Maryland 5 Million Trees Initiative

This case study highlights a tree planting program that values ecosystem services while recognizing the co-benefits to fish, wildlife and plant life. The project aims to create resilient ecosystems by prioritizing native biodiversity.

In 2021, the Maryland General Assembly passed the Tree Solutions Now Act which set the goal to plant and maintain 5 million native trees in Maryland by 2031 as an investment in climate action and ecosystem restoration. The initiative supports the state's climate action under the Greenhouse Gas Reduction Act and the Climate Solutions Act Now by expanding the state's carbon sequestration capability while leveraging the co-benefits of reforestation.

The plantings are part of a multi-agency effort by state government, community programs, and individuals. The Maryland Department of the Environment tracks and coordinates the initiative. This includes increasing the stock of native tree species, engaging local communities, planting and maintenance, and progress tracking. While the main goal of this effort is to increase carbon sequestration, ecosystem restoration mitigates key local climate change vulnerabilities such as increased native biodiversity in streams and riparian areas, improved air and water quality, and reduced urban heat island effects.

Additionally, the initiative committed to growing at least 10% of the trees in urban underserved communities while simultaneously building the framework to advance workforce development for local communities to increase community owned resource stewardship.

Maryland Department of Natural Resources planting programs have accounted for 321,000 trees, or about two out of every three trees planted as part of the initiative. Community organizations, private partners, and other state agencies have also planted trees that were counted towards the overall goal.

> "Confronting climate change represents another chance for Maryland to lead. We can be a leader in wind technology, in grid electrification, and clean transit."
>
> — Governor Wes Moore

Two years into the 10-year initiative, close to 10% of the total goal has been planted, and 7% of the 500,000 tree goal for underserved areas. DNR's contribution to the initiative has depended on the hard work of programs and partners ranging from the Maryland Urban and Community Forest Committee, Alliance for the Chesapeake Bay, Maryland Forestry Foundation, the Western Maryland Research Conservation and Development Council, Interfaith Partners for the Chesapeake, the Maryland Association for Environmental and Outdoor Education and many others.

The Maryland Department of Natural Resources will continue to post news and initiative updates online at dnr.maryland.gov/forests/Pages/5-million-trees.aspx. The 5 Million Trees, 5 Million Voices series will highlight planting opportunities undertaken by the Maryland Forest Service.

Bird's eye view of recent tree plantings with Maryland Department of Agriculture at Edwin Remsberg Farm

Maryland DNR - Forest Service Staff delivering trees for a Tree-Menous Program planting.

References:

https://five-million-tree-tracking-tool-maryland.hub.arcgis.com/pages/climate-change

Final Plan:

https://mde.maryland.gov/programs/air/ClimateChange/Documents/FINAL_Plan-for-Growing-5-Million-Trees-in-Maryland_10.28.22%20%281%29.pdf

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The Nonprofit Resilience Authority of Charles County, Inc.: Maryland

This case study highlights a community-based resilience program to plant trees, mitigating the impacts of increased storm events and flooding and benefiting fish, wildlife and plant life. The project sites tree plantings to cool the air, provide shade, absorb stormwater, and prevent flooding.

The nonprofit Resilience Authority of Charles County, Inc's *Resilience Forward – RAYC Ahead* initiative is nature-based climate resilience grounded in youth-led environmental justice. This initiative addresses the threats of climate change by establishing native and biodiverse tree canopies in urban heat islands while also developing a conservation workforce through its Resilience Authority Youth Corps (RAYC). Empowering local youth to establish tree equity in under shaded and overburdened communities, The program provides year-round employment and natural resources career development opportunities for Charles County high school students and young adults. By establishing and caring for native tree canopies, RAYC members build resilience in their own communities; the trees help cool the air, provide shade, absorb stormwater, and prevent flooding All of this work benefits both human and wildlife communities on land and in the water; trees provide habitat, and by absorbing runoff, help filter water that drains to streams and rivers, benefiting fish and aquatic ecosystems. . RAYC works with government and nonprofit forestry and natural resource professionals to design, plant, and sustainably maintain urban tree cover and healthy forests at public schools, parks, and community-based organizations in underserved communities throughout Charles County.

The effort is a product of the Resilience Authority's partnership with the Maryland Forest Service and Charles County Public Schools, and is funded through the MDOT Urban Tree Program, the Maryland Urban

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>
> — Beverly Keadle Mayor of Romney

and Community Forestry Committee, the Maryland Forest Service's Community Catalyst Fund, the Urban Sustainability Directors Network, and the Chesapeake Bay Trust's Urban Tree Program.

Relevant links:

Accounting for Ecosystem Services in Charles County, MD

New Bay Program report offers a roadmap for combating rising water temperatures

NOAA Fisheries - Chesapeake Bay: Climate Change

Resilience Authority of Charles County, MD - About Us

Graphics:

Eyes on the Bay: Long-Term Monitoring Data Chart Query

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Middle Branch Resiliency Initiative: Baltimore, Maryland

This case study highlights a community-based resilience program to restore riparian buffers, mitigating the impacts of increased storm events and flooding, benefiting fish, wildlife and plant life, and improving the quality of surface waters. The project sites tree plantings to build a continuous corridor of restored habitat.

"The Middle Branch is a community connector and a vital part of the Chesapeake Bay's environmental ecosystem that supports the entire state of Maryland, especially Baltimore City. The Middle Branch Resiliency Initiative will revitalize this shoreline to expand economic opportunity, protect the Bay Watershed, boost climate resiliency, advance environmental justice and create new greenspaces that bring Baltimoreans together," said former Congressman John Sarbanes (MD-3).

Middle Branch Resiliency Initiative (MBRI) is Maryland's largest coastal resilience initiative, dedicated to restoring 50+ acres of habitat along 11 miles of shoreline in the Middle Branch of the Patapsco River. MBRI is the shoreline restoration arm of Reimagine Middle Branch, a community-driven environmental justice initiative to reconnect South Baltimore to a restored and enhanced waterfront. This initiative aims to enhance South Baltimore communities' resilience, reconnect communities to the waterfront, restore habitat function and diversity, improve water quality, and protect critical infrastructure from coastal flooding, intense storm events, erosion, and sea level rise through a wide suite of restoration practices such as upland urban forest plantings, conservation landscaping, green infrastructure, and living shorelines.

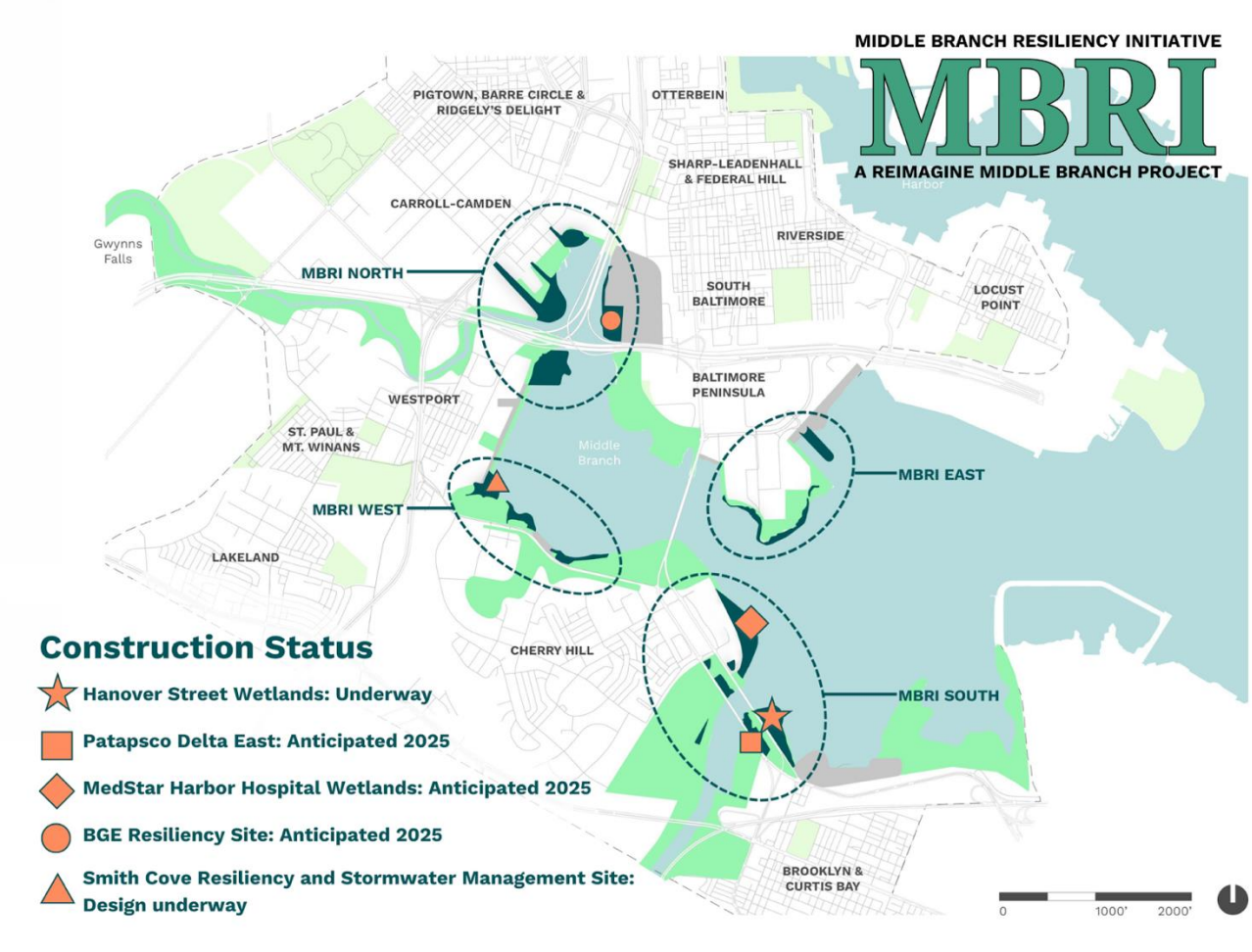
Historically, the Middle Branch shoreline was characterized by diverse habitat, including marshes and riparian forests that sustained fish populations, migratory birds, amphibians and reptiles. With industrialization, these diverse habitats were dredged and filled leading to loss of ecosystem function and increased susceptibility to coastal hazards. Today, much of the area experiences erosion that threatens transit infrastructure and flooding (pluvial and coastal) that renders the area unpassable. Included in this area are Hanover Street and Potee Street, both major connectors into Baltimore City for the nearby communities and Port of Baltimore commerce, and critical

infrastructure like the MedStar Harbor Hospital. MBRI seeks to restore ecosystem function, improve water quality, increase resilience to climate change, and reconnect communities to the waterfront.

Reimagine Middle Branch (RMB) is being led by the City of Baltimore and the South Baltimore Gateway Partnership (SBGP), working in collaboration with Parks & People, SB7 Coalition, State agencies, and a variety of other local organizations with input from over 500 community members. The Reimagine Middle Branch Plan cites living shorelines, wetlands, and forest buffers as addressing and improving the following: bacteria, nitrogen & phosphorus, sediment & suspended solids, biodiversity, and heat reduction. Key plant species include: Seashore Saltgrass, Smooth Cordgrass, Shoreline Sedge, Smooth Alder, American Holly, Bitternut Hickory, Southern Red Oak, Sweetbay Magnolia, and Big Bluestem. The riparian buffers created from the gradient of marsh to maritime and terrestrial forest are transforming a harsh shoreline susceptible to coastal hazards into an ecologically diverse ecosystem. With effects from climate change intensifying, these buffers form a natural barrier against sea level rise, erosion, flooding, and extreme weather events.

MBRI has demonstrated success in advancing restoration in the Baltimore Harbor Watershed with support from Baltimore City, Baltimore County, the State of Maryland, the National Oceanic and Atmospheric Administration (NOAA), the National Fish & Wildlife Foundation (NFWF), and the Federal Emergency Management Agency's Building Resilient Infrastructure and Communities (BRIC) funds. The Hanover Street Wetlands, a 7.3-acre wetland restoration project, is the first living shoreline section of MBRI to reach construction and represents a step towards fulfilling RMB's commitment to protecting and connecting South Baltimore's shoreline and communities. Completion of Hanover Street Wetlands and construction commencement of an additional three sites is anticipated in 2025.

Critical to the success of MBRI are strong partnerships with local government, deep connections and engagement with the Middle Branch neighborhoods, and open communications with funders and regulators. By prioritizing both community and environmental needs, restoration projects are able to meet the goals of RMB. Innovative fundraising and utilizing a variety of sources to advance MBRI has increased commitment of all involved to seeing the projects through to completion while engaging a wider audience and adding value to the final product.



Links:

Reimagine Middle Branch - The Plan

SBGP & Elected Leaders Make Major Announcement on Regional Resiliency Initiative

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Climate Crew, Greater Baltimore Wilderness Coalition: Maryland

This case study highlights a community-based resilience program to plant trees, mitigating the impacts of increased storm events and flooding and benefiting fish, wildlife and plant life. The project uses tree species selected based in part on their ability to adapt to a changing climate, supporting ecosystem resilience.

Greater Baltimore Wilderness Coalition is an inclusive network of partners co-leading transformational green infrastructure solutions across Central Maryland. Using a collective impact model, the Coalition focuses on equity, biodiversity, discovery of nature, climate resiliency, and health, with a vision of people and nature thriving together in every community across Central Maryland.

The first project of the Greater Baltimore Wilderness Coalition (GBWC) aimed to develop a regional vision for climate resilience by identifying key green infrastructure investments across the Patapsco, Patuxent and Gunpowder River watersheds. To implement these priorities, GBWC worked with Chesapeake Conservancy and partners in 2023 to launch a Green Workforce Development pilot program called the Maryland Climate Crew Network. This is a joint effort between government, non-profit, and industry partners, and is currently funded through a grant from the National Fish and Wildlife Foundation. The goal of the Climate Crew Network is to focus restoration and resilience work in under-resourced communities. Simultaneously, it provides unemployed individuals and young adults from these communities with robust, multi-faceted green job training, field experience, and industry exposure. Through this program, the Coalition established a green jobs network supporting three workforce development hubs in Central Maryland - Grow Home in South Baltimore, Howard EcoWorks in Howard County, and Defensores de la Cuenca in Prince George's County. The hub organizations are responsible for recruiting and managing a cohort of participants

> "So many people are eager to help their communities and the environment … They just need a helping hand to learn the skills and find the best-fitting careers and employers."
>
> — Ashley Traut, Senior Advisor for GWBC

from their local communities and for ensuring that participants receive comprehensive training in urban environmental restoration, as well as other essential life and career skills. Much of this training is hands on, with crews planting thousands of trees each year.

Under the Coalition's resilience pillar, GBWC's partners seek to mitigate the impacts of climate change including sea level rise, flooding, stronger coastal storms, warmer temperatures, and drought, by creating a protected regional network of nature-based solutions (green infrastructure) including forests, wetlands, parks, rain gardens, and urban tree canopy. This network will help absorb rainfall, reduce flooding and erosion, provide cleaner air and water, and lower temperatures, supporting community health by lowering asthma rates and heat stress and providing space for community gathering and recreation.

Projects are largely focused on mitigating the impacts of climate change while improving community health and resilience, specifically in disadvantaged communities. One of the primary focuses involves increasing urban tree canopy. Using tools such as the Tree Atlas created by the Northern Institute of Applied Climate Science, American Forests' Tree Equity Map, and the Maryland Department of the Environment's Environmental Justice Screening Tool, aids the program partners in identifying communities with low canopy cover and in selecting tree species that show the greatest likelihood of adapting to climate change while also providing the greatest insect and wildlife value and public health benefits. Program partners also engage in the installation, enhancement, and maintenance of riparian buffers and other types of green infrastructure to mitigate climate impacts such as stormwater runoff, flooding, and erosion and build resilience.

To learn more about the accomplishments of the three Climate Crew hubs, read this release from the Greater Baltimore Wilderness Coalition.

Photos: Howard EcoWorks | Crews from the Climate Crew Hub Howard EcoWorks collect seeds for future plantings at CCBC Catonsville

Photos: Maryland DNR | Climate Crew Network trainees attend a live stake collection hosted by Maryland DNR, the Chesapeake Conservancy and Green Landing Nursery

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CommuniTree Program: Cacapon Institute and Town of Romney: West Virginia

This case study highlights a community-based resilience program to plant trees, mitigating the impacts of increased storm events and flooding and benefiting fish, wildlife and plant life. The project sites tree plantings to address stormwater management and stream temperature.

The Town of Romney has several tree canopy and green infrastructure projects; this case study highlights the Cacapon Institute's CommuniTree program. The WV Department of Environmental Protection Chesapeake Bay Program supported by the Chesapeake Bay Trust is implementing Romney's Urban Tree Canopy Project. This $120,268 project, supported by the Infrastructure Investment and Jobs Act, will advance the U.S. EPA Chesapeake Bay Program's Forest Buffers, Urban Tree Canopy, and Wetlands goals.

This project will see the installation of 150 age- and species-appropriate trees in the Town of Romney, WV. Fifty of these trees will be installed in impervious surfaces such as sidewalks and parking lots to assist in stormwater management and biofiltration efforts which address climate threats of increased stormwater and flooding and changes to water supplies. The remaining trees will be strategically placed around the Town to maximize the urban canopy coverage in otherwise barren parts of Romney. The tree plantings are mapped in the Cacapon Institute Project Inventory. This effort will not only have tremendous health and aesthetic benefits for the population of Romney, but the increase in urban canopy will be specifically implemented to maximize the water filtration and water cooling effects for stormwater that flows less than one mile into the South Branch of the Potomac River from any point in Romney.

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Tree plantings using native species for the local area assist with the mitigation of climate change impacts including flooding, erosion, and increased stream temperatures. Allocating tree plantings over impervious areas not only helps regulate air temperature but improves air quality and the overall aesthetics for the community.

Photos: Town of Romney

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30 by 30 Stream Delisting: Pennsylvania

This case study highlights a data-driven decision-making program to restore riparian forest buffers, mitigating the impacts of increased storm events and flooding and benefiting fish, wildlife and plant life. The project aims to build continuous, intact forested buffers along headwaters streams.

The objective of Pennsylvania's "30 by 30" stream delisting strategy is to restore 30 agriculturally-impaired streams to "delist" them from the state's impaired waters list by the year 2030. Originating in Pennsylvania, the Chesapeake Conservancy and a collaboration of local partner organizations at the federal, state, and local level use a collaborative, GIS-based prioritization to accelerate implementation of best management practices (BMPs) in the places that matter most.

The installation of riparian forest buffers and barnyard BMPs while addressing drainage issues throughout the property also helps address key climate vulnerabilities in their community. The local climate resilience benefits from riparian forest buffers include local flood and erosion mitigation, increased habitat for native species, and surface temperature control, all of which are key to restoring in-stream habitat toward delisting.

In the Pequea Creek watershed in Lancaster County, local partners led by the Lancaster Clean Water Partners focused on a small tributary—referred to as Catchment 92—with a 232-acre catchment area southeast of Lancaster City with a heavy agricultural presence. The stream catchment was prioritized **based on high-resolution land use/land cover to identify forest buffer planting opportunity areas** where full farm restoration could improve the mile-long tributary. By geospatially identifying these opportunity areas, local partners were able to strategize outreach and technical support opportunities and work with the landowners within the geography. As issues are addressed and the riparian areas are restored, the increased shade coverage helps maintain lower temperatures for the stream, allowing aquatic organisms to thrive in their natural habitat and avoid extreme temperature fluctuations associated with climate change. Partners in Lancaster County use the Collaborative Watershed Mapping Tool to enhance partnerships and work toward common priorities and goals.

In 2023, partners working to restore farmland and riparian forest buffers in Catchment 92 won the *2023 Places2040 Planning Leadership Award* from the Lancaster County Planning Commission for their efforts to meet the goals of Places2040, the Lancaster County Comprehensive Plan.

Read more: Clean Water Projects in the Pequea Creek Watershed
Data-based decision-making highlighted in the Collaborative Watershed Mapping Tool

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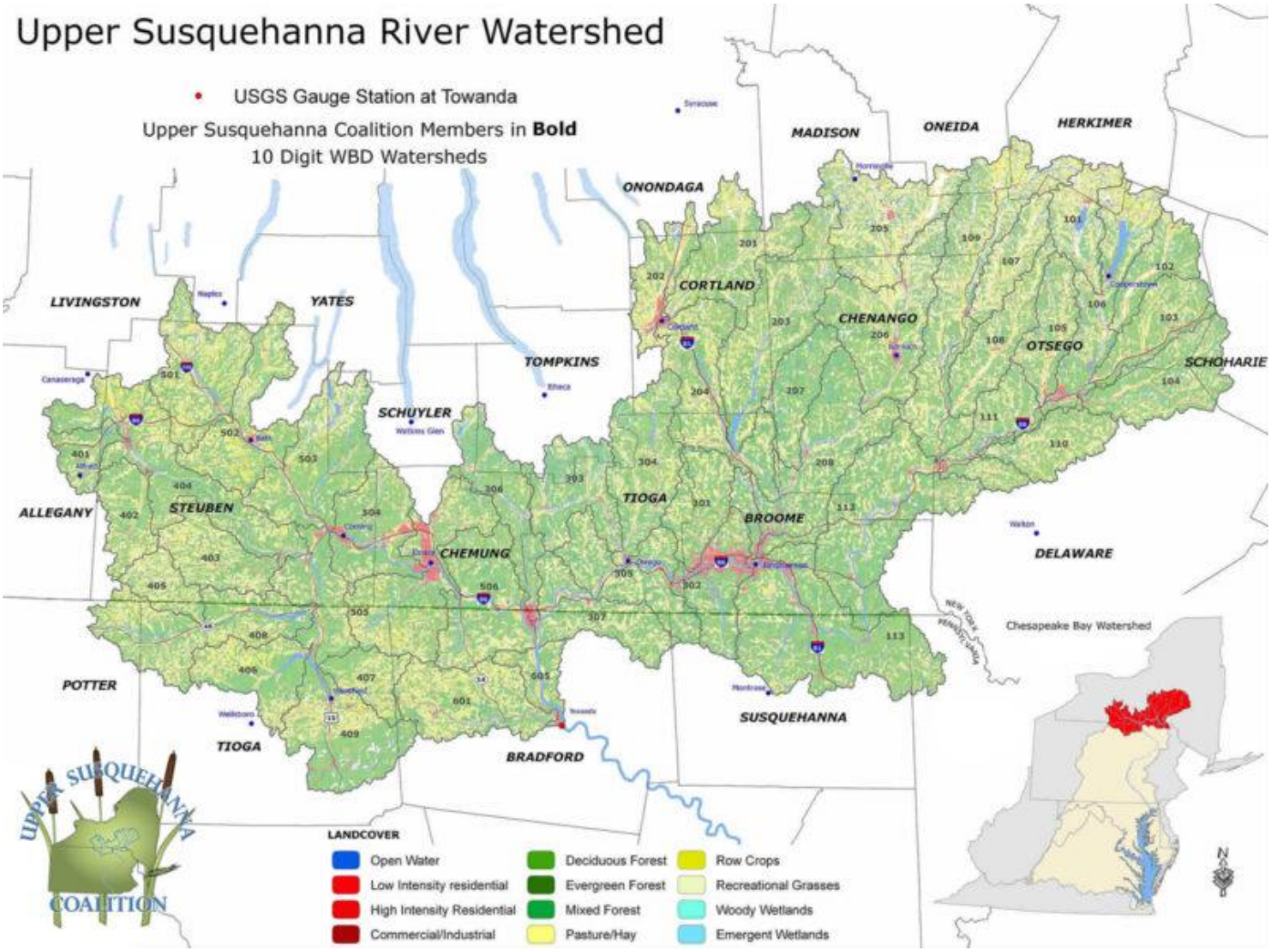
Upper Susquehanna Coalition Water Quality Program: New York and Pennsylvania

This case study highlights a data-driven decision-making program to mitigate the impacts of increased storm events and flooding and to benefit fish, wildlife and plant life. The project uses landscape and social data to prioritize projects that improve climate resiliency.

The Upper Susquehanna Coalition (USC) consists of 22 Soil and Water Conservation Districts and is a collaborative approach to improve local water quality and natural resources in the New York and Pennsylvania portion of the Upper Susquehanna River Watershed. Using a "Multiple Barrier Approach" (MBA), the Coalition addresses issues watershed-wide from the source, across the landscape, and in the stream while programmatically responding to issues in the watershed. In 2017, the coalition developed a series of datasets to identify climate change resiliency-oriented best management practices (BMPs) in the watershed. These BMPs primarily focus on wetland and riparian restoration opportunities.

To improve climate resiliency, these BMPs focus on flood storage, reducing in-stream temperatures, and preventing erosion in the region. Practice locations were identified within agricultural settings, but also throughout the rural landscape, as flood attenuation and other benefits can be achieved throughout the landscape. The USC prioritizes BMP implementation based on landscape position, community/farm needs, and landowner willingness in order to assist farms with climate adaptations. The framework for the coalition provides the ability for local communities to work independently or collaboratively to meet their respective goals.



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