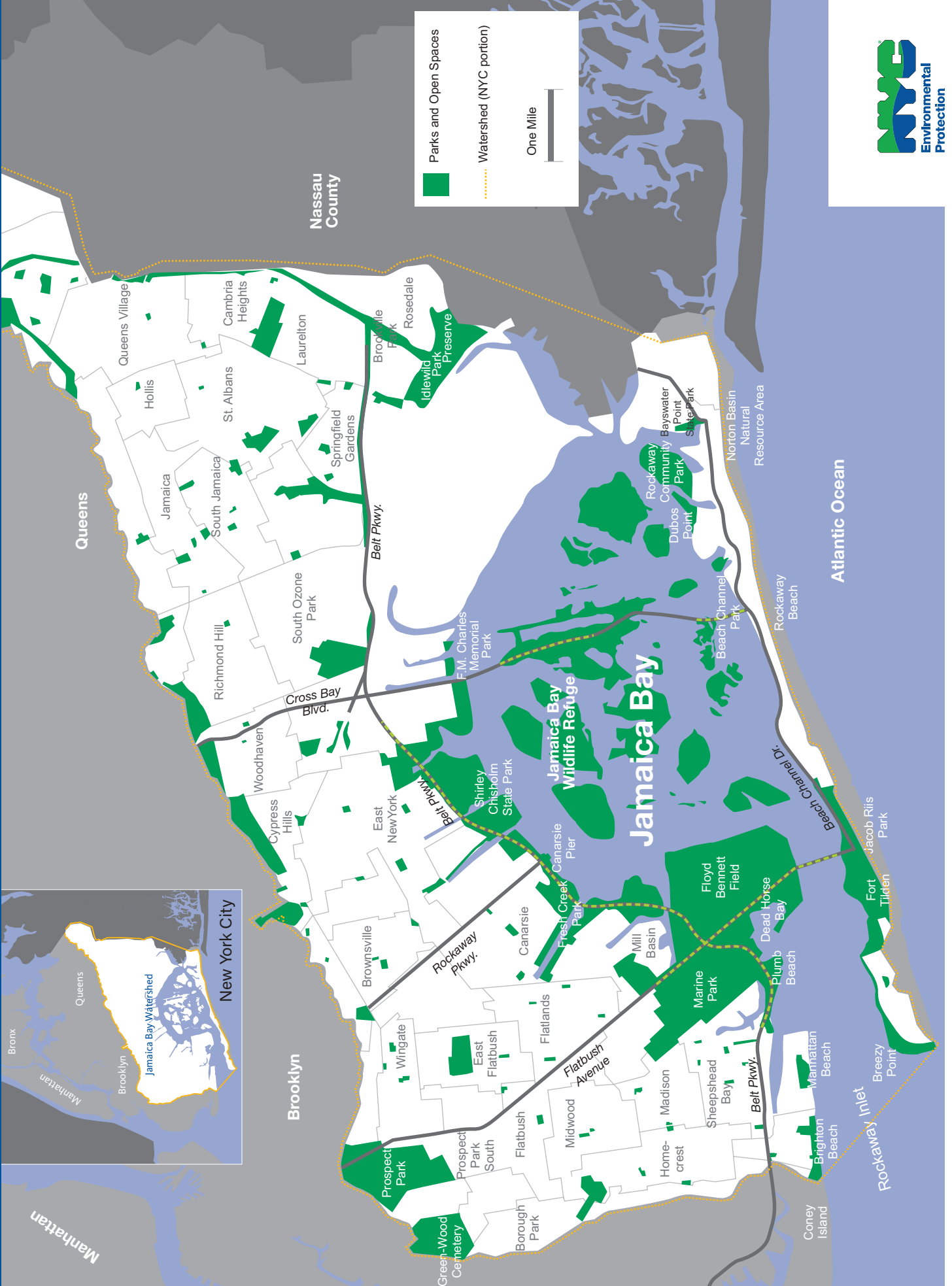


# **Jamaica Bay Education Resource Directory**

**A Teacher's Guide to Education Opportunities  
in the Jamaica Bay Watershed**



# 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](mailto:educationoffice@dep.nyc.gov).

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

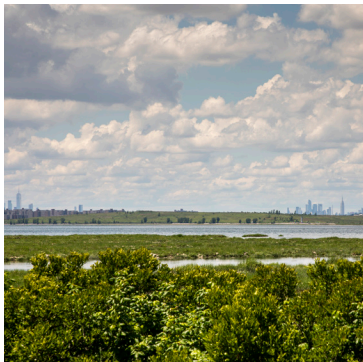
If you would like to refer to information contained in the directory, please use this citation statement: Jamaica Bay Education Resource Directory. New York: New York City Department of Environmental Protection, 2023.

Thank you,  
DEP Education Office



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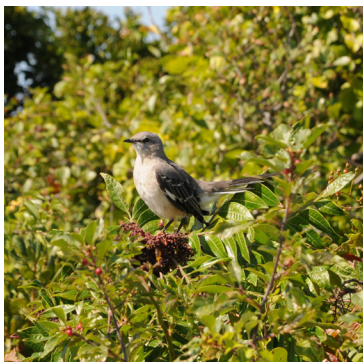
## Jamaica Bay and its Watershed

### 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 the 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 facilities 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](http://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](http://littoralsociety.org/Jamaica-Bay)

**Billion Oyster Project**  
[billionoysterproject.org](http://billionoysterproject.org)

**Brooklyn College**  
[brooklyn.cuny.edu/web/academics/centers/sri.php](http://brooklyn.cuny.edu/web/academics/centers/sri.php)

**Brooklyn Public Library**  
[brooklynpubliclibrary.org](http://brooklynpubliclibrary.org)

**Center for International Earth Science Information Network**  
[ciesin.columbia.edu](http://ciesin.columbia.edu)

**City Parks Foundation**  
[cityparksfoundation.org](http://cityparksfoundation.org)

**ConEdison - Queens College GLOBE NY Metro**  
[qc.cuny.edu/academics/sees/globe](http://qc.cuny.edu/academics/sees/globe)

**Coney Island Beautification Project**  
[facebook.com/cibproject/](https://facebook.com/cibproject/)

**Eastern Queens Alliance, Inc.**  
[easternqueensalliance.org/](http://easternqueensalliance.org/)

**Gateway National Recreation Area National Park Service**  
[nps.gov/gate/learn/education/index.htm](http://nps.gov/gate/learn/education/index.htm)

**Jamaica Bay-Rockaway Parks Conservancy**  
[jbrpc.org](http://jbrpc.org)

**National Wildlife Federation**  
[riscnyc.org](http://riscnyc.org)

**New York Aquarium**  
[nyaquarium.com/learn](http://nyaquarium.com/learn)

**New York City Audubon**  
[nycaudubon.org](http://nycaudubon.org)

**New York City Department of Education Genovesi Environmental Study Center**  
[schools.nyc.gov/school-life/learning/experiential-learning/genovesi-environmental-study-center](http://schools.nyc.gov/school-life/learning/experiential-learning/genovesi-environmental-study-center)

**New York City Department of Environmental Protection**  
[nyc.gov/dep](http://nyc.gov/dep)

**New York City Department of Parks and Recreation**  
[nyc.gov/parks/rangers](http://nyc.gov/parks/rangers)

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

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

**New York Sea Grant**  
[nyseagrant.org](http://nyseagrant.org)

**New York State Department of Environmental Conservation**  
[dec.ny.gov/education/38184.html](http://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](http://parks.ny.gov/regions/new-york-city/default.aspx)

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

**Queens Public Library**  
[queenslibrary.org](http://queenslibrary.org)









**RISE Rockaway Initiative for Sustainability & Equity**  
[riserockaway.org](http://riserockaway.org)





































































































**Waterfront Alliance**  
[waterfrontalliance.org](http://waterfrontalliance.org)

**Wilderness Inquiry**  
[wildernessinquiry.org](http://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.

-  Education/Speaker Visit
-  Field Experience
-  Professional Development
-  Web-Based Resource
-  Printed Resource
-  Program for General Public
-  Summer Program
-  Volunteer/Internship Opportunity

		Pre-K	Elementary	Middle School	High School	Adults	Families	Program Opportunities
p.17	American Littoral Society		☑	☑	☑	☑	☑	       
p.17	Billion Oyster Project		☑	☑	☑	☑		    
p.18	Brooklyn College					☑		
p.18	Brooklyn Public Library		☑	☑	☑	☑	☑	   
p.19	Center for International Earth Science Information Network		☑	☑	☑	☑	☑	 
p.19	City Parks Foundation		☑	☑	☑			   
p.20	ConEdison - Queens College GLOBE NY Metro					☑		   
p.20	Coney Island Beautification Project	☑	☑	☑	☑	☑	☑	    
p.21	Eastern Queens Alliance, Inc.	☑	☑	☑	☑	☑	☑	       
p.22	Gateway National Recreation Area, National Park Service Jamaica Bay Unit		☑	☑	☑	☑	☑	       
p.23	Jamaica Bay-Rockaway Parks Conservancy		☑	☑	☑	☑	☑	     
p.24	National Wildlife Federation	☑	☑	☑	☑	☑	☑	      
p.24	New York Aquarium	☑	☑	☑	☑	☑	☑	     
p.25	New York City Audubon					☑	☑	    
p.25	New York City Department of Education-Genovesi Environmental Study Center		☑	☑	☑			     
p.26	New York City Department of Environmental Protection	☑	☑	☑	☑	☑	☑	      
p.26	New York City Department of Parks & Recreation-Urban Park Rangers	☑	☑	☑	☑	☑	☑	    
p.27	NYC H2O		☑	☑	☑	☑	☑	    
p.27	New York City Urban Soils Institute		☑	☑	☑	☑		   

## Jamaica Bay Environmental Programs at a Glance (continued)

-  Education/Speaker Visit
-  Field Experience
-  Professional Development
-  Web-Based Resource
-  Printed Resource
-  Program for General Public
-  Summer Program
-  Volunteer/Internship Opportunity

		Pre-K	Elementary	Middle School	High School	Adults	Families	Program Opportunities
p.28	New York Sea Grant		☰	☰	☰	☰	☰	       
p.28	New York State Department of Environmental Conservation	☰	☰	☰	☰	☰	☰	      
p.29	New York State Office of Parks, Recreation and Historic Preservation	☰	☰	☰	☰			     
p.30	Queens Museum	☰	☰	☰	☰	☰	☰	 
p.31	Queens Public Library	☰	☰	☰	☰	☰	☰	     
p.31	RISE Rockaway Initiative for Sustainability & Equity	☰	☰	☰	☰	☰	☰	      
p.32	Waterfront Alliance		☰	☰	☰	☰	☰	      
p.32	Wilderness Inquiry		☰	☰	☰	☰	☰	     



## Jamaica Bay Environmental Topics at a Glance

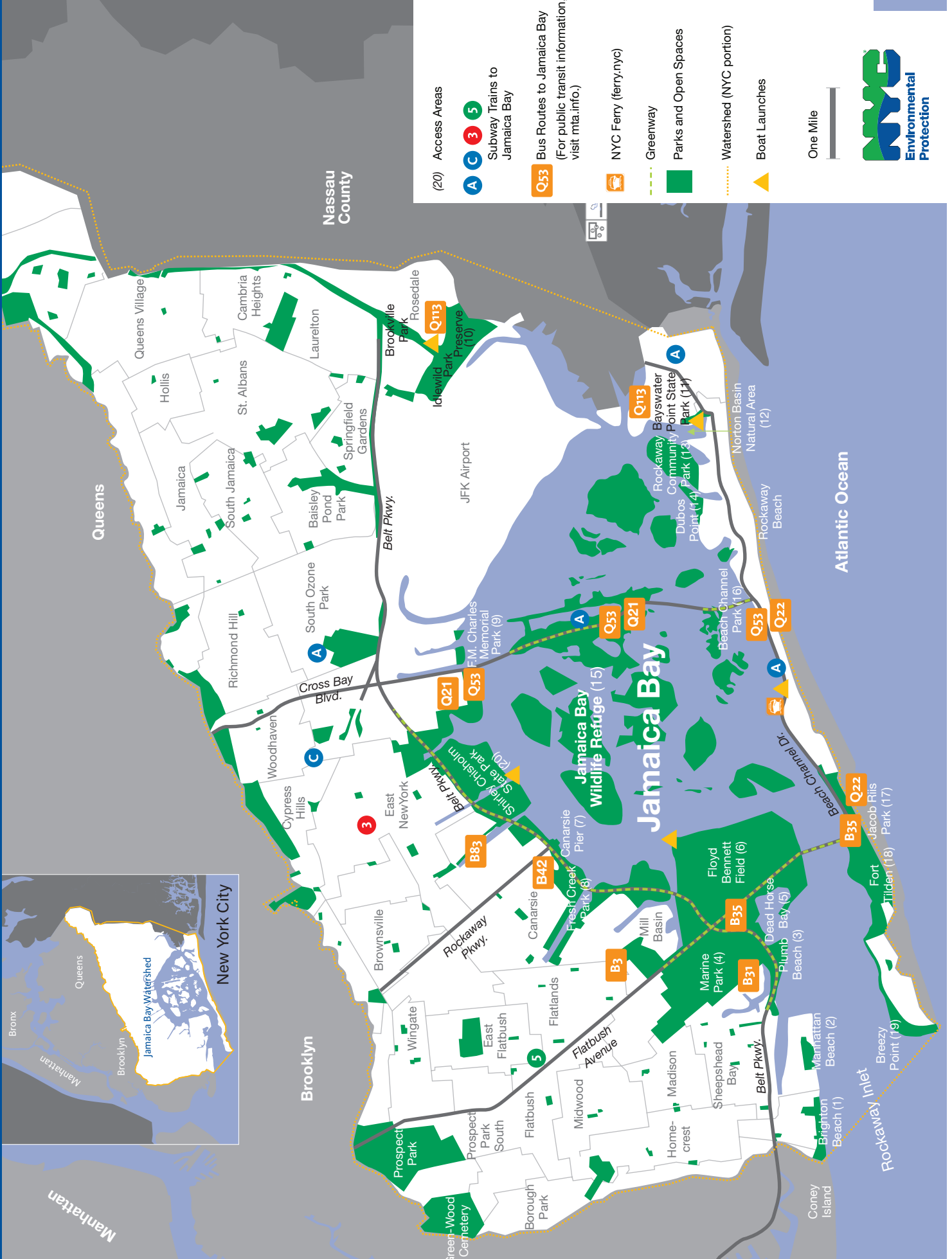
Below is a list of Jamaica Bay-related education topics that may be useful for lesson planning, field trip preparation and student research projects.

	Freshwater	Watersheds	Saltwater	Water Quality	Estuaries	Wetlands	Terrestrial Systems	Wastewater	Stormwater	Stewardship
American Littoral Society		💧	💧	💧	💧	💧	💧	💧	💧	💧
Billion Oyster Project		💧		💧	💧			💧	💧	💧
Brooklyn College	💧	💧	💧	💧	💧	💧	💧			💧
Brooklyn Public Library	💧	💧								
Center for International Earth Science Information Network / Columbia Climate School	💧	💧	💧	💧	💧	💧	💧	💧	💧	💧
City Parks Foundation		💧		💧	💧	💧				💧
ConEdison - Queens College GLOBE NY Metro	💧	💧	💧	💧	💧	💧	💧			💧
Coney Island Beautification Project	💧	💧	💧	💧	💧	💧		💧	💧	💧
Eastern Queens Alliance, Inc.	💧	💧	💧	💧	💧	💧	💧	💧	💧	💧
Gateway National Recreation Area, National Park Service - Jamaica Bay Unit	💧	💧	💧	💧	💧	💧	💧	💧	💧	💧
Jamaica Bay Rockaway Parks Conservancy		💧	💧		💧	💧	💧		💧	💧
National Wildlife Federation	💧	💧	💧	💧	💧	💧	💧	💧	💧	💧
New York Aquarium	💧	💧	💧	💧						💧
New York City Audubon	💧					💧				💧

## Jamaica Bay Environmental Topics at a Glance (continued)

	Freshwater	Watersheds	Saltwater	Water Quality	Estuaries	Wetlands	Terrestrial Systems	Wastewater	Stormwater	Stewardship
New York City Department of Education Genovesi Environmental Study Center	💧	💧	💧	💧	💧	💧	💧	💧	💧	💧
New York City Department of Environmental Protection	💧	💧	💧	💧	💧	💧	💧	💧	💧	💧
New York City Department of Parks & Recreation NYC H2O	💧	💧	💧			💧		💧	💧	💧
New York Urban Soils Institute		💧		💧	💧	💧	💧	💧	💧	💧
New York Sea Grant	💧	💧	💧	💧	💧	💧	💧	💧	💧	💧
New York State Department of Environmental Conservation	💧	💧	💧	💧	💧	💧	💧	💧	💧	💧
New York State Office of Parks, Recreation and Historic Preservation		💧	💧	💧	💧				💧	💧
Queens Museum	💧	💧				💧			💧	
RISE Rockaway Initiative for Sustainability & Equity			💧	💧	💧	💧			💧	💧
Waterfront Alliance			💧	💧	💧	💧			💧	💧
Wilderness Inquiry	💧	💧		💧		💧	💧			💧

# Jamaica Bay Access at a Glance



(20) Access Areas

**A C 3 5**  
Subway Trains to Jamaica Bay

**Q53** Bus Routes to Jamaica Bay  
(For public transit information, visit [mta.info](http://mta.info).)

NYC Ferry ([ferry.nyc](http://ferry.nyc))













Greenway

Parks and Open Spaces

Watershed (NYC portion)

Boat Launches

One Mile

-  Restrooms
-  Handicap Accessible
-  Bus Parking
-  Picnic Area
-  Nature or Visitor Center
-  Wading Area
-  Pier
-  Boat Launch
-  Camping
-  Marked Trails
-  Permit Required
-  Drinking Water Fountain

## 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.

Site #	Site Name	Agency	Site Information
1	Brighton Beach	NYC Parks & Recreation	
2	Manhattan Beach	NYC Parks & Recreation	
3	Plumb Beach	National Park Service	
4	Marine Park	NYC Parks & Recreation	
5	Dead Horse Bay	National Park Service	
6	Floyd Bennett Field	National Park Service	
7	Canarsie Pier	National Park Service	
8	Fresh Creek Park	NYC Parks & Recreation	
9	Frank M. Charles Memorial Park	National Park Service	
10	Idlewild Park Preserve	NYC Parks & Recreation	
11	Bayswater Point State Park	NYS Office of Parks, Recreation & Historic Preservation	
12	Norton Basin Natural Resource Area	NYS Department of Environmental Conservation	
13	Rockaway Community Park	NYC Parks & Recreation	
14	Dubos Point Wildlife Sanctuary	NYC Parks & Recreation	
15	Jamaica Bay Wildlife Refuge	National Park Service	
16	Beach Channel Park	NYC Parks & Recreation	
17	Jacob Riis Park	National Park Service	
18	Fort Tilden	National Park Service	
19	Breezy Point	National Park Service	
20	Shirley Chisholm State Park	NYS Office of Parks, Recreation & Historic Preservation	

**Contact Information:**

- **National Park Service** [nps.gov/gate](https://nps.gov/gate), Jamaica Bay Wildlife Refuge: 718-318-4340
- **New York City Department of Parks & Recreation** [nyc.gov/parks](https://nyc.gov/parks)
- **New York State Department of Environmental Conservation Region 2** [dec.ny.gov](https://dec.ny.gov), 718-482-4942
- **New York State Office of Parks, Recreation & Historic Preservation** <https://parks.ny.gov/parks/>, 212-866-3100



## 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 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.





**Program Opportunities**



Education/Speaker Visit



Field Experience



Professional Development



Web-Based Resource



Printed Resource



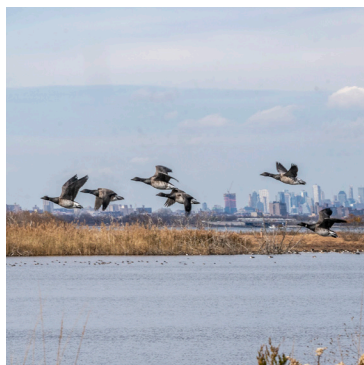
Program for General Public



Summer Program



Volunteer/Internship Opportunity



**American Littoral Society** ([littoralsociety.org/jamaica-bay](http://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 clean-ups, day and overnight field trips, lectures, and boat tours of Jamaica Bay.

**Location:** Various sites throughout Jamaica Bay

**Billion Oyster Project** ([billionoysterproject.org](http://billionoysterproject.org))

**Contact:** Shinara Sunderlal, 212-458-0800, educate@billionoysterproject.org  
**Audience:** Elementary to high school students, adults  
**Fee:** Sliding scale

**Organization Description:**

Billion Oyster Project (BOP) restores oysters to New York Harbor through public 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. 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](http://brooklyn.cuny.edu/web/academics/schools/naturalsciences/undergraduate/environmental.php))

**Contact:** Zhongqi Cheng (Dept. Chair), [zcheng@brooklyn.cuny.edu](mailto:zcheng@brooklyn.cuny.edu) or Rebecca Boger (Dept. Chair), [rboger@brooklyn.cuny.edu](mailto:rboger@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](http://bklynlibrary.org/brooklyncollection/connections))

**Contact:** Sam Fox, [SFox@bklynlibrary.org](mailto:SFox@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) Columbia Climate School ([ciesin.columbia.edu](http://ciesin.columbia.edu))

**Contact:** John Scialdone, 845-365-8978, [jscialdo@ciesin.columbia.edu](mailto: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/](http://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/](http://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](http://adaptmap.info)) 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](http://cityparksfoundation.org))

**Contact:** Luis Gonzalez, 212-360-3332, [lgonzalez@cityparksfoundation.org](mailto: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

### City Parks Foundation (continued)

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 [cityparksfoundation.org/learn/](http://cityparksfoundation.org/learn/).

**Location:** Various sites throughout Jamaica Bay

### ConEdison - Queens College GLOBE NY Metro

([qc.cuny.edu/academics/sees/globe](http://qc.cuny.edu/academics/sees/globe) and [www.globe.gov](http://www.globe.gov))

**Contact:** Allan Ludman, 718-997-3324, [allan.ludman@qc.cuny.edu](mailto:allan.ludman@qc.cuny.edu) or Peter Schmidt, 718-997-4268, [peter.schmidt@qc.cuny.edu](mailto: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.

([facebook.com/cibproject](https://facebook.com/cibproject))

**Contact:** Pamela Pettyjohn, 718-265-0814, [cibproject@aol.com](mailto: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

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

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 include Coney Island Creek and its five parks along its three miles

**Eastern Queens Alliance, Inc. (EQA)** ([easternqueensalliance.org](http://easternqueensalliance.org))

**Contact:** Barbara E. Brown, Chairperson, [bebrown@easternqueensalliance.org](mailto:bebrown@easternqueensalliance.org), Matthew Loyd, Environmental Education Specialist, [mloyd.idlewildesc@gmail.com](mailto:mloyd.idlewildesc@gmail.com), 347-824-2301, [ldlewildesc@easternqueensalliance.org](mailto:ldlewildesc@easternqueensalliance.org)

**Audience:** Pre-K to high school students, adults, families

**Fee:** See individual program listings. Call center for information.

**Organization Description:**

Eastern Queens Alliance, Inc. (EQA), a federation of civic associations in Southeast Queens, has been an environmental steward stepping up to the call for the preservation and restoration of the Idlewild Preserve that provides our communities with the many benefits that come from wetlands, including flood protection including:

- Preserving and restoring the wetlands in Idlewild Park Preserve, an approximately 324 acre natural Forever Wild site found just north of JFK Airport. It is Head of the Bay and a major source of fresh water to Jamaica Bay. Many rare species abound in this park, including ospreys, snowy egret, fiddler crabs, and diamondback terrapins.
- Running the Idlewild Environmental Science Center which offers environmental education, as well as environmental, cultural, stewardship, and recreational activities to families and children.
- Protecting Idlewild Park Preserve which over the years, has been threatened by economic development and industrialization.
- Blazing of trails in Idlewild which offer access to visitors as well as opportunities for informal education in a natural area.

Volunteer Opportunities to those who share the vision.

**Program Opportunities:** 

**Program Description:**

Our major goals at the Idlewild Environmental Center are:

To educate children and adults, including educators, about the importance and ecological benefits of Idlewild Park Preserve and its wetlands, the Jamaica Bay Watershed, and the entire New York/New Jersey Harbor Estuary. To help adults and children understand the relationship between that which man does, its impact on nature, and how all of that aligns with

### Eastern Queens Alliance, Inc. (continued)

global warming and climate change using the park as a metaphor. To promote awareness and understanding of the elements of sustainability, resilience, and environmental justice and their relationship to our quality of life.

Specifically, Eastern Queens Alliance, Inc. (EQA) provides hands-on environmental science education for children in public and private schools through in-school workshops and workshops at the center as well as field trips. We also offer after-school and out of session workshops. In addition, we organize stewardship building activities for children & adults, recreational/cultural events in Idlewild Park Preserve to promote the park as an ecologically important area and motivate people to actively participate in stewardship and educational initiatives for the park. Finally, we promote environmental justice initiatives and advocacy activities, i.e., citizen science studies, community cafes, and workshops on environmental and sustainability topics.

**Location:** Idlewild Environmental Center, intersection of 149th Avenue and Springfield Lane, Springfield Gardens, NY

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

([nps.gov/gate/learn/education/index.htm](https://nps.gov/gate/learn/education/index.htm))

**Contact:** Jamaica Bay Unit, Division of Interpretation and Education, [gate\\_education@nps.gov](mailto: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) Educators Outdoors** ([www.outdoors.org/community/center-for-outdoor-learning-and-leadership/educators-outdoors/](http://www.outdoors.org/community/center-for-outdoor-learning-and-leadership/educators-outdoors/))

**Contact:** Eva Leonard, Program Coordinator, [eleonard@outdoors.org](mailto:eleonard@outdoors.org)

**Audience:** Teachers and youth group leaders

**Fee:** Varies. Scholarships available

#### **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** ([www.jbrpc.org/](http://www.jbrpc.org/))

**Contact:** 347-690-0931, [education@jbrpc.org](mailto:education@jbrpc.org)

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

**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 [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** ([www.riscnyc.org](http://www.riscnyc.org))**Contact:** Emily Fano, 917-301-8830, [fanoe@nwf.org](mailto:fanoe@nwf.org)**Audience:** Pre-K to high school students, adults, families**Fee:** \$0.00**Organization Description:**

The National Wildlife Federation is America's largest conservation organization. Our K-12 educational resources include the children's publications Ranger Rick and Ranger Rick Jr.; our programs include Schoolyard Habitats, Eco-Schools USA, and the Resilient Schools Consortium (RiSC).

**Program Opportunities:** **Program Description:**

The National Wildlife Federation's award-winning Resilient Schools Consortium (RiSC) program and curriculum educates middle and high school students about climate science, climate impacts, climate justice, and the natural and built solutions that increase climate resiliency. RiSC engages students in seasonal hands-on projects - like dune restoration and tree planting - that mitigate the impacts of flooding and extreme heat in communities. The program also creates opportunities for meaningful interactions with community members, resilience practitioners and decision makers in NYC. For more information, visit [www.riscnyc.org](http://www.riscnyc.org). Schools can access Eco-Schools USA program resources at [www.nwf.org/ecoschools](http://www.nwf.org/ecoschools) and Schoolyard Habitats resources at [nwf.org/schoolyardhabitats](http://nwf.org/schoolyardhabitats).

**Location:** School and community-based programming**New York Aquarium** ([nyaquarium.com/learn](http://nyaquarium.com/learn))**Contact:** Stephanie Joseph, Curator of Education, 800-433-4149, [nyaeducation@wcs.org](mailto:nyaeducation@wcs.org)**Audience:** Pre-K to high school students, adults, families**Fee:** Varies per program**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](http://nycaudubon.org))**Contact:** Roslyn Rivas, 212-691-7483, [rrivas@nycaudubon.org](mailto:rrivas@nycaudubon.org)**Audience:** Adult, 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 many programs around Jamaica Bay and across the five boroughs, including bird outings, public wildlife festivals, and community science volunteer opportunities. Check out the full calendar of outings, classes, and events at [www.nycaudubon.org/calendar](http://www.nycaudubon.org/calendar). For more information about volunteer opportunity Horseshoe Crab monitoring and tagging in the spring, visit [www.nycaudubon.org/volunteer](http://www.nycaudubon.org/volunteer).

**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](http://schools.nyc.gov/school-life/learning/experiential-learning/genovesi-environmental-study-center))**Contact:** Christine Mazza, 718-444-6560, [GESC@schools.nyc.gov](mailto:GESC@schools.nyc.gov)**Audience:** K-12**Fee:** Varies**Organization Description:**

The Genovesi Environmental Study Center (ESC) offers rich and engaging experiential environmental science programs for students and teachers at all grade levels. Nestled in the Bergen Beach section of Brooklyn, this 7,000 square foot learning center, sitting on over an acre of beautiful grounds, is home to over 200 living organisms, four dynamic learning labs (Flora, Fauna, STEM, and a fully equipped biotechnology lab), an outdoor learning space with pond habitat and urban garden, and a fully functioning greenhouse.

As a premier informal science destination space, ESC's mission is to deliver hands-on environmental science and STEM instruction. Through targeted standards-based enrichment programs, the highly trained ESC staff encourage students to explore the natural world 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 New York State P-12 Science 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](http://nyc.gov/dep/education))

**Contact:** Robin Sanchez, 718-595-3506, [educationoffice@dep.nyc.gov](mailto: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](http://nyc.gov/parks/rangers))

**Contact:** Marc Sanchez, 212-360-2774, [Marc.Sanchez@parks.nyc.gov](mailto: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.

**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](mailto: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@urbansoils.org](mailto:tatiana@urbansoils.org)**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 ([www.nyseagrant.org/nysgcurricula](http://www.nyseagrant.org/nysgcurricula))

**Contact:** 631-632-6905, [www.nyseagrant.org](http://www.nyseagrant.org)

**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 34 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).

### New York State Department of Environmental Conservation

([www.dec.ny.gov/education/38184.html](http://www.dec.ny.gov/education/38184.html))

**Contact:** Ian Clearly, 718-482-6404, [r2ed@dec.ny.gov](mailto:r2ed@dec.ny.gov)

**Audience:** Pre-K to high school students, adults, families

**Fee:** \$0.00

#### Organization Description:

DEC's environmental education staff offers a number of environmental programs throughout Jamaica Bay and the rest of New York City. The three over-arching programs are the School and Community Programs, Professional Development Opportunities, and Public Outreach Programs. All our programs are free and centered around our goal to engage NYC families, students, and teachers with local natural resources through programs that raise ecological awareness, promote outdoor recreation, and inspire environmental stewardship.

**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

### New York State Office of Parks, Recreation & Historic Preservation

([parks.ny.gov/regions/new-york-city/default.aspx](https://parks.ny.gov/regions/new-york-city/default.aspx))

**Contact:** Ciara Scully, [ciara.scully@parks.ny.gov](mailto:ciara.scully@parks.ny.gov)

**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 ([parks.ny.gov/parks/86](https://parks.ny.gov/parks/86))

**Contact:** Ciara Scully, [ciara.scully@parks.ny.gov](mailto:ciara.scully@parks.ny.gov)

**Audience:** Pre-K to high school students, 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** ([parks.ny.gov/parks/200](https://parks.ny.gov/parks/200))**Contact:** 718-277-2420, [SCSPeducation@parks.ny.gov](mailto:SCSPeducation@parks.ny.gov)**Audience:** Pre-K to high school students, 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**Queens Museum** ([queensmuseum.org](https://queensmuseum.org))**Contact:** Melisa Pucar, 718-592-9700, [mpucar@queensmuseum.org](mailto:mpucar@queensmuseum.org)**Audience:** Pre-K to high school students, adults, families**Fee:** DOE Public Schools - \$275

Private Schools - \$375

Title 1 &amp; District 75 Schools - \$75

**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](http://queenslibrary.org))

**Contact:** Felix A. Urrutia Jr., Director of Children, Youth and Families Services,  
718-990-8554, [felix.urrutia@queenslibrary.org](mailto: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 (Rockaway Initiative for Sustainability & Equity)** ([riserockaway.org](http://riserockaway.org))

**Contact:** Alana Danieu, Programs Manager, 718-327-5919, [programs@riserockaway.org](mailto:programs@riserockaway.org)

**Audience:** Pre-K to high school students, adults, families

**Fee:** \$0.00

**Organization Description:**

RISE inspires all generations of Rockaway residents to care for our environment and community. We provide civic engagement and youth development programs that advance social equity and the physical well-being of our vibrant coastal neighborhood in Queens, New York.

**Program Opportunities:** 

**Program Description:**

Living Classroom operates throughout the school year, offering hands-on educational workshops for grades pre-K through twelve that merge environmental science with creative arts. Topics range from climate change to sustainable farming. RISE offers 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. RISE also runs a variety of weekend community service events, from beach cleanups to dune plantings and Earth Day celebrations.

**Location:** RISE, 58-03 Rockaway Beach Boulevard, Far Rockaway, NY 11692

### Waterfront Alliance ([waterfrontalliance.org](http://waterfrontalliance.org))

**Contact:** Furhana Husani, [fhusani@waterfrontalliance.org](mailto:fhusani@waterfrontalliance.org)

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

**Fee:** Reach out for payment details

#### Organization Description:

After more than a decade of leading the charge in how the New York metropolitan region views and uses its harbor, and with more than 1,000 Alliance Partners committed to bringing real change to our region's 700+ miles of coastline, in 2019 the Waterfront Alliance stepped into a new and critical leadership role to define New York Harbor's response to sea level rise and coastal storms. Our crucial, long-term focus on increasing waterfront accessibility for all, along with our efforts to advocate for a working waterfront that is a vital source of business activity and well-paying jobs and educating the next generation of waterfront stewards, continue as essential pillars of our work to create a well-adapted and resilient New York Harbor.

**Program Opportunities:** 

#### Program Description:

Waterfront Alliance's premier climate change education program, Estuary Explorers, is STEM-based and grounded in experiential learning at the waterfront. Through our hands-on field labs, multi-week programs, and teacher trainings, students and educators alike learn about the scientific method and how they can apply it to their classrooms and local shorelines.

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

### Wilderness Inquiry ([wildernessinquiry.org](http://wildernessinquiry.org))

**Contact:** Christine Rettler, 612-676-9412, [christine@wildernessinquiry.org](mailto: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 10-person North 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
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## 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 fresh water 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 rain gardens 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 experiences. A great way to introduce these terms is by making a crossword puzzle or matching game.

**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 wastewater that discharges directly into waterways during heavy rainstorms in a combined sewer system.

**Dissolved Oxygen:** The level of oxygen (O<sub>2</sub>) 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:** practices designed to manage stormwater runoff using plants and engineered soils, such as rain gardens and green roofs; methods that mimic the way runoff is absorbed and infiltrated in the natural water cycle.

**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 that carries stormwater 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 take 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

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

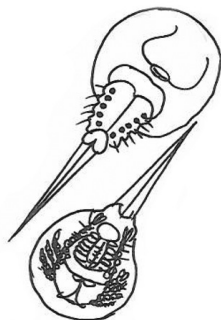


### Shrubs and Vines

Common Name	Scientific Name	Location & Date Observed
Beach plum	<i>Prunus maritima</i>	
Japanese honeysuckle	<i>Lonicera japonica</i>	
Northern bayberry	<i>Myrica pensylvanica</i>	
Poison ivy	<i>Toxicodendron radicans</i>	
Pussy willow	<i>Salix discolor</i>	
Virginia creeper	<i>Parthenocissus quinquefolia</i>	
Winged sumac	<i>Rhus copallina</i>	



Common milkweed



Horseshoe Crab



Poison IVY

### Wildflowers and Grasses

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

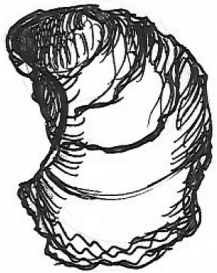
### Macroinvertebrates

Common Name	Scientific Name	Location & Date Observed
Amphipod	<i>Ampelisca abdita</i> (e.g.)	
Asian shore crab	<i>Hemigrapsus sanguineus</i>	
Blue crab	<i>Callinectes sapidus</i>	
European green crab	<i>Carcinus maenus</i>	
Fiddler crab	<i>Uca</i> spp.	
Horseshoe crab	<i>Limulus polyphemus</i>	
Lady crab	<i>Ovalipes ocellatus</i>	
Polychaete worm	<i>Streblospio benedicti</i> (e.g.)	
Sand shrimp	<i>Crangon septemspinosa</i>	





Blue Fish



Eastern Oyster

**Fish**

Common Name	Scientific Name	Location & Date Observed
American eel	<i>Anguilla rostrata</i>	
Atlantic menhaden	<i>Brevoortia tyrannus</i>	
Atlantic silverside	<i>Menidia menidia</i>	
Bluefish	<i>Pomatomus saltatrix</i>	
Lined seahorse	<i>Hippocampus erectus</i>	
Mummichog	<i>Fundulus heteroclitus</i>	
Northern pipefish	<i>Syngnathus fuscus</i>	
Northern puffer	<i>Sphoeroides maculatus</i>	
Northern searobin	<i>Prionotus carolinus</i>	
Striped killifish	<i>Fundulus majalis</i>	
Striped mullet	<i>Mugil cephalus</i>	
Summer flounder (Fluke)	<i>Paralichthys dentatus</i>	
Tautog (Blackfish)	<i>Tautoga onitis</i>	
Winter flounder	<i>Pseudopleuronectes americanus</i>	

**Mollusks (Univalves and Bivalves)**

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

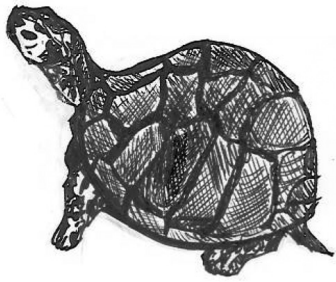


## Birds

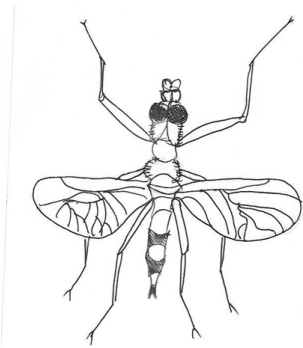
Common Name	Scientific Name	Location & Date Observed
Black duck	<i>Anas rubripes</i>	
Brant	<i>Branta bernicla</i>	
Canada goose	<i>Branta canadensis</i>	
Common tern	<i>Sterna hirundo</i>	
Glossy ibis	<i>Plegadis falcinellus</i>	
Gray catbird	<i>Dumetella carolinensis</i>	
Great blue heron	<i>Ardea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

## Mammals

Common Name	Scientific Name	Location & Date Observed
Eastern gray squirrel	<i>Sciurus carolinensis</i>	
Little brown bat	<i>Myotis lucifugus</i>	
Meadow vole	<i>Microtus pennsylvanicus</i>	
Muskrat	<i>Ondatra zibethicus</i>	
Norway rat	<i>Rattus norvegicus</i>	
Raccoon	<i>Procyon lotor</i>	
Virginia opossum	<i>Didelphis virginiana</i>	
White-footed mouse	<i>Peromyscus leucopus</i>	



Box turtle



Salt marsh Mosquito

**Reptiles and Amphibians**

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

**Insects**

Common Name	Scientific Name	Location & Date Observed
Ant	<i>Tapinoma sessile (e.g.)</i>	
Bumblebee	<i>Bombus vagans (e.g.)</i>	
Cabbage white butterfly	<i>Pieris rapae</i>	
Dragonfly	<i>Anax junius (e.g.)</i>	
Eastern tent caterpillar	<i>Malacosoma americanum</i>	
Field cricket	<i>Gryllus spp.</i>	
Greenhead fly	<i>Tabanus spp.</i>	
Ladybug	<i>Hippodamia convergens</i>	
Monarch butterfly	<i>Danaus plexippus</i>	
Salt marsh mosquito	<i>Aedes sollicitans</i>	



Name: \_\_\_\_\_

Date: \_\_\_\_\_

### 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.

- |                                     |                                   |                                      |
|-------------------------------------|-----------------------------------|--------------------------------------|
| <input type="checkbox"/> Beach      | <input type="checkbox"/> Urban    | <input type="checkbox"/> Commercial  |
| <input type="checkbox"/> Swampy     | <input type="checkbox"/> Grassy   | <input type="checkbox"/> Residential |
| <input type="checkbox"/> Industrial | <input type="checkbox"/> Forested | <input type="checkbox"/> Other       |

3. What is the shoreline like? Check all that apply.

- |                                |   |
|--------------------------------|---|
| <input type="checkbox"/> Sandy | <input type="checkbox"/> Covered with plants  |
| <input type="checkbox"/> Rocky | <input type="checkbox"/> Paved                |
| <input type="checkbox"/> Piers | <input type="checkbox"/> Pipes entering river |

4. What does the water look like? The surface is (check one):  Choppy  Calm

Can you see the bottom? If so, what is it? Check all that apply.

- |                                |  |
|--------------------------------|--|
| <input type="checkbox"/> Sandy | <input type="checkbox"/> Rocky               |
| <input type="checkbox"/> Muddy | <input type="checkbox"/> Covered with plants |



5. Name and/or draw plants and animals that you see.

6. What activities are people doing here?

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

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

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

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**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.)

Day	Observations
1	
2	
3	

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

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## 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?

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2. Turbidity Tube: Reading 1 \_\_\_\_\_ Reading 2 \_\_\_\_\_ Reading 3 \_\_\_\_\_  
Average reading: \_\_\_\_\_

3. How do you think your waterbody's turbidity affects organisms that live here?

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## Station 3: pH and Salinity

pH measures how acidic or basic (alkaline) a solution is. The pH scale ranges from 0 to 14, with 7 being neutral, below 7 being acidic, and above 7 being 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?

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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 measures 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?

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

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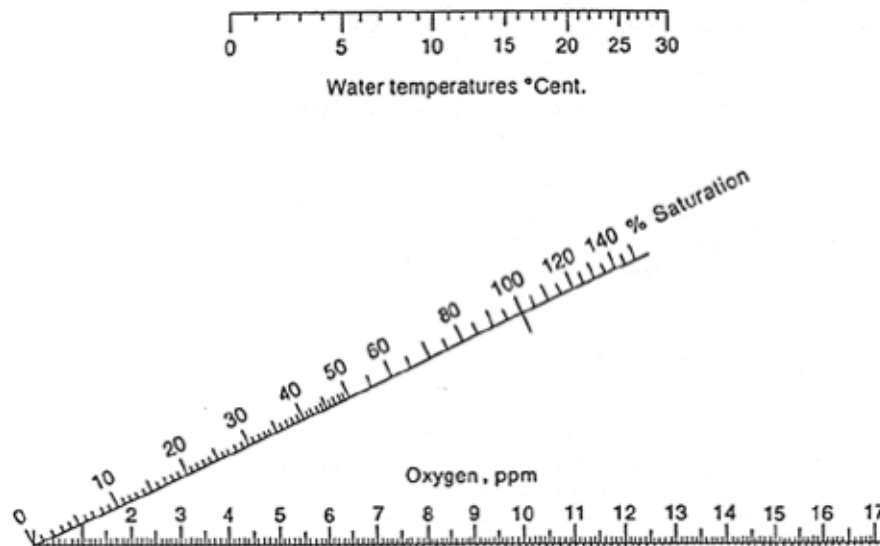
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DO measurements are given in PPM (parts per million), and as percent saturation. Many variables affect DO, including temperature, presence of plants and nutrients, and wind conditions. 100% saturation means that the water cannot hold any more oxygen 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

Ackerman, Diane. *A Natural History of the Senses*. New York: Vintage Books, 1990. Essays awaken us to a fresh awareness of the power of our senses. (Adult)

Atwell, Debby. *River*. Boston: Houghton Mifflin, 1999. A river gradually becomes depleted as more and more people use its resources to build cities, transport goods and handle sewage. (Ages 5-8)

Cherry, Lynne. *A River Ran Wild*. New York: Harcourt Brace and Co., 1992. An environmental history of the Nashua river in Massachusetts, from its discovery by Native Americans through the polluting years of the Industrial Revolution to the ambitious clean-up that revitalized it. (Ages 9-12)

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)

Fischbach, Jordan. *Building Resilience in an Urban Coastal Environment*. California: Rand Corporation, 2018. Baywide concepts to reduce future flood risk while also improving water quality and restoring habitats. (Adult)

Fowle, Marcia. *The New York City Audubon Society Guide to Finding Birds in the Metropolitan Area*. New York: Cornell University Press, 2001. Tapping the expertise of 47 metropolitan birders, Marcia T. Fowle and Paul Kerlinger provide residents, tourists, and visiting birders with the information they need to make the most of the area's extraordinary birding sites. (Adult)

Hendrick, Daniel. *Images of America: Jamaica Bay*. Charleston, South Carolina: Arcadia Publishing, 2006. Through historic photographs, follow the transformation of the Bay into a shell-fishing haven, wildlife preserve, recreational playground and now, the focus of long-term environmental rehabilitation. (Adult)

Hooper, Meredith. *The Drop in my Drink*. New York: Viking, 1998. The story of water on our planet. (Ages 9-12)

Kadinsky, Sergey. *Hidden Waters of New York City: A History and Guide to 101 Forgotten Lakes, Ponds, Creeks, and Streams in the Five Boroughs*. New York: Countryman Press, 2016. Beneath the asphalt streets of Manhattan, creeks and streams once flowed freely but remnants of these once-pristine waterways are hidden in plain sight. (Adult)

Kornblum, William. *At Sea in the City: New York From the Water's Edge*. North Carolina: Algonquin Books of Chapel Hill, 2002. New York City (including Jamaica Bay) through the eyes of a sailor and environmentalist. (Adult)

Kurlansky, Mark. *The Big Oyster: History on the Half Shell*. New York: Ballantine Books, 2006. Here's a chatty, free-wheeling history of New York City told from the humble perspective of the once copious, eagerly consumed, now decimated eastern oyster. It focuses on an inviting social and economic history. (Adult)

La Rocco, Barbara. *Going Coastal New York City: A Guide to the Waterfront*. New York: Going Coastal, Inc., 2004. A rich resource for all matters relating to New York's vast waterfront. (Adult)

Locker, Thomas. *Where the River Begins*. New York: Penguin Books, 1984. A three-day journey to find the source of a river amid changing landscapes. (Ages 4-8)

Louv, Richard. *Last Child in the Woods*. North Carolina: Algonquin Books of Chapel Hill, 2006. Research and solutions that direct exposure to nature is essential for healthy childhood development and for the physical and emotional health of children and adults. (Adult)



Moreno, Dr. Adam and New York City Audubon. *Las Aves de la Ciudad de Nueva York / The Birds of New York City*. New York, 2023. A guide to the birds of New York City, in Spanish and in English. (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)

National Park Service, Gateway National Recreation Area. *The Evolving Legacy of Jamaica Bay*. Washington, DC: U.S. Department of Interior, 2003. Provides background information about Jamaica Bay's resources and resource issues, identifies stakeholders and user groups, outlines concerns and visions for the future. (Adult)

Outwater, Alice. *Water: A Natural History*. New York: Basic Books, 1992. A story of the symbiosis that exists between the country's land, water and the life it supports. (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)

Parris, Adam S., Sanderson, Eric W., Waldman, John R., Solecki, William D. *Prospects for Resilience: Insights from New York City's Jamaica Bay*. New York: Island Press, 1996. An essential foundation of information and advice for researchers, urban planners, students and others who need to create more resilient cities that work with, not against, nature. (Adult)

Peterson Field Guides. Various titles. Boston: Houghton Mifflin. Comprehensive and authoritative guides use accurate and detailed drawings to pinpoint key field markings for easy identification. Useful titles include, *Trees and Shrubs*, *Birds of Eastern North America*, *Atlantic Coast Fishes*, *Shells of the Atlantic Seashore*, *Butterflies*, *Wildflowers* and other areas of nature study. (Adult)

Peterson First Guides. Various titles. Boston: Houghton Mifflin. A simplified version of the full-sized guides, these are the first books the beginning naturalist, whether young or old, needs. Titles include, *Guide to Birds of North America*, *Guide to Butterflies and Moths*, *Guide to Caterpillars of North America*, *Guide to Clouds and Weather*. (Ages 7-12)

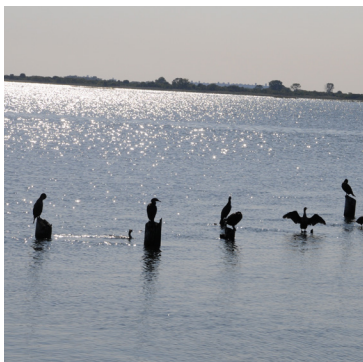
Rivel, Deborah and Kellye Rosenheim. *Birdwatching in New York City and on Long Island*. New York: University Press of New England. 2016. A guide to birding spots and tips for the greater metropolitan area. (Adult)

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)

Seitz, Sharon and Stuart Miller. *The Other Islands of New York City: A History and Guide*. Vermont: Countryman Press, 2001. Part travel guide, part comprehensive history and entertaining guide to forty-two human-made and natural islands that dot the waters around New York City (including Ruffle Bar, Canarsie Pol, Rulers Bar Hassock and other islands of Jamaica Bay). (Adult)

Shulevitz, Uri. *Rain Rain Rivers*. New York: Farrar, Straus and Giroux, 1988. As rain patters everything nameless, a little girl imagines streams streaming, rivers rushing and the sea swelling to swallow up the sky. (Ages preschool-5)

Waldman, John R. *Heartbeats in the Muck: A Dramatic Look at the History, Sea Life and Environment of New York Harbor*. New York: Globe Pequot, 1999. The book traces the fate of New York City's harbor from the 17th century, when it teemed with fish, porpoises, and whales to success stories about how it has improved. (Adult)



## Additional Digital Resources

### **A Day in the Life of the Hudson River and Harbor** - [www.ldeo.columbia.edu/edu/k12/snapshotday/](http://www.ldeo.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.

### **New York City Audubon** - [www.nyc Audubon.org/events-birding/birding-resources/birding-by-subway](http://www.nyc Audubon.org/events-birding/birding-resources/birding-by-subway)

Birding by Subway - A quick guide to 30 birding hotspots that straphangers can access across the City's five boroughs.

### **Cafeteria Culture** - [cafeteriaculture.org](http://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](http://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](http://welcometocup.org)

Explore the power of design and art to increase meaningful civic engagement.

### **Jamaica Bay EcoWatchers** - [jamaicabayecowatchers.org/](http://jamaicabayecowatchers.org/)

Ensuring a safe and healthy environment.

### **Green Map** - [greenmap.org/stories/youth-green-mapping-tools/228](http://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](http://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](http://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](http://marine-ed.org)

Bringing together people with an interest in freshwater and saltwater organisms.

### **National Oceanic Atmospheric Administration** - [noaa.gov](http://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](http://nps.gov/parkhistory/online_books/gate/jamaica_bay_hrs.pdf)

A history of the human land use of Jamaica Bay.

### **New York City Department of Education Race Against Waste** -

#### [schools.nyc.gov/school-life/learning/experiential-learning/service-in-schools](http://schools.nyc.gov/school-life/learning/experiential-learning/service-in-schools)

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

### **New York City Department of Environmental Protection** -

#### [www1.nyc.gov/assets/dep/downloads/pdf/water/nyc-waterways/jamaica-bay/jamaica-bay-watershed-protection-plan-update-2018.pdf](http://www1.nyc.gov/assets/dep/downloads/pdf/water/nyc-waterways/jamaica-bay/jamaica-bay-watershed-protection-plan-update-2018.pdf)

View the Jamaica Bay Watershed Protection Plan.

### **New York City Department of Sanitation** -

#### [www1.nyc.gov/assets/dsny/site/resources/educational-materials/nycs-recycling-curriculum](http://www1.nyc.gov/assets/dsny/site/resources/educational-materials/nycs-recycling-curriculum) -

*K-12 RRRResource Guide*: helps educators implement Reduce, Reuse, and Recycle.

### **New York Harbor Parks** - [NYharborparks.org](http://NYharborparks.org)

Information on national parks on the water, including Jamaica Bay.

### **New York-New Jersey Baykeeper** - [nynjbaykeeper.org](http://nynjbaykeeper.org)

Working to protect, preserve and restore ecological integrity and habitats of local waterways.

### **New York State Marine Education Association** - [nysmea.org](http://nysmea.org)

Information about marine awareness, instructional resources, activities, and links to student programs.





## Survey: Jamaica Bay Education Resource Directory

Name of Organization:

Website:

Contact Person Name:

Address:

Phone Number:

Contact E-mail:

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](mailto:educationoffice@dep.nyc.gov).

1. Your Name:

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

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Yes  No 3. Was this information helpful to you?

Comments:

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Yes  No 4. Do you think it will be helpful to other educators?

Comments:

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Yes  No 5. Before you received the Directory, did you present information about Jamaica Bay and its watershed in lessons you conduct? Please describe.

Comments:

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Yes  No 6. Will you now consider including information about Jamaica Bay in your lessons?

Comments:

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Yes  No 7. Before you received the Directory, did you use Jamaica Bay field trips to enhance your lessons?

Please describe:

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Yes  No 8. Will you now use Jamaica Bay field trips to enhance your lessons?

Please describe:

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Yes  No 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:

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Yes  No 10. Will you now consider working with any of the organizations listed in the Directory to help you develop lessons/curriculum?

Comments:

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Yes  No 11. Did the information in the Directory help you learn about the subject?

Comments:

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Yes  No 12. Is the information in the Directory well organized?

Comments:

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Yes  No 13. Did you find any inaccuracies in the Directory?

Comments:

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cut here > >

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](mailto:educationoffice@dep.nyc.gov)