Jamaica Bay
Education Resource Directory

A Teacher’s Guide to Education Opportunities in the Jamaica Bay Watershed
Welcome to Jamaica Bay.

Migrating birds come here to play.

Here the Great Blue Heron makes a nest.
Monarch butterflies think this place is the best!

A salt marsh makes a great breeding ground.
But you can watch an Osprey taking a bath.

The East and West Ponds are great bird watching spots.
If you want nature’s beauty, this place has lots!

Jamaica Bay takes up almost 40 square miles.
All people who go there have nothing but smiles.

Many new plans have been made to protect it.
If there’s ever a problem, the workers will detect it!

We’re reintroducing old species like eel grass.
Preservation is another obstacle to pass.

If we succeed, we will truly be helping our nation.
Jamaica Bay will always aid the wildlife population!

Thomas, Grade 6, St. Andrew Avellino School, Queens
For additional information about the Jamaica Bay Watershed Protection Plan, to provide comments about this directory, or if you know of an organization that should be included in the next edition, please email educationoffice@dep.nyc.gov.

To learn more about DEP's education resources, please email educationoffice@dep.nyc.gov, visit nyc.gov/dep/education, or call (718) 595-3506.

If you would like to refer to information contained in the directory, please use this citation statement: Jamaica Bay Education Resource Directory. New York: New York City Department of Environmental Protection, 2021.

Thank you,
DEP Education Team
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Jamaica Bay and its Watershed

What is Jamaica Bay?

Jamaica Bay is one of the largest tidal wetlands in New York State. Comprised of approximately 20,000 acres of open water, upland islands, and salt marshes, the bay provides the New York City metropolitan area with a unique, ecologically rich, natural area right in its own backyard.

The bay is located in New York City along the southern edges of Brooklyn and Queens, with a small portion in Nassau County. Measuring approximately 10 miles at its widest point east to west and approximately four miles at its widest point north to south, the bay is commonly referred to as an estuary, a partially enclosed body of water where freshwater from rivers and streams meet and mix with salt water from the ocean. The bay is a component of the National Park Service's Gateway National Recreation Area and a significant portion of it, approximately 9,100 acres, is designated as the Jamaica Bay Wildlife Refuge.

For thousands of years, Jamaica Bay has been home to a diverse array of flora and fauna. It has evolved over time as an important and complex network of open water, salt marsh, grasslands, coastal woodlands, maritime shrublands, and brackish and freshwater wetlands. According to a study conducted by the U.S. Fish and Wildlife Service, these natural communities support 91 species of fish, 325 bird species (of which 62 are confirmed to breed locally), and are an important habitat for many species of reptiles, amphibians, and mammals. The bay supports seasonal and year-round populations of 214 species of special concern, including state and federally endangered and threatened species, such as piping plover, osprey, peregrine falcon and seabeach amaranth. It serves as a critical stopover area along the Atlantic Flyway migration route and an internationally renowned birding location. In recognition of these values and functions, Jamaica Bay was designated a Significant Coastal Fish and Wildlife Habitat by New York State in 1992 and the first Important Bird Area by the National Audubon Society in 1997.

The Jamaica Bay Watershed Protection Plan

In contrast to the myriad natural resources provided by Jamaica Bay, its watershed is one of the most developed and densely populated regions in the country, with approximately 2.8 million people living and working within the watershed’s boundaries. The land area of the bay’s watershed is approximately 71,000 acres, with 47,000 acres lying within the boroughs of Brooklyn and Queens and approximately 24,000 acres in Nassau County. A major concern for all who care about Jamaica Bay’s ecosystem has been the accelerated loss of salt marsh wetlands, a defining ecological feature of the bay. The transition from a natural to a more developed watershed over the last 150 years has directly and indirectly impacted the bay’s water quality. Historically, industrial pollution and raw sewage degraded water quality in the Bay before the first wastewater treatment plants were built there in the late 1800s. Other issues that have impacted water quality include Combined Sewer Overflows (CSOs), stormwater pollution, and hardened shorelines.
The protection of this invaluable resource is intimately connected to the uses and activities contained within its vast watershed. Since the 1980s, New York City has invested hundreds of millions of dollars to improve water quality in Jamaica Bay and in 2005 the New York City Department of Environmental Protection (DEP) was tasked with outlining a comprehensive approach towards restoring and maintaining the water quality and ecological integrity of the bay. What was developed was the Jamaica Bay Watershed Protection Plan, which is intended to serve as a blueprint for the management of the bay and implementation of specific action strategies. The plan is a living adaptive management approach to protecting the bay for generations to come.

Since the development of the Jamaica Bay Watershed Protection Plan, DEP has been working diligently to implement the innovative hard and soft infrastructure alternatives, pilot studies, regulatory initiatives and public outreach efforts recommended in the plan to collectively address the water quality and ecological issues facing Jamaica Bay. Currently, DEP is managing more than $705 million in projects that are upgrading and modernizing sewer infrastructure, adjacent wastewater resource recovery facilities, and pumping stations, and DEP has already invested $1 billion in grey infrastructure to reduce CSOs.

Through its green infrastructure program, DEP is investing millions of dollars in green infrastructure in the Jamaica Bay watershed. Installations such as rain gardens, green roofs, and permeable pavements collect stormwater runoff and prevent it from degrading water quality. DEP has partnerships with the New York City departments of Parks, Education, and Design & Construction to add green infrastructure on city-owned properties. DEP also has a robust private incentive program to encourage green infrastructure on private properties.

In 2018, New York City also submitted a Long Term Control Plan for Jamaica Bay to the New York State Department of Environmental Conservation (DEC) which sets forth goals to improve water quality through reducing the impacts of CSOs. Throughout the plan’s development, the City collected water quality data, performed extensive modeling, held multiple public meetings, and analyzed potential solutions based on costs and anticipated water quality benefits. As part of this plan, the City expects to invest $579 million to restore more than 50 acres of wetlands and seven acres of ribbed mussel biofiltration, in addition to environmentally dredging 50,000 cubic yards and expanding green infrastructure by 379 acres.

To access a copy of the Jamaica Bay Watershed Protection Plan and Plan Updates, please go to nyc.gov/dep.

The Jamaica Bay Education Coordinating Committee

The Jamaica Bay Education Coordinating Committee was formed to unite the diverse local organizations that serve the Jamaica Bay watershed and to develop specific education strategies for the Jamaica Bay Watershed Protection Plan. Committee members expressed interest in raising awareness among young people and educators about the importance of Jamaica Bay and to promote local environmental stewardship. The work of committee members and information shared at meetings resulted in the development of the original Jamaica Bay Education Resource Directory, now updated to reflect a growing community of local environmental stewards.
Jamaica Bay Organizations at a Glance

The following local organizations provide a wealth of education resources about Jamaica Bay for young people and adults. You will find detailed information about these organizations beginning on page 16, Jamaica Bay Organization and Program Descriptions.

American Littoral Society  
littoralsociety.org/Jamaica-Bay

Billion Oyster Project  
billionoysterproject.org

Brooklyn College  
brooklyn.cuny.edu/web/academics/centers/sri.php

Brooklyn Public Library  
brooklynpubliclibrary.org

Center for International Earth Science Information Network  
ciesin.columbia.edu

City Parks Foundation  
cityparksfoundation.org

ConEdison - Queens College GLOBE NY Metro  
qc.cuny.edu/academics/degrees/dmns/sees/GLOBE/

Coney Island Beautification Project  
nycservice.org/organizations/index.php?org_id=2591

Gateway National Recreation Area National Park Service  
home.nps.gov/learn/education/

Jamaica Bay-Rockaway Parks Conservancy  
jbrpc.org

National Wildlife Federation  
nwf.org/ecoschools

New York Aquarium  
nyaquarium.org

New York City Audubon  
nycaudubon.org

New York City Department of Environmental Protection  
nyc.gov/dep

New York City Department of Parks and Recreation  
nyc.gov/parks/rangers

New York City Urban Soils Institute  
urbansoils.org/

NYC H2O  
ych2o.org

New York Sea Grant  
nyseagrant.org

New York State Department of Environmental Conservation  
dec.ny.gov/education/38184.html

New York State Office of Parks, Recreation and Historic Preservation  
parks.ny.gov/regions/new-york-city/default.aspx

Queens Museum  
queensmuseum.org

Queens Public Library  
queenslibrary.org

RISE Rockaway Initiative for Sustainability & Equity  
riserockaway.org

Rockaway Youth Task Force  
rytf.org

Waterfront Alliance  
waterfrontalliance.org

Wilderness Inquiry  
wildernessinquiry.org
Jamaica Bay Environmental Programs at a Glance

Full descriptions of the programs offered by each organization can be found in the Jamaica Bay Organization and Program Descriptions Section, beginning on page 16. Program offerings may vary depending on season, funding, and staff availability.

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## Jamaica Bay Environmental Topics at a Glance

Below is a list of Jamaica Bay-related education topics that may be useful for lesson planning, field trip preparation and student research projects.

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# Jamaica Bay Access at a Glance

The best way to educate young people and adults about the importance of Jamaica Bay is to give them the opportunity to experience the Bay. The following parks offer access to its beauty and natural features. The site numbers correspond to the sites illustrated on the accompanying map. For information, please contact the agency listed for each site.

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**Contact Information:**
- National Park Service [nps.gov/gate](http://nps.gov/gate), Jamaica Bay Wildlife Refuge: 718-318-4340
- New York City Department of Parks & Recreation [nyc.gov/parks](http://nyc.gov/parks)
- New York State Department of Environmental Conservation Region 2 [dec.ny.gov](http://dec.ny.gov), 718-482-4942
Jamaica Bay Organization and Program Descriptions

The following pages contain detailed information about the many local organizations that provide education programs related to Jamaica Bay and its watershed. All of the organizations are eager to support your classroom lessons with resources such as field trips, speakers, publications, volunteer opportunities, and professional development. Contact them, giving advance notice, to arrange for programs and for advice on ways to enhance your curriculum with a Jamaica Bay unit. Program offerings may vary depending on season, funding and staff availability.

Please let us know what you think about the Jamaica Bay Education Resource Directory. An evaluation is included in the Appendix. Please complete the evaluation so that we can revise the Directory accordingly. Your input is invaluable in helping to improve and update the Directory, to ensure that the content is useful.

Thank you for helping to raise awareness of the importance of Jamaica Bay and its watershed. Please use this legend to help you find Jamaica Bay program opportunities.
American Littoral Society (littoralsociety.org/jamaica-bay)

**Contact:** Don Riepe, 718-474-0896, don@littoralsociety.org  
**Audience:** Elementary to high school students, adults, families  
**Fee:** $250

**Organization Description:**
The American Littoral Society is a non-profit, coastal conservation organization dedicated to the study, enhancement, and restoration of marine life and habitats. Our mission includes education, restoration, and advocacy of coastal habitats and wildlife.

**Program Opportunities:**

**Program Description:**
We provide a summer green jobs program, as well as field trips and education programs for school children and the general public. Programs include marsh restoration, shoreline cleanups, day and overnight field trips, lectures, and boat tours of Jamaica Bay.

**Location:** Various sites throughout Jamaica Bay

Billion Oyster Project (billionoysterproject.org)

**Contact:** Ann Fraioli, 212-458-0800, afraioli@nyharbor.org  
**Audience:** Elementary to high school students, adults  
**Fee:** Contact the Billion Oyster Project to discuss payment options

**Organization Description:**
Billion Oyster Project (BOP) restores oyster reefs to New York Harbor through education initiatives. Our vision is a future in which New York Harbor is the center of a rich, diverse and abundant estuary. The communities that surround this complex ecosystem have helped construct it and, in return, benefit from it with endless opportunities for work, education and recreation. The harbor is a world-class public space, well used and well cared for – our commons.

**Program Opportunities:**

**Program Description:**
The Billion Oyster Project has a number of field stations along Jamaica Bay. Student groups, community organizations and local volunteers can visit these field stations to monitor oysters, conduct water quality testing, seine for fish, and engage in other STEM activities. BOP currently has a field station in Paedergat Basin, Brooklyn, and at Bayswater Point State Park, Queens. Both of these sites host community oyster reefs. During low tide, participants bring sections of the reef to shore to inspect local reef-associated critters and measure oysters. Participants also use the oyster reefs as tools for independent research projects. Teachers can access BOP curriculum to support their students’ research in the field and in the classroom. Participants present their research at BOP’s annual June symposium.

**Location:** Various sites throughout Jamaica Bay
**Brooklyn College, City University of New York**
(brooklyn.cuny.edu/web/academics/schools/naturalsciences/undergraduate/environmental.php)

**Contact:** Jennifer Cherrier (Dept. Chair), jennifer.cherrier18@brooklyn.cuny.edu or Wayne Powell (Graduate Deputy), wpowell@brooklyn.cuny.edu

**Audience:** Educators

**Fee:** Based on the number of credits

**Organization Description:**
The Department of Earth and Environmental Sciences is part of an institution of higher education offering credit-bearing graduate courses leading to NYS certification to teach Earth Science. Professional Development Summer Institutes are also offered for credit and not for credit.

**Program Opportunities:**

**Program Description:**
In partnership with the School of Education, the Department of Earth and Environmental Sciences offers graduate and undergraduate programs for K-12 teachers. The Master of Arts for Teachers targets elementary, middle and high school teachers who wish to specialize in earth science. Three years of high quality professional development will be achieved through a partnership between Brooklyn College and the National Park Service. Programs also provide middle and high school teachers in need of state certification with 18 credits of earth science. Teachers will be immersed in research-based pedagogy to become more effective teachers and improve student performance. All professional development align with the NYC Science Scope and Sequence the NYS Science Core Curriculum.

**Location:** Brooklyn College Campus

**Brooklyn Public Library** (bklynlibrary.org/brooklyncollection/connections)

**Contact:** Charles Rudoy, 718-230-2245, crudoy@bklynlibrary.org

**Audience:** Elementary to high school students, adults, families

**Fee:** $0.00

**Organization Description:**
Brooklyn Public Library (BPL) is among the borough’s most democratic civic institutions, serving patrons in every neighborhood and from every walk of life. Established in 1896, BPL is the nation’s sixth largest public library system and currently has nearly 700,000 active cardholders.

**Program Opportunities:**

**Program Description:**
Brooklyn Connections is the school outreach arm of Brooklyn Public Library’s Brooklyn Collection. Our signature partnership program offers classes rare access to original archival materials, while completing a customized, standards-based project. Brooklyn Connections supports NYC educators and students through professional development workshops, after-school visits, and online resources.

**Location:** 10 Grand Army Plaza, Brooklyn
Center for International Earth Science Information Network (CIESIN)
Earth Institute (ciesin.columbia.edu)

Contact: John Scialdone, 845-365-8978, jscialdo@ciesin.columbia.edu
Audience: Elementary to high school students, adults, families
Fee: $0.00

Organization Description:
CIESIN, a Center within the Earth Institute at Columbia University, provides data sets, databases, applications, services, and information resources for scientists, decision-makers, and the public to advance the understanding of the changing relationship between human beings and the environment.

Program Opportunities: 🌙 🌑

Program Description:
CIESIN builds websites to keep users informed on what's going on in the bay, as well as decision-support, data download and mapping tools. The Jamaica Bay Research and Management Information Network (ciesin.columbia.edu/jamaicabay/) is a community-driven knowledge base of past, present, and future activities in Jamaica Bay, drawing on information from federal, state and local government agencies, academic institutions, non-governmental organizations, and private industry. The Jamaica Bay Water Quality Data Visualization and Access Tool (ciesin.columbia.edu/jbwq/) is an interactive Web application created by CIESIN and Brooklyn College providing water quality data collected by the National Park Service and the New York City Department of Environmental Protection (DEP). The water quality data can be used to analyze trends for over 60 parameters and explore indices such as DEP Indicators of Environmental Change, and the National Estuary Program Water Quality Index. AdaptMap (adaptmap.info/jamaicabay/) is an online mapping tool constructed by CIESIN, Stevens Institute of Technology, and the Wildlife Conservation Society demonstrating how sea level rise will worsen storm-driven flooding. It also enables users to select flood adaptation scenarios to see how they reduce flooding. Additionally, AdaptMap displays historic landscapes for the years 1609 and 1877 with associated historic flood zones.

City Parks Foundation (cityparksfoundation.org)

Contact: Luis Gonzalez, 212-360-3332, lgonzalez@cityparksfoundation.org
Audience: Elementary to high school students
Fee: $0.00

Organization Description:
At City Parks Foundation, we are dedicated to invigorating and transforming parks into dynamic, vibrant centers of urban life through sports, arts, community building, and education programs. Our programs — located in more than 350 parks, recreation centers and public schools across New York City — reach 425,000 people each year. Our ethos is simple: thriving parks mean thriving communities.

Program Opportunities: 🏖️ 🎨 🏖️ 🌞

Program Description:
Coastal Classroom After School is designed to support middle school students to create meaningful relationships with their waterfront parks. Starting in late September, Coastal Classroom provides after school programming for up to 30 middle school students in Coney Island Creek / Kaiser Park. Using site-specific inquiry-based lessons and authentic learning experiences in their own communities, students participate in hands-on
exploratory activities such as data collection on shoreline creatures, fishing, and rowing/canoeing. Students build their curiosity for the natural environment and develop knowledge and skills in science with a focus on coastal ecology, water quality, urban waterfront restoration, and preservation.

Coastal Classroom Summer Institute is a five-week program offering lessons to middle school students during the summer in Coney Island Creek / Kaiser Park. Science-based activities coupled with recreational opportunities such as rowing, fishing, and field trips to a variety of sites allow students to experience our waterways as their own backyards and to learn how to protect them.

For more information on our other educational program offerings, please visit https://cityparksfoundation.org/learn/.

Location: Various sites throughout Jamaica Bay

**ConEdison - Queens College GLOBE NY Metro**
(www.qc.cuny.edu/academics/degrees/DMNS/sees/GLOBE and www.globe.gov)

**Contact:** Allan Ludman or Peter Schmidt, 718-997-3324 or 718-997-4268, allan.ludman@qc.cuny.edu or peter.schmidt@qc.cuny.edu  
**Audience:** Educators  
**Fee:** Negotiable

**Organization Description:**
GLOBE Program partnership for southern New York State offers professional development in science for K-12 teachers. GLOBE is based on the premise that students learn science by doing science, not reading about it. Teachers gain insight into rigorous scientific protocols so their students can collect environmental data and send those data to research scientists.

**Program Opportunities: [ ]**

**Program Description:**
Teachers model best practices in inquiry-based education using GLOBE Program science research protocols. Workshops train teachers to carry out measurements of local environmental variables. Topics covered include atmosphere, hydrology, soils, seasonal change, land cover, and ecology.

**Location:** Queens College Campus or workshop requester's own site

**Coney Island Beautification Project, Inc.**

**Contact:** Pamela Pettyjohn, 718-265-0814, cibproject@aol.com  
**Audience:** Pre-K to high school students, adults, families  
**Fee:** $0.00

**Organization Description:**
Coney Island Beautification Project (CIBP) is an environmental organization that came into existence to help the community respond to the huge impacts of Superstorm Sandy. Members wanted to help neighbors care for their local environment and build hope and community through cleanups and plantings. CIBP has evolved into a group that convenes
key conversations about important local environmental issues such as resiliency and flood protection, stormwater management, disaster preparedness, waterfront access, and green infrastructure interventions. We host more than 10 environmental engagement events each year and partner with more than 50 schools, community groups and government agencies in bringing resources and expertise to our community.

**Program Opportunities:**

**Program Description:**
Organize and educate communities about environmental issues, plan and execute events that focus on the beautification of public spaces, introduce native plants to neighborhood parks, conduct independent water quality testing, monitor and count horseshoe crabs, and speak to the public about climate issues.

**Location:** Various sites throughout Jamaica Bay which includes Coney Island Creek and its five parks along its three miles.

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**Coney Island Beautification Project, Inc. (continued)**

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**Gateway National Recreation Area, Jamaica Bay Unit, National Park Service**

(home.nps.gov/gate/learn/education)

**Contact:** Jamaica Bay Unit, Division of Interpretation and Education, gate_education@nps.gov

**Audience:** Students of all ages, teachers, and the general public

**Fee:** $0.00

**Organization Description:**
Gateway encompasses the largest collection of natural systems, wildlife habitats, historic resources, and recreational opportunities in the New York City/New Jersey metropolitan area. Established with the express purpose of opening the “National Park Experience” to the urban population, Gateway lives up to its name. In addition to school programming, the park offers year-round programs for the general public that present learning opportunities for all ages. Ecology boat tours, birding and photography workshops, beach clean-ups and other stewardship programs, and an annual series of nature themed festivals, are just a few of the many programs that are offered.

**Program Opportunities:**

**Program Description:**
Gateway National Recreation Area offers multiple educational experiences for students of all ages that aim to harness a greater connection to New York and New Jersey's natural and historical resources.

Each of these programs can be reserved as either in person field trips or online experiences.

Learn more and reserve your classes for these opportunities through the website listed above.

**Location:** Brooklyn; Jamaica Bay Wildlife Refuge, Queens, program also available as an online field trip.
Educational Youth Camping at Ecology Village - Appalachian Mountain Club (AMC)
(nps.gov/gate/learn/education/youth-camping.htm)

**Audience:** Teachers and youth group leaders

**Program Description:**
Outdoor leadership skills training is offered several times a year through the AMC. Training entitles teachers and group leaders to use AMC gear and camp with youth of any age.

Teachers and youth group leaders learn the skills needed to have a successful, fun, and unique group camping experience. Leaders do not need to have any camping experience, just a willingness to learn and the time to attend training. Once the training is completed, leaders will have access to all the gear (tents, sleeping bags, rain jackets, cooking stove and utensils), access to campsites and trip planning assistance.

**Location:** Floyd Bennett Field Ecology Village campsites, Brooklyn

Jamaica Bay-Rockaway Parks Conservancy (http://www.jbrpc.org/)

**Contact:** 347-690-0931, education@jbrpc.org

**Fee:** $0.00

**Organization Description:**
The Jamaica Bay-Rockaway Parks Conservancy (JBRPC) is a public-private partnership established in 2013 that is dedicated to improving the 10,000 acres of public parkland throughout Jamaica Bay and the Rockaway peninsula for local residents and visitors alike. With its partners at the National Park Service, the New York City Department of Parks and Recreation and the New York State Parks, Recreation and Historic Preservation, JBRPC works to expand public access; increase recreational and educational opportunities; foster citizen stewardship and volunteerism; preserve and restore natural areas, including wetland and wildlife habitat; enhance cultural resources; and ensure the long-term sustainability of the parklands.

**Program Opportunities:**

**Program Description:**
The Jamaica Bay-Rockaway Parks Conservancy (JBRPC) offers hybrid educational programming and volunteer stewardship opportunities in parks throughout Jamaica Bay in both Brooklyn and Queens. JBRPC offers virtual and in person field trips and robust multimedia resources for educators and families including videos, ArcGIS StoryMaps and a STEAM-based Jamaica Bay curriculum. For a complete list of educator resources, please visit [http://www.jbrpc.org/educator-resources](http://www.jbrpc.org/educator-resources). For volunteer opportunities, please visit: [www.jbrpc.org/volunteer](http://www.jbrpc.org/volunteer).

**Location:** Various sites throughout Jamaica Bay
**National Wildlife Federation**  (nwf.org/ecoschools)

**Contact:** Emily Fano, 646-502-7096, fanoe@nwf.org  
**Audience:** Pre-K to high school students, adults, families  
**Fee:** $0.00

**Organization Description:**
For more than 80 years, the National Wildlife Federation has been educating people about the environment. Our K-12 educational resources include the children's publications Ranger Rick and Ranger Rick Jr.; our programs include Schoolyard Habitats, Trees for Wildlife and Eco-Schools USA.

**Program Opportunities:**

**Program Description:**
The National Wildlife Federation’s Eco-Schools USA program empowers students to engage with their environment and provides them with tools, resources, and opportunities to actively protect it. Tested and validated in more than 65 countries, Eco-Schools inspires and motivates students through real-world learning and problem-solving. Students cultivate leadership skills while creating healthy learning environments, conserving resources, saving money, and establishing schools as models for community sustainability. The Eco-Schools 7-Step framework and 12 Pathways to Sustainable Development provide students and teachers with a road map for launching resource conservation and environmental protection projects of their choosing. Once one or more Pathways are completed, schools can apply for Eco-Schools awards and certification including the Green Flag Award (which comes with a real flag)! Contact Emily Fano at nwf.org for information about current programming.

**Location:** Sites throughout Jamaica Bay watershed

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**New York Aquarium**  (nyaquarium.org)

**Contact:** Stephanie Joseph, Curator of Education, 800-433-4149, nyaeducation@wcs.org  
**Audience:** Pre-K to high school students, adults, families  
**Fee:** $200.00

**Organization Description:**
The New York Aquarium is located on the boardwalk in Coney Island, Brooklyn. The aquarium is operated by the Wildlife Conservation Society as part of its integrated system of four zoos and one aquarium, most notably the Bronx Zoo. It is accredited by the Association of Zoos and Aquariums. The recently opened Ocean Wonders: Sharks! exhibit focuses on sharks and other species found in the waters off the coast of New York.

**Program Opportunities:**

**Program Description:**
New York Aquarium offers a variety of programs including guided tours, school field trip programs, outreach, summer camp, family and children programs, teacher professional development and volunteer opportunities for ages 14 to adult.

**Location:** 602 Surf Avenue, Brooklyn
New York City Audubon (nycaudubon.org)

Contact: Danielle Sherman, 212-691-7483, dsherman@nycaudubon.org
Audience: Adult, Elementary – High School, Families
Fee: $150

Organization Description:
NYC Audubon is a grassroots community organization that works for the protection of wild birds and habitat in the five boroughs, improving the quality of life for all New Yorkers.

Program Opportunities: 🦃 🪤 🎭 🎈

Program Description:
NYC Audubon organizes various programs around Jamaica Bay including bird walks, wildlife festivals, beach cleanups, and other volunteer opportunities.

Location: Jamaica Bay Wildlife Refuge, and other sites throughout Jamaica Bay

New York City Department of Education’s Genovesi Environmental Study Center (schools.nyc.gov/school-life/learning/experiential-learning/genovesi-environmental-study-center)

Contact: Christine Mazza, 718-444-6560, GESC@schools.nyc.gov
Audience: K-12
Fee: Varies

Organization Description:
The Genovesi Environmental Study Center offers rich and engaging environmental science programs. This 7,000 square foot learning center, sitting on more than an acre of beautiful grounds, is home to 200 living organisms, four dynamic learning labs, a fully equipped biotechnology lab, an outdoor learning space with pond habitat and urban garden, and a greenhouse laboratory.

At the Center, students participate in hands-on environmental science and STEM instruction. The highly trained staff help students explore the urban habitats around them and become stewards for the environment. Our programs are age and grade-appropriate and aligned to the NYC Science Scope and Sequence and the Common Core Learning Standards.

Program Opportunities: 🌟 🌿 🌑 🌕 🌬️

Program Description:
Environmental education teaches us to coexist with and appreciate nature so that we can make responsible decisions for our communities and future generations. Environmental education begins in our own backyards, encouraging learning to connect with the world around us. The awareness, knowledge and skills established by exploring local habitats provide a basis for developing global awareness and a richer comprehension of causes, connections and consequences. The Genovesi Environmental Study Center engages students in experiences that challenge them to think critically about real-world contexts and issues from which STEM concepts and skills can be learned.

Location: 7151 Ave T, Brooklyn
New York City Department of Environmental Protection (nyc.gov/dep/education)

**Contact:** Robin Sanchez, 718-595-3506, educationoffice@dep.nyc.gov  
**Audience:** Pre-K to high school students, adults, families  
**Fee:** $0.00

**Organization Description:**  
The mission of the New York City Department of Environmental Protection is to enrich the environment and protect public health for all New Yorkers by providing high quality drinking water, managing wastewater and stormwater, and reducing air, noise, and hazardous materials pollution.

**Program Opportunities:**

**Program Description:**
The New York City Department of Environmental Protection's (DEP) Education Office provides pre-Kindergarten through college graduate students and formal and non-formal educators with a wide range of free STEM programs and resources about New York City’s drinking water supply, wastewater treatment system, harbor water quality, sound and noise issues, climate change and stormwater management, and stewardship opportunities. Education programs include classroom presentations, student research projects, field trips to the Visitor Center at the Newtown Creek Wastewater Resource Recovery Facility, Trout in the Classroom, and the annual Water Resources Art and Poetry Contest. DEP supports teachers with complementary print and online curricula, funding for special programs, and professional learning opportunities focused on place-based experiences earning CTLE hours. Learn more about DEP’s education programs and resources by visiting our website.

New York City Department of Parks and Recreation Urban Park Rangers (nyc.gov/parks/rangers)

**Contact:** Marc Sanchez, 212-360-2774, Marc.Sanchez@parks.nyc.gov  
**Audience:** Pre-K to Adults  
**Fee:** Varies

**Organization Description:**  
For over 40 years, the Urban Park Rangers have helped New Yorkers of all ages to discover the great outdoors, uncovering the natural wonders that exist right in their own backyards. With an Urban Park Ranger as your guide, you can experience the marvels of the natural world.

**Program Opportunities:**

**Program Description:**
Free Programs: Weekend Adventures enable adults and families to experience the natural world in new and unexpected ways. They include canoeing, hiking, biking, camping, wildlife viewing, and astronomy, as well as special programs for kids and families. Ranger Conservation Corps is a great urban environmental internship for high school students who are interested in the natural world or environmental issues. Participants gain experience working on park-based restoration projects and receive community service hours. Sessions occur in the fall and spring.
New York City Department of Parks and Recreation Urban Park Rangers (continued)

Fee-based Programs: *The Natural Classroom: People, Place, and Parks!* is a series of hands-on programs that lets you explore the natural world of New York City’s parks with your students. Students will investigate the diversity of Jamaica Bay and how these spaces make life better for New Yorkers. Five distinct programs are available for students in grades K-8 and can be customized to fit the specific needs of each group.

**Location:** Salt Marsh Nature Center, Marine Park, and various sites throughout Jamaica Bay watershed

**NYC H2O** ([nych2o.org](http://nych2o.org))

**Contact:** Matt Malina, 917-656-2984, matt@nych2o.org

**Audience:** Elementary to high school students, adults, families

**Fee:** $75.00

**Organization Description:**
NYC H2O’s mission is to inspire and educate New Yorkers of all ages to learn about, enjoy and protect their city’s local water ecology. Through providing public and school programs at historic reservoirs, parklands, watersheds, bays, rivers and wetlands, we encourage diverse citizens to advocate for responsible public policy. Our activities promote science-based knowledge of New York’s local ecosystems and of what is needed for urban water resilience in a time of escalating climate change impacts.

**Program Opportunities:** 🌱 🍃 🌱 🌱 🌱

**Program Description:**
NYC H2O offers in-person and virtual field trips, water ecology and engineering field trips to Plumb Beach, as well as clean-ups.

**Location:** Plumb Beach, Brooklyn

**New York City Urban Soils Institute** ([urbansoils.org](http://urbansoils.org))

**Contact:** Tatiana Morin, 212-431-9676, tatiana@usi.nyc

**Audience:** Elementary to high school students, adults

**Fee:** $0.00

**Organization Description:**
The New York City Urban Soils Institute is a partnership among the NYC Soil & Water Conservation District, United States Department of Agriculture - Natural Resources Conservation Service, Brooklyn College, and the Gaia Institute. The mission of the New York City Urban Soils Institute (USI) is to advance the scientific understandings and promote the conservation and sustainable use of urban soils.

The USI achieves its mission through four divisions: soils testing and technical services, education and outreach, data depository/clearing house, and research. The USI achieves its goals through partnerships, resource sharing and coordination of programs.

**Program Opportunities:** 🌱 🍃 🌱 🌱 🌱

**Program Description:**
USI offers basic soil sciences, soil quality, and soil health workshops for school groups and community gardeners. All our workshops involve hands-on activities because we believe in learning from doing.

**Location:** Ecology Village, Gateway National Recreation Area, Brooklyn
**New York Sea Grant** ([nyseagrant.org](http://nyseagrant.org))

**Contact:** 631-632-6905, nyseagrant@stonybrook.edu  
**Audience:** Elementary to high school students, adults, families  
**Fee:** $0.00

**Organization Description:**
New York Sea Grant (NYSG), a cooperative program of Cornell University and the State University of New York, is one of 33 university-based programs under the National Sea Grant College Program of the National Oceanic and Atmospheric Administration.

**Program Opportunities:**

**Program Description:**
Through its statewide network of integrated services, NYSG has been promoting coastal vitality, environmental sustainability, and citizen awareness about New York State’s marine and Great Lakes resources since 1971.

For up-to-date information about New York Sea Grant activities, view the e-newsletter, Coastlines, at [seagrant.sunysb.edu](http://seagrant.sunysb.edu).

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**New York State Department of Environmental Conservation** ([https://www.dec.ny.gov/education/38184.html](https://www.dec.ny.gov/education/38184.html))

**Contact:** River Dileo, 718-482-6404, r2ed@dec.ny.gov  
**Audience:** Pre-K to high school students, adults, families  
**Fee:** $0.00

**Organization Description:**
The New York State Department of Environmental Conservation (NYSDEC) is charged with conserving, improving, and protecting New York’s natural resources and environment. NYSDEC Region 2’s professional environmental education staff offers environmental programs throughout New York City, including Jamaica Bay. Our goal is to increase environmental awareness, to foster more informed decision-making and get youth outdoors to study and enjoy their local environment.

**Program Opportunities:**

**Program Description:**
During the summer, NYSDEC Camps offer students with the opportunity to go upstate and experience, at no cost, the out-of-doors for one week. To prepare for this special program, local, in-city pre-camp activities are provided to all participating students. Professional development workshops for educators include Project Learning Tree, Project WET, and Project WILD (Basic, Aquatic, Flying, and Science & Civics), all proven environmental education curricula. NYSDEC education staff are also available for outreach at conferences, fairs, and celebrations.

**Location:** Various sites throughout Jamaica Bay watershed

**Contact:** 212-866-3100  
**Audience:** Pre-K to high school students, adults, families  
**Fee:** $0.00

**Organization Description:**  
NYS Parks offers extraordinary and diverse recreation, environmental education and cultural opportunities in its eight parks located throughout the five boroughs of New York City. In Jamaica Bay, NYS Parks operates Bayswater Point State Park in Far Rockaway, Queens and Shirley Chisholm State Park in East New York, Brooklyn.

**Program Opportunities:**  

**Program Description:**  
NYS Parks offers a wide variety of environmental education opportunities with hands-on learning for all ages from school field trips to public citizen science and fishing. As the newly opened Shirley Chisholm State Park evolves, our educational programs will grow. NYS Parks also coordinates volunteer events focusing on beach clean ups, trail maintenance and invasive species removal.

**Location:** Bayswater Point State Park and Shirley Chisholm State Park

Bayswater Point State Park (https://parks.ny.gov/parks/86)

**Contact:** Devin Gorsen, Devin.Gorsen@parks.ny.gov  
**Audience:** Pre-K, Elementary, Middle School, High School, Adults, Families

**Program Opportunities:**  

**Program Description:**  
Bayswater Point State park comprises 12 acres at the tip of a peninsula jutting out into Mott Basin on the eastern shore of Jamaica Bay in the Far Rockaways. The park’s terrain is wonderfully varied and includes beachfront, wetlands and woodlands. This diversity helps make it an ideal habitat for migrating and nesting birds. In fact, the park was once a bird sanctuary overseen by the Audubon Society. At Bayswater Point, NYS Parks offers a wide variety of environmental education opportunities with hands-on learning for all ages from school field trips to public community science and fishing. NYS Parks also coordinates volunteer events focused on beach clean ups, trail maintenance and invasive species removal.

**Location:** 1479 Point Breeze Place, Far Rockaway
**Shirley Chisholm State Park**  ([https://parks.ny.gov/parks/200](https://parks.ny.gov/parks/200))

**Contact:** 718-277-2420, SCSPeducation@parks.ny.gov  
**Audience:** Pre-K, Elementary, Middle School, High School, Adults, Families

**Program Opportunities:** ⛅️ 🐓 🌿 🍀

**Program Description:**
Our environmental education program takes advantage of the park’s 407 acres and 10 miles of hiking and biking trails. Rising up 130 feet above sea level, this park offers spectacular panoramic views of beautiful Jamaica Bay. As a capped former landfill and ecologically restored landscape right on Jamaica Bay, SCSP offers a rich natural environment to explore. Program topics are seasonal and volunteer projects include beach clean-ups and trail maintenance. More information can be found on our website, or by joining our email list.

**Location:** 1750 Pennsylvania Avenue, Brooklyn; 950 Fountain Avenue, Brooklyn

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**Queens Museum**  ([queensmuseum.org](http://queensmuseum.org))

**Contact:** Melisa Pucar, 718-592-9700, mpucar@queensmuseum.org  
**Audience:** Pre-K to high school students, adults, families  
**Fee:** $200.00

**Organization Description:**
The Queens Museum is dedicated to presenting the highest quality visual arts and educational programming for people in the New York metropolitan area, and particularly for the residents of Queens, a uniquely diverse, ethnic, cultural, and international community.

The Museum fulfills its mission by designing and providing art exhibitions, public programs and educational experiences that promote the appreciation and enjoyment of art, support the creative efforts of artists, and enhance the quality of life through interpreting, collecting, and exhibiting art, architecture, and design.

**Program Opportunities:** 🌱 🌈

**Program Description:**
Waterways Workshop:
During a 2-hour workshop, students trace the water cycle and the path of water from watershed to its destination in New York City through writing and movement within the Watershed Gallery. Additionally, students visit the Panorama of the City of New York to view and discuss the impact and importance of the New York City water supply system. Students look for aesthetic clues to understand the factors that impact water consumption, transportation and water quality. Through experiential learning, students create a mountainous landscape and watch how water collects in reservoirs. Students will make drawings that illustrate the journey of water using water from the reservoir experiment to paint their illustrations, opening the conversation to methods for reusing our resources and protecting harbor water quality.

**Location:** New York City Building, Flushing Meadows Corona Park, Queens
Queens Public Library (queenslibrary.org)

**Contact:** Felix A. Urrutia Jr., Director of Children, Youth and Families Services, 718-990-8554, felix.urrutia@queenslibrary.org  
**Audience:** Pre-K to high school students, adults, families  
**Fee:** $0.00

**Organization Description:**  
Queens Borough Public Library was established through an Act of Incorporation by the City of New York and approved by the Governor on April 17, 1907. Queens Library has since functioned as a private, independent non-profit organization, providing free services to 2.3 million people from 62 locations plus seven Adult Learning Centers and two Family Literacy Centers. Queens Library’s customer base is among the most diverse in the world.

**Program Opportunities:** 📚 ✏️ 🎨 🌱 🌊 🚣

**Program Description:**  
Queens Library transforms lives by cultivating personal and intellectual growth and by building strong communities. Our vision is a vibrant, informed, cohesive, and empowered society.

**Location:** Branches throughout Jamaica Bay watershed

RISE Initiative for Sustainability and Equity (Formerly Rockaway Waterfront Alliance) (riserockaway.org)

**Contact:** Giselle Herrera, Program Manager, 718-327-5919, programs@riserockaway.org  
**Audience:** Pre-K to high school students, adults, families  
**Fee:** $0.00

**Organization Description:**  
RISE is a community-based organization dedicated to empowering residents of underserved communities in the Rockaways to play a role in the determination of their neighborhoods. We provide enriching education and community programming, which instill both individual and civic respect for nature, and contribute to advancing the physical, economic and social sustainability in the Rockaway peninsula.

**Program Opportunities:** 📚 ✏️ 🎨 🌱 🌊 🚣

**Program Description:**  
Our Living Classroom program operates throughout the school year, offering hands-on educational workshops for grades pre-K through 12 that merge environmental science with creative arts. Topics range from climate change to sustainable farming. Aqua 101 summer program for ages 9-13 engages children with their environment through water-based recreation and outdoor learning. Additionally, we offer after-school and summer internships for high school students—Shore Corps focuses on civic engagement and community building, and Environmentor is an environmental research program in which students complete projects with local scientists. We also offer a variety of weekend community service events, from beach clean-ups and kayaking to dune plantings and Earth Day celebrations.

**Location:** RISE Center, 5803 Rockaway Beach Blvd, Rockaway, Far Rockaway, NY 11692
### Rockaway Youth Taskforce (rytf.org)

**Contact:** Tamera Jacobs, 718-868-0386, tamerajacobs@rytf.org  
**Audience:** Middle school to high school students, adults, families  
**Fee:** $0.00

**Organization Description:**
The Rockaway Youth Task Force (RYTF) is a grassroots member-led organization principally comprised of young women of color within the Rockaway Peninsula. Rockaway Youth Task Force builds power to secure social, economic and racial justice for residents of the Rockaway Peninsula and beyond. Rockaway Youth Task Force develops politically conscious youth leaders who are invested in improving themselves and their communities through member-led campaigns, leadership development, movement building, and cultural expression.

**Program Opportunities:**

**Program Description:**
The Rockaway Peninsula is a federally labelled food desert. RYTF combats the lack of healthy food options for our people through our Urban Farming Program, which gives RYTF members the opportunity to grow healthy, organic produce for themselves, their families, and their community. Through volunteering on our acre Urban Farm, youth gain firsthand knowledge of environmentally-conscious and sustainable urban farming practices and healthy eating habits. Through running our weekly farm stand during the summer and fall, RYTF youth learn entrepreneurial skills like customer service and managing inventory.

**Location:** Various schools throughout Jamaica Bay, Brooklyn and Queens

### Waterfront Alliance (waterfrontalliance.org)

**Contact:** Jake Madelone, 212-935-9831 x108, jmadelone@waterfrontalliance.org  
**Audience:** Elementary to high school students, adults, families  
**Fee:** Reach out for payment details

**Organization Description:**
The Waterfront Alliance inspires and effects resilient, revitalized, and accessible coastlines for all communities. We believe New York Harbor and the surrounding waterways should be a shared resource for all. Our coastal communities must resolutely prepare for the reality of sea level rise and be prepared for the next big storm. Adapting to this new reality, we will create healthy, resilient, accessible, and equitable waterways that are alive with commerce and recreation, and exciting waterfront destinations that reflect the vitality and diversity of the communities that surround them.

**Program Opportunities:**

**Program Description:**
Through Estuary Explorers, students apply scientific method to their local shorelines. The program pairs experiential education at community waterfronts with extension lessons in the classroom to enrich students’ understandings of marine ecology, water quality, estuarine geography, sea level rise, and climate change. The program is adaptable for a variety of ages, but always includes measuring and analyzing data, including salinity, pH, water temperature, and permeable and non-permeable surfaces. A few, simple supplies and our ready to use data sheets and instructions, make it possible to host a meaningful environmental education lab at any local waterfront.

**Location:** Various sites throughout Jamaica Bay watershed
Wilderness Inquiry (wildernessinquiry.org)

**Contact:** Christine Rettler, 612-676-9412, christine@wildernessinquiry.org  
**Audience:** Elementary to high school students, adults, families, people of all abilities  
**Fee:** $0.00

**Organization Description:**
Our mission is to connect people from all walks of life to the natural world through shared outdoor adventures. We inspire personal growth, enhanced awareness of the environment and community integration.

**Program Opportunities:**

**Program Description:**
The Canoemobile program is a “floating classroom” that brings students on local waterways in 24-foot Voyageur canoes. Canoemobile engages youth to cultivate a stewardship ethic and create pathways to pursue educational and career opportunities in the outdoors.

Canoemobile offers free and open-to-the-public paddles in communities where it is working. These experiences change waterways into places of recreation, learning, and community-building.

**Location:** Various sites throughout Jamaica Bay watershed
Appendix

35  Jamaica Bay Education Topics
38  Vocabulary
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44  Harbor Water Quality Testing: Recording Results
49  Books
51  Additional Digital Resources
52  Survey: Jamaica Bay Education Resource Directory
53  Evaluation: Jamaica Bay Education Resource Directory
Jamaica Bay Education Topics

The Jamaica Bay Education Coordinating Committee compiled the following list of education topics based on these three overarching questions:

1. What do we want young people and adults to learn about Jamaica Bay?
2. Why does Jamaica Bay matter?
3. What action do we want young people and adults to take to improve and protect Jamaica Bay?

We hope that the detailed topics below identified by the Jamaica Bay Education Coordinating Committee will assist educators in developing lessons and activities about Jamaica Bay’s environs and ecological systems.

Where does fresh water come from?
- What is the hydrological cycle?
- What can interfere with the movement of water through the cycle?

What is a watershed?
- How does fresh water flow to a river?
- What factors influence the movement of water?
- What factors influence the quality of water?
- What are the land-use issues for the areas adjacent to the Bay?
- What are the land-use issues for the areas upland from the Bay?
- How does water cycle through an urbanized watershed?
- How does water cycle through a natural area?

Where does salt water come from?
- How does water become salty?
- What causes tides?
- How do tides influence the environment?
- What are the differences between freshwater and salt water?

What is an estuary?
- How are estuaries created?
- Why are estuaries important?
- Why do we need to protect estuaries?

What is a wetland?
- Why are wetlands important?
- What makes wet land a wetland?
- What vegetation is characteristic of wetlands?
- What types of soil are characteristic of wetlands?
- What hydrology is characteristic of wetlands?
- Why is the classification of wetlands important?
- Why learn about wetlands?

How is water quality monitored in an estuary?
- What are the federal and local regulations?
- What government programs monitor water quality?
- What local stewardship programs take place in your community?
What is needed for healthy ecosystems?
- What abiotic and biotic factors affect life processes?
- What is plankton?
- What are food webs and food chains?
- What are aquatic habitats and what life do they support?
- What are upland habitats and what life do they support?
- What is biodiversity and why is it important?
- How does water quality influence the interconnectedness of habitats?
- How do watersheds affect water quality?

What are the ecosystems of Jamaica Bay?
- Where is Jamaica Bay?
- How do you access the resources of Jamaica Bay?
- Where are the wetlands of Jamaica Bay?
- What purpose do they serve?
- What organisms have adapted to life there?
- Where are the barrier beaches?
- What purpose do they serve?
- What organisms have adapted to life there?
- Where are salt marshes?
- What purpose do they serve?
- What organisms have adapted to life there?
- Where are mudflats?
- What purpose do they serve?
- What organisms have adapted to life there?
- Is Jamaica Bay an estuary?
- How do tides influence Jamaica Bay?

What is wastewater?
- What is the source of wastewater?
- What is a combined sewer system?
- What is a municipal separate storm sewer system (MS4)?
- What path does litter take from streets to the Bay?
- How do we treat our wastewater?
- Why do we treat our wastewater?
- How does wastewater affect our surrounding waterbodies?
- How are we responsible for our wastewater?
- What is combined sewer overflow?
- Why should grease and wipes be disposed of properly?

What is stormwater?
- What is the source of stormwater?
- How do we treat our stormwater?
- How does stormwater affect our surrounding waterbodies and communities?
- How can we help reduce the impact of stormwater?
- How do raingardens and other green infrastructure manage stormwater?
- Why is green infrastructure important?
What is the watershed for Jamaica Bay?
• What is a watershed?
• What are the boundaries of the Jamaica Bay Watershed?
• Is your school/home in the watershed?
• Where is it located in relation to the Bay?
• What human and natural features influence the watershed?
• What is non-point source pollution?
• What are sources of freshwater into the Bay?
• What are the sources of water pollution in the Bay?

How do human activities impact Jamaica Bay water quality?
• What activities take place on the Bay?
• How do they impact water quality?
• What activities take place in the watershed?
• How do they impact water quality?
• What activities take place globally that may impact water quality?
• How do they impact water quality?
• How will climate change impact Jamaica Bay?

What is the water quality of Jamaica Bay?
• Is Jamaica Bay important? Why?
• How is the water monitored?
• Who monitors the water?
• What are water quality problems?
• Why does water quality matter?

What can people do to protect Jamaica Bay?
• How can people help improve water quality and habitats?
• What is the value of open space to the health of the Bay?
• What are people doing to enhance the Bay?
• What regulations exist to protect the Bay?
• What still needs to be done?
Vocabulary

This list is designed to help define unfamiliar terms you may encounter in the Jamaica Bay Education Resource Directory as well as during classroom lessons and field excursions. A great way to introduce these terms is by making a crossword puzzle or matching game. Have fun!

**Atlantic Flyway**: An important bird migration route along the Atlantic coast of North America, the Atlantic Flyway stretches more than 3,000 miles from the Arctic tundra to the Caribbean.

**Brackish Water**: Water that is saltier than fresh water but not as salty as seawater. It may result from mixing of seawater with fresh water, as in estuaries.

**Climate Literacy**: Basic understanding of one’s relationship with the climate, both personally and societally.

**Coastal Woodlands**: An area near a coast that has substantial canopy cover from mature trees and other understory vegetation.

**Combined Sewer Overflow (CSO)**: A mix of stormwater and untreated sewage that discharges directly into waterways during heavy rainstorms in a combined sewer system; stormwater is discharged directly into waterways in a separate sewer system.

**Dissolved Oxygen**: The level of oxygen \( O_2 \) contained in water.

**Dredging**: The excavation of sediments to maintain and promote ecological and navigational improvements.

**Endangered Species**: A species that is in danger of extinction throughout all or a portion of its range.

**Estuary**: An area where a freshwater river or stream meets the sea.

**Grasslands**: Land dominated by grasses and other herbaceous plants.

**Green Infrastructure**: a way to manage water through the construction of green roofs, rain gardens, etc.; this method mimics the natural water cycle’s method of runoff absorption.

**Impervious**: A term used to describe a feature that cannot absorb water.

**Maritime Shrublands**: The spray of saltwater blown ashore by strong offshore winds create scattered stunted trees with contorted branches and wilted leaves.

**MS4**: The Municipal Separate Storm Sewer System which is a publicly owned system which carries storm water to nearby waterbodies, which helps mitigate flooding.

**Nutrients**: Chemical substances found in every living thing and necessary for life processes such as food breakdown, growth, and repair.

**Resilience**: Sometimes called ecological resilience, it is the capacity of an ecosystem to respond to and recover from a disturbance, such as a storm or fire.

**Salt Marsh**: Coastal wetlands that are flooded and drained by salt water brought in by the tides.

**Stewardship**: A personal priority to take care of the environment.

**Stormwater**: Surface water generated from precipitation; when it flows in great quantities over impervious surfaces, it may cause flooding.

**Sustainability**: The effort to avoid depletion of natural resources in order to maintain ecological balance.

**Tidal Wetlands**: Areas, where the land meets the sea, that are periodically flooded by seawater during high or spring tides.

**Wastewater Treatment Plant (or Wastewater Resource Recovery Facility)**: Where the physical, chemical, and biological processes to clean used water and stormwater before being released into a local waterbody takes place.

**Watershed**: A land area that drains water to a particular stream, river, lake, bay or reservoir.

**Wetlands**: Areas where water covers the soil, or is present either at or near the surface of the soil, for varying times during the year.
Flora and Fauna at a Glance: Jamaica Bay’s Plants and Animals

The Jamaica Bay ecosystem is an important network of open water, salt marsh, grasslands, coastal woodlands, maritime shrub lands, brackish and freshwater wetlands. These 20,000 acres provide seasonal and year-round habitats for a remarkable variety of wildlife, including 91 species of fish and 325 species of birds.

How many common plants and animals can you find when you visit Jamaica Bay? Please refer to the following lists to keep a record of the flora and fauna you observe and add other species you find. To help with identification, use a field guide book listed in Additional Resources or join a Ranger-led interpretive walk featured in Program Descriptions. You may even want to bring a pair of binoculars if you have them. Enjoy!

### Trees

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Location &amp; Date Observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>American holly</td>
<td>Ilex opaca</td>
<td></td>
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<tr>
<td>Black cherry</td>
<td>Prunus serotina</td>
<td></td>
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<tr>
<td>Eastern cottonwood</td>
<td>Populus deltoides</td>
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<tr>
<td>Eastern red cedar</td>
<td>Juniperus virginiana</td>
<td></td>
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<tr>
<td>Eastern white pine</td>
<td>Pinus strobus</td>
<td></td>
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<tr>
<td>Gray birch</td>
<td>Betula populifolia</td>
<td></td>
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<tr>
<td>Pitch pine</td>
<td>Pinus rigida</td>
<td></td>
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<tr>
<td>Red maple</td>
<td>Acer rubrum</td>
<td></td>
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<tr>
<td>Tree of heaven</td>
<td>Ailanthus altissima</td>
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</table>

### Shrubs and Vines

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Location &amp; Date Observed</th>
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<tbody>
<tr>
<td>Beach plum</td>
<td>Prunus maritima</td>
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<tr>
<td>Japanese honeysuckle</td>
<td>Lonicera japonica</td>
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<tr>
<td>Northern bayberry</td>
<td>Myrica pensylvanica</td>
<td></td>
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<tr>
<td>Poison ivy</td>
<td>Toxicodendron radicans</td>
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<tr>
<td>Pussy willow</td>
<td>Salix discolor</td>
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<tr>
<td>Virginia creeper</td>
<td>Parthenocissus quinquefolia</td>
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<tr>
<td>Winged sumac</td>
<td>Rhus copallina</td>
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</table>
### Wildflowers and Grasses

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<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Location &amp; Date Observed</th>
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</thead>
<tbody>
<tr>
<td>American beachgrass</td>
<td><em>Ammophila brevilligulata</em></td>
<td></td>
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<tr>
<td>Beach pea</td>
<td><em>Lathyrus japonicus</em></td>
<td></td>
</tr>
<tr>
<td>Common milkweed</td>
<td><em>Asclepias syriaca</em></td>
<td></td>
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<tr>
<td>Common mullein</td>
<td><em>Verbascum thapsus</em></td>
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<tr>
<td>Evening primrose</td>
<td><em>Oenothera biennis</em></td>
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<tr>
<td>Little bluestem grass</td>
<td><em>Schizachyrium scoparium</em></td>
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<tr>
<td>Reed grass</td>
<td><em>Phragmites australis</em></td>
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<tr>
<td>Saltmarsh cordgrass</td>
<td><em>Spartina alterniflora</em></td>
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<tr>
<td>Salt marsh hay</td>
<td><em>Spartina patens</em></td>
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<tr>
<td>Seaside goldenrod</td>
<td><em>Solidago sempervirens</em></td>
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<tr>
<td>Sea-rocket</td>
<td><em>Cakile edentula</em></td>
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### Macroinvertebrates

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Location &amp; Date Observed</th>
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<tbody>
<tr>
<td>Amphipod</td>
<td><em>Ampelisca abdita</em> (e.g.)</td>
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<tr>
<td>Asian shore crab</td>
<td><em>Hemigrapsus sanguineus</em></td>
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<tr>
<td>Blue crab</td>
<td><em>Callinectes sapidus</em></td>
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<tr>
<td>European green crab</td>
<td><em>Carcinus maenus</em></td>
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<tr>
<td>Fiddler crab</td>
<td><em>Uca spp.</em></td>
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<tr>
<td>Horseshoe crab</td>
<td><em>Limulus polyphemus</em></td>
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<tr>
<td>Lady crab</td>
<td><em>Ovalipes ocellatus</em></td>
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<tr>
<td>Polychaete worm</td>
<td><em>Streblospio benedicti</em> (e.g.)</td>
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<tr>
<td>Sand shrimp</td>
<td><em>Crangon septemspinosa</em></td>
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### Fish

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Location &amp; Date Observed</th>
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<tbody>
<tr>
<td>American eel</td>
<td>Anguilla rostrata</td>
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<tr>
<td>Atlantic menhaden</td>
<td>Brevoortia tyrannus</td>
<td></td>
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<tr>
<td>Atlantic silverside</td>
<td>Menidia menidia</td>
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<tr>
<td>Bluefish</td>
<td>Pomatomus saltatrix</td>
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<tr>
<td>Lined seahorse</td>
<td>Hippocampus erectus</td>
<td></td>
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<tr>
<td>Mummichog</td>
<td>Fundulus heteroclitus</td>
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<tr>
<td>Northern pipefish</td>
<td>Syngnathus fuscus</td>
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<tr>
<td>Northern puffer</td>
<td>Sphoeroides maculates</td>
<td></td>
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<tr>
<td>Northern searobin</td>
<td>Prionotus carolinus</td>
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<tr>
<td>Striped killifish</td>
<td>Fundulus majalis</td>
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<tr>
<td>Striped mullet</td>
<td>Mugil cephalus</td>
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<tr>
<td>Summer flounder (Fluke)</td>
<td>Paralichthys dentatus</td>
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<tr>
<td>Tautog (Blackfish)</td>
<td>Tautoga onitis</td>
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<tr>
<td>Winter flounder</td>
<td>Pseudopleuronectes americanus</td>
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### Mollusks (Univalves and Bivalves)

<table>
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<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Location &amp; Date Observed</th>
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</thead>
<tbody>
<tr>
<td>Amethyst (gem) clam</td>
<td>Gemma gemma</td>
<td></td>
</tr>
<tr>
<td>Atlantic jacknife clam</td>
<td>Ensis directus</td>
<td></td>
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<tr>
<td>Atlantic mud crab</td>
<td>Panopeus herbstii</td>
<td></td>
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<tr>
<td>Atlantic ribbed mussel</td>
<td>Geukensia demissa</td>
<td></td>
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<tr>
<td>Atlantic slipper shell</td>
<td>Crepidula fornicata</td>
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<tr>
<td>Blue mussel</td>
<td>Mytilus edulis</td>
<td></td>
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<tr>
<td>Channeled whelk</td>
<td>Busycotypus canaliculatus</td>
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<tr>
<td>Eastern mudsnail</td>
<td>Ilyanassa obsoleta</td>
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<tr>
<td>Eastern oyster</td>
<td>Crassostrea virginica</td>
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<tr>
<td>Hard-shelled clam/ northern quahog</td>
<td>Mercenaria mercenaria</td>
<td></td>
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<tr>
<td>Knobbed whelk</td>
<td>Busycon carica</td>
<td></td>
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<tr>
<td>Soft shell clam</td>
<td>Mya arenaria</td>
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### Birds

<table>
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<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Location &amp; Date Observed</th>
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<tbody>
<tr>
<td>Black duck</td>
<td>Anas rubripes</td>
<td></td>
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<tr>
<td>Brant</td>
<td>Branta bernicla</td>
<td></td>
</tr>
<tr>
<td>Canada goose</td>
<td>Branta canadensis</td>
<td></td>
</tr>
<tr>
<td>Common tern</td>
<td>Sterna hirundo</td>
<td></td>
</tr>
<tr>
<td>Glossy ibis</td>
<td>Plegadis falcinellus</td>
<td></td>
</tr>
<tr>
<td>Gray catbird</td>
<td>Dumetella carolinensis</td>
<td></td>
</tr>
<tr>
<td>Great blue heron</td>
<td>Ardea herodias</td>
<td></td>
</tr>
<tr>
<td>Herring gull</td>
<td>Larus argentatus</td>
<td></td>
</tr>
<tr>
<td>Osprey</td>
<td>Pandion haliaetus</td>
<td></td>
</tr>
<tr>
<td>Piping plover</td>
<td>Charadrius melodus</td>
<td></td>
</tr>
<tr>
<td>Red-winged blackbird</td>
<td>Agelaius phoeniceus</td>
<td></td>
</tr>
<tr>
<td>Snowy egret</td>
<td>Egretta thula</td>
<td></td>
</tr>
<tr>
<td>Tree swallow</td>
<td>Tachycineta bicolor</td>
<td></td>
</tr>
<tr>
<td>Willet</td>
<td>Catoptrophorus semipalmatus</td>
<td></td>
</tr>
<tr>
<td>Yellow-rumped warbler</td>
<td>Dendroica coronata</td>
<td></td>
</tr>
</tbody>
</table>

### Mammals

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Location &amp; Date Observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern gray squirrel</td>
<td>Sciurus carolinensis</td>
<td></td>
</tr>
<tr>
<td>Little brown bat</td>
<td>Myotis lucifugus</td>
<td></td>
</tr>
<tr>
<td>Meadow vole</td>
<td>Microtus pennsylvanicus</td>
<td></td>
</tr>
<tr>
<td>Muskrat</td>
<td>Ondatra zibethicus</td>
<td></td>
</tr>
<tr>
<td>Norway rat</td>
<td>Rattus norvegicus</td>
<td></td>
</tr>
<tr>
<td>Raccoon</td>
<td>Procyon lotor</td>
<td></td>
</tr>
<tr>
<td>Virginia opossum</td>
<td>Didelphis virginiana</td>
<td></td>
</tr>
<tr>
<td>White-footed mouse</td>
<td>Peromyscus leucopus</td>
<td></td>
</tr>
</tbody>
</table>
### Reptiles and Amphibians

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Location &amp; Date Observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common snapping turtle</td>
<td><em>Chelydra serpentine</em></td>
<td></td>
</tr>
<tr>
<td>Eastern box turtle</td>
<td><em>Terrapene carolina carolina</em></td>
<td></td>
</tr>
<tr>
<td>Eastern garter snake</td>
<td><em>Thamnophis sirtalis sirtalis</em></td>
<td></td>
</tr>
<tr>
<td>Gray tree frog</td>
<td><em>Hyla versicolor</em></td>
<td></td>
</tr>
<tr>
<td>Northern black racer</td>
<td><em>Coluber constrictor</em></td>
<td></td>
</tr>
<tr>
<td>Northern brown snake</td>
<td><em>Storeria dekayi</em></td>
<td></td>
</tr>
<tr>
<td>Northern diamondback terrapin</td>
<td><em>Malaclemys terrapin terrapin</em></td>
<td></td>
</tr>
<tr>
<td>Painted turtle</td>
<td><em>Chrysemys picta</em></td>
<td></td>
</tr>
<tr>
<td>Redback salamander</td>
<td><em>Plethodon cinereus</em></td>
<td></td>
</tr>
<tr>
<td>Spring peeper</td>
<td><em>Pseudacris crucifer</em></td>
<td></td>
</tr>
</tbody>
</table>

### Insects

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Location &amp; Date Observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ant</td>
<td><em>Tapinoma sessile</em> (e.g.)</td>
<td></td>
</tr>
<tr>
<td>Bumblebee</td>
<td><em>Bombus vagans</em> (e.g.)</td>
<td></td>
</tr>
<tr>
<td>Cabbage white butterfly</td>
<td><em>Pieris rapae</em></td>
<td></td>
</tr>
<tr>
<td>Dragonfly</td>
<td><em>Anax junius</em> (e.g.)</td>
<td></td>
</tr>
<tr>
<td>Eastern tent caterpillar</td>
<td><em>Malacosoma americanum</em></td>
<td></td>
</tr>
<tr>
<td>Field cricket</td>
<td><em>Gryllus spp.</em></td>
<td></td>
</tr>
<tr>
<td>Greenhead fly</td>
<td><em>Tabanus spp.</em></td>
<td></td>
</tr>
<tr>
<td>Ladybug</td>
<td><em>Hippodamia convergens</em></td>
<td></td>
</tr>
<tr>
<td>Monarch butterfly</td>
<td><em>Danaus plexippus</em></td>
<td></td>
</tr>
<tr>
<td>Salt marsh mosquito</td>
<td><em>Aedes sollicitans</em></td>
<td></td>
</tr>
</tbody>
</table>
Harbor Water Quality Testing: Recording Results

Date and Time: ______________________________________________________
Location: __________________________________________________________
Name of Water Body: ________________________________________________

Observations:
1. Use the space below to sketch your location. Be sure to include a compass rose showing N/S/E/W, the water body you are sampling, and your sampling site.

2. What is the landscape like near your sampling site? Check all that apply.
   - Beach
   - Urban
   - Commercial
   - Swampy
   - Grassy
   - Residential
   - Industrial
   - Forested
   - Other

3. What is the shoreline like? Check all that apply.
   - Sandy
   - Covered with plants
   - Rocky
   - Paved
   - Piers
   - Pipes entering river

4. What does the water look like? The surface is (check one):
   - Choppy
   - Calm
   - Sandy
   - Rocky
   - Muddy
   - Covered with plants
5. Name and/or draw plants and animals that you see.

6. What activities are people doing here?

_______________________________________________________________________________________

_______________________________________________________________________________________

_______________________________________________________________________________________

7. Do you see any evidence of pollution? If so, what types?

_______________________________________________________________________________________

_______________________________________________________________________________________

_______________________________________________________________________________________

8. Are there boats on the water? What type are they? What direction are they traveling? What do they appear to be transporting?

_______________________________________________________________________________________

_______________________________________________________________________________________

_______________________________________________________________________________________

9. What else do you observe (consider what you see, smell, hear or feel)?

_______________________________________________________________________________________

_______________________________________________________________________________________

_______________________________________________________________________________________
Station 1: Weather & Observations

Weather Conditions:

1. Air temperature: ______ °C / ______ °F

2. Wind speed (Beaufort Chart): _______ Wind direction (where is it coming from): ________

3. Cloud cover (check one):
   - clear
   - mostly cloudy
   - partly cloudy
   - scattered clouds
   - overcast

4. Is there precipitation? If so, describe it here________________________________________________

5. What has the weather been like for the last three days (include rain, wind, unusual temperatures).

<table>
<thead>
<tr>
<th>Day</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

6. How can weather from previous days affect water quality today?

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________
Station 2: Turbidity

Turbidity is the cloudiness of water. Sediments, microorganisms, decayed matter, and pollution can cause turbid or cloudy water. Light can penetrate farther in clear water than it can in turbid water. Turbidity is usually measured by the distance needed to see an object clearly. The farther the distance, the cloudier or more turbid the water is.

1. Describe how the water looks. How clear is it? What color is it?
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

2. Turbidity Tube:  Reading 1 ________  Reading 2 ________  Reading 3 ________
   Average reading: ___________

3. How do you think your water body’s turbidity affects organisms that live here?
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

Station 3: pH and Salinity

pH measures how acidic or basic (alkaline) a solution is. The pH scale goes from 0 to 14 with 7 (neutral), below 7 (acidic), and above 7 (basic). Most fish prefer an environment with a pH of 6.5 to 8.5.

1. pH reading: ________

2. Based on the pH, do you think living things can survive well in this water body?
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

Salinity is a measure of the amount of salt present in the water. It is measured in PPT (parts per thousand). Salinity can be measured using a device called a hydrometer, which measure the water’s density using a floating object. As salinity increases, density increases, and the object floats higher.

1. Salinity reading: ________

2. Freshwater has very little salt (around 2-3 PPT) while the open ocean is very salty (around 36 PPT). Based on your salinity reading, is your water body fresh, salt, or brackish water?
   ____________________________________________________________
Station 4: Water Temperature and Dissolved Oxygen

Most organisms need oxygen to survive, even ones that live in the water. The amount of dissolved oxygen (DO) in the water is one of the most important factors in determining the health of an ecosystem. Many variables affect DO, including temperature, time of day, presence of plants, and wind conditions.

1. Would a high or low DO level promote a healthier environment? Why?
   _______________________________________________________________________________
   _______________________________________________________________________________
   _______________________________________________________________________________

2. How can the environmental factors you observe at your sampling site affect the water’s DO level?
   _______________________________________________________________________________
   _______________________________________________________________________________
   _______________________________________________________________________________

DO measurements are given in PPM (parts per million), and as percent saturation. Many variables affect DO, including temperature, presence of plants and nutrients, and wind conditions. 100% saturation means that the water cannot hold any more oxygen at that temperature. Waterways with a saturation value of 90% or above are considered healthy (70-100% is good).

1. Water Temperature: ______ °C    ______ °F
2. DO reading: ______________
   * Using the graphic below, locate the temperature of the water in degrees Celsius on the top scale. Draw a straight line between the temperature and DO. The % saturation is the value where the line intercepts the saturation scale. *

3. % Saturation: ______
Books


Day, Leslie. *Field Guide to the Natural World of New York City*. Maryland: Johns Hopkins University Press, 2007. Combining stunning paintings with a variety of photographs and maps, this book is a complete guide for the urban naturalists—with tips on identifying the city's flora and fauna and maps showing the nearest subway stop. Adult


McCully, Betsy. *City at the Water's Edge: A Natural History of New York*. New Jersey: Rivergate Books, Rutgers University Press, 2007. A unique account of how New York has served as an evolving habitat for a diversity of species, including our own. The author chronicles the growth of the city at the expense of the environment, but leaves the reader with a vision of a future city as a human habitat that is brought into balance with nature. Adult


Parham, Jerril. *Boundary Breakers: Remarkable People*. New York: Scholastic Library Publishing, 2007. While most people are content to rationalize the way things are, very few are willing to dedicate their lives to human rights, the environment, and other causes. A series of short biographies explains the motivations and accomplishments of people who decided not to accept the status quos. Ages 9-12


Seitz, Sharon and Adrian Benepe. *Big Apple Safari for Families: The Urban Park Rangers’ Guide to Nature in New York City*. Vermont: Countryman Press, 2005. A valuable resource for those parents who have always held the love of nature as an integral part of their lives, and wish to share it with their children. This book is filled with activities and information about how to find and experience nature in all five boroughs. Adult


Additional Digital Resources

A Day in the Life of the Hudson River and Harbor - ideo.columbia.edu/edu/k12/snapshotday/
Annual fall event for school groups along the Hudson River estuary to collect and share scientific information about their water body.

Cafeteria Culture - cafeteriaculture.org
Working with youth to creatively achieve zero waste schools, plastic free waters, and climate smart communities; view free tool kits, videos and other great online resources.

Center for International Earth Science Information Network - ciesin.columbia.edu
Datasets, applications, services, and lessons/modules for educators interested in using GIS technology to explore environmental issues on local, regional, and global scales.

Center for Urban Pedagogy - welcometocup.org
Explore the power of design and art to increase meaningful civic engagement.

Jamaica Bay EcoWatchers - jamaicabayecowatchers.org/
Ensuring a safe and healthy environment.

Green Map - greenmap.org/stories/youth-green-mapping-tools/228
Six energy and environment exploration modules designed to help middle and high school age youth experience and interpret New York City from a perspective of sustainability.

Harbor Estuary Program - harborestuary.org
A National Estuary Program authorized in 1987 by the U.S. EPA to develop and implement a plan to protect, preserve, and restore the estuary.

National Conservation Training Center - training.fws.gov
Online conservation library, including photos of species, teaching materials, publications, posters, newsletters, and training opportunities.

National Marine Educators Association - marine-ed.org
Bringing together people with an interest in freshwater and saltwater organisms.

National Oceanic Atmospheric Administration - noaa.gov
To understand and predict changes in climate, weather, oceans, and coasts, to share that knowledge and information, and to conserve and manage coastal and marine ecosystems.

National Park Service - nps.gov/parkhistory/online_books/gate/jamaica_bay_hrs.pdf
A history of the human land use of Jamaica Bay.

Supporting teams of middle- and high-school students as they investigate waste in their community and develop service-learning projects.

View the Jamaica Bay Watershed Protection Plan.


New York Harbor Parks - NYHarborparks.org
Information on national parks on the water, including Jamaica Bay.

New York-New Jersey Baykeeper - nynjbaykeeper.org
Working to protect, preserve and restore ecological integrity and habitats of local waterways.

New York State Marine Education Association - nysmea.org
Information about marine awareness, instructional resources, activities, and links to student programs.
### Survey: Jamaica Bay Education Resource Directory

<table>
<thead>
<tr>
<th>Name of Organization:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Website:</td>
</tr>
<tr>
<td>Contact Person Name:</td>
</tr>
<tr>
<td>Address:</td>
</tr>
<tr>
<td>Phone Number:</td>
</tr>
<tr>
<td>Contact E-mail:</td>
</tr>
</tbody>
</table>

**Audience (check all that apply)**

- [ ] Pre-kindergarten
- [ ] Elementary
- [ ] Middle School
- [ ] High School
- [ ] Adults
- [ ] Families

**Program Fee:**

**Description of Organization:**

**Program Opportunities (check all that apply)**

- [ ] Educator/Speaker Visit
- [ ] Field Experience
- [ ] Professional Development
- [ ] Web-based Resource
- [ ] Printed Resource
- [ ] Program for General Public
- [ ] Summer Program
- [ ] Volunteer/Internship Opportunity

**Program Description:**

**Program Location:**

**Site Information:**

- [ ] Restroom On-Site
- [ ] Handicapped Accessible
- [ ] Bus Parking
- [ ] Picnic Area
- [ ] Nature or Visitor Center Indoor Facilities
- [ ] Wading Area
- [ ] Pier
- [ ] Boat Launch
- [ ] Camping
- [ ] Marked Trails
- [ ] Permit Required
- [ ] Drinking Water Fountain
Evaluation: Jamaica Bay Education Resource Directory

Thank you for completing this evaluation of the new Jamaica Bay Education Resource Directory. Your feedback will help us when we periodically update and enhance the information contained within the directory. To receive a digital copy of this evaluation form to complete online, please contact educationoffice@dep.nyc.gov.

1. Your Name:

2. How did you find out about the Jamaica Bay Watershed Education Resource Directory?

3. Was this information helpful to you?
   Comments:

4. Do you think it will be helpful to other educators?
   Comments:

5. Before you received the Directory, did you present information about Jamaica Bay and its watershed in lessons you conduct? Please describe.
   Comments:

6. Will you now consider including information about Jamaica Bay in your lessons?
   Comments:

7. Before you received the Directory, did you use Jamaica Bay field trips to enhance your lessons? Please describe:

8. Will you now use Jamaica Bay field trips to enhance your lessons?
   Please describe:

9. Before you received the Directory, did you work with any of the organizations listed in the Directory to help you develop lessons and curriculum? If you used others, please list them here.
   Comments:

10. Will you now consider working with any of the organizations listed in the Directory to help you develop lessons/curriculum?
   Comments:

11. Did the information in the Directory help you learn about the subject?
   Comments:

12. Is the information in the Directory well organized?
   Comments:

13. Did you find any inaccuracies in the Directory?
   Comments:
☐ Yes  ☐ No  14. Would you recommend this publication to your colleagues?
   Comments:

☐ Yes  ☐ No  15. Would you post the electronic version of the Directory on your website or recommend it for another site?
   Comments:

COMMENTS: Please share any additional information with us.

16. What additional information about Jamaica Bay and its watershed would you find helpful?

17. How do you suggest we promote Jamaica Bay and the Jamaica Bay Education Resource Directory?

18. Please add any further comments here. Thank you.

Please send the completed evaluation to:
   Education Office
   New York City Department of Environmental Protection
   59-17 Junction Boulevard
   Flushing, NY 11373
   educationoffice@dep.nyc.gov
For information about DEP’s education programs and resources, contact educationoffice@dep.nyc.gov