



LONG ISLAND SOUND FUTURES FUND

15 YEARS OF CONSERVATION SUCCESS



Common terns
preen along
Long Island Sound.

Anglers fish at the mouth of the Connecticut River near the lighthouse in Old Saybrook on Long Island Sound.





NFWF



LONG ISLAND SOUND
FUNDERS COLLABORATIVE

The **Long Island Sound Futures Fund** supports projects to restore the health and living resources of the sound.

The National Fish and Wildlife Foundation manages the Long Island Sound Futures Fund in partnership with the Long Island Sound Study, through the U.S. Environmental Protection Agency's Long Island Sound Office.

Additional partners include the U.S. Fish and Wildlife Service and the Long Island Sound Funders Collaborative.

For the past 15 years, the Long Island Sound Futures Fund has supported community-led and science-based projects that are making tangible differences in the health of Long Island Sound. Thanks to the support of partners, efforts to engage and encourage New Yorkers' long-term stewardship of Long Island Sound are active and ongoing. EPA applauds the wide range of programs and opportunities that support pollution prevention, stormwater control, wetland and habitat restoration, water monitoring and public education. These efforts are enhancing and promoting a sustainable Long Island Sound for generations to enjoy."

— *Pete Lopez, EPA Region 2 Regional Administrator*

EPA and our partners have made great strides in restoring Long Island Sound's water quality, ecosystems and watershed, and creating connections between local communities and the water since this program was established in 2005. We're excited to build on this progress and accomplish even more over the next 15 years."

— *Dennis Deziel, EPA New England Regional Administrator*

A Futures Fund grant helped young people learn about protecting Long Island Sound's wildlife.

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Long Island Sound waters support popular sport fish such as striped bass, along with the native forage fish on which they depend, such as these alewives.

PROGRAM TIMELINE

2005

Launch of the Long Island Sound Futures Fund (LISFF)



2010

Surpassed \$1 million in grants by this year

Largest grant ever: \$500,000 to City of Stamford to create a green and clean oasis at Mill River Park

2013

558 acres of coastal habitat restored by this year

2016

350 total grants awarded by this year

2020

15-year anniversary of LISFF

2009

243 tons of debris removed from shorelines by this year

2011

1.5 million people engaged in conservation by this year

2012

195 million gallons of polluted stormwater treated by this year

2015

10-year anniversary of LISFF

2018

Cleanup volunteers reach 26,000 by this year

2019

Record year for grants: \$2.7 million awarded

Long Island Sound Futures Fund

Estuaries and their surrounding lands and waters represent some of the most productive environments in the world. Such is the case with Long Island Sound, the second-largest estuary on the East Coast and one of North America's most biologically diverse estuaries — an amazing fact, considering that more than 23 million people live within 50 miles of the sound.

While the area of Long Island Sound encompasses just 1,320 square miles, its watershed stretches 16,820 square miles across five states. Fresh water from 16,000 miles of rivers feed the sound's productivity, ultimately mixing downstream with saltwater from the Atlantic Ocean.

With 9 million people living and working in its watershed, the waters and surrounding lands of the sound are busy and complex, playing a vital role in the environment and in the lives of residents. Sustaining the health of Long Island Sound benefits wildlife, boosts the quality of life for millions of people, and bolsters the long-term resilience of its communities.

CRUCIAL HABITAT FOR WILDLIFE

Thousands of fish, birds and other wildlife species depend on the diverse habitats found in and around Long Island Sound: open waters, freshwater and saltwater marshes, coastal forests, sandy beaches and dunes, muddy and rocky tidal flats, rivers, and seagrass beds.

Birdwatchers know the sound as a birding paradise, with nearly 70 species of seabirds and shorebirds breeding, nesting, and feeding, and with tens of thousands of birds stopping here during their spectacular 6,000-mile annual migration from Canada to South America.

And, nearly 50 species of fish spawn and sustain their young in the waters of Long Island Sound. Many of these fish, including vital forage fish such as alewives and blueback herring, migrate from the ocean through the sound and up into rivers within the watershed. These small fish play a large role as prey for a variety of animals. Ospreys, eagles, striped bass, tuna, seals, whales and a host of other predators all depend on the vitality and productivity of the sound.

COMMUNITY RESOURCE

The sound's complex mix of marshes, beaches and dunes, forests and grasslands, and barrier islands help to buffer communities from storms. The remaining eelgrass beds trap sediments and excess nitrogen,

improving water quality. Moving deeper into the watershed, forests and wetlands along the 410-mile Connecticut River and other rivers and their floodplains act as natural water storage areas, which reduces flooding both upstream and downstream.

ECONOMIC ENGINE

More than 190,000 jobs depend upon the natural capital of the sound. Oysters, clams, herring and other fish harvested in its waters generate \$65 million annually. Ferries, container ships and barges transport cargo and people on this marine highway, helping to reduce congestion on roads. In total, economists estimate that the sound generates \$9.4 billion in economic value every year.

RECREATIONAL GEM

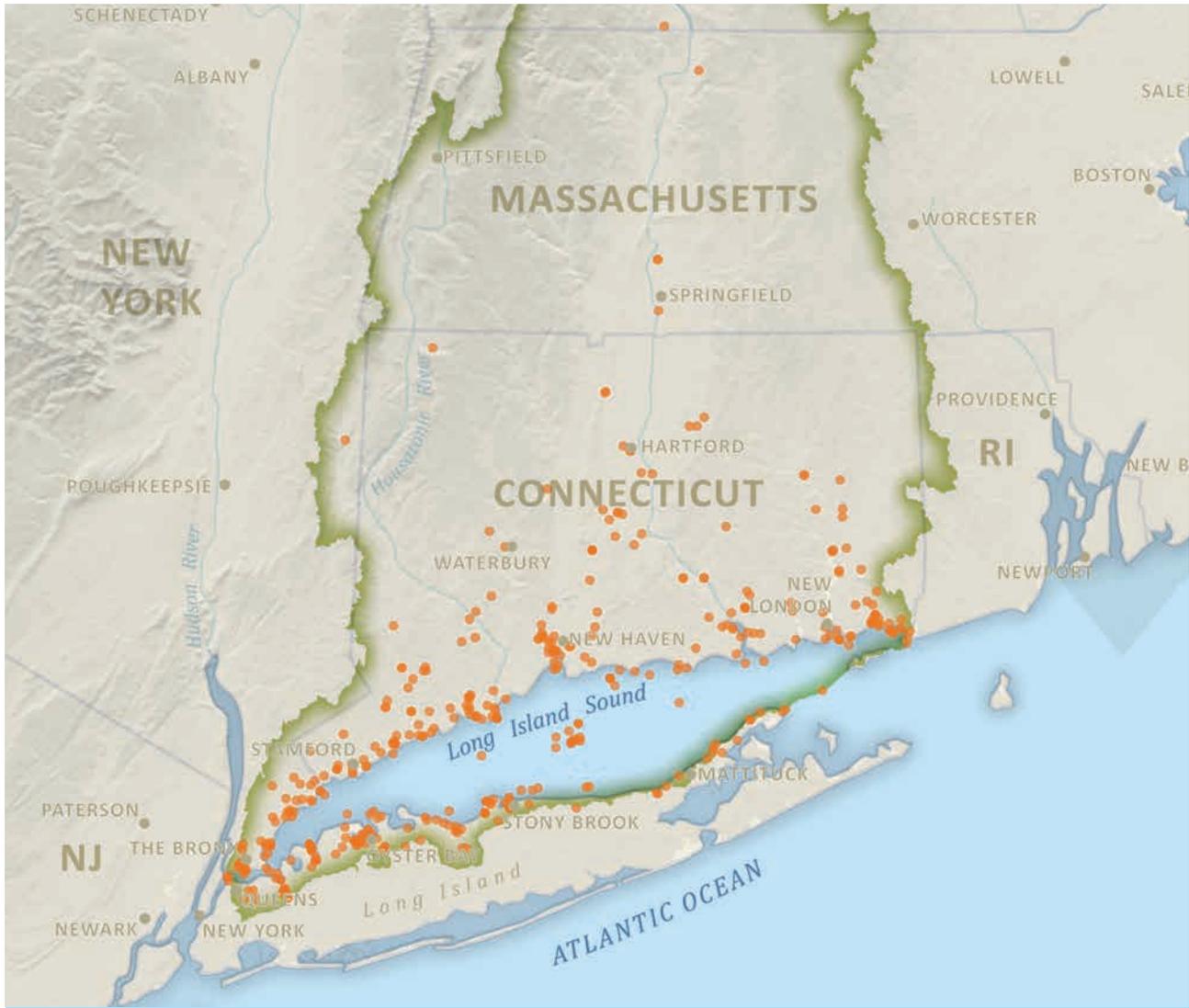
Recreation and public enjoyment of the sound provide major value for people and local communities in the region, both in terms of economic activity and quality of life. Beachgoers enjoy the sound's 600 miles of coast. Each summer, estimates are that 30,000 to 50,000 recreational boaters use its 115 harbors, bays and coves, rivers, and open waters. And anglers fish for some of the 120 kinds of finfish that make the sound their home, including striped bass, bluefish, and flounder.

CONSERVATION CHALLENGES

Long Island Sound faces many of the same issues that impact coastal communities across the United States. Small, diffuse sources of stormwater pollution, from plastics to fertilizer, drain into rivers that feed into the sound. Sewage pollution from wastewater treatment plants and aging residential septic systems forces the closure of beaches and shellfish beds. The loss of tidal wetlands — 27 percent loss in Connecticut and 48 percent loss in New York — has reduced the sound's



A Futures Fund grant supported an event at the SUNY Maritime College with on-the-water activities for everybody to experience the sound and learn about how to conserve it.



15 YEARS OF CONSERVATION

Since its launch in 2005, the Long Island Futures Fund has awarded 450 grants totaling more than \$22.8 million to 156 grantee organizations.

Note: Areas with multiple grants in close proximity appear darker orange on the map.

value as habitat and its ability to buffer communities against storms, floods, and sea-level rise.

Solutions often depend on finding the most effective tools to educate individuals about the actions they can take at home and in their community to protect and restore Long Island Sound.

CELEBRATING 15 YEARS OF PARTNERSHIP

In 2005, the Long Island Sound Futures Fund (Futures Fund) grant program was launched by the National Fish and Wildlife Foundation (NFWF) and the Long Island Sound Study, a partnership of people, organizations and agencies — government, business, nonprofit, foundation, and university — working together to restore the sound.

Over the next 15 years, the Futures Fund would go on to award 450 grants totaling more than \$22.8 million to 156 grantee organizations. Throughout that time, the Futures Fund received critical funding support from the U.S. Environmental Protection Agency, NFWF, the U.S. Fish and Wildlife Service, the Long Island Sound Funders Collaborative, and a variety of state agencies and corporations.

The fund also leveraged enormous matching contributions by its grantee organizations – nearly \$40.2 million since 2005. Together, the grant program, its funding partners and its grantees generated a total conservation impact for the sound of \$63 million.

These investments have led to:

- 200 million gallons of stormwater treated
- 773 acres of important coastal habitat restored
- 105 miles of river corridors improved for fish

Achieving a restored Long Island Sound requires a shared understanding of its value to the people who call the sound home. To that end, Futures Fund grants



Futures Fund grants that improve water quality and restore coastal and aquatic habitats benefit economically important game fish species such as bluefish.



A Futures Fund grant supported volunteer-based riparian habitat planting along the Pequonnock River.

have supported projects that provide public education and engagement. And as a result of these grants, an estimated 3 million people have been reached over the past 15 years.

This shared vision for the sound includes waters that are clean, clear and charged with life. Publicly accessible harbors and shorelines. Litter free beaches. Abundant and diverse fish and wildlife. Flourishing recreational and commercial fisheries. In sum, a regional awareness and a willingness to engage in actions that will sustain the sound for generations to come.

The road map that guides the Futures Fund is the *Long Island Sound Comprehensive Conservation and Management Plan*. This plan includes four themes:

- Clean Waters and Healthy Watersheds
- Thriving Habitats and Abundant Wildlife
- Sustainable and Resilient Communities
- Sound Science and Inclusive Management

The Futures Fund supports efforts to test innovative approaches to conservation, deliver transformative projects and support people and communities who value the sound and take a direct role in its future.

The Long Island Sound Futures Fund partners see the work done today as vital investments for the next generation. Innovative projects to address sea-level rise with living shorelines at Stratford Point may lead to entire coasts being more resilient to storms. Young environmental stewards who ask residents to share the shore with wildlife at Pleasure Beach may go on to become community leaders and scientists. Restoring the Bronx and Mill rivers will create sustainable places for people and wildlife. Citizen- scientists monitoring water quality in their harbors and bays will help ensure healthier local waters and Long Island Sound.

LONG ISLAND SOUND FUTURES FUND

2005-2020

IMPACT

450 Grants awarded	\$63 MILLION Conservation impact of grants and matching contributions	773 Acres of coastal habitat restored
3 MILLION People aware and engaged	200 MILLION Gallons of stormwater pollution prevented	

PROGRAM PRIORITIES

CLEAN WATERS AND HEALTHY WATERSHEDS

Improve water quality by reducing pollution from land and waters draining into Long Island Sound

THRIVING HABITATS AND ABUNDANT WILDLIFE

Protect and restore the sound's ecological balance to benefit people and wildlife

SUSTAINABLE AND RESILIENT COMMUNITIES

Support informed and engaged communities that use, appreciate, and help restore the sound, and improve community resilience and sustainability

SOUND SCIENCE AND INCLUSIVE MANAGEMENT

Support inclusive, adaptive, innovative and accountable management of Long Island Sound

American oystercatchers in the Long Island Sound depend on oyster beds for feeding and safe dunes for nesting.



\$8.2 MILLION GRANT INVESTMENT

\$16.1 MILLION GRANTEE MATCH

\$24.3 MILLION CONSERVATION IMPACT



A Futures Fund grant restored eelgrass to improve water quality and provide habitat for fish such as flounder.



A Futures Fund grant for a green roof at a New York City park building prevents stormwater from entering the sound.

Clean Waters and Healthy Watersheds

The Clean Waters and Healthy Watersheds theme of the *Long Island Sound Comprehensive Conservation and Management Plan* addresses the connection between a healthy Long Island Sound and the quality of the waters draining from hundreds of local watersheds comprised of bays, harbors, streams and rivers that flow into the sound.

Despite progress achieved from sewage treatment plant improvements, Long Island Sound still suffers from dead zones, beach closures and other effects of pollution that impair water quality.

Addressing these challenges requires a holistic approach to address polluted stormwater from surrounding rivers and lands, and to improve the resilience of the natural and built infrastructure.

The Long Island Sound Futures Fund supports projects that prevent pollution before it negatively affects the quality of local waters and the sound itself. Many projects supported by these grants use innovative “green infrastructure” tools that naturally filter pollution before it flows into storm drains or waterways during storms.

108 GRANTS AWARDED

78,319 POUNDS POUNDS OF NITROGEN PREVENTED

A Futures Fund grant installed rain gardens in the Thames River watershed, a cost-effective and beautiful way to reduce runoff.



Rain Garden at Work
The Springtown Garden Club is working with the Board of Storington and the Eastern CT Conservator District to grow this rain garden.
This bevel-shaped garden is one of over 100 installed by LCCD in Eastern Connecticut to use native, non-invasive plants to protect the environment. This rain garden will:
- catch and filter out water runoff, and
- use its native plants to filter out pollutants before the water enters the harbor.



Health officials close beaches when heavy rains send polluted runoff pouring into local waterways.



A Futures Fund grant used green infrastructure to collect stormwater from a building and parking lot, keeping pollution from entering the water at a local beach.

PROJECT HIGHLIGHT: CLEAN WATERS AND HEALTHY WATERSHEDS

Centerport Beach Recreation Facility: Clean and green beachgoing

Every year, millions of people visit the more than 200 beaches along Long Island Sound to enjoy the surf and sand while experiencing a direct connection to nature. The good news is that the *Long Island Sound Beach Report 2016-2018* found that dozens of Sound beaches met safe-swimming criteria 93.3 percent of the time.

Unfortunately, for the three summers covered in the report, the overall failure rate of water samples at beaches more than doubled in wet weather. The major cause? Polluted stormwater contributing to beach closures and threatening marine life as it runs into the beaches, bays and harbors of Long Island Sound. With more than 4 million people living in nearby coastal communities, the sound's watershed includes dense concentrations of man-made, impervious surfaces. These roads, parking lots and buildings contribute to stormwater runoff by limiting the ability of water to soak into the ground.

For many years, such runoff has been reducing water quality and hampering public enjoyment of the sound's waters in and around Centerport Harbor, New York. In 2015, the Long Island Sound Futures Fund awarded \$137,000 to the Town of Huntington for a project designed to address stormwater pollution at the Centerport Beach Recreation Facility, a prime spot for swimming, fishing and walking. Heavy rains sent untreated runoff out into the harbor and Northport Bay,

an embayment of Long Island Sound.

Residents also wanted to reduce flooding around the facility, which was located at the bottom of a large hill. Project leaders deployed a suite of green infrastructure to manage stormwater from the facility and capture excess water from nearby outdoor showers. The project created a rain garden of native plants in the facility's parking lot and replaced 6,700 square feet of impermeable concrete and asphalt with walking paths of permeable pavers. Curb heights were also adjusted to further trap stormwater.

Now stormwater enters the rain garden and pavers, seeps into the soil and filters through the plantings, with a second cycle of filtration in a layer of sand, gravel and rock. The new process captures an estimated 80 percent of the stormwater from the facility. The town also partnered with Citizens Campaign for the Environment to create a brochure and video about the project and worked with Boy Scouts to create signs that allow visitors to better understand the project.

"We now have a beautiful natural feature that filters 315,000 gallons of stormwater annually," said Chad A. Lupinacci, Town of Huntington supervisor. "The project will go a long way to keep the beach and water cleaner at a popular place for public recreation in our community."

PROJECT HIGHLIGHT:
CLEAN WATERS AND HEALTHY WATERSHEDS

Mill River Park: An urban oasis

Before the creation of Mill River Park, people in downtown Stamford, Connecticut had less than an acre of open green space to enjoy. Downtown areas flooded during heavy rains and polluted stormwater runoff would drain into the river and flow downstream to Long Island Sound. The loss of habitat and poor water quality drove away wildlife.

In 2010, the Long Island Sound Futures Fund awarded \$500,000 to a public-private partnership between the City of Stamford and the Mill River Park Collaborative. The decades-long partnership leveraged this grant to achieve its vision of a vibrant urban park and greenway along the Mill River where people could play, gather, and enjoy nature.

The project installed bioswales, rain gardens, organic soils and native plants to convey, slow and filter stormwater runoff, and restore riverside habitat improving ecological functions in the park and along the river.

By employing “green infrastructure” in this way, project leaders treated stormwater as a resource rather than a waste product. They capitalized on natural floodplain drainage patterns and park topography to capture and direct a majority of stormwater pollution from the surrounding streets and buildings into the swales and gardens, with a



A Futures Fund grant installed green infrastructure in a park to improve water quality, public access and ecology along the Mill River.

backup stormwater treatment infrastructure of drains, detention basins and oil and grit separators within the green footprint.

The project replaced paved lots and roads near the river with porous promenades of substrates, granite and crushed stone to further capture stormwater before it reaches the river and to make the river more accessible to people.

Mill River Park now encompasses 12 acres of beautiful “green,” with plans to expand to 28 acres and add a 3-mile greenway.

“Today, there is a transformed landscape with a healthy, free-flowing river; a thriving natural ecosystem of fish, birds and wildlife, and a place where people can reconnect with nature in the heart of Stamford,” said Nia Rhodes Jackson, director of visitor experience for the Mill River Park Collaborative.

\$9.5 MILLION GRANT INVESTMENT

\$15.5 MILLION GRANTEE MATCH

\$25 MILLION CONSERVATION IMPACT



Healthy marsh in the Long Island Sound watershed

Thriving Habitats and Abundant Wildlife

The Thriving Habitats and Abundant Wildlife theme of the *Long Island Sound Comprehensive Conservation and Management Plan* has a goal of protecting and restoring the sound's ecological balance to benefit people and the natural environment in a healthy, productive and resilient state.

The sound's waters support 170 species of fish, and dozens of species of migratory birds. Ferries, ships, and barges, commercial and recreational shellfishers, anglers, boaters and sunbathers, tourists and birdwatchers all use the sound. Its marshes and dunes, rivers, oyster reefs, forests and islands help clean water, buffer communities from storms and floods, and shelter fish and wildlife. But, the ability of the sound to support these diverse uses is dependent upon the quality of its waters, living resources and habitats.

To restore and sustain the natural environment of the sound, organizations and community members must overcome a range of challenges: habitat loss, pollution, sea-level rise, changing flood patterns, and increased frequency and intensity of storms. The Long Island Sound Futures Fund invests in conservation projects that address these challenges by restoring habitats and strengthening natural infrastructure to better protect communities and to bolster populations of fish and wildlife.

153 Grants awarded

92 ACRES Tidal wetlands restored

105 MILES River opened to fish passage

239 ACRES Coastal forest restored

From March through August,
piping plovers care for their
young on the beaches
of Long Island Sound.



PROJECT HIGHLIGHT:

THRIVING HABITATS AND ABUNDANT WILDLIFE

Living shorelines benefit wildlife and communities

Known as the place to be for migrating and wintering birds, Stratford Point is a spectacular 30-acre site, located on a peninsula adjacent to the Stratford Point Lighthouse at the junction of the Housatonic River and Long Island Sound in Stratford, Connecticut.

From a coastal ecological standpoint, Stratford Point has it all: coastal forests, grasslands, bluffs, dunes, intertidal flats, tidal marsh, and shellfish reefs. The area also serves as a vital linkage between other ecologically important areas, including the Stewart B. McKinney National Wildlife Refuge and Silver Sands State Park.

Such natural abundance has not always been the case. During a site cleanup and remediation, Stratford Point's intertidal area was excavated, cleaned and back-filled, leaving the shoreline devoid of salt marsh plants. Oyster reefs that once protected this area also disappeared.

The loss of such natural features generates particular concern along Long Island Sound, where the shoreline has been eroding at a rate of 100 feet per decade. Sea-level rise represents a serious threat at Stratford Point, as its low-elevation salt marsh could drown in rising seas.

The Long Island Sound Futures Fund awarded \$175,000 to Sacred Heart University, working in



A Futures Fund grant supported a living shoreline at Stratford Point, providing habitat for marine life and a buffer against storms.

partnership with Audubon Connecticut, to build a living shoreline, which was installed in stages from 2013 to 2016. Unlike traditional structures such as bulkheads or seawalls that can worsen erosion, living shorelines incorporate natural elements to absorb wave energy, lessen erosion and provide habitat.

For this project, workers deployed 64 Reef Balls™ in the intertidal zone and planted native salt-marsh cordgrass landward of the Reef Balls. Varying in size up to 5 feet, Reef Balls are made with a special cement that resists erosion. And holes in Reef Balls are positioned so that when a wave hits it, water shoots through more gently. These holes create a variety of habitat similar to that found in nature, and the surface textures enhance use by marine life.

Restoring the saltmarsh and planting the fringe marsh of cordgrass were key to alleviating coastal erosion. Fringe marshes stabilize shorelines, dampen wave energy, and retain sediment, which builds up marsh elevation, further protecting vulnerable shorelines from sea-level rise.

“A critical element of this pilot project was to collect information to learn if the living shoreline was successful,” said Jennifer Mattei, project director and professor at Sacred Heart University. “The living shoreline reduced the impact of waves by 30 percent, accumulated more than 36 inches of sediment to raise the marsh, and provided habitat for fish, oysters, mussels and many benthic organisms. Based on this success the living shoreline has been expanded 900 feet.”

PROJECT HIGHLIGHT:
THRIVING HABITATS AND ABUNDANT WILDLIFE

Helping alewives reconnect to their spawning grounds

The cycle of life for river herring, also known as alewives, begins with their birth in freshwater rivers and tributaries from South Carolina to Maine including the Bronx River in New York. After hatching, they travel through Long Island Sound to mature in the North Atlantic. The herring then travel thousands of miles before returning as adults to their original freshwater nursery to produce the next generation.

Alewives once migrated upstream by the millions, turning rivers into runs of silver. These relatively small fish, about the size of a small sandal, fill a critical part of the food web for coastal birds. Commercial and recreational species of fish such as salmon, bluefish and striped bass also depend heavily on them for food. In fact, rivers and lakes with river herring tend to support stronger populations of sport fish such as smallmouth bass, largemouth bass and trout.

But, starting in Colonial times, hundreds and hundreds of dams and culverts have severed the connection these fish need to allow them to travel between the ocean, the sound and freshwater streams. Today, alewives are abundant only in rivers that are free of such barriers, where they can reach their spawning grounds.



A Futures Fund grant allows alewives to swim up this fishway, bypassing a dam on the Bronx River to reach historic spawning grounds.

Along the Bronx River, such a connection was broken in the 1600s when one of the first dams was built at what is now 182nd Street (just south of the Bronx Zoo).

The dam blocked alewives from reaching ideal spawning grounds upstream. In 2008, the Long Island Sound Futures Fund awarded \$150,000 to the New York City Department of Parks and Recreation as part of a larger effort to help alewives make the journey back to their natal home by supporting the design and installation of a fishway on the dam.

The new fishway provides a bypass for the river herring to get around this 14-foot tall dam and access 1.1 miles of river upstream. Alewives now swim 25 feet up a

20-degree slope, gather energy in a resting pool, and then swim in one burst up and over the dam. In 2017, a fish counter and underwater video monitoring system documented the return of the first 72 alewives in 400 years traveling upstream.

“The return of the river herring will help increase the biodiversity of the Bronx River by attracting more fish and birds,” said Marit Larson, chief of natural resources for the New York City Department of Parks and Recreation. “This project is another example of the recovery of the Bronx River. With a canoe portage also incorporated into the fishway, the project reconnects fish and wildlife that depend on an open river as well as people who enjoy it.”

\$3.3 MILLION GRANT INVESTMENT

\$6.4 MILLION GRANTEE MATCH

\$9.7 MILLION CONSERVATION IMPACT



A Futures Fund grant supported resiliency planning in New London, Connecticut.

Sustainable and Resilient Communities

The Sustainable and Resilient Communities theme of the *Long Island Sound Comprehensive Conservation and Management Plan* has a goal of supporting informed and engaged communities that use, appreciate, and help protect the sound.

A *Public Perception Survey of Long Island Sound* watershed residents identified both challenges and opportunities associated with this goal. While people are not always well-informed about the specifics of sound-related environmental issues, they expressed high levels of concern about its environmental health.

The Long Island Sound Futures Fund invests in projects that build public awareness of the many threats to the sound and what can be done to diminish those threats. Some projects help people learn how they can take individual actions to protect local waterways, while others bolster community-wide stewardship efforts and resilience planning to restore the sound and its watershed.

151 Grants awarded

908,573 POUNDS Marine debris and trash removed

Community stewards protect the largest concentration of nesting common terns in the world — about 9,500 pairs on Great Gull Island.



Turning back the tide of plastics



The Futures Fund provided a grant to ask people to sign written pledges to kick the plastics habit.



Six of the top 10 litter items collected in cleanups on the sound are made of plastic.

The Long Island Sound watershed is home to more than 9 million people, with 4 million of them living along its coast, making it one of the most heavily populated regions in the United States.

Americans use an average of 500 plastic bags per year. Our use of plastic has tripled since 1970, with beaches and shorelines awash in all manner of plastic debris, including plastic bags, one of the top-10 types of litter collected in shoreline cleanups of the sound.

Highly populated Long Island Sound communities produce significant amounts of litter, which can flow from upstream waters as well as local storm drains and streets into the sound. As an example, during the annual International Coastal Cleanup, volunteers picked up 18,000 pounds of trash from Long Island Sound shorelines.

Plastic bags foul boat propellers and block intake valves. Thousands of birds and marine animals die from eating or becoming entangled in plastic. Fishing lines, balloons, and six-pack ring holders litter the sound. Scientists estimate that at the current rate, there will be more plastic than fish in the world's oceans by 2050.

In one of its earlier grants, in 2011, the Futures Fund provided a \$25,000 grant to Citizens Campaign for the Environment supporting a project to encourage people to "bring your own bag" when shopping in three coastal communities in New York. The project combined environmental education with social marketing to build

public awareness about the problem of plastic pollution and to foster change. It developed information about barriers preventing people from carrying reusable bags, including forgetting bags in the car and the use of plastic bags for other purposes. A public service announcement and complimentary educational materials were then crafted, with short messages about the impact of plastic bags. "Half a million plastic bags are used every minute." "Every reusable bag can prevent 1,000 bags from entering the environment." "The cost of plastic bags is passed on to the consumer in higher food costs."

A video was posted on social media, and materials were distributed to 5,000 people at community events and supermarkets. People were given a reusable bag to shop with and were asked to sign a pledge to bring their own bag. The project also worked with local businesses to reduce their use of plastic bags. The project learned from a participating large grocer it costs stores 1.5 cents per bag, which really adds up when purchasing large quantities of the bags. Participating businesses were recognized with certificates and in press outreach for their leadership in protecting the environment.

More than 500 people signed pledges to "kick the plastic bag habit," said Adrienne Esposito, executive director of the Citizens Campaign for the Environment. "Ultimately, the most effective strategy is to combat the root cause of the problem. We use too many plastic products and we need to switch to sustainable alternatives. This project helped bring that message home."

PROJECT HIGHLIGHT:
SUSTAINABLE AND RESILIENT COMMUNITIES

‘Wildlife Guards’ look after birds and beaches

Pleasure Beach is part of 2½ miles of barrier beach located in Bridgeport, Connecticut. This sand spit comprises much of the remaining undeveloped public beachfront in the state, where only 7 percent of the shoreline is publicly accessible.

Bridgeport ranks as Connecticut’s largest city, its most densely populated (9,029 people per square mile), and one of its most economically disadvantaged. Every summer, Bridgeport residents flock to the shores of Long Island Sound to swim and enjoy the outdoors.

Pleasure Beach also serves as a vital stopover point for many species of shorebird, who typically arrive at Long Island Sound during the summer months. The same beaches enjoyed by so many people are part of a network of beaches and dunes, intertidal flats, grasslands and salt marshes that serve as critical habitat for migrating bird species in North America.

Abandoned in 1996 after a fire burned the bridge connecting it to the mainland, Pleasure Beach reopened in 2014. The Long Island Sound Futures Fund provided \$41,000 to Audubon Connecticut to deploy student ambassadors as “Wildlife Guards” on



A Futures Fund grant enabled local youths to serve as wildlife guards of coastal birds at their community beach.

Pleasure Beach to encourage returning beach-going residents to share the shore with beach-nesting birds.

The project hired 10 students from Bridgeport high schools to work alongside bird biologists. The students were trained in bird monitoring, coastal ecology, public outreach, and general job skills. They worked alongside conservation professionals, and their experience was enhanced with field trips to places such as the Maritime Aquarium and by monitoring the nesting success of shorebirds such as least terns at Pleasure Beach.

After training, Wildlife Guards set up tables at a local pier where beach-goers first enter Pleasure Beach. Guards set up a touch tank of marine life, helped local children make marshmallow versions of piping

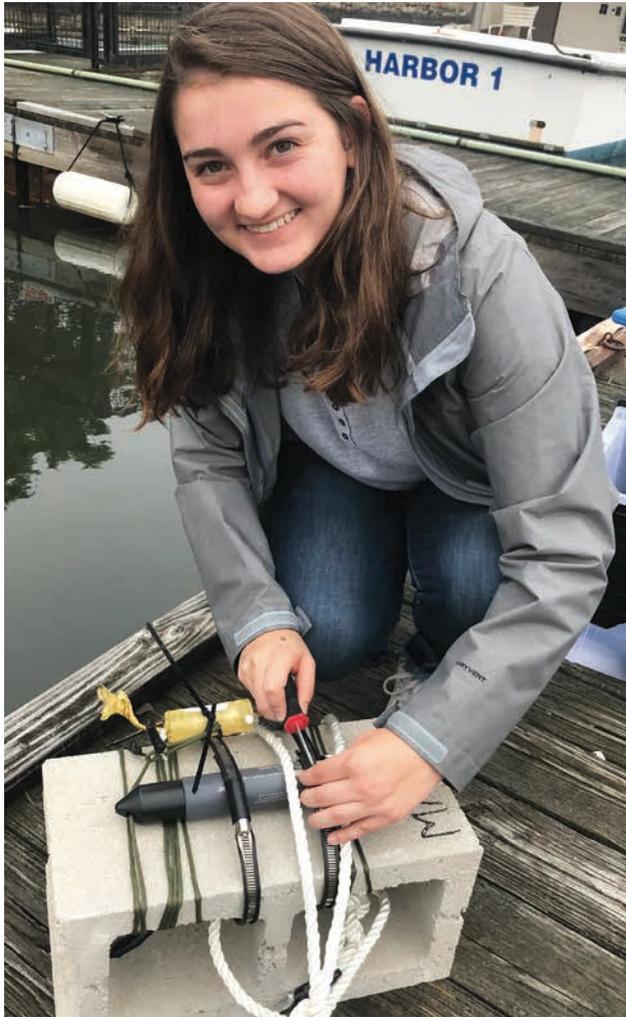
plovers to teach them about the bird, led bird-walks, and conducted beach cleanups. They had face-to-face contact with more than 700 visitors, with many signing the “Be a Good Egg,” pledge to give birds space and to keep the beach clean of trash. The guards also created a website and Facebook page to educate 3,800 more people about beach-nesting birds.

“Young people in cities often have more limited opportunities to play an active role in conservation and learn about environmental careers,” said Corrie Folsom-O’Keefe, director of bird conservation for Audubon Connecticut. “Wildlife Guards at Pleasure Beach provided a chance for students to practice conservation stewardship right at home and help balance protecting valuable habitat and providing a recreational resource for their community.”

\$1.8 MILLION GRANT INVESTMENT

\$2.1 MILLION GRANTEE MATCH

\$3.9 MILLION CONSERVATION IMPACT



A citizen-scientist at work getting ready to monitor water quality.

Sound Science and Inclusive Management

The Sound Science and Inclusive Management theme of the *Long Island Sound Comprehensive Conservation and Management Plan* recognizes that efficient and effective management of the sound must be inclusive, adaptive, innovative, and accountable.

Along its 600 miles of shoreline, Long Island Sound includes 115 “embayments,” a catch-all term for harbors, rivers, inlets, guts, coves and bays. Embayments are places where people swim, fish, crab and boat; they are also nurseries and foraging areas for many commercially and recreationally important species of fish and crustaceans. Embayments also contribute approximately one fifth of the total load of nitrogen pollution to the sound. Excess nitrogen from stormwater runoff, fertilizers, and aging septic systems leads to water quality problems in local embayment waters, as well as the open waters of Long Island Sound.

People interact most directly with Long Island Sound through these embayments, so these areas present excellent opportunities to engage citizen-scientists to collect data that can help reduce nitrogen and other sources of pollution.

The Long Island Sound Futures Fund provides grants to enhance citizen-science in embayments and supports efforts to apply the results of the data collected to improve the health of local and Sound waters.

38 Grants awarded

23 GROUPS Monitored 37 bays and harbors in 2019

Hempstead Harbor citizen-scientists have been monitoring local water quality since 1992.



Citizen-science helps restore shellfish beds

Archaeologists studying Native American middens — a mound containing shells, animal bones, and other refuse at the sites of native American settlements — in Hempstead Harbor have found oyster shells nearly a foot long. Large and small oysters that once crowded Long Island Sound could filter up to 50 gallons of water each day. Vast beds of these oysters kept the waters of Hempstead Harbor clean.

Since those pre-Colonial days, this embayment of Long Island Sound in Nassau County, New York has struggled with an accumulation of environmental challenges. Over-harvesting of oysters, industrial and air pollution, suburban development, polluted runoff draining from roads and storm drains, and high volumes of sewage leaking from aging wastewater systems all contributed to the closure of the harbor to shellfish harvesting before 1970 to 2011.

After being closed for more than 40 years, 2,500 acres in the outer harbor reopened to shellfishing in 2011. What changed? The commitment of nine determined communities surrounding the harbor to identify and respond to sources of pollution. How did this happen? The commitment of a dedicated corps of citizen-scientists monitoring local water quality beginning in



Harvesting clams in outer Hempstead Harbor.

1992. These citizens used that monitoring to pinpoint areas where there were deteriorating trends in water quality and to gauge progress.

In 2009, the Long Island Sound Futures Fund awarded \$45,000 to the Hempstead Harbor Protection Committee, the inter-municipal organization made up of nine local governments that have jurisdiction over the harbor, to support the Coalition to Save Hempstead Harbor's efforts to monitor pollution indicators and assess bacteria levels that affected swimming and shellfish harvesting. The goal was to accumulate enough data to establish that parts of the harbor met governmental water quality criteria for further opening of shellfish beds.

The project supported new sampling and continued water quality sampling at 19 locations, with 17 of the 19 shellfish growing stations shown to exceed state standards for water quality. Data was reported

to water resource managers including local, state and federal officials. Such pollution control actions and documentation of water quality improvements allowed for safe harvesting of shellfish.

One other playful indicator of the improving harbor ecosystem has emerged: bottle-nosed dolphins have returned to the harbor.

"While the recovery of the shellfish beds is always a work-in-progress, the gradual reopening shows we have come a long way towards a restored Hempstead Harbor," said Carol DiPaolo, program director and water-monitoring coordinator for the Coalition to Save Hempstead Harbor. "This project is an example of how citizen-scientists who care deeply about their local environment can both contribute to management of embayments and provide information to help open closed shellfish beds in Long Island Sound."

Unified community-monitoring improves the health of the sound

Monitoring water quality in Long Island Sound provides many benefits to communities and the environment, among them helping control local pollution, tracking how healthy the Sound is for marine life, identifying contaminants, and testing to make sure bathing beaches are safe for swimming. Most importantly, the water quality monitoring helps enhance management of Long Island Sound and its surrounding waters.

Significant focus is placed on monitoring rivers, bays, harbors, inlets and other embayments that drain into the sound. These areas often struggle with problems like stormwater runoff, which delivers excess nitrogen into the water and leads to algae blooms and fish die-offs. Citizen-scientists and other experts monitoring water quality are among the most active environmental stewards in local communities, many of which lack all of the resources needed to conduct comprehensive monitoring. If information is not collected in a uniform way by these groups, efforts to establish a common understanding about the health of each embayment and the sound could be hampered.

In 2017 and 2018, the Long Island Sound Futures Fund provided \$100,000 to Save the Sound to scale-up a common approach to measure the individual and relative health of the bays and harbors of the Sound called the “Unified Water study” (UWS). Participating groups monitor common factors that indicate excess nitrogen in embayments, such as the amount of

dissolved oxygen in the water. Too little dissolved oxygen creates dead zones in waterways.

The UWS requires all groups to follow standard operating procedures and to prepare an embayment-specific plan to assure the data collected is of the highest quality and usefulness, and it trains participants to use these tools. During the summer monitoring season, the UWS conducts in-field quality checks and provides ongoing monitoring support. Of high value to all groups, the project distributes funds and provides equipment for monitoring. All the data collected is synthesized and input into a national water quality database.

The UWS now provides support to 23 groups to monitor 37 bays and harbors from New York City out to eastern Long Island and in Connecticut, doubling the number of groups and embayments measured in just one year.

“The Unified Water Study offered a much-needed framework, as well as tools and resources, to leverage the work of groups from around the sound, and to fill a water quality data gap in our local bays and harbors,” said Tracy Brown, regional director of water protection at Save the Sound. “The network of groups are amplifying their impact by working in a coordinated way and know the information they collect is being used to target problems and improve water quality in local waters and the sound.”



A Futures Fund grant supported development of an integrated monitoring framework to enhance citizen science and the utility and application of their data to management of the sound and its local waters.

Futures Fund grants support International Coastal Cleanup events around Long Island Sound.



You can help Long Island Sound!

Black skimmer in
Long Island Sound

Do less for a healthy yard

Rainwater carries fertilizers, pesticides, pet waste and chemicals into the sound. Consider ways to reduce or eliminate the use of such chemicals. Mow high and water less to encourage grass roots to grow stronger. Compost yard waste into valuable soil for lawns and gardens.

#DontTrashLISound

Disposable plastic bags, bottles and straws often end up on the shore or in the water. Bring reusable bags, bottles and utensils to your favorite Long Island Sound beach, park or green space. Remember to properly dispose of fishing line, which can remain in the environment for years and entangle fish and wildlife.

Pump it out

Nearly half of the homes and businesses in the Long Island Sound watershed have septic tank waste-disposal systems. When not maintained, they pollute Long Island Sound waterways and drinking water. Remember to pump out those tanks every two to three years.

Share the Shore

In spring and fall, thousands birds migrate through Long Island Sound. People often unintentionally disturb these birds, particularly those nesting along beaches. With a little help, beach-nesting birds can survive and coexist with people. Keep your dog on a leash, and avoid flying kites and exploding fireworks near nesting and feeding areas.



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A Futures Fund grant increased awareness about how to be "RiverSmart" and reduce pollution into the Farmington River and Long Island Sound.



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