



# NEW YORK STATE WATER RESOURCES INSTITUTE

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## Hudson River Estuary Climate Change Lesson Plans Project

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Teachers practice lesson plan at New York Sea Grant 11/14 Workshop- P.Focazio

### Abstract

Impacts from climate change are clearly evident in New York's Hudson River Valley. To meet challenges brought on by these changes, All New York residents need to be climate and weather literate. Working with the NYSDEC Hudson Estuary Program, and New York Water Resources Institute at Cornell New York Sea Grant has developed a series of lesson plans that teachers can easily use to help students in the region learn basic climate science. The lessons designed to help middle school students understand climate and weather basics and explore climate change related issues close to home in the Hudson River Valley. The lessons and associated material are now posted at [www.nyseagrant.org/hvclimate](http://www.nyseagrant.org/hvclimate)

### Major Accomplishments

- A set of 9 lesson plans, including one field activity were selected from existing scientist and peer reviewed plans and adapted for this project, focusing on the use Hudson River Valley data.
- STEM professionals educators worked with a project designer to adapt the lesson to a user friendly print-on-demand format.
- NY Sea Grant developed webpage for the plans

## **Introduction**

In partnership with the New York State Department of Environmental Conservation Department's Hudson River Estuary Program, New York Sea Grant worked with regional middle school teachers and curriculum development professionals to adapt or create classroom lesson plans and activities relevant to their communities. While Sea Grant has long partnered with the New York Department of Environmental Conservation, it is important to also note that the project aligns with New York Sea Grant's Strategic Plan and the National Sea Grant College Program Strategic Plan Sea Grant Focus Area: Environmental Literacy and Workforce Development.

## **Program Description and Methods**

Following thorough review of available resources generated by NOAA and associated programs and agencies (2013) by New York Sea Grant and NYSDEC, a set of 9 lesson plans including one field activity were selected from existing scientist and peer reviewed plans, and adapted as needed to include Hudson Estuary specific data. Originally we surveyed lessons designed for middle and high school levels but in consult with the Estuary Program staff decided to develop the plans for grades 5-8. To guide lesson plan selection, New York Sea Grant consulted the NOAA sponsored Essential Principles of Climate Science, <http://www.climate.gov/teaching/teaching-climate-literacy-and-energy-awareness>.

Sea Grant worked closely with STEM consultant and Cornell Alumnus, Meghan Marrero Ed.D, who currently teaches Science Education for teachers training at Mercy College in the Hudson River Valley. Dr. Marrero adapted and correlated the plans to learning standards teachers use or may soon be required to use in their classrooms including New York State Learning Standards, Next Generation Science Learning Standards and the Common Core. Sea Grant also "field checked" the lesson topics with two Hudson Valley classroom teachers based in Poughkeepsie and Irvington to make sure we were on target. Steven Stanne, Hudson River Estuary Program Education Coordinator provided thorough review of the plans and valuable editing assistance to create user friendly documents.

## **Results**

The lessons are not offered as a curriculum unit, but can and do stand alone. Presented as print on demand online their specific numbered order is intentional it builds from basic climate and weather literacy to understanding climate change issues. Lesson titles are:

- 1) Investigating the Differences Between Climate and Weather
- 2) Observing Changes at Mohonk Preserve
- 3) Climate Change in My City
- 4) Paleoclimate of the Hudson Valley
- 5) Changes Close to Home: Climate Oral History
- 6) Energy Walkabout
- 7) Earth's Albedo

8) Carbon Through The Seasons

9) New York Explores Sea Level Rise

The lesson Observing Changes at Mohonk Preserve is exceptional as it is the single originally produced lesson for this project. For all lessons we were very careful to provide source credits and links to original authors sites where available.

During the fall of 2014, Sea Grant introduced the project to more than 200 teachers and educators at the annual New York State Marine Educators Association Conference in NYC and the lesson plans were introduced as part of a regional NYSDEC Climate Change In the Classroom Conference in Hyde Park New York. Sea Grant worked with many education partners to provide this set best available educational materials to the region's teachers to meet a growing need to understand climate change issues.

#### **Project Extensions:**

- Although project support has termed New York Sea Grant extension will continue to conduct outreach to increase awareness about these plans throughout 2015. Currently we are submitting presentation proposals to the NYC Science Council Conference (NYC March) and the National Marine Educators Conference (Rhode Island, June 2015). If accepted, we will consider the feasibility attending and presenting at these programs.

Project partners, NYSDEC and NY Marine Educators Association will provide links to the plan on their organization websites

- New York Sea Grant will also work through the New York State Marine Education Association to link our place to *The Bridge*, a National Marine Education Association/NOAA partner site for k-12 marine related lesson plans and activities.
- Sea Grant will also promote these plans through our network of 33 Sea Grant College Programs throughout the U.S. Our hope is that our partner programs will note how general lessons can indeed be adapted and place-based.
- Cornell Cooperative Extension Colleagues will upload or link the lessons on their Climate Resiliency website.
- Teaching the Hudson Valley, the host of the November 2014 conference will provide links to the plans on their website.
- Sea Grant will continue to monitor lesson plan links and compile download metrics for evaluations.

#### **Policy Implications**

Correlating all of these lesson plans to three separate leaning standards secures continued user-friendly application of these plans and activities if NYS education teaching standards policy change.

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