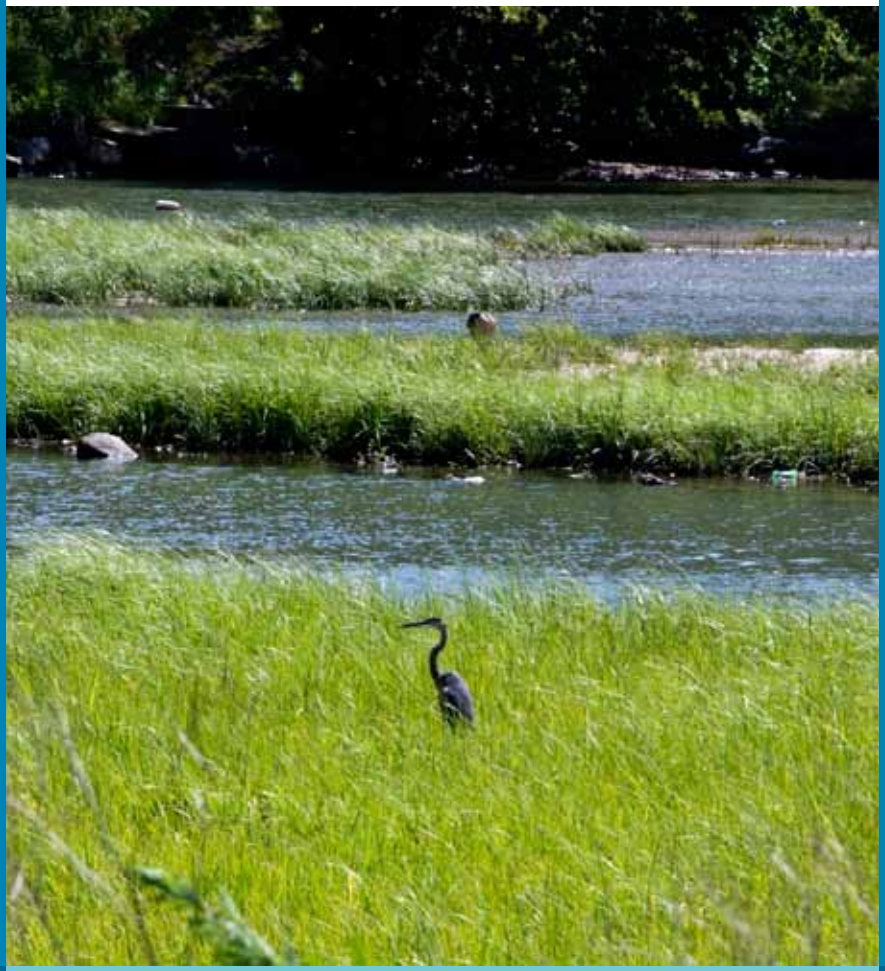

RANDALL'S ISLAND WETLANDS STEWARDSHIP

EXPLORING THE SALT MARSH & FRESHWATER WETLANDS

Acknowledgements

The Randall's Island Wetlands were constructed by the Randall's Island Sports Foundation, the New York City Department of Parks & Recreation Natural Resources Group and the New York City Economic Development Corporation, through generous support from:

The New York City Council
The New York City Department of Environmental Protection
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Stewards of the Randall's Island Wetlands include:

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Special thanks to Fernand Brunschwig for many of the wildlife photos in this booklet.

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This Randall's Island Wetlands Stewardship Booklet belongs to:

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The Randall's Island Sports Foundation (RISF) was formed in 1992 to act as stewards of Randall's Island Park, in partnership with the New York City Department of Parks & Recreation and the local community. Based on the Management, Restoration and Development Plan created in 1999, RISF has worked to transform the Park into an accessible and comprehensive resource for sports and recreation, while preserving the Island's parkland and natural areas.

The first phase of environmental restoration at Randall's Island included a salt marsh and a freshwater wetland, both located near Little Hell Gate Inlet on the west side of the Island.

This booklet will help you learn about the wetlands at Randall's Island, including their environmental benefits, the site history, how the wetlands were created, and what kind of plants and animals inhabit the wetlands. At the end, you will learn how to promote environmental stewardship and become a Randall's Island Wetlands Steward!

For more information, go to www.randallsisland.org.

Randall's Island

What are WETLANDS and why are they valuable?

A **Wetland** is an area between land and water where the soil is often saturated with water.

In order to be called a wetland, two other things besides water have to be present: specific kinds of plants and specific kinds of soils that support those plants.

Wetlands are a very valuable resource because they improve water quality, provide habitat for animals, and provide learning opportunities for people!

Wetland plants **IMPROVE WATER QUALITY** by removing pollution like sediments and chemicals and cleaning the waters at and around Randall's Island.

There are two wetland types at the Park – salt marsh and freshwater wetland. The hydrology of the two wetlands is not the same, so they help improve water quality in different ways. The salt marsh filters the river water that flows through it as the tide goes up and down. The freshwater wetland filters stormwater runoff that flows off the roads and sports fields. Instead of flowing directly into the rivers on either side of the Island, the runoff and pollution will first flow through the wetlands and be cleaned before it reaches the rivers – and finally the Atlantic Ocean.

The Randall's Island Wetlands **PROVIDE WILDLIFE HABITAT** like feeding and nesting sites for birds, fish, crustaceans, and insects.

The restored salt marsh is attracting wading birds, shorebirds, and waterfowl, in particular providing food sources for the great and snowy egrets and black-crowned and yellow-crowned night herons that nest on nearby South Brother Island. It also provides habitat for blue crabs, fiddler crabs and ribbed mussels, as well as finfish and shellfish.

The restored freshwater wetlands provide important habitat for different species of butterflies, dragonflies and damselflies, and birds such as red-winged blackbirds, marsh wrens, common yellow throats, swamp sparrows and green herons.

The Randall's Island Wetlands provide **LEARNING OPPORTUNITIES** for people to study and enjoy our natural environment – just as you are doing now!

Water for **Freshwater Wetlands** comes from rain, stormwater runoff and/or groundwater.

The freshwater wetland at Randall's Island gets water from all three of these sources, but mostly from the water that drains from the roads and sports fields to the south of the site.

Many different types of plants can grow in freshwater wetlands. The freshwater wetland at Randall's Island is an emergent wetland, which means the water is shallow and most of the plants are small and low to the ground. However, as the wetland changes over time, trees may grow and the emergent areas may become a forested wetland, which is sometimes referred to as a swamp.

Freshwater Wetland Site

Freshwater Wetland Vegetation

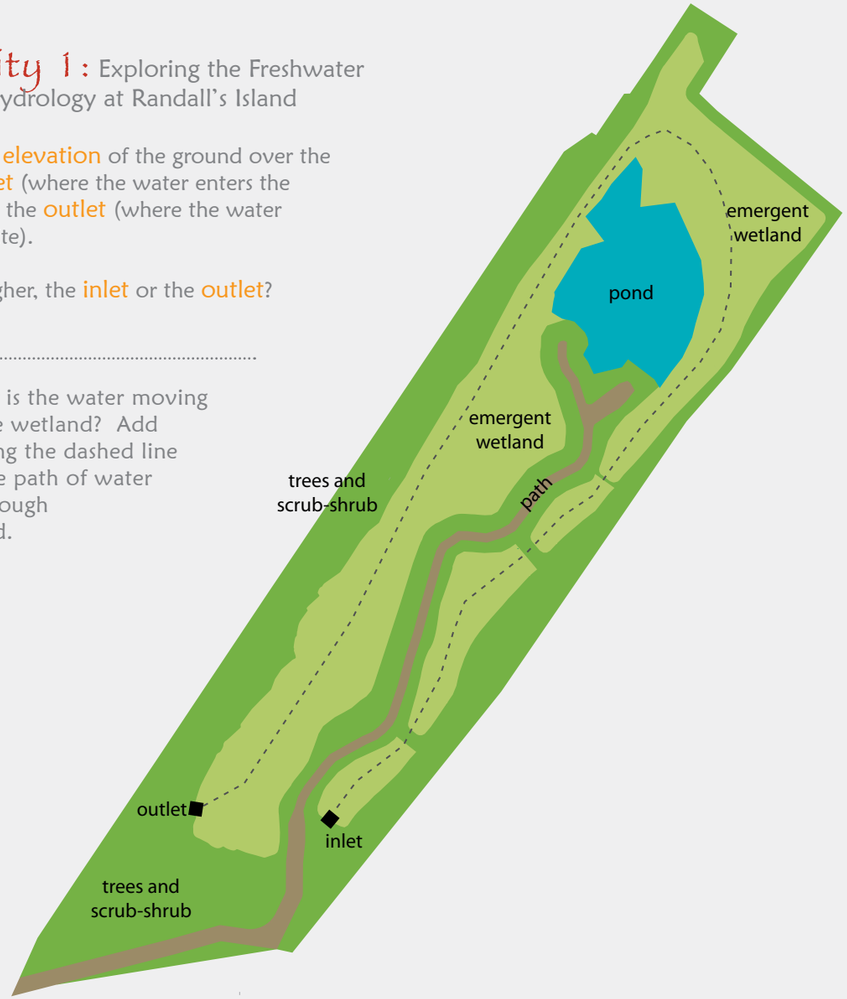
Activity 1: Exploring the Freshwater Wetland Hydrology at Randall's Island

Look at the elevation of the ground over the site, the inlet (where the water enters the site), and at the outlet (where the water leaves the site).

Which is higher, the inlet or the outlet?

.....

Which way is the water moving through the wetland? Add arrows along the dashed line to show the path of water flowing through the wetland.



Salt Marsh is a type of wetland that is found next to salty or brackish water bodies. Salt marshes are among the most productive ecological systems on earth, with very rapid rates of photosynthesis.

Salt marshes are usually tidal, which means that the water comes in and flows out of the wetland twice a day. The tide flows into and out of the Randall's Island salt marsh from the Harlem River, which feeds into the New York Harbor, which in turn is connected to the Atlantic Ocean.

You will not find many types of plants growing in salt marshes because they have to be able to live in the salty water. Most of the plants here are tall marsh grasses. Shrubs and upland grasses were planted on the slopes alongside the marsh to provide different kinds of wildlife habitat.

Salt Marsh Site

Salt Marsh Vegetation

Activity 2: Exploring the Salt Marsh Hydrology at Randall's Island

Look out at the marsh. Notice how some areas are higher in elevation than others. At low tide, the water will only be in the tidal pool and channels. At high tide, the water will rise to cover the low marsh plants.

Below are two pictures that show a slice of the entire marsh from the boardwalk down to the tidal pool. On Picture A, color in where the water will be at low tide. On Picture B, color in where the water will be at high tide.

Picture A, Low Tide

Picture B, High Tide

Where is the water level right now as you look out at the marsh? Is it low tide or high tide or somewhere in between? _____

HISTORY & DEVELOPMENT
of Randall's Island

Randall's Island used to be three separate islands: Randall's Island, Wards Island and Sunken Meadow. You can see in the photo that they were separated by Little Hell Gate, a narrow channel that flowed between them.

1700s-1920s

For hundreds of years, the islands were used not as a public park, but as a place for public facilities serving the people of Manhattan. There was a boys' home, a hospital, and a home for civil war veterans.

1930s

In the 1930's, President Franklin Delano Roosevelt opened the Triborough Bridge and the islands were designated as park areas for New York City residents to use for recreation.

1930s - 1980s

After the Triborough Bridge was built, the Little Hell Gate Channel and its adjacent wetlands were filled by debris from construction projects in Manhattan. This joined Randall's Island, Wards Island, and Sunken Meadow into a single island.

1990s - Today

In 1992, RISF was formed to work with the City of New York to develop sports and recreational facilities, maintain the Park and restore its natural environment, including the Randall's Island Wetlands.

You can contribute to the history of Randall's Island by becoming a Wetlands Steward - read on to learn more!

SALT MARSH

Prior to 2007
Site before

2007-2008
Clearing site

2007-2008
During site excavation

Wetlands RESTORATION
How did we get there?

As you learned on the previous pages, Randall's Island used to be three separate islands surrounded by rivers and wetlands. The Randall's Island Wetlands that you see today are actually located where the Little Hell Gate Channel and its wetlands used to be before they were filled. That's why they are called restored wetlands.

FRESHWATER WETLAND

Prior to 2007
Site before

2007-2008
Clearing site

2007-2008
Removing garbage and debris

2007-2008
Placing clean sand for plants

Spring 2008
During planting

August 2008
First summer after planting

August 2009
Second summer after planting

When beginning the design process, the restoration team looked at the areas to be restored. They knew that they had to remove a lot of fill and debris in order to restore the wetlands. Because the features of the two sites were very different, they determined that two different types of wetlands would need to be created – a SALT MARSH and a FRESHWATER WETLAND.

Watch the changes in the photos as the wetlands are restored!

2007-2008
During site excavation

Spring 2008
During planting

August 2008
First summer after planting

August 2009
Second summer after planting

Activity 3: Word Search

The paragraphs below describe how the Randall's Island Wetlands were restored and the kinds of plants and animals you can expect to find in the wetlands now. After reading about the wetlands, see if you can find the bolded words in the word search. The words are hidden diagonally, across and down – nothing is backwards!

Salt Marsh

The **SALT MARSH** was built by excavating the old **FILL** and placing clean **SAND** at lower levels, or **ELEVATIONS**, that would allow the **TIDE** to flow in and out of the site. A tidal **CHANNEL** was also built, which allows the tide to flow into the marsh and provides additional habitat for **FISH** and other wildlife, like **CRABS**. Birds like **EGRETS**, ducks, and **HERON**s will also visit the marsh to **NEST** and search for food. The marsh was then planted with a **GRASS** called **SPARTINA** and the upland areas next to the boardwalk were planted with different kinds of plants, including a flower called New York **ASTER** and a shrub called **BAYBERRY**.

Freshwater Wetlands

Fill was also excavated from the **FRESHWATER** wetlands site, a berm (higher area) was built through the center, and the **SOIL** was shaped so that water would follow a new **FLOW PATH** into and out of the site. The new flow path created more **WETLAND** areas and increased the amount of time the water flows through the wetlands, so that it stays there long enough for the plants and soil to **FILTER** the water and remove pollution. The **PLANTS** at the freshwater wetlands include grasses, rushes, flowering plants like goldenrod, and trees like **WILLOW** and pin **OAK**. The freshwater wetlands provide **HABITATS** for many different types of animals, including insects like **BUTTERFLIES**, dragonflies and **CRICKETS**, as well as **BIRD**s like **ROBINS** and **DUCKS**.

F	L	O	W	P	A	T	H	A	B	I	T	A	T	S
I	R	O	B	I	N	S	Q	W	A	E	I	F	E	P
L	P	E	I	T	L	R	T	Y	Y	U	D	I	I	A
T	L	O	S	O	I	L	P	A	B	L	L	S	S	R
E	A	D	D	H	F	S	O	G	E	F	H	H	J	T
R	N	E	S	T	W	K	L	W	R	Z	X	C	D	I
V	T	B	N	A	N	A	M	E	R	H	E	R	O	N
Q	S	W	F	I	L	L	T	E	Y	R	I	I	Y	A
C	U	E	G	R	E	T	S	E	I	B	P	C	S	S
H	A	S	D	F	U	G	M	H	R	O	A	K	J	T
A	C	R	A	B	S	K	T	A	Z	T	C	E	C	E
N	V	G	R	A	S	S	B	I	R	U	D	T	Q	R
N	K	W	E	R	T	Y	A	U	D	S	I	S	O	P
E	L	E	V	A	T	I	O	N	S	E	H	A	U	D
L	A	F	W	E	T	L	A	N	D	B	S	X	I	X

Let's learn about the PLANTS & ANIMALS at the Randall's Island Wetlands

Activity 4: Observation

In order to learn about the plants and animals at the Randall's Island Wetlands, you will need to practice your observation skills. Observe the photo on the next page of a praying mantis, one of the species that lives at the Randall's Island Wetlands.

Use your observation skills to describe the praying mantis above: color, type of creature, body parts. What is it doing? How else can you describe it?

Activity 4: Species Matching

Match the description of the Randall's Island Wetlands species with these photos taken at the Park by drawing a line to connect the dots.

- **Great Egret** (*Ardea alba*): a large, long-legged and long-necked white heron, seen in tidal areas and salt marshes. It can stand still for a long time, then quickly skewer its fish and crab prey with its long, sharp beak. Great egrets build nests made of a platform of sticks in shrubs or trees near the water.

- **Mallard Duck** (*Anas platyrhynchos*): a common East Coast duck that spends much of the winter in salt marshes. The male mallard has a shiny green head and neck and a white collar. Females have speckled brown feathers. Mallards feed by picking insects from the water surface and plucking bugs and grasses from the bottom.

- **Mummichog** (*Fundulus heteroclitus*): lives in the salt marsh year-round. This finger-length brown fish travels in schools of hundreds of fish. At low tide, mummichogs are confined to the remaining wet areas, but at high tide they rise with the water and look for food among the cordgrass and other plants. During the winter, mummichogs escape the cold by burrowing into the mud.

- **Pickerelweed** (*Pontederia cordata*): an aquatic plant that prefers calm shallow waters and typically grows to be two to four feet tall. It has waxy, dark green leaves that are almost heart shaped. Its long purple-blue flower blooms in summer. Its seeds are eaten by water birds, and fish hide under its large leaves.

Match the description of the Randall's Island Wetlands species with these photos taken at the Park by drawing a line to connect the dots.

- **Spotted Skimmer** (*Libellula pulchella*): a dragonfly often found in or near freshwater wetlands. Like all dragonflies, spotted skimmers have two life stages. Young spotted skimmers, called naiads, are wingless insects that live among the debris at the bottom of freshwater ponds. The adult has dark spots on its wings and is an agile flier that feeds on mosquitoes, flies and butterflies.

- **Staghorn Sumac** (*Rhus typhina*) and **Winged Sumac** (*Rhus copallinum*): large shrubs with green-yellow flowers, red, hairy fruits, and many leaflets along each leaf. Sumac turns bright shades of yellow, orange and red in the fall. Many birds eat the fruit of sumacs, and cottontail rabbits eat the bark.

- **Monarch Butterfly** (*Danaus plexippus*): a butterfly often found in meadows, fields, marshes, and roadsides. Adults are bright orange with black markings and a black body. Wings have white spots on the edge. Female monarchs lay their eggs under milkweed leaves and the larvae eat the plant.

- **Smooth Cordgrass** (*Spartina alterniflora*): a perennial grass, meaning a grass that regrows on its own every year. It can be found all over the East Coast, including the tidal salt marsh at Randall's Island. Smooth cordgrass makes dense clumps, grows up to six feet tall and has tough roots, which hold onto the wetland soil, keeping it from being washed away. Stands of smooth cordgrass also provide habitat for fish and crustaceans.

Match the description of the Randall's Island Wetlands species with these photos taken at the Park by drawing a line to connect the dots.

Great Blue Heron (*Ardea Herodias*): a lean, blue-grey bird that is the largest and most widespread heron in North America. It has a long "S-shaped" neck and dagger-like bill, which it uses to spear fish out of the tidal creek in the salt marsh. When scared by predators the bird will take flight and produce a distinctive deep, croaking call: *frahnk, frahnk, frahnk.*

Salt Marshmallow (*Hibiscus moscheutos*): a plant found where the marsh meets dry land. Salt marshmallow plants can grow up to four feet tall, and the stems and leaves are covered in hairs. The leaves are toothed. The flowers are pink with a dark center, and can be as big as seven inches.

Strawcolored Flatsedge (*Cyperus strigosus*): a grasslike plant with triangular stems and has very tiny clusters of brown seeds on top. It can grow up to three feet tall. These sedges prefer moist to wet areas and are often found in tidal fresh and brackish marshes, swales, and moist meadows. Sedge seeds provide food for water birds, and geese will also eat the leaves.

Blue Crab (*Callinectes sapidus*): a bottom-dwelling crab which inhabits coastal waters along the Atlantic and Gulf coasts. The back legs of the crab are broad and flat like paddles, allowing it to swim quickly. Blue crabs eat crustaceans, fish, and plants.

Match the description of the Randall's Island Wetlands species with these photos taken at the Park by drawing a line to connect the dots.

Asters (*Asteraceae*): the largest family of flowering plants. Asters bloom in late summer or fall with bright white, pink, purple, or blue flowers, usually around a yellow center. Three aster species were planted within the restoration site: New York aster, New England aster, and smooth blue aster.

Fiddler Crab (*Uca*): a small crustacean, easily found looking for food in large numbers along creek banks when the tide is out. They live in burrows, which they dig up to two feet deep, and feed on tiny organisms living in the marsh mud. Male crabs have one claw which is much larger than the other one, and which they may slowly wave to attract a female or to defend their burrow from other males.

Marsh Elder (*Iva frutescens*): a shrub that grows in clusters on the upland side of salt marshes throughout the East Coast. The leaves on the plant are narrow. Most marsh elders are about as tall as a person but some grow to twice that height. They provide nesting areas for small birds such as the marsh wren.

Canada Goose (*Branta canadensis*): a grey bird with a black head, white cheeks and a long black neck. The Canada goose finds a mate at two years old and they stay together for life. Geese eat grasses, sedges, grain, and berries. They are a danger to young plants in the salt marsh because they grab hold of them with their bills and pull them out by jerking their heads.

How do you become a WETLANDS STEWARD?

Wetland stewardship means taking care of environments like the Randall's Island Wetlands, which are sensitive natural resources. If the wetlands are protected, animals that live there can be healthy, plants can work to filter pollution and help keep our water clean, and we can continue to visit and learn from our environment.

To be a good Randall's Island Wetlands Steward:

- Observe the wetlands from the boardwalk and pathways to prevent injury to you and to protect the wetlands.
- Be careful not to step on any of the plants in the wetlands.
- Be sure not to litter or leave any of your trash behind.
- Pick up any garbage that you see in and around the wetlands and place it in trash cans.
- Quietly observe the wetlands. Loud noises and too much activity may disturb wildlife that use the wetlands for nesting, feeding, and rest.
- Teach your family and friends how to be Wetlands Stewards!

In Memory of Don S. Cook:

Don S. Cook inspired generations of teachers and students to appreciate nature at Randall's Island and far beyond. Don was an Honorary Randall's Island Wetlands Steward, Director of the Tiorati Workshop for Environmental Learning at Bank Street College of Education, and Chair of the Science Education Section, New York Academy of Sciences.

Open yourself to the world around you,
look and see, listen and hear,
ask questions, share your ideas,
love learning.

Activity 6: Take notes on your observations at Randall's Island.

PLANTS: What species did you find?

ANIMALS: What species did you find? Also include any clues such as tracks, nests, etc.

Activity 7:

Choose one plant or animal you found in Activity 6 and draw it.
Pay close attention to the details.

Activity 8:

Describe the plant or animal you chose to observe in Activity 7.
What made it look special and seem different from the others?

PLANT or ANIMAL NAME .....

LOCATION .....

COLORS .....

MARKINGS .....

HABITAT TYPE .....

NEIGHBORS .....

OTHER PHYSICAL CHARACTERISTICS .....

.....

APPROXIMATE SIZE AND SHAPE .....

.....

BEHAVIOR NOTES .....

.....

IDENTIFICATION .....

Glossary

GLOSSARY

Aquatic – growing or living or often found in water

Brackish – describes water that is more salty than fresh water but less salty than sea water; it usually occurs where fresh water and sea water mix

Elevation – the measure of the height or vertical distance of the ground surface

Emergent – a type of freshwater wetland with vegetation growing out of shallow water

Groundwater – water located beneath the ground surface that occupies spaces between soil particles

Habitat – environment or area where plant and animal species live

Hydrology – study of the movement, flow patterns, and quantity of water

Inlet – location where water enters an area

Invasive – non-native; invasive plants or animals often multiply, spread quickly, and push native species out of an ecosystem

Native – describes something that is naturally found in a specific place

Outlet – location where water exits an area

Photosynthesis - the process by which light from the sun helps plants to make food from water and from carbon dioxide in the air

Pollution – chemicals and waste that cause harm to the environment by destroying habitat or contaminating soil, water or the food chain; most pollution comes from human activities

Restore – to bring back a former condition; specifically, in a natural area, to return native soils, plants, and water flow by removing invasive plants, manmade pollution and structures

Saturated – full of water; thoroughly wet

Scrub-shrub – a habitat type found between wetland and upland (drier) areas; usually shrubs, grasses, and flowering plants grow in these areas

Sediment – particles of soil; sediment makes water murky

Species – a group or class of animal or plant with common traits

Stewardship – careful and responsible management

Stormwater Runoff – rainwater, dew or snow that falls on hard surfaces like roads, sidewalks, and parking lots and does not soak into the ground but instead flows directly into the sewer system

Tide – the rise and fall of sea water, caused by rotation of the Earth and by the Moon and the Sun orbiting around it; most areas experience two daily tide cycles, with two high tides and two low tides in a 24-hour period

Notes:

Randall's Island

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