



D. Hoffman

Presented to the Hudson River Estuary Management Advisory Committee
in accordance with the provisions of the Hudson River Estuary Management Act, NYS Environmental Conservation Law Section 11-0306



Department of
Environmental
Conservation

2024 ANNUAL HUDSON RIVER ESTUARY COORDINATOR'S REPORT

Kathy Hochul, Governor | Amanda Lefton, Commissioner



Wendy Blanchard

MESSAGE FROM DEC'S COMMISSIONER

Dear friends and colleagues,

I am pleased to present the *2024 Annual Hudson River Estuary Coordinator's Report*, highlighting the important work DEC is undertaking to restore and enhance the ecological health of the Hudson River estuary. This diverse and valuable ecosystem supports essential commercial and recreational species that depend on the estuary's nursery habitats. Globally rare freshwater tidal marshes, mudflats, and significant habitats support an extraordinary diversity of life throughout the watershed.

In 2024, the Hudson River Estuary Management Program worked closely with local communities, government agencies, and other stakeholders on numerous important initiatives. These collaborative efforts improved water quality in the tidal Hudson and its tributaries, advanced natural shoreline restoration practices, monitored and responded to invasive species, and helped communities adapt to climate change impacts.

More than \$4.6 million from the New York State Environmental Protection Fund supported 26 Estuary Program grants and 13 research projects and provided technical assistance to 31 municipalities and 3 counties throughout the Hudson Valley. These funded projects included climate-adaptation plans, water quality monitoring, fish habitat restoration, river access improvements, tree plantings, and field education programs—creating opportunities for hundreds of volunteers to contribute to

the health of the estuary. This funding leveraged more than \$7.8 million in additional grants and resources from local governments, State and federal agencies, and environmental organizations.

The health of the Hudson River and its tributaries, the protection of vital aquatic habitats, the conservation of natural areas within the watershed, and an engaged public remain critical to maintaining the estuary's intricate web of life and ecosystem management. I am proud of all that has been accomplished over the past year and I'm grateful to our dedicated staff, our partners, and the communities we serve for their continued support and collaboration. DEC looks forward to building on this work to implement a shared, targeted, and inclusive vision for the future of this vital resource.

Sincerely,



Amanda Lefton, Commissioner

June 2025

OUR MISSION

The Department of Environmental Conservation's (DEC) Hudson River Estuary Management Program includes the Hudson River National Estuarine Research Reserve (HRNERR), Hudson River Estuary Program (Estuary Program), Hudson and Delaware Marine Fisheries, and regional marine habitat. Our mission is to protect, preserve, restore, and enhance the Hudson River estuarine district. Our staff and partners work to achieve the goals of the [Hudson River Estuary Action Agenda 2021–2025](#):

A Vital Estuary Ecosystem

- Sustainable Estuarine Fisheries
- Robust River Habitats
- Clean Hudson River Water

A Thriving and Resilient Watershed

- Healthy Tributaries
- Climate-Adaptive Communities
- Conserved Natural Areas

People Living Well with Nature

- An Informed and Engaged Public
- An Accessible Hudson River for People of All Ages and Abilities

Hudson River Estuary Management Advisory Committee

Stuart Findlay, Cary Institute of Ecosystem Studies, Committee Chairman

Jon Kramer, Hudson River Foundation, Committee Co-Chair

Dan Shapley, Riverkeeper, Committee Secretary

Allan Beers, Rockland County Dept. of Environmental Resources

Corey Allen, Habitat for Humanity of Greater Newburgh

Vacant, Scenic Hudson

Jim Bonesteel, Rensselaer Plateau Alliance

Carla Castillo, Hudson Valley Regional Council

Scott Croft, Hudson River Boat & Yacht Club Association

Martin Daley, Capital District Regional Planning Commission
David Decker, Constitution Marsh Audubon Center and Sanctuary

Todd Erling, Hudson Valley AgriBusiness Development Corporation

Walter Garschagen, Sea Tow Central Hudson

Oded Holzinger, Groundwork Hudson Valley

Karen Imas, Waterfront Alliance

Lucille Johnson, Vassar College, and the Environmental Consortium of Colleges & Universities

Suzette Lopane, Westchester County Department of Planning

John Mylod, Commercial fisherman

Peter Park, Farmingdale State College

Ed Skorupski, Recreational angler and outdoor writer

Richard Slingerland, Historic Hudson River Towns

Steve Stanne, Hudson River Sloop Clearwater

Emily Svenson, Hudson River Watershed Alliance

Shino Tanikawa, NYC Soil & Water Conservation District

Ex-officios:

Peter Brandt, U.S. Environmental Protection Agency

Diana Carter, NYS Office of Parks, Recreation and Historic Preservation

Chris DeRoberts, New York Power Authority

Noreen Doyle, Hudson River Park Trust

Joshua Hunn, NYS Department of State

Vacant, Hudson River Valley Greenway

Jessica Kuonen, NY Sea Grant

Rob Pirani, New York–New Jersey Harbor & Estuary Program

Audrey Van Genechten, NYS Department of Health

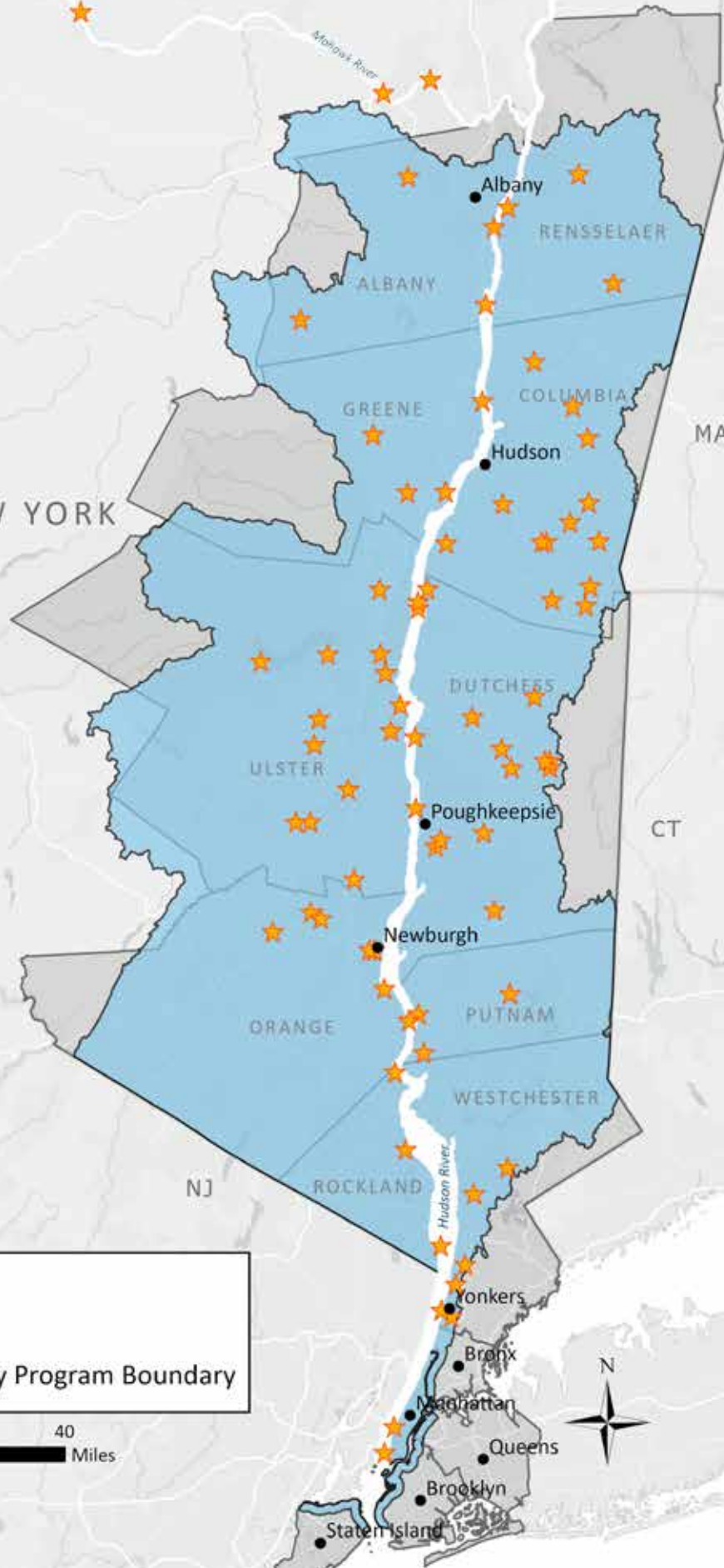
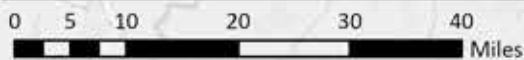
Peter Weppeler, U.S. Army Corps of Engineers

LOCAL FUNDED PROJECTS 2024

In 2024, DEC's Hudson River Estuary Management Program awarded more than \$1.8 million for **26 Estuary Program grants**. **Nearly \$1.5 million, 79%, of this funding** went to Disadvantaged Communities or Potential Environmental Justice Areas. In addition, the Estuary Program supported **13 research projects** and provided hands-on technical assistance to **31 municipalities and 3 counties** in locations throughout the Hudson Valley. More than **\$4.6 million** in New York State Environmental Protection Fund (EPF) supported these projects, which included tree plantings, climate-adaptation plans, water quality monitoring, fish habitat restoration, river access improvements, and education programs. This funding leveraged more than **\$7.8 million** in grants and funding from local governments, State and federal agencies, and environmental organizations.

Legend

- ★ Project Locations
- ▭ Hudson River Estuary Program Boundary



BY THE NUMBERS

- **MORE THAN \$4.6 MILLION** in EPF funding supported climate-adaptation plans, water quality monitoring, fish habitat restoration, river access improvements, tree plantings, and field education programs.

- **1,481 LOCAL DECISION-MAKERS** RECEIVED TRAINING on best management practices for climate adaptation, watershed protection, conservation and land use, and river habitat conservation.

- **2,145 PEOPLE** VOLUNTEERED to count eels, plant trees, record fishing data for striped bass, and help amphibians cross roads.

- **2024 MARKED THE 46th year of tracking** and monitoring the dynamics of **migratory fish** populations in the Hudson River estuary.

- **1,221 VOLUNTEERS** counted and released **226,751** eels contributing **3,263** hours of volunteer time.

- **SUBMERGED AQUATIC VEGETATION (SAV)** monitoring volunteers documented presence or absence of SAV at 153 locations within 11 sites throughout the estuary. SAV was positively identified in **28%** of the observed locations.

- **TREES FOR TRIBS** (tributaries) staff and **469** volunteers planted more than **3,197 NATIVE TREES** and shrubs, restoring **3 acres** on more than **1 mile** of streams.

- **16 COMMUNITIES** have plans underway or completed to **PROTECT THE WATERSHEDS** of their drinking water supplies and **9 watershed groups** worked with us to achieve regional stream conservation goals.

- **60% OF COMMUNITIES** in the Hudson Valley have taken the **Climate Smart Communities** pledge, and **32%** are **Climate Smart certified**.

- **3 MUNICIPALITIES** created new or updated conservation practices, plans, and policies, including **ALL 3 IN PRIORITY CONSERVATION AREAS**; **37%** of municipalities with **Natural Resources Inventories** (NRIs) have used them to implement plans or policies.

- **13 NEW RESEARCH PROJECTS** will inform conservation actions for fisheries management, watershed protection, and climate justice.

- **14,000 VISITS WERE MADE** to the Hudson River Environmental Conditions Observing System website hrecos.org, **16 HYDROLOGICAL STATIONS** and **7 METEOROLOGICAL STATIONS** collected HRECOS data throughout the Hudson and Mohawk rivers.

- **66,500 PEOPLE** subscribe to the e-newsletter **Hudson RiverNet**, **18,800** subscribe to the **Hudson River Almanac**, and **OVER 7,560** people subscribe to our *Conservation and Land Use*, *Amphibian Migrations & Road Crossings*, and *Climate Adaptive Communities* bulletins.

MANAGING ESTUARINE FISH

DEC's [Hudson and Delaware Marine Fisheries](#) biologists have been managing the migratory and resident fishes of the estuary since the 1980s through numerous long-term monitoring surveys. Long-term data are extremely valuable for documenting population trends over time, as they can reveal patterns in abundance not evident from single-survey events or short-term studies. Migratory species are managed in collaboration with other coastal states through the [Atlantic States Marine Fisheries Commission](#) (ASMFC).



Natural Resources Deputy Commissioner Katie Petronis and volunteer John Kogan hold an Atlantic sturgeon that has been weighed, measured, and scanned for tags. NMFS Permit 20340.

Acoustic River Array Aids Fish Research

DEC's Hudson River Fisheries Unit and Delaware State University have been maintaining an acoustic river-wide array since 2009. The array consists of 68 receivers from New York Harbor to the Federal Dam at Troy and detects fish that are equipped with a unique acoustic tag. The receivers are hung on United States Coast Guard buoys, and when the fish



swim past the equipment the receiver stores the tag number, date, and time (like E-ZPass for fish). The data help us understand how fish move through the Hudson River and allow us to identify, protect, and restore important habitat.

A Hudson River Fisheries biologist deploys a winter receiver in the Hudson.

During fall 2024, we deployed special ice-resistant receivers to better understand winter movement and use of the river during a vulnerable time of year. The array will be retrieved in spring 2025 and will be redeployed in the fall for another winter of data collection. The year-round array will inform important research on a variety of Hudson River species, including Atlantic sturgeon, striped bass, blueback herring, and American eel.

Studying American Eel Movement in the Hudson River Estuary

American eels are catadromous fish, meaning they hatch in the ocean, spend most of their lives in fresh water, and migrate back to the ocean to spawn. Throughout their complex life cycle, they undergo dramatic transformations, with each stage marked by distinct physical characteristics and names.



Photo by ElizaBeth Streifeneder

Fish biologist Jessica Best implanting an acoustic tag into an eel.

Eels begin life as transparent leaf-shaped larvae called leptocephali. After about a year riding ocean currents, they transform into glass eels about two inches long. These glass eels enter estuaries and waterways, developing pigmentation to become elvers and later maturing into yellow eels that may spend decades in inland waters. Upon reaching sexual maturity, they transform into silver eels

with enlarged eyes, darker backs, white bellies, and elongated fins. The silver eels then migrate back to the Sargasso Sea to spawn.

The Hudson River Fisheries Unit is studying these mysterious silver eel movements by tagging individuals and tracking them through a river-wide acoustic array and coastal receivers. This research aims to identify which environmental factors trigger their migration and which habitats they use during their final journey—critical information for protecting this remarkable species.

Seining for Striped Bass: 45 Years of a Hudson River Survey

Each summer as the migratory striped bass spawning run tapers off, juvenile bass hatch from eggs in the upper reaches of the Hudson River estuary and begin a downriver journey of growth and survival. These tiny fish quickly reach several inches in length over a few months, then spend time in the lower estuary and coastal ocean until they are large enough

to join the coastal migratory stock. We've kept track of these juvenile striped bass and other estuarine fish with the help of dozens of technicians and biologists in the Hudson River Fisheries Unit who have pulled in a beach seine over 8,300 times during the past 45 years.



On a beautiful mid-October sampling day, DEC technicians pull in the 200-foot seine at a Nyack beach.

In 1979, DEC began monitoring annually for young-of-year (YOY) striped bass in the Haverstraw and Tappan Zee regions of the Hudson River. The survey uses a 200-foot small-mesh net deployed in a horseshoe shape by boat to collect juvenile striped bass and other juvenile estuarine species—such as white perch, Atlantic menhaden, and Atlantic silversides—at 13 stations throughout the sample region. Before returning the fish to water, they are identified and counted, and a subset is measured. Since 1979, DEC staff have measured over 300,000 fish during striped bass beach seining.



Yearling striped bass caught while seining in Haverstraw Bay in September.

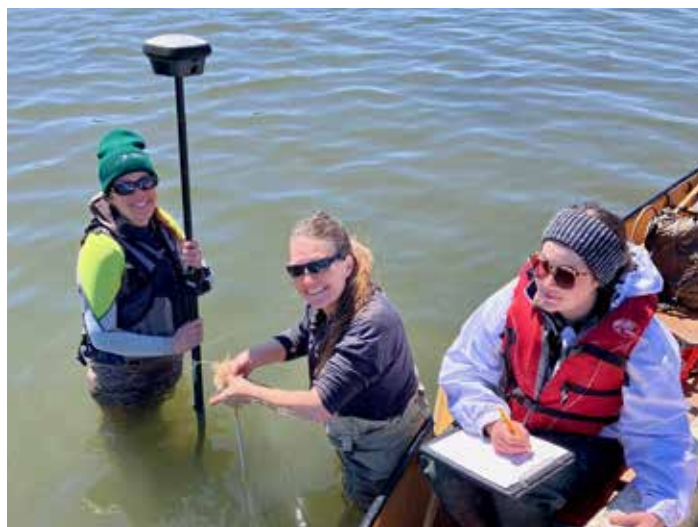
YOY survey data are used to generate a juvenile abundance index for Hudson River striped bass. [ASMFC](#), responsible for managing striped bass and other migratory Atlantic Coast species, uses this index along with data from other surveys to guide regulations that will ensure a robust striped bass population for years to come.

ROBUST RIVER HABITATS

Intertidal wetlands and shallow water habitats in the Hudson River estuary contain richly diverse but distinct plant communities that are home to a great variety of species. Conserving, protecting, and enhancing river and shoreline habitats assures life cycles of key species are supported to sustain a healthy ecosystem.

Restoring Submerged Aquatic Vegetation

[HRNERR](#) is partnering with the University of Maryland Center for Environmental Science to identify effective methods for growing, transporting, and planting native Hudson River [SAV](#) in tidal areas. The project goal is to develop methods to support future SAV and shallow-water restoration efforts. Periodic mapping and inventory of SAV in the Hudson River since the late 1990s has demonstrated a net loss of about 1,800 acres over the last 20 years.



Restoring submerged aquatic vegetation

In summer 2023, 20 native plants were transplanted near Stockport Creek where SAV had been documented in the past. By the end of summer, new plant material appeared at the planting locations, suggesting turions (buds) planted below the ground survived and grew.

New pilot plantings took place in April 2024. SAV in different stages of development (seeds and turions) were planted in separate burlap bundles along a transect from shallow to deeper water. In June, mature plants were bundled in burlap and weighted down with topsoil or gravel, then tossed into the water at three sites to test the effectiveness of each substrate and planting method. By mid-August, vegetation had established at two of three 'toss' method sites. A larger restoration experiment is planned for 2025 based on these findings.

Improving Resiliency in Water Quality Monitoring

[HRNERR](#) maintains and operates five long-term continuous water quality monitoring stations in the Hudson River Estuary as part of a national initiative called the [System-Wide Monitoring Program](#). These stations also are part of [HRECOS](#), a network of 15 other monitoring stations distributed along the Hudson and Mohawk Rivers. The data are available near [real-time online](#) and are important for scientists, educators, resource managers, and people interested in Hudson River conditions. Water quality data has been collected continuously since 1995 and is essential to tracking change over time.



HRNERR research staff remove a broken monitoring tube at Bear Mountain.

In 2024, HRNERR researchers replaced broken and degrading PVC instrument tubes at the Bear Mountain and Ferry Landing stations with durable, $\frac{1}{8}$ th-inch-thick aluminum tubes. Both are coated with an antifouling paint to help prevent encrusting barnacles or algal buildup. These new tubes are expected to better withstand impacts from floodwaters, ice jams, river debris, and storm events. Investing in stronger, more resilient infrastructure will allow researchers to continue to provide high-quality continuous water quality data with minimal interruption.

Upgrades to Tidal Monitoring Equipment

In July 2024, HRNERR staff completed an upgrade to tidal monitoring equipment located at [Turkey Point State Forest](#) in Saugerties. This station, constructed in 2014 with funds from the Hudson River Estuary Program, was included in 2017 by the [National Oceanic and Atmospheric Administration](#) (NOAA) as a partner station in the [National Water Level Observation Network](#). Upgrades to the station include the addition of a microwave water-level sensor that delivers greater accuracy of water level and tidal predictions in the

northern portions of the estuary—essential for safe maritime navigation, scientific research, and analysis of climate change and sea level rise.

In December 2024, NOAA and DEC established the [Hudson River Estuary Physical Oceanographic Real-Time System \(PORTS®\)](#), which incorporates the water level station at [Turkey Point](#). The [Hudson River Estuary PORTS®](#) is the second system of its kind in New York State—the first is located in the lower portion of the estuary and New York Harbor, which operates as the [New York–New Jersey Harbor PORTS®](#).

The system will fill critical geographic gaps in the state’s maritime data and expands coverage to include the tidally influenced portions of the Hudson River north of the Mario M. Cuomo Bridge to the head of tide at the Federal Dam in Troy. Hudson River Estuary PORTS® will support both safe navigation and natural resource decision-making, giving commercial mariners, recreational boaters and anglers, resource managers, and coastal planners access to real-time water-level data and online tools for the upper reaches of tidal estuary.

HEALTHY TRIBUTARIES

The health of the Hudson River estuary depends on its many tributary streams and rivers, which provide essential habitat and drinking water for millions. The Estuary Program offers funding and technical assistance for protection and restoration projects through partnerships with the [Hudson River Watershed Alliance](#); the [New York State Water Resources Institute](#); and [NEIWPC](#), formerly known as the New England Interstate Water Pollution Control Commission.

Sprout Brook Dam Removal Restores Fish Spawning Habitat

In November, [Hudson Valley Stream Conservancy](#) removed a small, obsolete concrete dam on Sprout Brook in the Town of Cortlandt. The dam was the first barrier to springtime fish migration of river herring and American eel from the Hudson River estuary into the tributary spawning grounds of Sprout Brook. Removing the dam restores an additional 1.25 miles for spawning fish and improves aquatic habitat connectivity, natural stream flow, and water quality.

The dam removal and stream restoration project were made possible with \$225,760 in funding from the Hudson River Estuary Program through two Tributary Restoration and Resiliency Grants, with additional funding from the Hudson River Foundation and Scenic Hudson.



On George Road in the Town of Ghent, a culvert that created a barrier to fish movement was replaced with a bridge on a tributary to Black Creek.

Watershed Characterizations Leads to Management Plans

From 2022 to 2024, the [Hudson River Watershed Alliance](#) worked with local advisory committees in collaboration with DEC's Estuary Program staff to complete two watershed characterizations for the Sparkill Creek and Punch Brook–Roeliff Jansen Kill watersheds. A watershed characterization is the initial step in formulating a watershed management plan. This process includes gathering data, creating maps specific to the watershed, and summarizing findings in detailed reports.

The [Punch Brook-Roeliff Jansen Kill Watershed Characterization Report](#) and [Sparkill Creek Watershed Characterization Report](#) provide valuable insights into the current conditions of land and water resources, highlighting the physical, ecological, and human dimensions of each watershed—essential aspects for effective management. Insights gained from these pilot projects will be compiled into a regionally applicable guidance document on watershed characterizations next year that will be prepared by the Hudson River Watershed Alliance with funding from an Estuary Program Stewardship grant.

Improving Road-Stream Crossings

Two priority culvert removal and replacement projects moved forward in 2024 to reconnect fish habitat and restore free-flowing Hudson River tributaries. Both project planning and engineering designs were funded by NEIWPCG grants from 2019 and 2020 administered by the Estuary Program. Construction in 2024 was funded through Water Quality Improvement Program grants.

On George Road in the Town of Ghent, a culvert that created a barrier to fish movement was replaced with a bridge on a tributary to Black Creek, providing access to three and a half miles of upstream habitat for American eel. On Haddock Hill Road in the Town of Chatham, a culvert that was a barrier to aquatic species was replaced, reconnecting one-half mile of habitat for species of concern.

Planting Native Trees to Protect Streams

[Hudson Estuary Trees for Tributaries](#) (Trees for Tribs) offers free native trees and shrubs for planting along streams in the Hudson River Valley. In 2024, Trees for Tribs planted over 3,200 native trees and shrubs at 26 sites along a mile of streams with the help of more than 400 volunteers.

Trees planted along streams help protect water quality, fish, and wildlife, and also reduce erosion and flooding. They provide an opportunity for the public to learn more about native plants and how they can benefit streams and may also help to reduce long-term maintenance costs.



Volunteers planted dozens of trees at Chauncy Park in Dobbs Ferry.

Ten of these plantings took place on lands open to the public, where municipal staff, land trusts, and local volunteer groups teamed up to help plant more than 2,050 plants. [Nyquist-Harcourt Preserve](#) in New Paltz, [Mawignack Preserve](#) in Catskill, [Hampton Manor Lake Park](#) in East Greenbush, Chauncy Park in Dobbs Ferry, and [Tibbets Brook Park](#) in Yonkers were among the locations where large plantings took place.

Indian Brook Gorge Conservation Overlay

With grant funding and support from the Estuary Program, five Hudson Valley municipalities have established a pioneering inter-municipal conservation overlay zone. This collaborative effort is designed to protect water quality within the Indian Brook–Croton Gorge watershed. The Indian Brook Reservoir serves as a primary water source for the Village of Ossining, while an aquifer in the lower Croton River supplies drinking water to the Village of Croton-on-Hudson. Additionally, the Croton River is a vital tributary to the Hudson River. Explore the [interactive map of the Indian Brook–Croton Gorge Watershed Protection Overlay District](#) to learn more.

CLIMATE-ADAPTIVE COMMUNITIES

Capacity building is an essential foundation for climate adaptation and resilience actions at the local level. The Estuary Program works with regional partners to deliver education, training, technical assistance, and peer-learning opportunities for local leaders to prepare for current and future climate impacts, such as extreme storms, flooding, sea level rise, extreme heat, and drought. To learn more, visit the [Climate-adaptive Communities](#) page on DEC’s website or the [New York State Water Resources Institute at Cornell University website](#).

Building Adaptive Capacity

In 2024, the Estuary Program piloted the [Climate Adaptation Planning Institute Adaptation Program](#) (CAPI Adapt) in partnership with the Hudson Valley Regional Council and [ICLEI USA, the U.S. chapter of the International Council for Local Environmental Initiatives](#). CAPI Adapt has provided technical assistance to 15 municipalities in Dutchess and Westchester counties to develop climate vulnerability assessments, prioritize adaptation strategies, and integrate these strategies in municipal Climate Action Plans. Municipal leaders learned from resiliency experts and peers to create local plans based on the latest climate science and adaptation planning guidance.



The Hudson waterfront at Long Dock Park in the City of Beacon includes many flood resiliency measures.

The [Hudson Valley Flood Resilience Network](#) (FRN) is a partnership with the [Hudson River Watershed Alliance](#), [Scenic Hudson](#), [NY Sea Grant](#), and CBI ([Consensus Building Institute](#)), with support from the Estuary Program. FRN convenes municipal leaders from 23 watershed communities to discuss current and future flood risks, local resilience strategies, and lessons learned. In 2024, the network held three virtual meetings and met in person at Long Dock Park in Beacon for a tour showcasing flood resiliency measures.

The network also established working groups focused on funding for municipalities and flood emergency communications, and is working to expand membership—which is free for municipalities and professional experts.

The Estuary Program also provides funding for the [Climate Resilience Partnership](#) of Cornell Cooperative Extension (CCE). Across six counties, CCE partners with local municipalities to complete [Climate Smart Communities](#) resilience actions and certification. In 2024, CCE helped 16 communities complete 18 resilience actions and assisted 8 communities in becoming Climate Smart certified. Resilience actions included culvert assessments for flood mitigation and habitat connectivity, flood preparedness guides and outreach, heat emergency plans, local policy gap analysis, comprehensive planning, and more.

Advancing Climate Resilient Waterfront Design

In partnership with NEIWPCC, the Estuary Program has awarded funding to advance climate-resilient waterfront projects in two Hudson River communities. The City of Hudson received \$200,000 and the Town of Bethlehem received \$184,000 to develop final engineering and construction designs for their respective riverfront parks.

These projects build upon Cornell University Department of Landscape Architecture's [Climate Adaptive Design \(CaD\) Studio](#) and DEC's Sustainable Shorelines initiatives. Since 2015, the CaD program has worked with nine municipalities to create resilient waterfront designs that enhance habitat value while reducing flood impacts.

[Forest habitat in the Esopus/Lloyd Wetlands and Ridges significant biodiversity area](#)

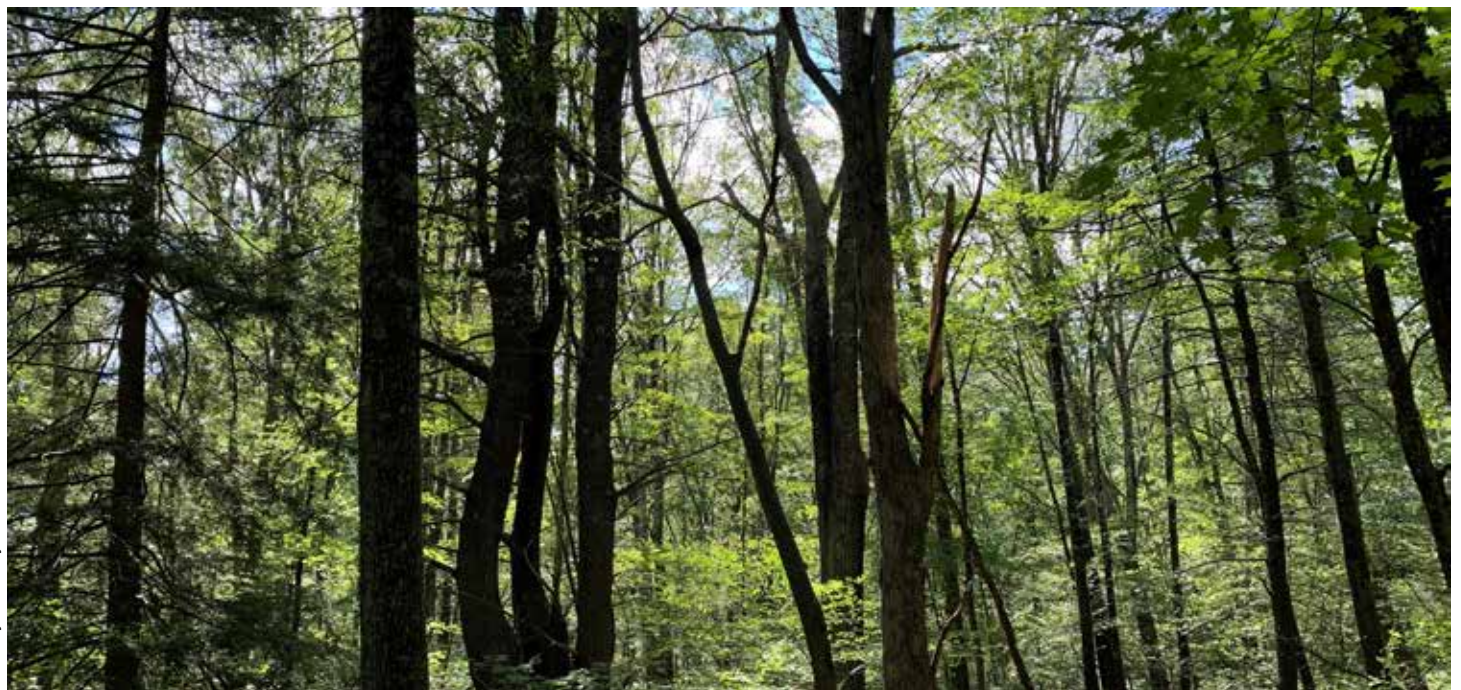


Photo by L. Heady

For the City of Hudson's Riverfront Park, Assemblage Landscape Architecture will create designs that maintain water-based recreation while transforming the shoreline into a dynamic intertidal marshland. This nature-based approach will help the park adapt to projected sea level rise and increased flooding from climate change.

At Henry Hudson Park in Bethlehem, Greenman-Pedersen, Inc. will focus on shoreline stabilization and ecological enhancement, working to balance environmental health, climate resiliency, and recreational opportunities.

Both projects will advance from conceptual designs to detailed engineering plans that include all materials needed for permitting and construction. The final designs will incorporate extensive stakeholder input to enhance public access while implementing nature-based solutions to protect against flooding and intense storms associated with climate change.

CONSERVING NATURAL AREAS

The Estuary Program helps protect the remarkable biodiversity of the Hudson River watershed through conservation of significant natural areas and wildlife habitat. In collaboration with Cornell University, we help partners and municipalities create plans and policies that incorporate current scientific information, conservation principles, and local and regional biodiversity priorities. Much of our success is due to collaboration with communities, land trusts, and conservation partners from across the estuary watershed. To learn how to get involved, visit [Conservation Planning in the Hudson River Estuary Watershed](#).

Building Connections Through Partnership

There are many complex layers to conservation and land use in the Hudson River estuary watershed that involve thousands of individual and local government decision-makers and include ecological systems that span political and property boundaries. As communities create plans and policies to address their local needs, many are also grappling with the broader issues of a changing climate, threats to biodiversity, and a housing crisis. To rise to these challenges, strong partnerships and continued learning are essential.



Photo by L. Heady

Neighbors of the Onondaga Nation with Haudenosaunee facilitators at Norrie Point Environmental Center in Staatsburg for the Witness to Injustice program in November

While we plan for the region's future, we cannot forget the history of Indigenous peoples who lived here for millennia and called the Hudson River Muhheacannituck. In fall 2024, we invited [Neighbors of the Onondaga Nation](#) to bring their [Witness to Injustice](#) program to the Hudson Valley to help our staff and municipal and conservation partners deepen our collective understanding of Indigenous history.

Conservation and Land Use Specialist Christine Vanderlan (center) with participants of a "Small Streams and Wetlands Workshop" in Orange County



Photo by L. Heady

Mapping Natural Areas for Planning and Conservation

When communities inventory and map natural areas like forests, streams, and important wildlife habitats, they are better positioned to identify local priorities and strategies to protect places they care about, while also contributing to conservation of regional biodiversity.

In 2024, with grant and technical support from the Estuary Program, the **towns of Kent (Putnam County); Clinton, Milan, and Washington (Dutchess County); and New Scotland (Albany County)** finalized and adopted their [NRIs](#), and **Dutchess County** launched an [NRI website and interactive mapper](#). In addition to guiding land-use planning, conservation, and stewardship for individuals, municipal officials, and watershed groups, the NRIs can support a place-based learning approach for students, educators, and the public.

The **City of Rensselaer** published its [Open Space and Recreation Plan](#) with funding from an Estuary Program grant. The project evaluated the ways in which parks and open spaces support climate resiliency and recreation for city residents.

Local Financing for Land Protection

For municipalities interested in implementing their open space and conservation plans, securing funds is an important next step. In 2024, the City of Kingston successfully established a [community preservation fund](#) (CPF) through public referendum. The CPF will establish a dedicated account to preserve natural areas, recreational lands, clean water, and other community priorities identified in the [city's Community Preservation Plan \(CPP\)](#). The Estuary Program provided assistance and grants to support Kingston's planning process, including an [NRI](#), [open space plan](#), and the CPP.

RIVER ACCESS

The Estuary Program, with State and local partners, works to improve the accessibility of existing river sites so that everyone can enjoy inclusive and positive activities along the Hudson River. We are also helping communities improve the resiliency of their docks, boat launches, and facilities to address flooding, storm surge, and sea level rise now and in the future. In 2024, the Estuary Program awarded \$141,350 for three [River Access grants](#), two of which will serve [Environmental Justice communities](#).

Interactive Website for Regional Waterfront Access

Access to the waterfront in New York State and New Jersey has increased dramatically in recent years. There is now a reliable source for comprehensive, up-to-date information about where people can safely access the water across the region.

The New York–New Jersey Harbor & Estuary Program; Pratt Institute’s Recover, Adapt, Mitigate, Plan program in the School of Architecture; and DEC’s Hudson River Estuary Program have launched the [Hudson Access Project](#) (HAP) database and website, which provides valuable information about water quality and safe access for recreation in the lower Hudson River estuary and New York–New Jersey Harbor waterfronts.

The website allows users to find locations for activities like biking, walking, or kayaking, and amenities such as nearby restaurants. Users can get updates about tides and water temperature and find information about fishing regulations, fish advisories, and boating permits. [HAP](#) was created with funding from DEC’s Hudson River Estuary Program River Access Grant and a Taconic Fellowship from the Pratt Center for Community Development.



Photo by Nicholas Conklin
Kinnally Cove Park



Photo by M. McDonald

Spotted salamander

Volunteering for Amphibian Conservation

More than 350 people participated in the 16th year of the [Amphibian Migrations & Road Crossings \(AM&RC\) Project](#). These stellar volunteers collected data on rainy nights when temperatures remained above 40° Fahrenheit, which, if the ground is thawed, provide the perfect conditions to spur the breeding migrations of forest amphibians to vernal pools. These migrations were once considered a rite of spring, but with milder winters they have started earlier. In 2024, amphibians were on the move throughout the estuary watershed in late February.

AM&RC volunteers survey locations where migration pathways cross roads and, after documenting their observations, help move the salamanders and frogs safely to the other side. In 2024, they counted more than 7,500 live and 4,670 dead amphibians and assisted 7,025 individuals, including spotted salamander, Jefferson–blue spotted salamander complex, four-toed salamander, and wood frog.

New Publication: *Municipal Conservation Stories*

Our research collaborators at the Department of Natural Resources and the Environment (DNRE) at Cornell University released the publication [Natural Resources Protection in the Hudson Valley: Municipal Conservation Stories](#) in 2024, which illustrates the important contributions and dedication that local municipalities bring to conservation and land-use planning in the estuary watershed. The publication presents case studies from seven watershed towns and highlights the experiences, challenges, and successes of elected officials and municipal volunteers in pursuing conservation actions.

Arm-of-the-Sea Makes Progress at the Tidewater Center

[Arm-of-the-Sea Theater](#) has been bringing the history and ecology of the Hudson River to life with live music in mask and puppet theater performances for 41 years. Its new home, the Tidewater Center, is located on the site of the nineteenth century Sheffield Paper Mill on the tidal Esopus Creek in Saugerties. Arm-of-the-Sea is transforming the site into a cultural space, outdoor performance venue, and a Hudson River education center.

In 2024, Arm-of-the-Sea hosted nine Waterfront Wednesday events featuring a stream table and watershed model, and four evening performances of the Esopus Creek Puppet Suite under the large open-air Tidewater Center performance tent. The organization also hosted two weeks of a theater arts camp for young people.

Early in 2024, Arm-of-the-Sea was awarded a River Access grant to construct an ADA-compliant electrically powered lift and to install a resilient electrical supply to the Tidewater Center. This project builds on previous Estuary Program grant funding awarded between 2016 and 2019 that helped create the Tidewater Center's Phase One Site Plan and Master Plan. This funding also helped with clean fill capping of the site and design and permitting of the 130-foot walkway, 125-foot fishing area, and a vegetative buffer zone between the Center's parking area and the public waterfront area. Future plans for the park include an educational waterworks playground for children.

Arm-of-the-Sea's stream table and watershed model



ENGAGING WITH THE HUDSON RIVER

The Hudson River Estuary Program and Hudson River National Estuarine Research Reserve work to inspire the next generation of environmental stewards through hands-on experiences with the river. A particular focus of this work is to provide research and field opportunities for students traditionally underrepresented in the sciences. Since 2021, the Hudson River Estuary Grants Program has awarded \$697,555 in funding to launch or continue 10 programs throughout the Hudson River Valley to help young adults develop skills in STEM (science, technology, engineering, and mathematics) with a focus on the estuary ecosystem.

The Institute Discovering Environmental Scientists

[The Institute Discovering Environmental Scientists \(TIDES\)](#) is a summer field-research and laboratory science experience. The program takes place at [Norrie Point Environmental Center](#) in Staatsburg and is designed with inclusive practices to increase participation from individuals in traditionally underrepresented communities. The selected high school and college students are paid and transportation is provided.

The program celebrated its sixth year in 2024, and many previous participants returned as mentors to guide new students through their projects. Students in TIDES conduct environmental research projects along the banks of the Hudson River and in freshwater tidal wetlands, examining the water quality, plant life, and fish biodiversity of the estuary.



Student researchers hold a quadrant, which can be used to define an area to identify aquatic plants or other sampling parameters within the section.

Research scientists lead the students in fieldwork throughout the program, introducing them to a wider world of environmental science monitoring and inquiry. The students work together to formulate their own scientific questions, gather field data, conduct scientific analysis, and present their final research.

Co-Creating Connections: Homeland Visits with Federally Recognized Lenape Tribal Nations

The Hudson River Estuary Management Program hopes to honor the Indigenous communities of the Delaware Nation, Delaware Nation at Moraviantown of the Thames, Delaware Tribe of Indians, Munsee Delaware Nation, and Stockbridge-Munsee Band of Mohican Indians by co-creating engaging programs of shared learning and committing resources for longer-term partnerships. These Indigenous communities, violently dispossessed and displaced far from their homelands, are building bridges to Lenapehoking, their homelands in what is now known as the Hudson Valley, through a number of dynamic programs of their own.

At Norrie Point Environmental Center, staff learned alongside the Lenni Lenapexkweyok for the past two summers. The Lenni Lenapexkweyok is an organization of Lenape matriarchs from the five federally recognized Lenape Nations who “organize multiple annual trips back home for our people, with special attention to the matriarchs and youth in our communities. Our trips are focused on land and water stewardship, culture, language, stories, healing, education, building relationships, and ceremony.”*

These trips included shared learning experiences while exploring *Muhheacannituck*, the Hudson River, by seining for fish and canoeing tidal marshes full of traditionally important flora and fauna, including beavers and their lodges and wild rice.

The visits to their homelands help connect cultures through stories, crafts, shared meals, and productive dialogue about State and Tribal relationships. We plan to continue supporting our partners, co-creating programs around reciprocity, and building resources so these opportunities continue as we learn about the Hudson River together.

The Lenapehoking Project’s Youth Advisory Group seeks to involve young adults in field programs and careers in historic preservation and natural resources. During summer 2024, the group invited DEC and Cornell University staff to join a homelands visit at the Delaware Water Gap to help explore the local waterways. The project was made possible through a grant from the National Fish and Wildlife Foundation, with support from Native Americans in Philanthropy and the U.S. Fish and Wildlife Service.

*Quoted sections are from the [Lenni Lenapexkweyok organization](#) website.



Lenni Lenapexkweyok members seining in the Hudson River.

A Day in the Life of the Hudson & Harbor Expands to the Mohawk River

In 2024, [A Day in the Life of the Hudson & Harbor](#) expanded into the Mohawk River, the largest tributary of the Hudson. Elementary and high schools were paired with local colleges or community groups during this one-day field program to conduct research on water chemistry, fish, macroinvertebrates, wildlife, and sediment while noting the physical characteristics of each site. Environmental partners, including SUNY Cobleskill, the [Schoharie River Center](#), Onondaga Environmental Institute, and Friends of the North Chuctanunda Inc. provided expert guidance for the field investigations. The Mohawk River data are added to the data collected throughout the Hudson River estuary and New York Harbor.

