

Resilient Schools and Communities (RiSC) Spring Dune Grass Planting Guide for Educators



**NATIONAL
WILDLIFE
FEDERATION**

**Resilient
Schools and
Communities**

What is RiSC?

The National Wildlife Federation's Resilient Schools and Communities (RiSC) is an award-winning climate and resilience education program that educates middle and high school students and their teachers about climate science, climate impacts, climate justice and resilience solutions.

For the past seven years the RiSC program has worked in Brooklyn, New York developing and deepening relationships with community leaders, local educational organizations, and teachers. to implement a climate and resilience education program that gives students agency and opportunities to work towards a more environmentally just city. The RiSC curriculum introduces students to the impacts that colonization, industrialization, and urbanization have had on the original indigenous inhabitants of the area as well as on current residents, our ecosystems and shorelines. Through a series of field-based activities from the [RiSC Curriculum 3.0: Connecting Schools to Communities](#), students learn how to build resilience to the impacts of climate change.

RiSC teams take field trips to local "Adopt-a-Shoreline" sites whose neighborhoods and communities are becoming increasingly more vulnerable to the impacts of climate change. Through intergenerational events and climate action projects, RiSC teams are able to reflect on the power of community and youth voice to advocate for climate justice, ease climate anxiety, and effect change.



Watch the documentary film: ["Where It Floods: Planting Hope In Coney Island"](#)- a 10-minute documentary that showcases the RiSC program in action.

You can learn more about RiSC at riscnyc.org.

What is a Frontline Community

Coastal communities in and around New York City are more vulnerable to the impacts of climate change as sea levels rise and extreme weather events increase. Frontline communities, those already facing social, economic, or environmental vulnerabilities and institutional racism, are disproportionately impacted by climate change. These impacts - including coastal erosion, inequitable exposures to flooding and extreme heat - can exacerbate existing challenges and create new threats to the well-being of local residents who often experience the "first and worst" consequences of climate change even though they have contributed the least to its causes. Redlining - a discriminatory practice that created racially segregated neighborhoods in areas deemed to be high-risk or undesirable - played a significant role in determining where people have lived in the U.S. since the 1930s. The legacy of redlining is visible in the vastly different levels of climate risk these neighborhoods face as a consequence of generations of disinvestment in quality infrastructure, housing, parks, trees, and health care.

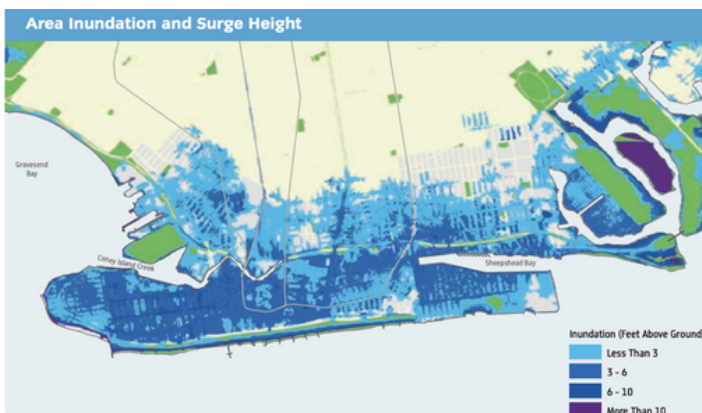
To explore these issues further, use the [RiSC Curriculum 3.0, Project 2](#).

riscnyc.org

What is a Frontline Community (cont'd)

Coney Island is a frontline community. It is considered “highly vulnerable” with an overall Social Vulnerability Index (SVI) of 0.8845 out of 1 (with 0 being the lowest vulnerability and 1 being the highest). This means that Coney Island is more socially vulnerable than about 98% of U.S. communities. In addition to its high SVI rating, Coney Island remains highly vulnerable to climate impacts. Because of its geography as a peninsula, history as a fully isolated island, and projected sea level rise, Coney Island could be underwater by the end of the century. It is a designated Coastal Erosion Hazard Area, located in a “high-risk zone” for flooding, according to FEMA’s [New York flood help site](#). There are six hurricane evacuation zones in NYC, ranked by the risk of storm surge impact, with Zone 1 being the most likely to flood. In the event of a hurricane or tropical storm, residents in these zones may be ordered to evacuate. Coney Island is in Zone 1 and is experiencing sunny day flooding events that impact residents’ quality of life and students’ ability to get to school.

Coney Island was devastated by Superstorm Sandy in 2012; flooding in the Coney Island peninsula reached 11 feet above ground level.



- NYC has over 520 miles of coastline and over 8.4 million residents.
- About 43% of New York State’s population is concentrated in NYC.
- Though only 10% of total land area in the United States, coastal areas are home to almost 40% of the US population.
- Currently, 1.3 million NYC residents live within or directly adjacent to the floodplain. By 2100, this number could rise to 2.2 million; 56% of the residents within or directly adjacent to the floodplain identify as non-white.
- More than half of NYC’s floodplain residents live in areas with a median income less than \$75,120, which is considered low income for a family of three.¹ The median household income in Coney Island is \$40,467.2² Climate change will exacerbate existing inequities.

1. <http://rebuildbydesign.org/our-work/research/who-lives-in-nyc's-floodplain>

2. <https://www.incomebyzipcode.com/newyork/11224>

What Are Living Shorelines?

Living shorelines are coastal management approaches that utilize natural elements, such as native vegetation, sand, or oyster reefs, to stabilize the shoreline and protect against erosion. Unlike traditional hard or structural shoreline stabilization methods, like seawalls or bulkheads, living shorelines incorporate natural elements that enhance habitat and ecological functions.

These shorelines are important for several reasons:

- **Erosion Control:** Living shorelines provide effective erosion control by stabilizing the shoreline with vegetation or other natural features. This helps reduce the impact of waves, storms, and beach shifting on coastal areas.
- **Habitat Enhancement:** Living shorelines promote biodiversity by providing habitats for various species of plants, animals, and marine life. The vegetation and substrate of living shorelines create habitats for fish, shellfish, and other aquatic organisms, supporting a healthier and more diverse ecosystem compared to traditional stabilized shorelines.
- **Water Quality Improvement:** The natural components of living shorelines, such as marsh plants and oyster reefs, help filter and improve water quality by trapping pollutants and sediments, leading to cleaner and healthier coastal waters.
- **Resilience to Climate Change:** Living shorelines contribute to the resilience of coastal areas in the face of climate change. They can adapt to rising sea levels, increased storm intensity, and other climate-related challenges more effectively than rigid, non-natural structures.
- **Aesthetics and Recreation:** Living shorelines often enhance the aesthetic value of coastal areas, making them more attractive for residents and visitors. Additionally, they can support recreational activities such as bird watching, fishing, and other pursuits.

Read More:

[Living Shorelines Build Resilient Coasts - The National Wildlife Federation Blog](#)

[RiSC Students Help Create Living Shorelines in Coney Island Creek Park - The National Wildlife Federation Blog](#)

Use this RiSC Coastal Redesign Lesson for a Class Discussion



Which coastline do you think will be better prepared for coastal flood hazards?

Read more:

[Rising Tide: New York and Sea Level Rise](#)

Why Are We Planting American Beach Grass in Coney Island?

A former barrier island famous for its amusement parks, Coney Island was permanently connected to the rest of Brooklyn by landfill in the 1930s. Because of this land connection, Coney Island is a peninsula surrounded by water. It is one of the coastal communities most threatened by sea level rise in New York City and was hit hard by Superstorm Sandy in 2012. During that historic event, a 10-foot storm surge brought debris and toxic sludge into peoples' homes, destroying property and livelihoods.

About 30,000 people live in small multi-story houses along Bayview Avenue and in the 15 Gravesend Houses – a NYC Housing Authority (NYCHA) public housing complex - adjacent to Coney Island Creek - one of the last remaining creeks and estuaries in this urban landscape. In the 17th and 18th centuries, many other creeks cut through Brooklyn, but they were filled in as the borough developed.

In 2001, a large sand dune was installed in Coney Island Creek Park to prevent erosion. However, sand dunes are dynamic systems that move and migrate over time with prevailing winds. This natural movement of sand has caused a problem for people living adjacent to the Park's shoreline on Bayview Avenue. Residents frequently have to sweep sand out of their homes and the build-up of sand in the street has made it difficult for people to use the road and park their cars.

In an effort to help protect the Coney Island Creek community from sand migration as well as coastal flooding and erosion, and working with community partner Coney Island Beautification Project, RiSC students, teachers, and community members have planted tens of thousands of American beach grass culms in Coney Island Creek Park.



Planting American beach grass (*Ammophila breviligulata*) in Coney Island is an important solution for this densely populated, vulnerable coastal area. American beach grass, known for its robust root system and adaptability to sandy environments, serves as a formidable natural defense against the erosive forces of wind and water. With a dense network of interwoven roots, the beach grass effectively anchors the sand in place, preventing it from being easily eroded, or swept away during storms or high tides. By reducing the impact of wind, waves and storm surges, American beach grass helps safeguard the shoreline of Coney Island, bolstering the community's resilience to the challenges posed by rising sea levels and extreme weather events. The presence of this native grass not only fortifies the coastline but also enhances the ecological balance of the area by providing habitat for local flora and fauna and contributing to the overall well-being of the coastal ecosystem.

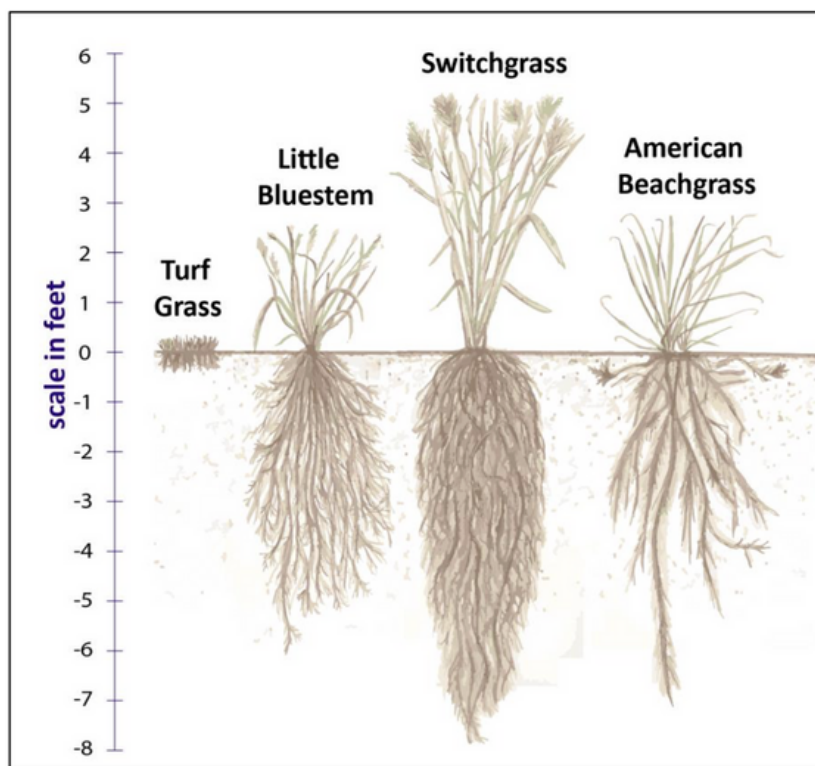
See New York Sea Grant [American Beachgrass Planting Guide](#)



Newly planted culms of
American beach grass



Established American
beach grass



American beach grass is planted along New York beaches to increase sand stability. The species' root system extends much deeper than turf grass and spreads wider than many other grasses, allowing it to better anchor the sand in place.

Source: StormSmart Properties Fact Sheet 3: Planting Vegetation to Reduce Erosion and Storm Damage

Additional Resources

- Video: [Parks Dept. Works to Restore Dunes With Cost Effective Plan](#)
- Video: [How to Plant Dune Grass for Coastal Sustainability](#)
- Website: [New Study Examines the Role of Roots and Below Ground Plant Structures on Dune Dynamics](#)
- Website: [Grasses Shape and Protect Coastal Dunes in Different Ways](#)
- Report: [National Wildlife Federation & Allied Showcase Report: The Versatility of Nature-Based Solution](#)
- Report: [National Wildlife Federation Report: Softening Our Shorelines](#)
- Website: [Restoring Natural Dunes to Enhance Coastal Protection](#)