The Next Generation of Hudson River Educators: Using Place-Based Education to Connect Underrepresented Minorities to their Local Waterways

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Abstract

Place-based field education is the foundation of Lamont-Doherty Earth Observatory's Hudson River Field Station. The most effective method of engaging and connecting people with their local environment is through memorable and hands-on field investigations, with the Hudson River itself as the best educational tool. Our 'Next Generation of Hudson River Educators' is a six week summer internship program specifically designed to more effectively engage underrepresented minority (URM) students and communities with the Hudson River using a tiered mentoring structure. The high school interns first take a deep dive into the Hudson River to develop a better understanding of the historic to present human connection to the estuary, the dynamism of its biology, physics, chemistry, geology, and topography, and the challenges the Hudson faces, along with potential community solutions. These field investigations build an appreciation for the estuary that they can pass on to their communities. Unfortunately, the coronavirus introduced a unique challenge on place-based education making it impossible to run an in-person program. Through an innovative approach to place-based learning, we decided 'if we couldn't bring the students to the river, we would bring the river to the students'. The interns dedicated the first weeks to learning about the Hudson through "Virtual River" videos, games, interactive web activities, and live river demonstrations hosted down by the water. While the content is virtual, it simulates a place-based education that effectively engages students in the geosciences and increases science literacy. The interns then work in teams to create their own communication tools to share Hudson information that is captivating to a multigenerational and diverse audience. In order to offer information that is interesting and relevant to their communities, interns performed interviews to learn directly from their friends, family, and neighbors about their perceptions and existing knowledge of the Hudson. Involving the community in place-based education is crucial because residents provide key information that would be otherwise unknown to a visiting scientist or educator. They then use this information to build their communication outputs that are intended to better connect URM to their local waterways.

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The Next Generation of Hudson River Educators

Using Place-Based Education to Connect Underrepresented Minorities to their Local Waterways

Laurel Zaima, Lamont-Doherty Earth Observatory
Margie Turrin, Lamont-Doherty Earth Observatory
Madeline Salino, Rockland Conservation & Service Corp
Moira Delaney, Rockland Conservation & Service Corp

AGU FALL MEETING

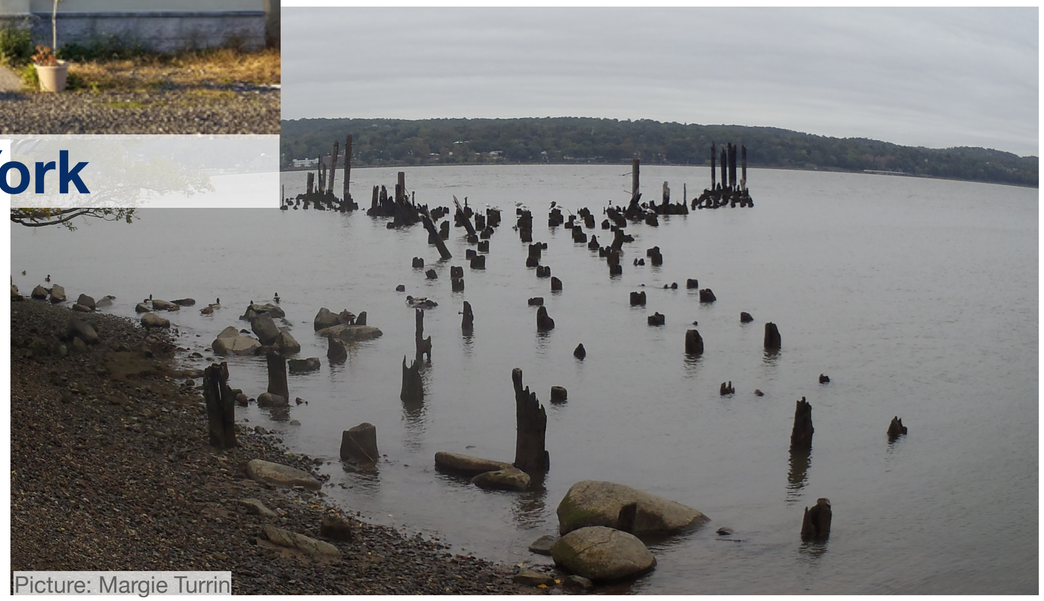
Hudson River Field Station

Picture: Margie Turrin

Picture: Scenic Hudson

Piermont Pier, New York

Picture: Margie Turrin



Picture: Margie Turrin

Hudson River Field Station

Piermont Pier, New York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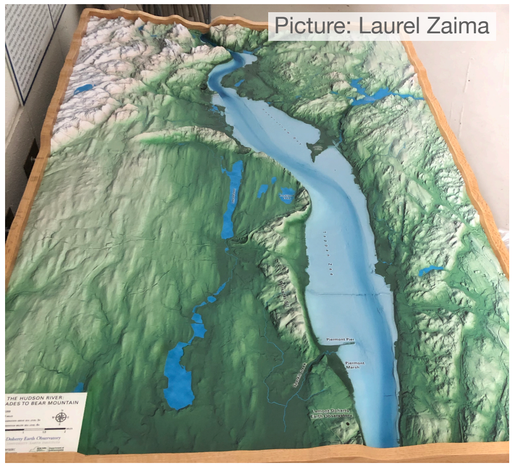

Picture: Laurel Zaima

To provide place-based learning opportunities of the Hudson through field investigations, allowing participants to explore and learn from the natural world


Picture: Margie Turrin


Picture: Laurel Zaima


Picture: Robin Bell


Picture: Margie Turrin

Students will:

1. Increase scientific literacy and understanding of the Hudson through field experiences

2. Create educational materials that are field-based, inclusive and culturally relevant to underserved communities

3. Develop communication skills through the delivery of the education materials they developed

Next Generation of Hudson River Educators

Program Pillars

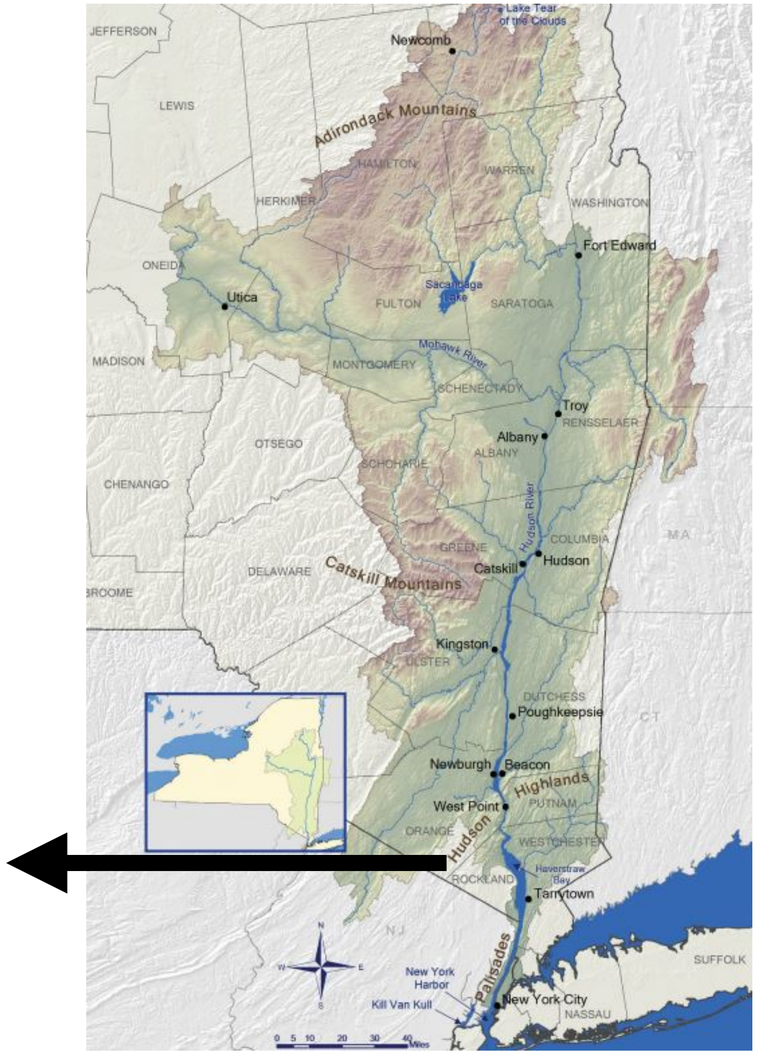
Purpose

Providing Estuary Education to Hudson Valley Residents

Rockland County:

- 29% of the population is Black and Hispanic
- Many have recently relocated to the area & unfamiliar with the Hudson

(Statistical Atlas)



Picture: The Garrison Union Free School District

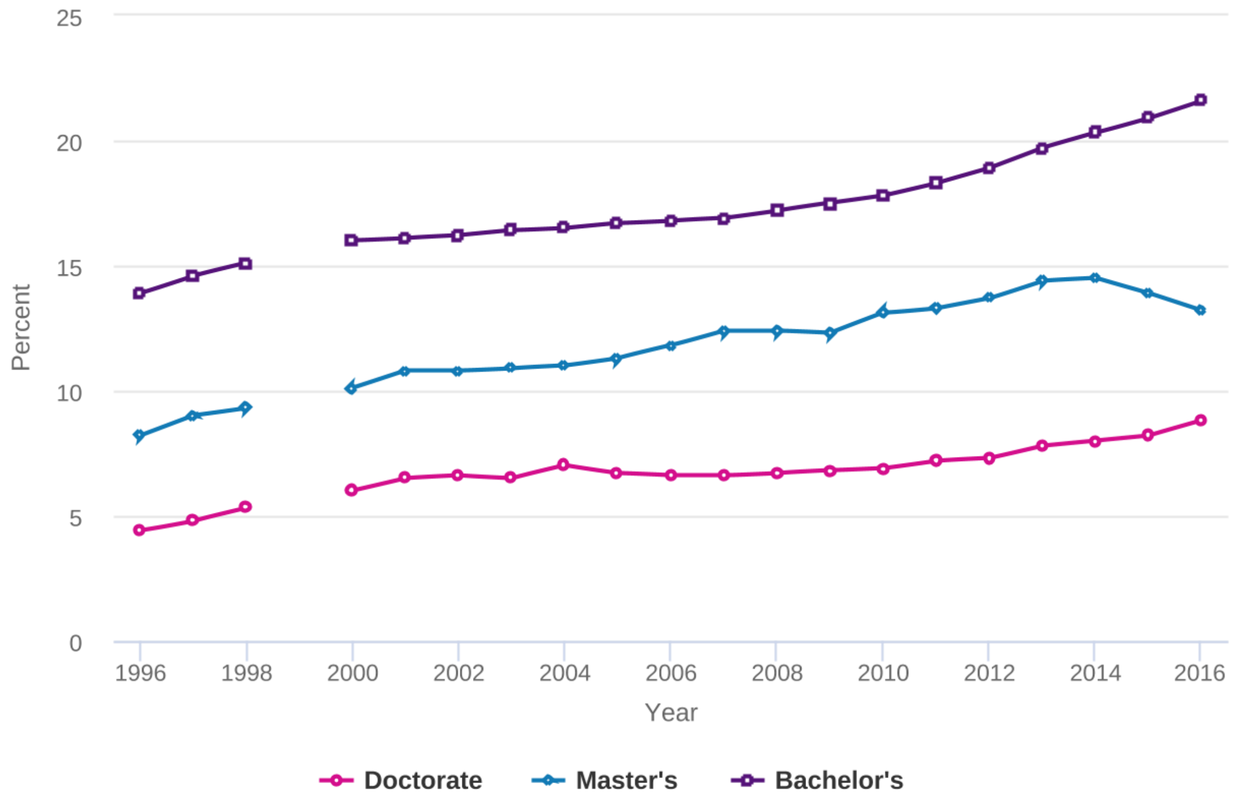
Purpose

Promote Diversity, Equity & Inclusion in the STEM field

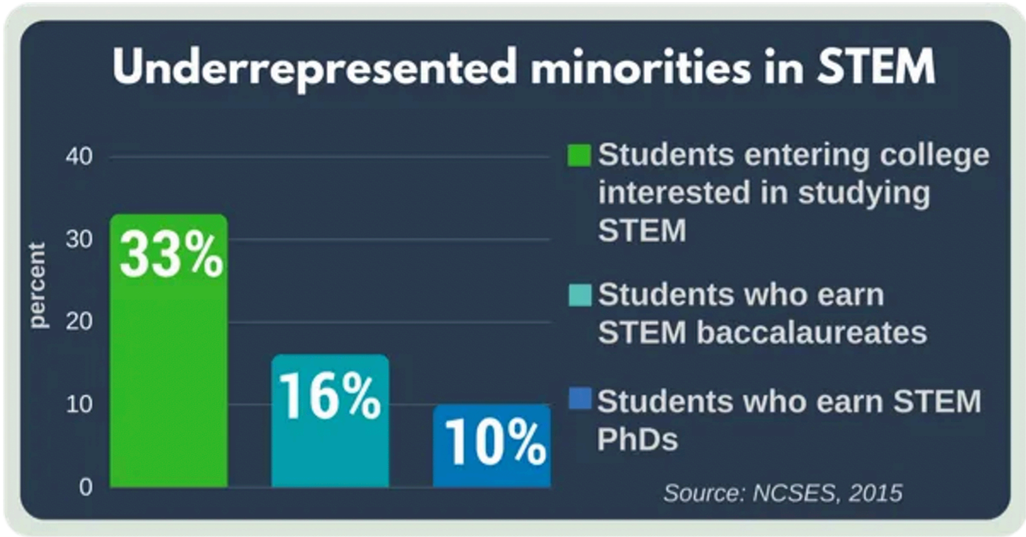
Graph 1

National Center for Science and Engineering Statistics | NSF 19-304

FIGURE 3-A
Science and engineering degrees earned by underrepresented minorities, as a percentage of degree type: 1996–2016



Graph 2

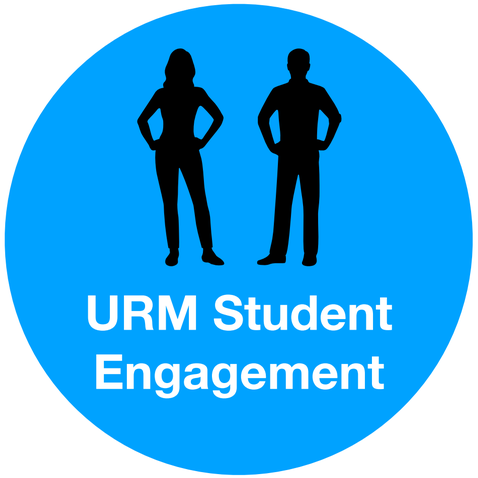


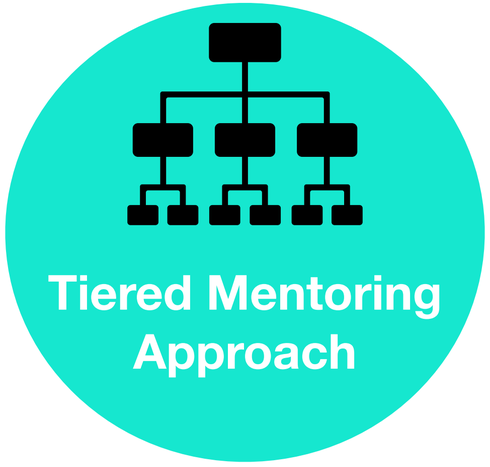
Graph 1 Notes:
Data not available for 1999. Underrepresented minority groups include black or African American, Hispanic or Latino, and American Indian or Alaska Native. Data are for U.S. citizens and permanent residents only.

Graph 1 Sources:
National Science Foundation, National Center for Science and Engineering Statistics, special tabulations of the U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey, unrevised provisional release data. Related detailed data: WMPD table 5-3, table 6-3, and table 7-4

Next Generation of Hudson River Educators

Program Methodology





If we can’t bring the students to the Hudson,

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we would bring the Hudson to the student


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100% Virtual Place-Based Program

9 students from Rockland County & New York City representing Black, Asian, Latinx or Hispanic, and Jewish backgrounds

Field Investigations	→	Virtual River Exploration
Field Educational Material	→	Digital Educational Communication
In-Person Interviews	→	Zoom Interviews

1.

THE HUDSON RIVER ISN'T AS POLLUTED AS YOU MAY THINK. ITS COLOR IS ACTUALLY A RESULT OF TIDES, CURRENTS, AND SEDIMENT RATHER THAN CONTAMINATION.

3.

THE AMERICAN EEL, BORN IN THE SARGASSO SEA, WILL THEN MIGRATE TO THE HUDSON RIVER WHICH AFFECTS ITS DIET AND PIGMENTATION.

2.

153 OUT OF 315 MILES OF THE HUDSON RIVER ARE ACTUALLY AN ESTUARY, WHERE FRESHWATER AND SALTWATER MIX.

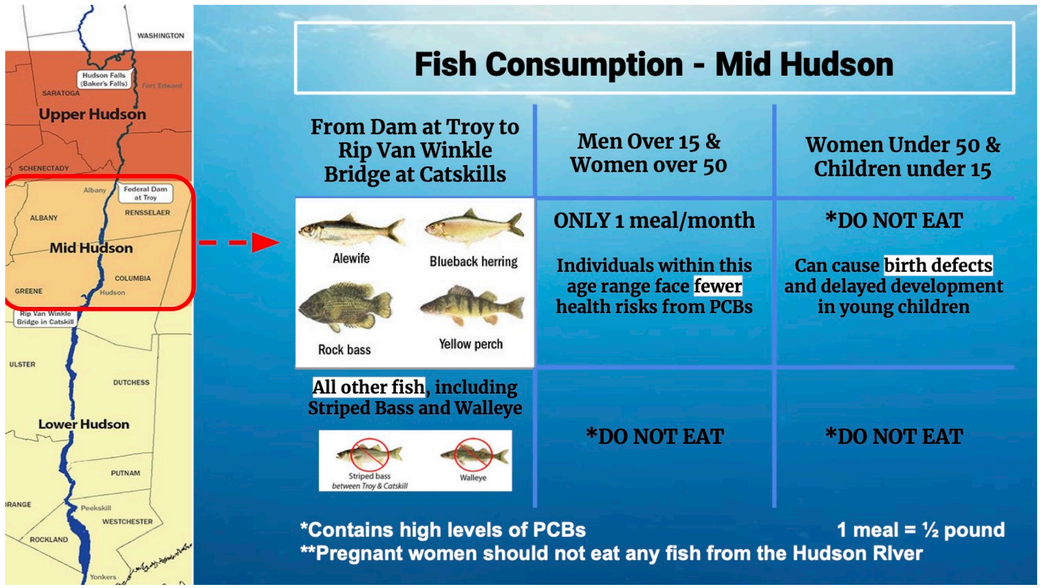
4.

THE HUDSON RIVER WAS GIVEN THE NAME MUHHEAKANTUCK BY NATIVE AMERICANS, MEANING "THE RIVER THAT FLOWS BOTH WAYS" BECAUSE OF ITS UNIQUE CURRENTS.

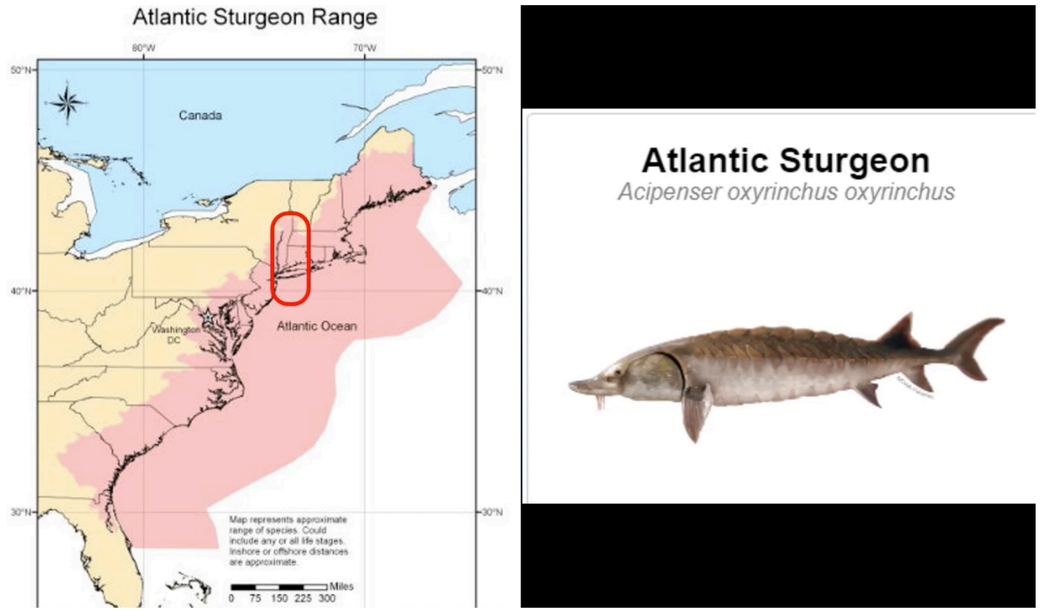
Hudson River Ecology

- Week 1
- Week 2
- Week 3
- Week 4
- Week 5
- Week 6

Instagram Post Created by Kashi Nanavati, Jed Roth, Jeanne Joof



Fish Consumption PSA Created By Yi Lin, Mika Pierre, and Jeanne Joof



Still Shot from Sturgeon Youtube Video Created By Jed Roth, Grace Gonzalez, and Yi Lin

Hudson River Ecology — Week 1

Science Communication — Week 2

Week 3

Week 4

Week 5

Week 6

LDEO FIELDSTATION PRESENTS

ENVIRONMENTAL JUSTICE

AN OVERVIEW

REDLINING

INEQUITY TOWARDS BIPOC COMMUNITIES

Historically this practice divided up communities by refusing to provide money or resources based on race.. To this day minorities are still heavily impacted by this., especially environmentally.

ENVIRONMENTAL RACISM

BIPOC TARGETED FOR POLLUTION SITES

Predominantly bipoc communities are disadvantaged by having environmentally degrading structures (factories, landfills, etc.) placed in their communities, often impacted by **redlining**.

Hudson River Ecology Week 1

Science Communication Week 2

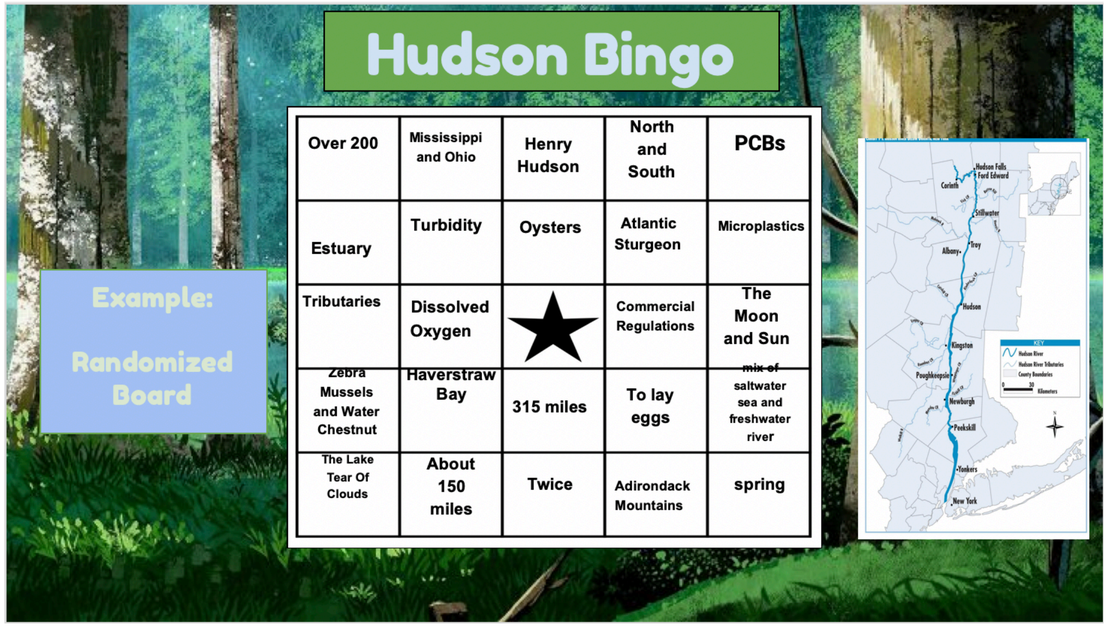
Environmental Justice Week 3

Week 4

Week 5

Week 6

Infographic Created By Kashi Nanavati, Yesenia Flores, Jeanne Joof



Hudson River Bingo Game Jam Created by Tenin Sidime, Mika Pierre, and Jed Roth

Life of the Hudson River, by Grace Gonzalez includes some species that only swim together in the Hudson for part of their lives.

Grace intentionally created this piece to be small and simple to capture the eye of young future scientists.

Hudson River Ecology — Week 1

Science Communication — Week 2

Environmental Justice — Week 3

Making Scientific Data Accessible — Week 4

Week 5

Week 6

Common Themes:

Misconceptions:

The Hudson is polluted:

“The Hudson is dirty”

“There are radioactive fish in the Hudson”

“…gross, diseases, dirty, not the cleanest river because of its murky-brown color”

The Hudson is not swimmable:

“Should put up signs to prevent people from swimming”

Perceptions:

Barely pay attention to the river… other things to worry about

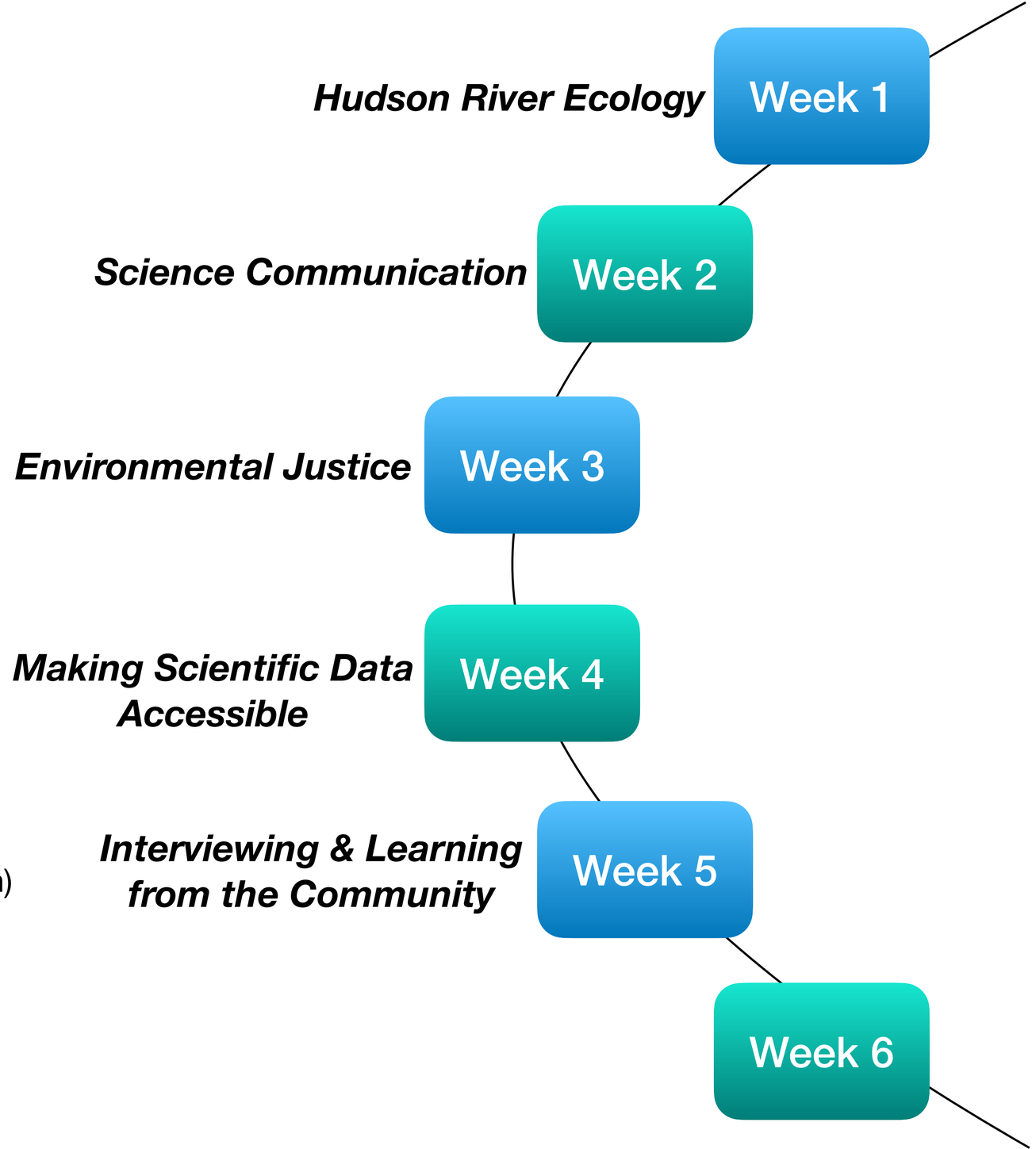
Experiences:

Primarily for Transportation (i.e. Ferries, bridges over the Hudson)

Walk along the Hudson for the scenery & skyline

Very few recreate ON the Hudson

Distance is an obstacle in using the Hudson

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EDUCATION

Environmental Justice Through the Eyes of The Next Generation of Hudson River Educators

BY MARGIE TURRIN | AUGUST 31, 2020 1 Comments


State of the Planet

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EDUCATION

A Summer Immersed in the Hudson: Next Generation of Hudson River Educators

BY MARGIE TURRIN | SEPTEMBER 4, 2020 1 Comments

Summary

- Impactful placed-based education can be performed on a virtual platform
- Effectiveness of the tiered mentorship
- Mentorship is a two way learning opportunity
- Community partnerships are links into the community you are trying to reach
- Community voices are key
- Paid STEM internships are essential in order to engage URM students

Next Steps

- Weave some components of the virtual program into next year's place-based program
- Place a strong emphasis on interviewing and start that process earlier
- Students will deliver their own educational material to their communities
- Rethink our recruitment strategy
    - Placing less of an importance on academic marks, and instead, value experience
    - Build relationships and trust within the communities we want to reach
    - Recruit from outside your existing networks

Thank you

Contact me:
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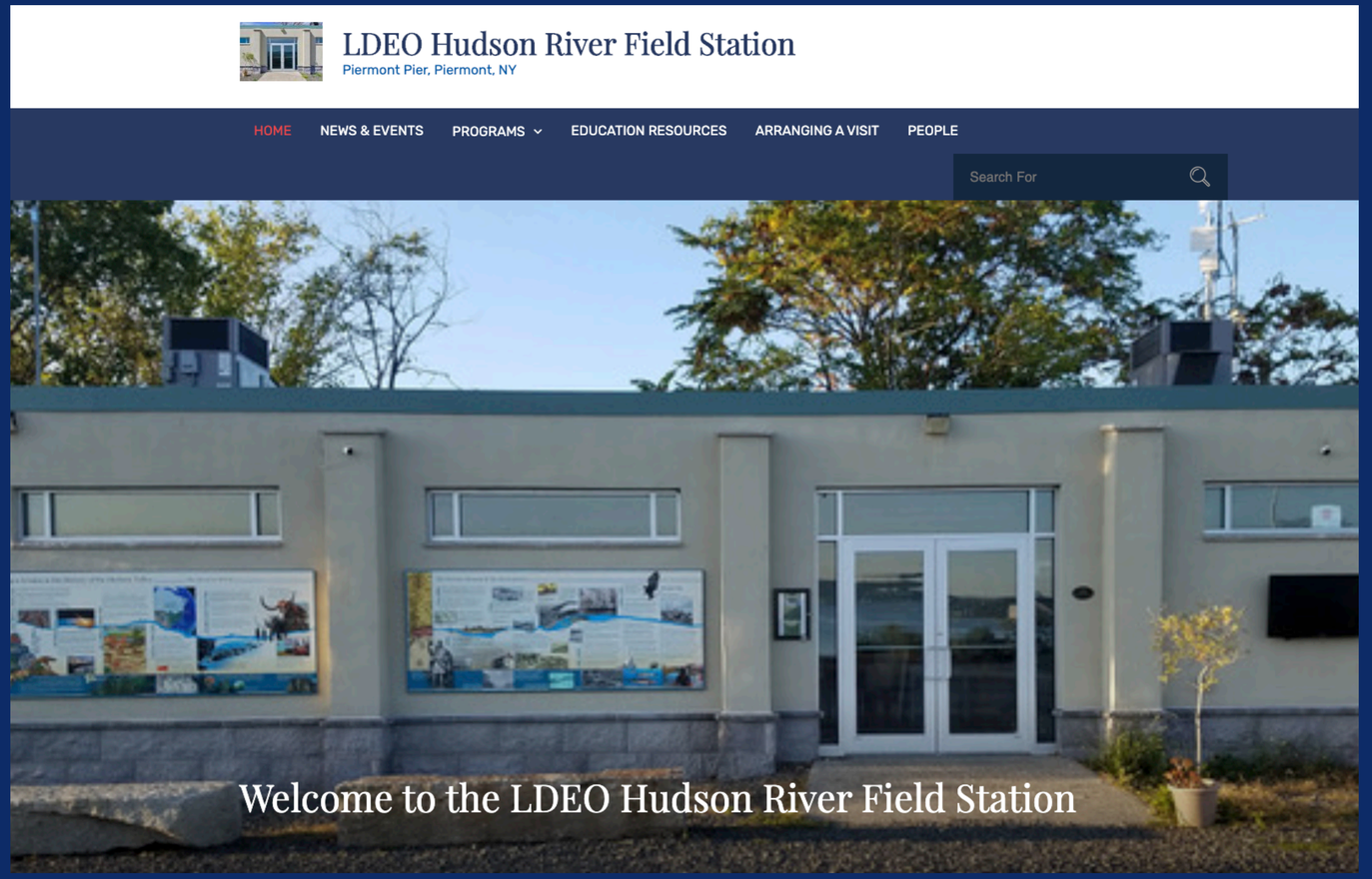

https://blog.ldeo.columbia.edu/piermont/

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