the right amount of water at the right time, promoting healthy and uniform growth. GCSWCD has **completed final design drawings for the system improvements** and currently preparing contract and bid documents.

Along with the irrigation improvements, the District is proposing improvements to an existing wood-framed barn at the PMC. The improvements include new electric service, lighting, outlet receptacles, heated bathroom, a water supply well, and a subsurface sewage treatment system. GCSWCD staff along with a NYCDEP Regulatory and Engineering representative performed soil tests in November 2024 to determine the soil properties and ability to filter and absorb wastewater. Based on the soil test results a subsurface sewage treatment system was designed by GCSWCD and approved by NYCDEP. Design plans for the electrical upgrades and new bathroom are in the final

stages of design. Implementation of the barn improvements is tentatively scheduled for 2025.

In addition to these exciting infrastructure improvements, some time was dedicated to giving the barn's door a welcome facelift. The barn, which serves as storage for tools and various supplies, sits near Big Hollow Road with its door facing outward toward the road. The new doors were handcrafted by District Technician Brandon Terrill, who thoughtfully carved the unique design seen by all who pass by. The design features a sun – symbolizing the way sunlight strikes the barn early in the morning – and the letter "C," a tribute to the Charbonneau family, a local name with deep historical significance.



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Agricultural Programs

GCSWCD's agricultural program – revived in 2023 – is available to assist Greene County farmers who are interested in enrolling in the Agricultural Environmental Management (AEM) program. Through AEM, farmers work with their local Soil and Water Conservation District to inventory current farming practices, identify and prioritize potential environmental concerns, develop conservation plans, and implement those plans using available technical and financial assistance. This confidential, voluntary, incentive-based program is administered by the New York State Department of Agriculture and Markets and is designed to support farm goals, while protecting and conserving natural resources.



In 2024, the District completed 11 AEM Tier 2 assessments and 3 AEM Tier 3 assessments. Additionally, the District implemented an AEM Tier 4 project.

The Tier 4 project focused on a beef farm. During the assessment and planning phase, District Technician Alex Johnk identified several areas needing improvement. These included deteriorated laneways with water ponding issues and a barnyard that frequently remained saturated, posing a significant risk of nutrient runoff from manure into nearby water sources.

Working closely with the farmer, a practical plan was developed to address these concerns while improving environmental impacts. The project consists of two phases – Phase 1 has been completed and Phase 2 is planned for Spring 2025. Phase 1 included two parts:

- 1. Laneway Improvements: Installing culverts and adding stone to improve drainage and durability.
- **2. Stream Access Upgrade**: Establishing a stabilized drinking area using fabric, cobbles, and gravel. This ensures cattle can access water without stirring up sediment or contaminating the stream with manure.

This project not only addresses environmental concerns but also provides long-term benefits for the farm's operations. The District looks forward to completing this initiative in the spring and to begin assisting other farms in similar ways.





Soil Maps & Soil Group Worksheets

In 2024, soil maps and Soil Group Worksheets (APD-1) were completed for 38 parcels in the towns of Ashland, Athens, Cairo, Catskill, Coxsackie, Durham, Greenville, Lexington, and New Baltimore of Greene County, NY. Of the 38 parcels, 18 parcels were included in Greene County's Agricultural District 124. Approximately 1,097 acres of agricultural land, 406 acres of farm woodland, and 293 acres of excess woodland were included in the 2024 NYS Agricultural Assessment Program for Greene County.

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Grant Funding

The Stream Management Implementation Program (SMIP) is a grant program administered through the Schoharie Watershed Stream Management Program (SWSMP) at GCSWCD, in partnership with the New York City Department of Environmental Protection (DEP). With funding available across multiple categories, SMIP supports projects aimed at enhancing water quality and fostering community engagement within the Schoharie Reservoir watershed. In 2024, SMIP awarded a total of \$475,277.14 to a diverse array of projects, reflecting its commitment to addressing both community and environmental needs. Below is a list of projects that were funded in 2024:

- County Route 23C Culvert Replacement Implementation: \$311,338.14 allocated to the Greene County **Highway Department**
 - The project involved the replacement of two undersized culverts that contributed to recurring flooding of CR 23C and the Town of Jewett Municipal Building. Existing culverts were replaced with one box culvert. This project was originally awarded \$500,000 and was completed under budget.
- County Route 2 over Little West Kill Culvert Replacement Engineering Services: \$86,500 awarded to the **Greene County Highway Department**
 - Through this project, SMIP funding will support the Greene County Highway Department working with a consultant to assess site conditions at the County Route 2 culvert over Little West Kill. Following the field assessments, the consultant will provide the preliminary design plans, advance detail plans, and final plan specifications along with a cost estimate for implementation of the replacement project.
- Schoharie Basin Road-Stream Crossing Assessment: Towns of Hunter and Jewett: \$52,799 awarded to **Cornell Cooperative Extension of Columbia and Greene Counties**
 - Through this project, SMIP funding will support detailed road-stream crossing evaluations using the Multi-Objective Stream Crossing Assessment Protocol (MOSCAP). Data gathered from these assessments will inform municipal officials and local highway departments about the overall condition and flood resiliency of structures – supporting informed planning and implementation of structure replacement and repair.
- 2025 Schoharie Reservoir Kayaking Program: \$14,640 awarded to the Education & Outreach **Subcommittee of the Schoharie Watershed Advisory Committee**
 - Through this project, SMIP funding will support continuation and expansion of the Schoharie Reservoir Kayaking Program. Introduced in 2024, this program provides Watershed education while engaging the community in outdoor recreation.
- Batavia Kill Splash and Learn: \$10,000 awarded to Cornell Cooperative Extension of Columbia and Greene **Counties**

Through this project, SMIP funding will support six educational outdoor workshops on the Batavia Kill. The project is designed to provide landowners, recreational users, watershed stewards and environmental enthusiasts with interactive in-stream and streamside learning experiences.

Funding Overview Through 2024		
Funds Allocated to Date	# of Awards through 30 Rounds (8/1/09-10/28/24)	
\$125,081.46	34	
\$2,051,214.40	18	
\$1,628,782.51	23	
\$216,387.81	10	
\$189,626.39	18	
\$1,597,408.50	20	
\$168,488.36	5	
\$26		
\$5,976,989.43	128	
	Funds Allocated to Date \$125,081.46 \$2,051,214.40 \$1,628,782.51 \$216,387.81 \$189,626.39 \$1,597,408.50 \$168,488.36	

- 128 awards (102 completed projects, 11 withdrawn projects, 4 in-process projects, and 11 awards for additional funding for previously-awarded projects)
- Next SMIP Round 3/15/25
- *Category formerly known as "Landowner Stream Assistance" in SMIP Cycles 1 & 2
- **Category formerly known as "Flood Hazard Mitigation" in SMIP Cycles 1 & 2. Totals in this category combine LFA & FHM projects.
 ***Stormwater category is only from SMIP Cycles 1 &2. Stormwater projects are currently funded through Catskill Watershed Corporation.

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Education & Outreach

2024 educational offerings began with the **Streamside Snowshoe Stroll** at Bearpen Mountain Sports. During this event, District staff **led 15 people along the Little West Kill**; encountering a beaver dam and lodge, a small waterfall, and signs of erosion from past storm events - all while observing how the surface water hydrology shifts in winter months.

Just ahead of the opening of the spring trout fishing season, the District hosted a **film viewing and fly-tying event** in partnership with West Kill Brewery. The evening celebrated the intricacies of stream ecosystems with a showing of



Freshwater Illustrated's award-winning documentary, RiverWebs. Following the film, Todd Spire of Esopus Creel and Jesse Vadala of Trout Unlimited conducted fly-tying demonstrations that highlighted five stages of the aquatic insect life-cycle. **This event received 24 attendees.**

On April 6th, we **welcomed 65 community members to the Schoharie Watershed Summit** – the District's flagship event. The Summit is a one-day conference that brings a variety of Watershed stakeholders together to network, learn from, and share interests with one another. 2024 presentations included:

- New York State Mesonet for Water-related Research by Dr. Junhong (June) Wang of UAlbany
- Local Flood Analysis: Making the Catskills Region more resilient to flooding by Mark Carabetta of SLR Consulting
- Unraveling the Gordian Knotweed: Management of Japanese Knotweed in the Catskills by John Thompson
 of the Catskill Regional Invasive Species Partnership (CRISP)

Afternoon workshops included the: Introduction to the National Flood Insurance Program, SEQR: The Short Environmental Assessment Form, Introduction to the Greene County Web Map, and Post Disaster Floodplain Administrator Response and Flood Insurance Implications.

In May GCSWCD hosted another successful event series as part of **Schoharie Watershed Month (SWM)**. This series offers a diverse range of experiences that help participants gain a more holistic understanding of the role they play in the health of this living resource. 2024's offerings included the:

• The Schoharie Reservoir Watershed BioBlitz

Community members were invited – and encouraged – to celebrate Schoharie Watershed Month with a biodiversity hunt across the Reservoir's drainage basin. Observations could be uploaded to the Schoharie Reservoir Watershed project on the iNaturalist app.

58 people contributed observations to the project. There was a total of 386 observations recorded – this total included 246 different species of plants, fungi, amphibians, reptiles, fish, and insects.

- Watershed Wednesdays Webinar Series a weekly virtual program featuring a variety of speakers. Last year's series included:
 - » A Brief History of Glacial Processes and Glacial Lakes in the Schoharie Watershed with Dr. Andrew Kozlowski of the New York State Museum;
 - » Messy Rivers are Healthy Rivers: The Role of Spatial Heterogeneity in Sustaining River Ecosystems with Dr. Ellen Wohl of Colorado State University;
 - » Flood Watch NY: Documenting Local Floods Through Community Science with Jess Kuonen of New York Sea Grant; and
 - » Unraveling the Gordian Knotweed: Management of Japanese Knotweed in the Catskills with Dan Snider-Nerp of the Catskill Regional Invasive Species Partnership

In total, the four webinars were attended by 96 members of the community.

• The Schoharie Reservoir Paddling Day

In partnership with Screaming Eagle Outdoor Adventures, and Rip Van Winkle Adventure Guide, the District led 13 people through a morning of watershed education... on the water!

Mountain Top BioBlitz

The **second annual Mountain Top BioBlitz** at the Mountain Top Arboretum – produced in partnership with the Mountain Top Arboretum and the NYC DEP – featured a full day of walks and activities led by local environmental professionals and naturalists. The day ended with a performance by Arm-of-the-Sea Theater.

The BioBlitz was attended by 86 people of all ages throughout the day.

The District offered another opportunity to kayak the Schoharie Reservoir on September 28th – this time adding two more kayaks and making space for 15 people to join the paddle.

On November 14th, we hosted the **Post-Flood Emergency Stream Intervention training**. This important training was led by Delaware County Soil & Water Conservation District and focused on stream assessment and management following flood events. The training was **attended by 12 people and included highway staff and municipal officials**.

School Visits

The District brought watershed education to two school districts in 2024. Visits to Windham-Ashland-Jewett and Greenville High School provided an introduction to stream processes and management with lessons tailored to the schools' existing curriculum. Students gained an understanding of different watershed features and water quality issues.

In April, District staff attended the Windham-Ashland-Jewett Career Fair where they shared their academic and career experiences with 5th-12th grade students. A week earlier, we visited Greenville Elementary School to participate in their **Agriculture Awareness Days – distributing 450 biodegradable pots with wildflower seed**.

District staff returned to Windham-Ashland- Jewett in October for a visit with the junior science club. Science club members were shown how to sample a stream for macroinvertebrates; and how to test the pH, temperature, and turbidity of the water.

Collectively, a total of 745 students participated in these activities.

Fairs and Tabling Events

In May, we were set up at the Mountain Top Earth Day celebration with outreach materials and wildflower seeds. The District also **donated 40 saplings to be given out** at the event.

In July, GCSWCD returned to the Greene County Youth Fair. Time at the Youth Fair was focused on distributing outreach materials that raise awareness about programs offered through the District and running demonstrations of stream processes using the Emriver stream table. In addition to bringing the stream table, we had the return of the Conservation Craft Corner. This youth-focused play area offered a seed bomb making activity. The demonstrations at the Youth Fair reached approximately 500 people over the course of the four days.

In September, the District participated in Cornell Cooperative Extension of Columbia & Greene Counties' annual Environmental Awareness Days at the Siuslaw Model Forest. Over the course of three days, we provided stream table demonstrations and watershed lessons to 252 fifth-grade students and their chaperones.



Social Media and Newsletters

GCSWCD has continued to increase visibility and community engagement through social media outreach. This effort has yielded a clear increase in reach and audience participation. In 2024 we **produced 68 posts** for both Instagram and Facebook. Collectively, these posts reached **6,768 accounts on Instagram and 37,667 accounts on Facebook**.

Two newsletters were published and printed in 2024. Twenty-three e-newsletters and announcements were sent out to our electronic mailing list – collectively reaching 4,543 inboxes.

Three new videos were added to the District's YouTube channel. The three videos currently have a total of 173 views.

Bare Root Sale System Upgrade

In 2024, GCSWCD upgraded the ordering system for the annual bare root sale. Orders can now be placed online via Square and paid for with credit card. This eliminated the need for customers to print out the order form and mail in a check. In 2024, sales rose to 3,930 plants, compared to 3,040 in 2023.

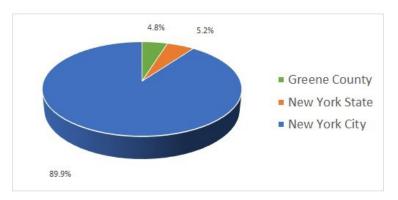
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District Funding

In 2024, the District received \$5,249,607.02 in total funding. Included in that amount is \$273,832.85 from New York State for reimbursement of technical services and conservation projects, a \$254,538 allocation from Greene County, and \$4,721,236.17 through the District's partnership with NYC Department of Environmental Protection.

The District's allocation from Greene County has remained consistent at \$254,538 for the period spanning 2018 - 2025; as our overall funding grew by 20% from 2023 to 2024.





District Staff

Joel DuBois Executive Director

Laurie Deyo Administrative Assistant/

Executive Secretary

Rich Andreassen Conservation District Program

Engineer

Jake Buchanan Conservation District Program

Specialist

Chris Langworthy Conservation District Program

Specialist

Abbe Martin Conservation District Program

Manager

Michelle McDonough Conservation District Program

Technician

Brandon Terrill Conservation District Program

Technician

Alex Johnk Conservation District Program

Technician

Michelle Yost Watershed Assistance Program

Coordinator

Amanda Cabanillas Education and Outreach

Coordinator

George Scherer Heavy Equipment Operator

Sean Wille Heavy Equipment Operator

Board of Directors

James Story, Chair Farm Bureau Representative

Dennis Lucas, Vice Chair Member at Large

Tom Hoyt, Treasurer Member at Large

Kevin Lewis Member at Large

David Cunningham Practical Farmer

Michael Bulich Legislative Representative

Jim Thorington Legislative Representative

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Instagram: instagram.com/gcswcd

YouTube: youtube.com/@GCSWCD