

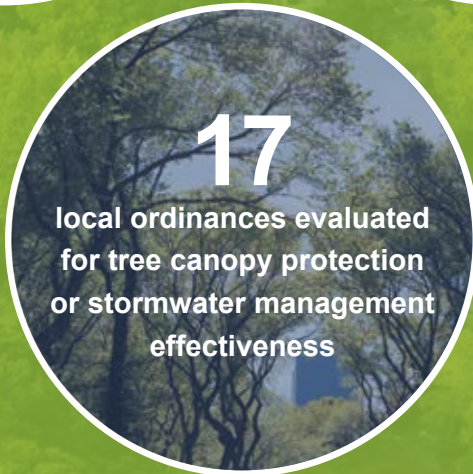
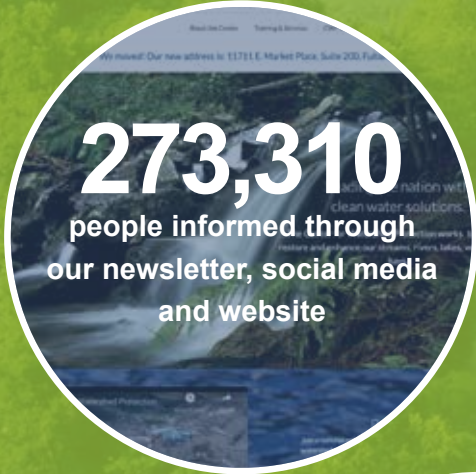
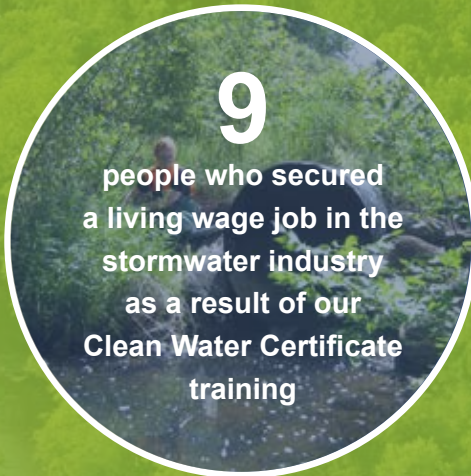
CENTER FOR
**WATERSHED
PROTECTION**

ANNUAL REPORT 2020



Mission & Impact

The Center for Watershed Protection is a 501(c)3 non-profit organization whose mission is to advance clean water resources and healthy ecosystems through responsible land and water management.



Dear Friends,

This past year, the Center for Watershed Protection, like most organizations and individuals faced extreme challenges and uncertainty from the COVID-19 pandemic. Among the specific critical unknowns was the impact on our workforce and the flow of current and potential business.

Maintaining and growing the Center's contributions to the science and practice of watershed-based management remained as the focus this past year as evidenced in this report. Nimble and creative in our response, we moved to the virtual format for conferences and meetings as a way to maintain connections between the Center and our audience.

During 2020, partnerships with regional and local organizations grew by engagement with groups such as the New England Interstate Water Pollution Control Commission; the Interstate Commission on the Potomac River Basin; Groundwork Cincinnati; Delaware Center for the Inland Bays; and the Audubon Naturalist Society. This complemented our ongoing work with many others such as the Department of Energy & Environment in the District of Columbia; Maryland Department of Natural Resources; Town of Bluffton, South Carolina; James River Association in Virginia; and EPA Chesapeake Bay Program.

In addition, funding from long-term partners such as the William Penn Foundation, Keith Campbell Foundation, National Fish & Wildlife Foundation, and Chesapeake Bay Trust continued to help us fund research and implementation projects.

In 2021, look for our new strategic plan, partnerships with new entities to expand our body of work, and a new initiative on research. We also foresee a resurgence of our work in the federal sector.

The future for CWP is brighter than ever. As we grow, we invite you all to engage with us in the coming year and to thank all who have continued to support this organization.



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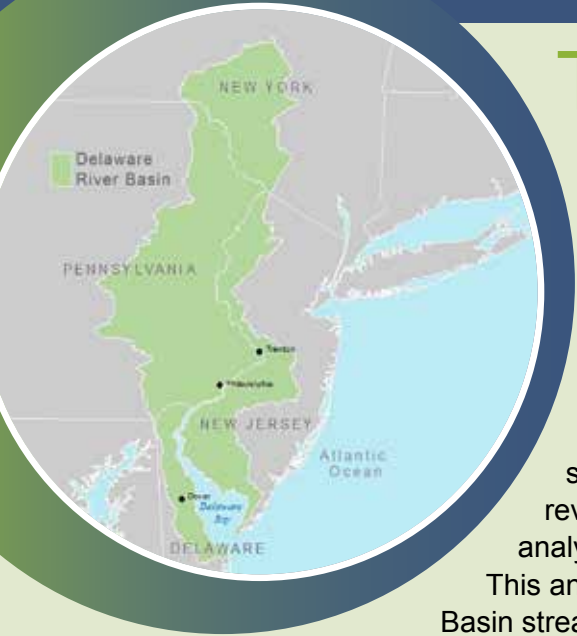
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Fishable and Swimmable Goals in the Delaware River Basin



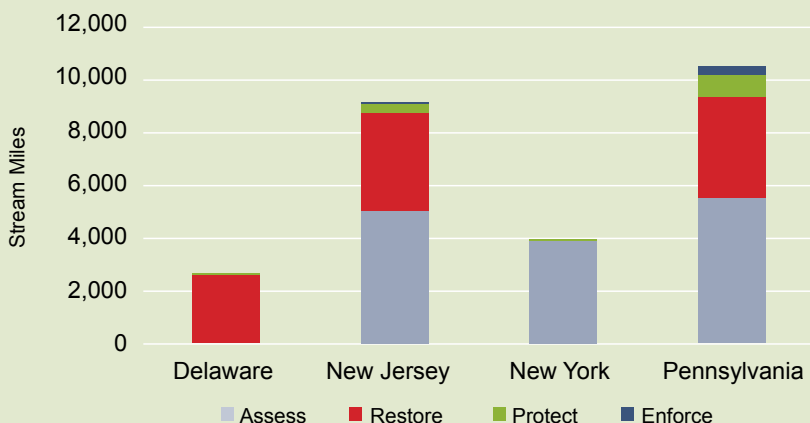
The William Penn Foundation provides extensive funding for protection and restoration activities in the four-state Delaware River Basin towards the long-term goal of ensuring all 25,000+ miles of stream are fishable and swimmable. In 2020, the Center led a study for the Foundation to assess the feasibility of developing Basin-wide metrics to measure progress on securing sustained regulatory protections for streams. As part of this study, the Center reviewed state Clean Water Act policies and analyzed data provided by the Basin states.

This analysis showed that only 6% of Delaware Basin streams are currently meeting both fishable and swimmable standards and quantified the opportunity

to make progress on stream assessment, protection, and restoration, and enforcement of Clean Water Act standards. These results can be used by the Foundation to establish interim goals and track progress towards a fishable and swimmable Basin. Nonprofits working in the Basin can use the study results to strategically target and better illustrate the impact of their work to ensure that water quality standards are met. This includes:

- conducting regular waterbody monitoring to document existing uses, gather water quality data to support reclassification petitions, and to supplement agency efforts to assess conditions
- petitioning for more stringent protection for specific waterbodies through a change in use designation
- submitting public comments on proposed revisions to water quality standards to secure more robust protections
- reviewing permit applications and submitting comments on proposed permits to help ensure that Clean Water Act protections are enforced

Goals for Delaware River Basin Streams



55% stream miles in the Basin that are unassessed for either aquatic life use or recreational use, making it difficult to determine their “fishable and swimmable” status. The goal for these streams is to conduct water quality monitoring to **assess** if they are meeting these designated uses.

4% stream miles in the Basin that are currently meeting fishable and swimmable standards but are not afforded any special protections. The goal is to increase **protection** for these streams through designation upgrades so that they can continue to support these uses.

39% stream miles in the Basin having water quality conditions that do not fully support aquatic life use and/or recreational use. The goal for these streams is to **restore** them so that they are fishable and swimmable.

2% stream miles in the Basin that are currently meeting fishable and swimmable standards and already have the highest level of protection. The goal for these streams is to maintain their high level of quality through **enforcement** of existing protections.

Prioritizing Stream Restoration at Multiple Scales



For the past nine years, the Center has been involved in research to help quantify the sediment and nutrient reduction benefits associated with stream restoration projects. The Center was instrumental in helping to develop the 2014 series of protocols for calculating pollutant reduction “credit” for stream restoration projects to clean up the Chesapeake Bay and participated in recent work groups to update the protocols. The first protocol is based on the assumption that stream restoration prevents sediment and associated nutrients from entering waterways by addressing stream bank erosion problems. Application of the protocols therefore requires a good estimate of stream erosion rates. In many parts of the Bay watershed, stream erosion is severe and restoration can provide significant benefits for communities who have limited funds to spend on restoration.

The Center has been piloting the use of Light Detection and Ranging (LiDAR) derived digital elevation model (DEM) differencing as a cost-effective method to measure stream erosion rates and help target restoration projects to the most beneficial locations. DEM differencing is the subtraction of two subsequent DEMs to map erosion, deposition, and volumetric change. The value of this methodology is the ability to identify changes within a watershed over broad time scales, unlike traditional methods of measuring or modeling streambank erosion that provide information only for one particular point in time. In 2020, the Center applied this methodology in parts of the Brandywine-Christina Watershed in Pennsylvania to assess its utility for quantifying stream erosion rates. The results were compared to a regression model analysis done by the United States Geological Survey and showed a high correlation between the results of the two methods for second and third order streams. The Center will continue to expand this research over the next few years.

The Center has continued to assist communities with the proper application of the Chesapeake Bay Program’s stream restoration crediting protocols and prioritization of stream reaches for restoration through project-specific assistance. This past year, the Center helped the City of Frederick, Maryland by assessing six candidate stream restoration sites and gathering the necessary information in the field to make a preliminary estimate of sediment and nutrient reduction associated with each project. The Center performed similar work for East Pennsboro Township, Pennsylvania, conducting assessments and prioritizing 64 stream reaches. In both cases, the results allow these communities to identify and plan for stream restoration projects targeted to the most effective locations as part of broader strategies to meet water quality improvement requirements. The Center also assisted Frederick County, Maryland with calculation of sediment and nutrient reduction credit for a recently completed project on North Branch Bennett Creek, by applying the newly approved crediting protocol for outfall and gully restoration.



Innovative Planning to Save the Chesapeake Bay

For decades, the Conowingo Dam on the Lower Susquehanna River in Maryland functioned to trap nutrients, sediment, and other pollutants, reducing the amount of pollution reaching the Chesapeake Bay. However, recent water quality monitoring data and new modeling indicate that sediment has built up behind the dam which is no longer able to trap more sediment or other pollutants. More nutrient reductions are needed to achieve Chesapeake Bay cleanup goals that states are already struggling to meet.

After many months of collaboration with the EPA and a steering committee of state representatives, the Center and partners Chesapeake Conservancy, University of Maryland Sea Grant, and the Harry R. Hughes Center for Agro-Ecology drafted a comprehensive approach to solve these issues in a cost-effective way. The goal of the Conowingo Watershed Implementation Plan (WIP) is to find the lowest cost solutions to eliminate six million pounds of nitrogen pollution entering waterways that builds on and does not duplicate the plans that states are already using to meet their existing Chesapeake Bay restoration goals. WIPs are the roadmaps for how the Bay jurisdictions, in partnership with federal and local governments, will achieve the Chesapeake Bay Total Maximum Daily Load (Bay TMDL) allocations, also known as a “pollution diet.” The Bay TMDL, developed by the EPA, identifies the necessary pollution reductions of nitrogen, phosphorus and sediment across the



watershed jurisdictions and sets pollution limits.

The Center team drafted the Conowingo WIP with input from a Steering Committee made up of representatives from the Chesapeake Bay Commission and each Chesapeake Bay watershed jurisdiction — Delaware, the District of Columbia, Maryland, New York, Pennsylvania, Virginia, and West Virginia. The draft was released in late 2020 and was followed by a 90-day public comment period during which a series of local stakeholder workshops were held to receive input from parties Bay-wide, with special focus across Maryland, Pennsylvania, and New York. More than 239 unique comments were received and addressed. In a recent evaluation of the draft plan, EPA commends the Center and the Steering Committee for developing a BMP implementation scenario that meets the necessary nitrogen reductions and focuses restoration activity, primarily agricultural BMPs, in the most effective areas of the Susquehanna River Basin.

In the coming year, the Center will finalize the draft Conowingo WIP, conduct continued stakeholder outreach, and work with jurisdictions to develop two-year milestones. The Center’s role in this project is also to help implement the Conowingo WIP and coordinate with partners leading a financing strategy and process for tracking and reporting on WIP implementation.

Photo Credit: Chesapeake Bay Program

Green Infrastructure Projects

In 2020, the Center wrapped up implementation of four green infrastructure projects that prevent 304 lbs/yr of nitrogen, 21 lbs/yr of phosphorus, and 26 tons/yr of sediment from reaching local waterways in Maryland and Virginia.

Fair Hill Natural Resources Management Area

At the Fair Hill Natural Resources Management Area in Cecil County, Maryland, the Center designed a complete redevelopment of an area near the Nature and Environmental Center. Completion of this project has transformed the site into a much more useful space by converting existing impervious areas to ADA-accessible and bus-friendly visitor parking and storage facilities, and by relocating parking away from the floodplain. It also improved stormwater management and water quality by eliminating over 2.6 acres of impervious cover and incorporating several green infrastructure projects, including permeable pavement, bioretention, impervious surface disconnection, and step pool storm conveyance systems. This project complements recent efforts by Maryland Department of Natural Resources to stabilize parts of Big Elk Creek by addressing upstream sources of stream erosion and supports the Department's efforts to improve local waterways in State parks.

Audubon Naturalist Society Woodend Sanctuary

A haven for native plants, the Audubon Naturalist Society's Woodend Sanctuary is visited by thousands of students, individuals, and families from the Washington, DC Metropolitan Area each year. The Center assisted with an ambitious plan to improve the property that included green infrastructure projects, a permeable path along the stream, and a large play space. The Center designed, obtained permits, and managed construction for a series of green infrastructure projects to address severe stream erosion and polluted runoff. The Center's design converted 1,400 feet of eroding stream running through the property into a series of 45 sequenced step pools. Bridges, overlooks, decks, and fords were included in the design to ensure that visitors would have access to the stream. The Center also designed three bioretention areas to capture and clean runoff before reaching the stream. These improvements to the property have resulted in a much more useable space and reduced polluted runoff entering nearby Rock Creek.



James G. Brumfield Elementary School

In the Town of Warrenton, Virginia, the Center worked with Fauquier County and Town staff to implement a green infrastructure demonstration project at a highly-visible site adjacent to the James G. Brumfield Elementary School. The Center designed and oversaw construction of the half-acre constructed wetland project which will be used as the basis for environmental education efforts by the Center for Urban Habitats. The Center helped to secure funding for this project and worked to inform the public about the project's benefits.

Town of New Market, Maryland

The Center helped the Town of New Market, Maryland with a project to convert an unused fire suppression pond to a step pool storm conveyance system. This green infrastructure project provides water quality improvements and helped the Town to eliminate the risk of downstream flooding, which was a concern due to the poor condition of the pond embankment. The Center helped to secure funding, designed the project, and handled permitting and construction oversight. The step pool system also contributes to the improved health of the receiving stream, designated for trout, by mitigating temperature impacts.

Safe and Successful Virtual Engagement

The Center recognized the need for connection during the COVID-19 pandemic. While many organizations were cancelling events, the 2020 National Watershed and Stormwater Conference transitioned to a virtual platform. It was an enormous task to pivot from an in-person event to a virtual experience that offered not only thought-provoking presentations and workshops, but also happy hours, trivia games, and networking opportunities. Our choice positively impacted our participants by providing an opportunity to connect with other water professionals and offering engaging conversations and a distraction from stress during a very uncertain time.

As a complement to the National Conference, the Center hosted its very first Specialty Conference in November. Over 100 attendees from throughout the United States (including Puerto Rico and the Virgin Islands!) joined us virtually for the 2020 Coastal & Island Specialty Conference.

Although in-person events were limited during the pandemic, our staff were still able to offer a variety of training and education opportunities to a diverse audience. The following examples highlight the versatility and ability of the Center's training program to reach a wide audience.

- In March 2020, the Center held a Clean Water Certificate program training in partnership with Civic Works' Baltimore Center for Green Careers. The training was attended by 11 unemployed or underemployed individuals, nine of whom secured a living wage job in the stormwater industry following successful completion of the program.
- At the Chesapeake Tree Canopy Summit, Center staff presented on forest-friendly codes and ordinances for communities.
- Over the course of the year, the Center provided both in-person and virtual training on compliance with the District of Columbia stormwater regulations, and design of green roofs and permeable pavement through 10 individual events attended by 58 people
- To support the City of Waynesboro, Virginia's stormwater program, the Center developed a 45-minute training series using PowerPoint with voice-over recording on topics such as watershed awareness, basics of the MS4 ordinance, fundamentals of stormwater pollution and erosion and sediment control, and illicit discharge detection and reporting.
- Center staff presented on trees as stormwater infrastructure to the City of Lexington, Kentucky's Stormwater Stakeholder Advisory Committee and at a community symposium organized by the University of Kentucky's Urban Forest Initiative
- The Center provided training to local government staff and consultants in coastal South Carolina on implementation of the South Carolina Low Impact Development Guide.
- The Center organized and led a session on stormwater management at the Delaware River Watershed Forum and hosted webinars on operation and maintenance of stormwater treatment practices, good housekeeping, and new methods to quantify stream erosion rates.
- The Center provided continuing education opportunities via webcasts and virtual lunch and learns to a national audience.



"Your presentation was spot on and we have received tremendous positive feedback."

*– Shane Tedder,
University of Kentucky*

Regulating Runoff for Maximum Impact



For nearly 30 years, the Center has helped state and local government agencies minimize the impacts of stormwater runoff from development projects through the creation of stormwater management design criteria and associated guidance manuals.

District of Columbia

The District of Columbia Department of Energy and Environment (DOEE) estimates that a single 1.2" rainstorm falling on the District produces 525 million gallons of runoff. Given the high rate of redevelopment activity in our Nation's capital, DOEE determined that regulating stormwater management through improved development requirements would be a very cost-effective way to lessen the impacts of stormwater runoff on District waterways. In 2013 DOEE adopted one of the country's most progressive retention standards and the Center subsequently revised the District's Stormwater Management Guidebook to align with this new rule. Over the past year, the Center has continued to support DOEE with implementation of its stormwater regulations through:

- plan reviews of proposed development projects
- an update to the Guidebook that reflects regulatory changes and improvements in our understanding of stormwater BMP performance
- monthly training workshops for designers, plan reviewers, inspectors, and others to ensure that development projects will proceed with the best stormwater management designs
- research to ensure the information and requirements in the Guidebook are based on the latest science

South Carolina's Southern Lowcountry

South Carolina's Lowcountry region has experienced tremendous growth over the past two decades. To plan for the expected future growth, the Southern Lowcountry Regional Board hired the Center, with partner McCormick Taylor, to develop watershed-based stormwater design standards and a model ordinance for stormwater management that will guide future development across the region. The Center developed the Southern Lowcountry Post Construction Model Ordinance and the Southern Lowcountry Stormwater Design Manual through extensive discussions with the Board and each participating municipality, and public input. This regional ordinance and design manual incorporates flexibility in requirements based on local watershed and specific water quality issues and is a first of its kind in the state of South Carolina.

Beaufort County has since updated their stormwater ordinance to align with the regional model. As a result, development plans submitted to the County must use green infrastructure practices to retain 1.95 inches of stormwater on sites in most areas of the County. The ordinance and design manual are in the process of being adopted by the Town of Bluffton, City of Beaufort, City of Hardeeville, Jasper County, and the Town of Port Royal intend to make the necessary updates. When passed by each of the jurisdictions, a unified program for stormwater management will go into effect across the Southern Lowcountry Region.



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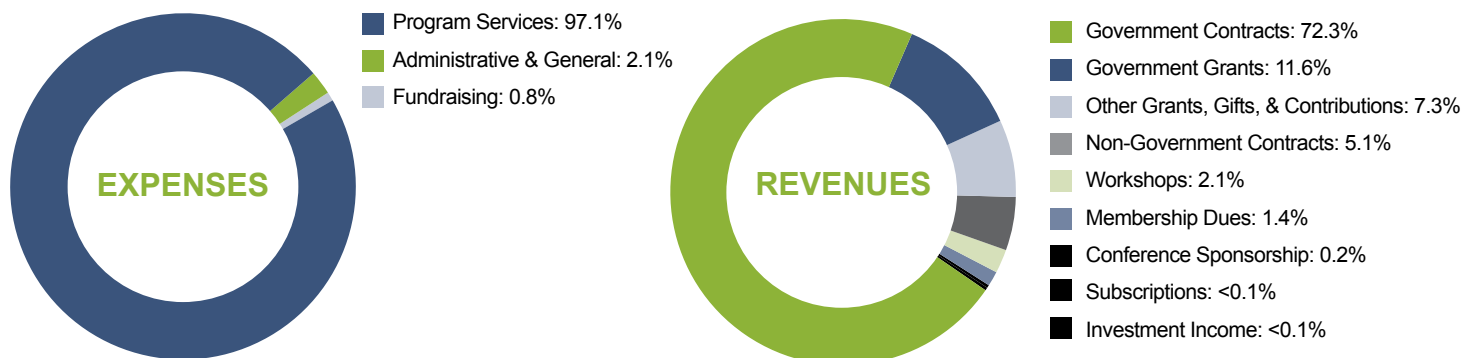
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We also appreciate the hundreds of individuals who made donations to the Center through their workplace giving and other campaigns. In 2020, the Center received \$359.08 from the United Way, \$50.55 from the Amazon Smile Foundation, \$3,855.26 from Target Circle, The Good Coin Foundation, \$19.00 from the Giant Community Bag Program, \$40.00 from Facebook, and \$2,569.39 from America's Best Charities/Independent Charities of America.

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