

# Building Resiliency in New York City

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## Description:

This lesson will introduce students to the concept of resiliency. Students will relate resiliency to Hurricane Sandy by studying the impacts of this natural disaster on the city.

This lesson has two options. The first option has students analyze Hurricane Sandy data to look at the resiliency of New York City at the neighborhood level. Students will explore the environmental, social, political, and economic factors that can impact resiliency and vulnerability. The second option has students creating a video that documents their community's response to Hurricane Sandy. Students can interview friends, family members, and classmates to learn about their personal experiences with natural disasters. The discussion questions will connect the concept of resiliency to the larger idea of climate change. Some students might not remember Hurricane Sandy, or might be too young to have been impacted by it personally, however, this event provides a unique, relatively recent and local case study that demonstrates how front-line communities and New York City at-large can organize to respond to large-scale natural disasters while building resiliency for future events. If time allows, complete both activities and/or explore a more recent event that has challenged New York City's resiliency.

## Objectives:

- Evaluate and communicate information related to the impacts and aftermath of Hurricane Sandy using maps and scientific data

- Understand the connection between natural disasters, climate change, and personal experiences

## Vocabulary:

Albedo, geographic Information System (GIS), Hurricane Sandy, natural disaster, resiliency, vulnerability

## Materials:

- [NYC Resiliency Interactive Map](#)
- Digital recording devices (i.e. phones, tablets or cameras)
- Computers, laptops, or tablets with internet access

## Background Information:

Resiliency is defined as “the ability of people, the places where they live, and our infrastructure systems—such as transportation and energy—to withstand a stress or shock event, to recover, and emerge even stronger.”<sup>1</sup>

In late October of 2012, Hurricane Sandy devastated much of the New York City metropolitan area. Neighborhoods were greatly affected, with homes and businesses flooded and much of our local infrastructure damaged. After the storm passed, it became clear that New Yorkers must adapt to a new era of climate change. The storm also highlighted New York City's vulnerability to coastal storms, as a coastal city.

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<sup>1</sup> [OneNYC 2015](#)

Hurricane Sandy caused \$19 billion dollars in damages in New York City, which the city was forced to recover from, with the goal of emerging even stronger. After Hurricane Sandy, New York City pledged to become a more resilient city.

In June 2013, New York City released a comprehensive resiliency plan known as *A Stronger, More Resilient New York*. The plan outlined a 10-year, over \$20 billion program as a response to this superstorm. This plan aims to enhance the City's resiliency by investing in communities, upgrading buildings, protecting infrastructure, and reducing flood risk.

The risks of climate change and other 21<sup>st</sup> century threats will continue to challenge the city's resiliency. OneNYC, the City's strategic plan, is a huge step towards preparing us for the various risks associated with climate change, like more frequent and more intense storms. For more information on OneNYC, refer to DEP's [Breaking Down OneNYC](#) lesson. Hurricane Sandy has shown us that we should constantly be adapting, innovating, and evolving as our climate changes.

## Method:

### Option 1: Resilience and Vulnerability in New York City using Maps

- Introduce the concept of resiliency and vulnerability. Relate these ideas of resiliency and vulnerability to New York City during Hurricane Sandy.
- Divide students into groups of 4-5. In groups, have students predict areas within the 5 boroughs that they think would be most vulnerable to storms, starting with environmental factors, and then considering other political, economic, and social factors.

Encourage students to think about the varying levels of vulnerability of the different geographic locations of NYC.

- Introduce students to the concept of tools like ArcGIS, which use software, mapping and raw data to visualize or process information (also used to create the map below).
- Present the [NYC Resiliency Projects Map](#) and give students time to explore the features of the map. Have students use the map legend to explore the different types of resiliency projects across the city, including information on the budget, project schedule and completion date. Ask students to also explore additional map layers to consider how a coastal city is affected by its surroundings.
- Have students reflect on their research and compare and contrast their findings from the map to their own predictions. Students will think about how their initial ideas compare to the data and why they are different.
- Discuss the actions New York City took in response to Hurricane Sandy and encourage students to consider the various economic, social and political factors that go into making these decisions.

### Option 2: Hurricane Sandy Documentary

- Ask students to recall the impacts of Hurricane Sandy. Were they or someone they know personally affected by it? Supplement personal responses with Hurricane Sandy data and news articles.
- Split students in small groups. Instruct groups to create a documentary style video on the aftermath of Hurricane Sandy. Have students interview at least one community member (this can include family members, teachers, or students) that will recount their

experience with Hurricane Sandy. Encourage students to include information on the local projects and initiatives that helped rebuild neighborhoods affected by the hurricane. For the sake of time, the length of their videos should be no longer than 10 minutes.

- Share the videos during class, and consider publishing on social media platforms (such as TeacherTube, Youtube, or Vimeo).
- Have students discuss the impacts of Hurricane Sandy on their community based on what they learned from creating their videos.

### **Discussion:**

- Were you or someone you know affected by Hurricane Sandy? Have an open discussion on the class' personal experiences with the natural disaster.
- What are some patterns you observe in the information you collected?
- What are some ways New York City responded to Hurricane Sandy?
- How can we create a more resilient city in response to climate change?
- Have you noticed an increase in storms in the news? Do you think these storms are connected to climate change?
- How can we use social media to spread information about resiliency?

### **Extension:**

- Related to Option 2: Connect with educators from New York City's upstate watershed communities, or from different cities, states, or countries and ask them to assign similar video projects on natural disasters that have impacted their region. Exchange videos and host a screening of the other class' videos with your students to learn about similar events in other regions.
- Compare the actions taken by New York City in response to Hurricane Sandy to other natural disasters.
  - What are some ways other cities respond to natural disasters?
- Have students consider and design other resiliency projects that they would like to see in New York City by exploring DEP's ... lesson.
- Discuss and consider other, more recent natural disasters or large-scale adverse events related to climate change that have impacted New York City. How has the City responded? Who and what were affected?

### **NYC Department of Environmental Protection**

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

For more information visit [www.nyc.gov/dep](http://www.nyc.gov/dep)