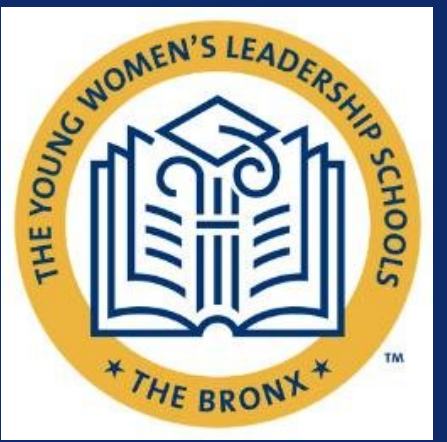




DBI 1649310



Old York  
Foundation



# 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





Picture: Margie Turrin

# Hudson River Field Station



Picture: Scenic Hudson



## Piermont Pier, New York



Picture: Margie Turrin



Picture: Margie Turrin



# Hudson River Field Station

## Piermont Pier, New York



Picture: Margie Turrin



Picture: Margie Turrin



Picture: Margie Turrin



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

# Hudson River Field Station



## SUMMER PROGRAM 2020

Lamont-Doherty Earth Observatory  
COLUMBIA UNIVERSITY | EARTH INSTITUTE




# Next Generation of Hudson River Educators

## Program Pillars



Developing  
Sense of  
Place through  
Scientific  
Exploration



Building  
Culturally  
Relevant  
Connections  
to the Hudson



Promoting  
Environmental  
Stewardship



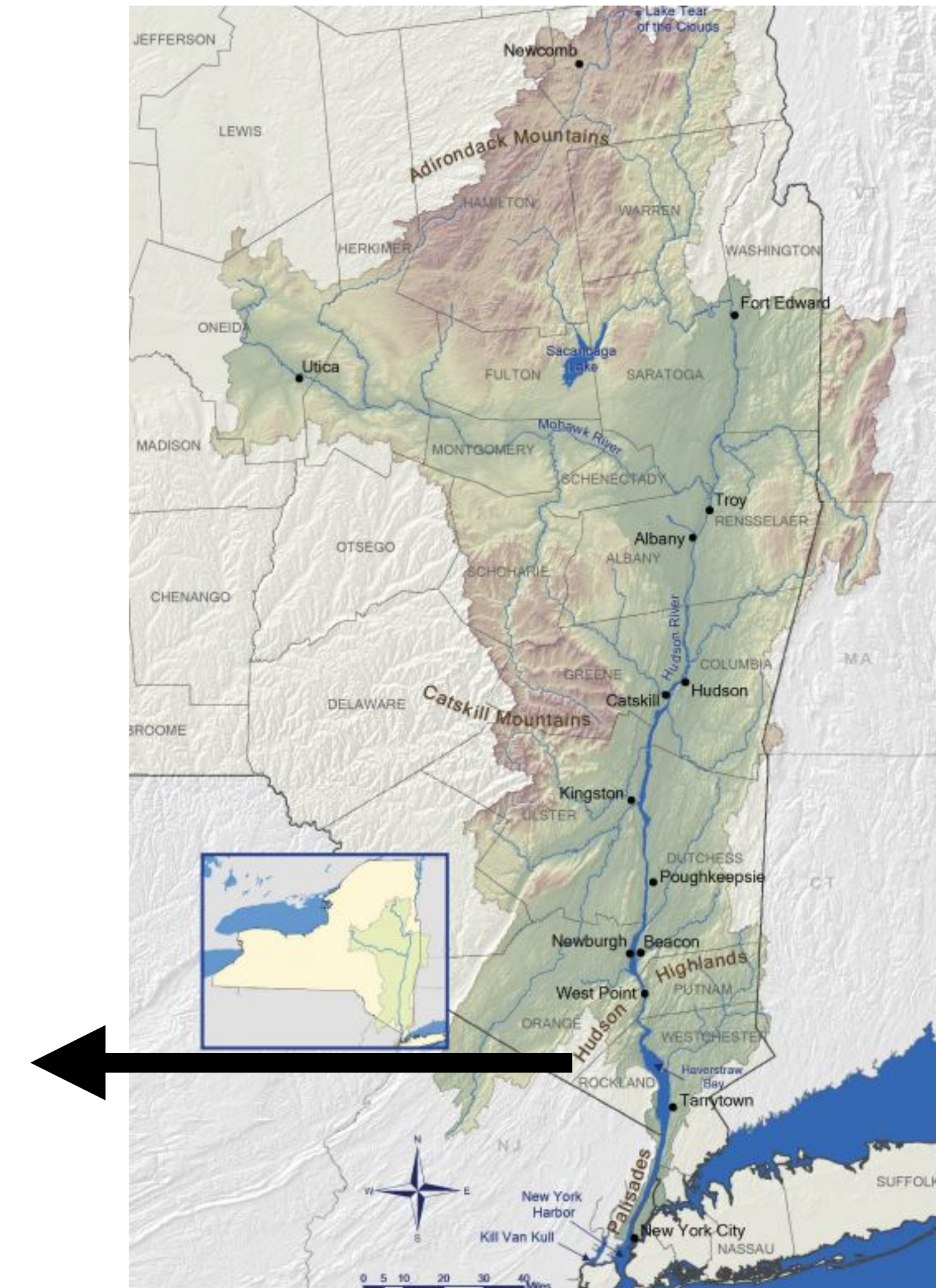
# Purpose

## 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



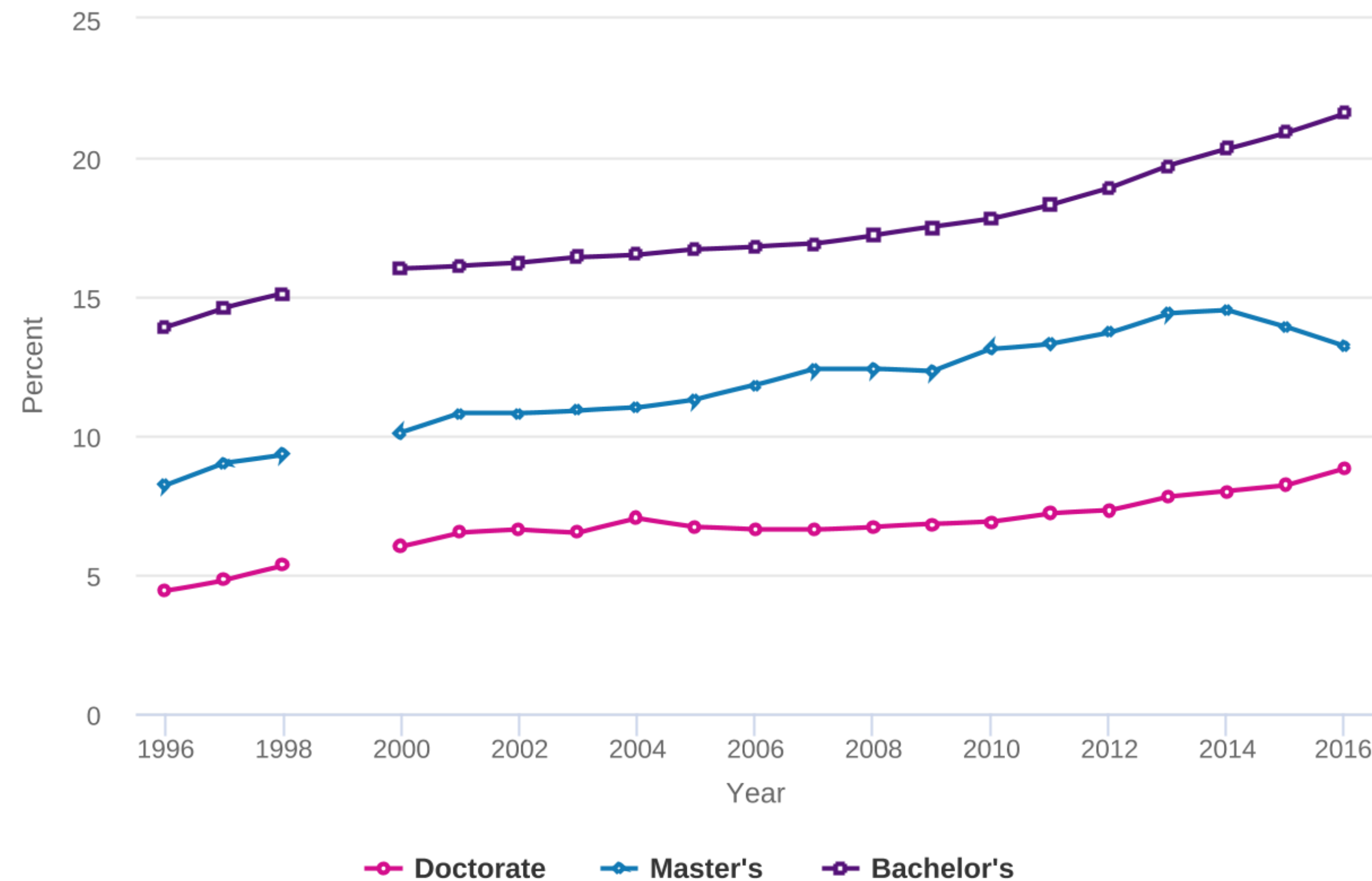
# Purpose

## Promote Diversity, Equity & Inclusion in the STEM field

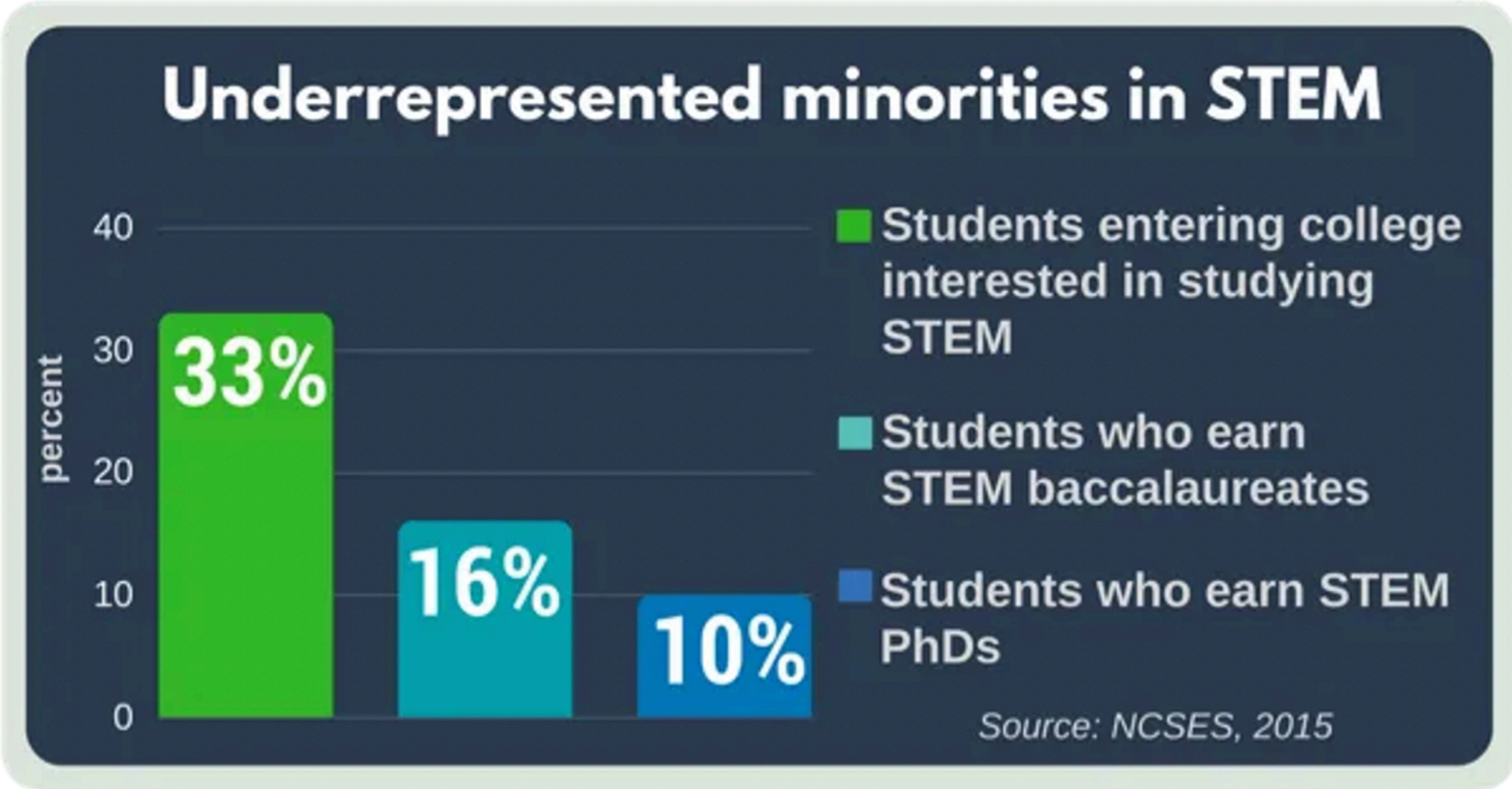
Graph 1

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



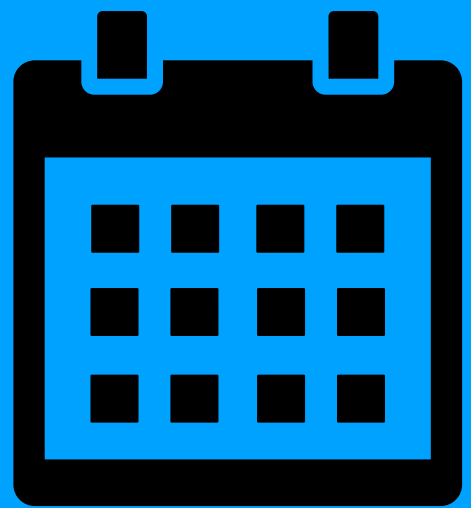
**Graph 1 Notes:**  
Data not available for 1999. Underrepresented minority groups include black or African American, Hispanic or Latino, and American Indian or Alaska Native. Data are for U.S. citizens and permanent residents only.

**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

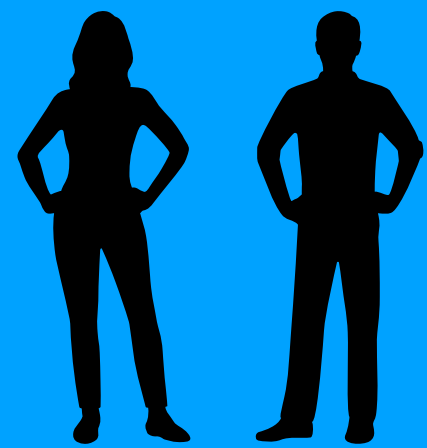


# Next Generation of Hudson River Educators

## Program Methodology



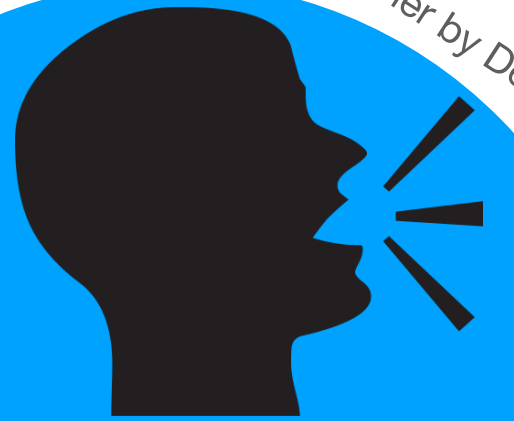
6 Weeks



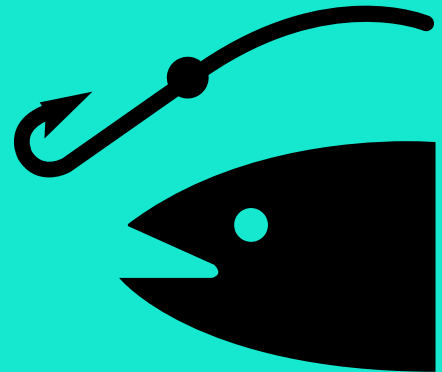
URM Student  
Engagement



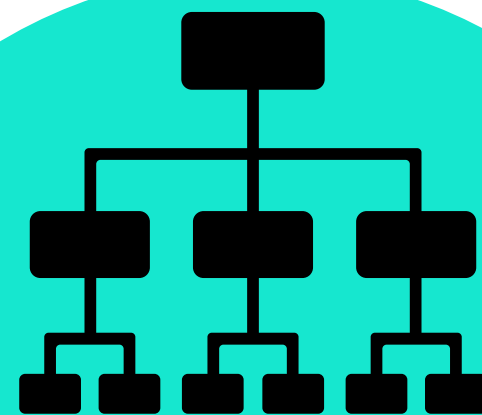
Deep Dive into  
HR Science



Develop Estuary  
Education  
Materials



Field Place-Based  
Curriculum



Tiered Mentoring  
Approach



Interviewing &  
Learning from the  
Community



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



we would bring  
the Hudson to  
the student

*NEXT GENERATION OF*



HUDSON RIVER  
EDUCATORS

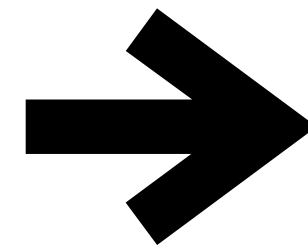
Lamont-Doherty Earth Observatory  
COLUMBIA UNIVERSITY | EARTH INSTITUTE



# 100% Virtual Place-Based Program

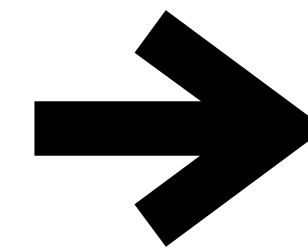
**9 students from Rockland County & New York City representing Black, Asian, Latinx or Hispanic, and Jewish backgrounds**

**Field Investigations**



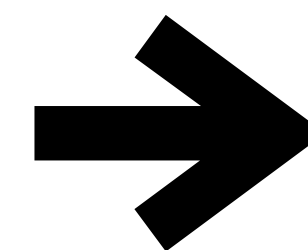
**Virtual River Exploration**

**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.



2.  
153 OUT OF 315  
MILES OF THE  
HUDSON RIVER  
ARE ACTUALLY AN  
**ESTUARY**, WHERE  
FRESHWATER AND  
SALTWATER MIX.

3.  
THE AMERICAN EEL, BORN  
IN THE SARGASSO SEA,  
WILL THEN MIGRATE TO  
THE HUDSON RIVER WHICH  
AFFECTS ITS DIET AND  
PIGMENTATION.



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**

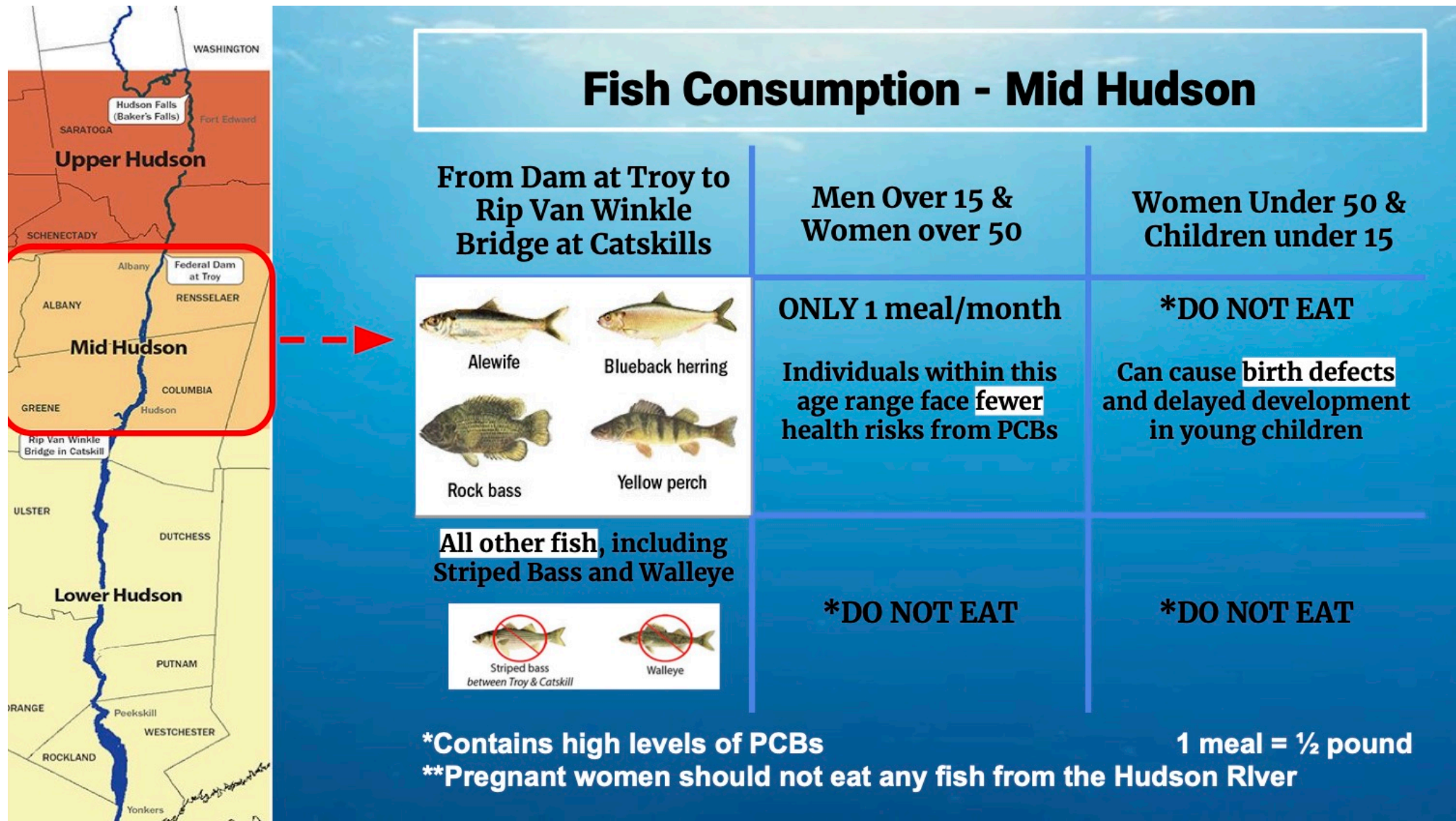
**Week 4**

**Week 5**

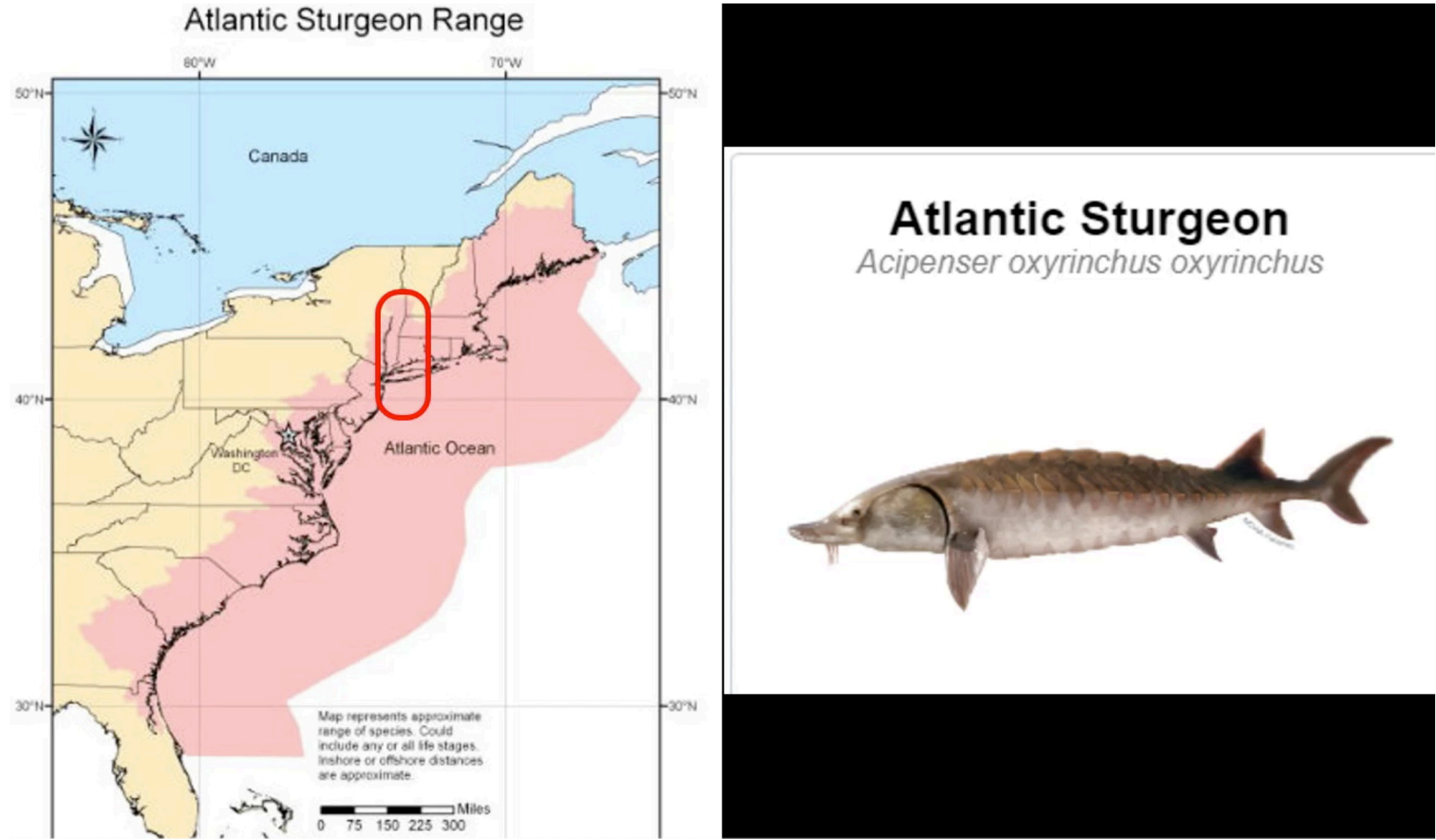
**Week 6**

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

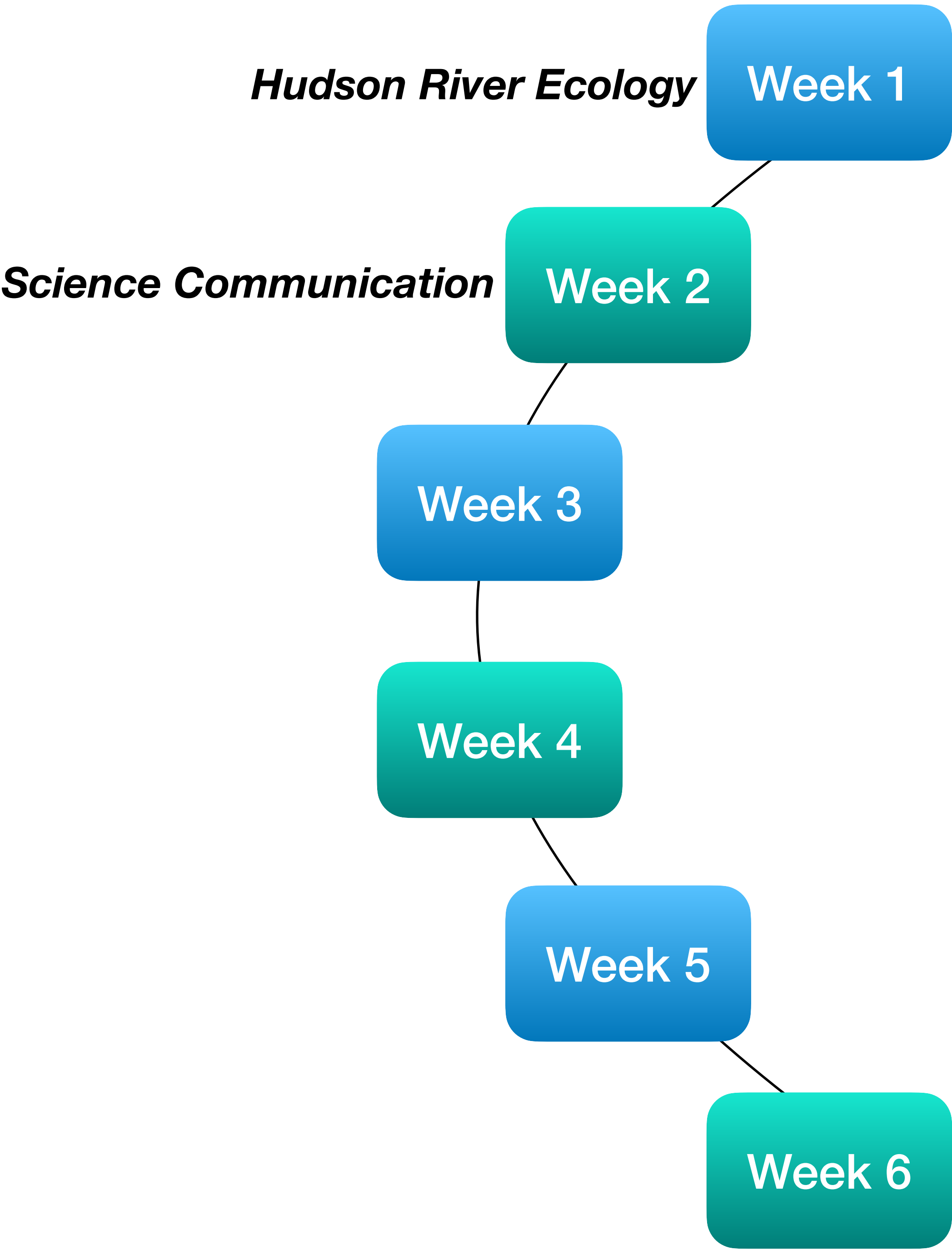




Fish Consumption PSA Created By Yi Lin, Mika Pierre, and Jeanne Joof



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





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**

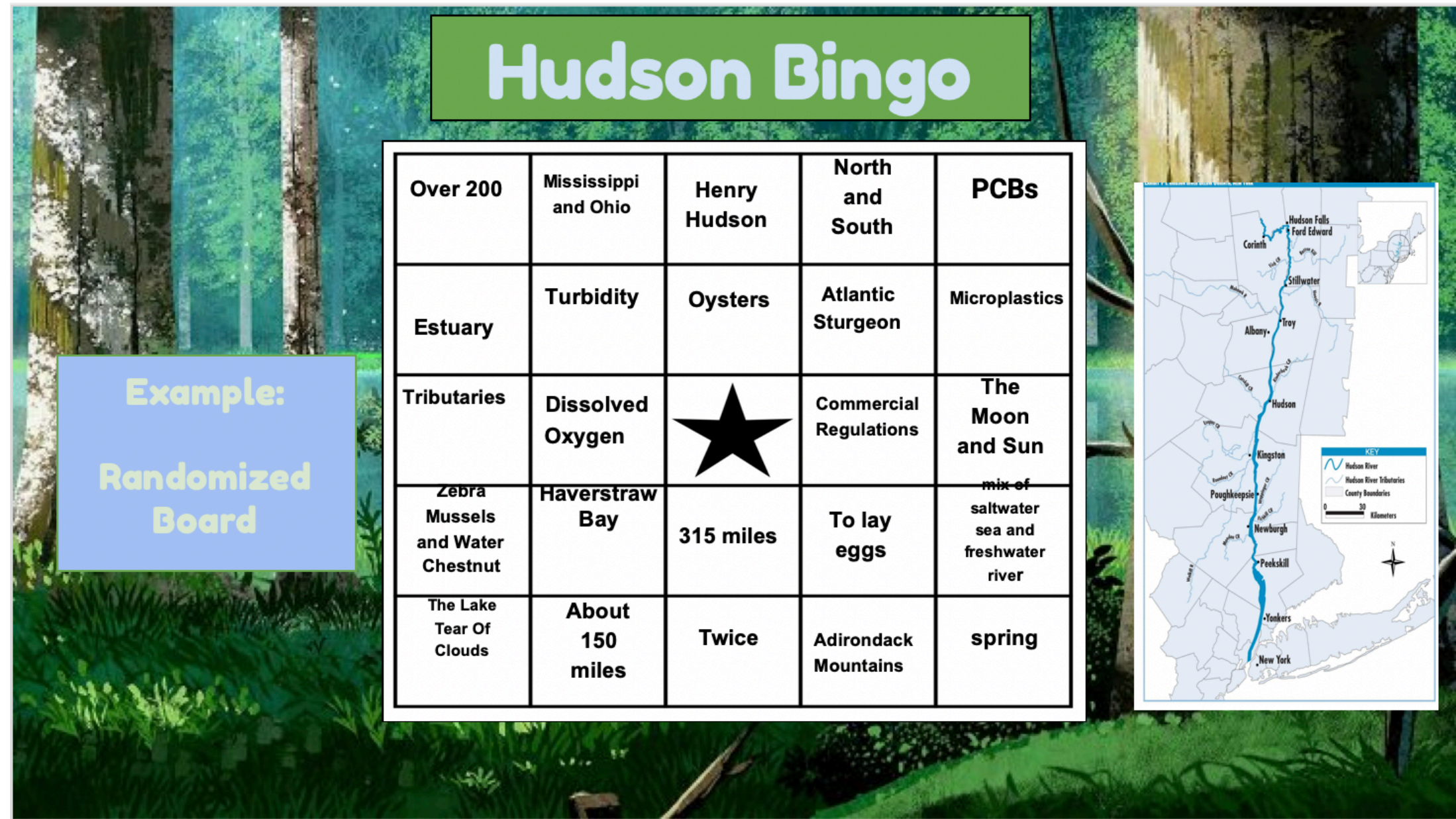
**Week 4**

**Week 5**

**Week 6**

Infographic Created By Kashi  
Nanavati, Yesenia Flores, Jeanne  
Joof



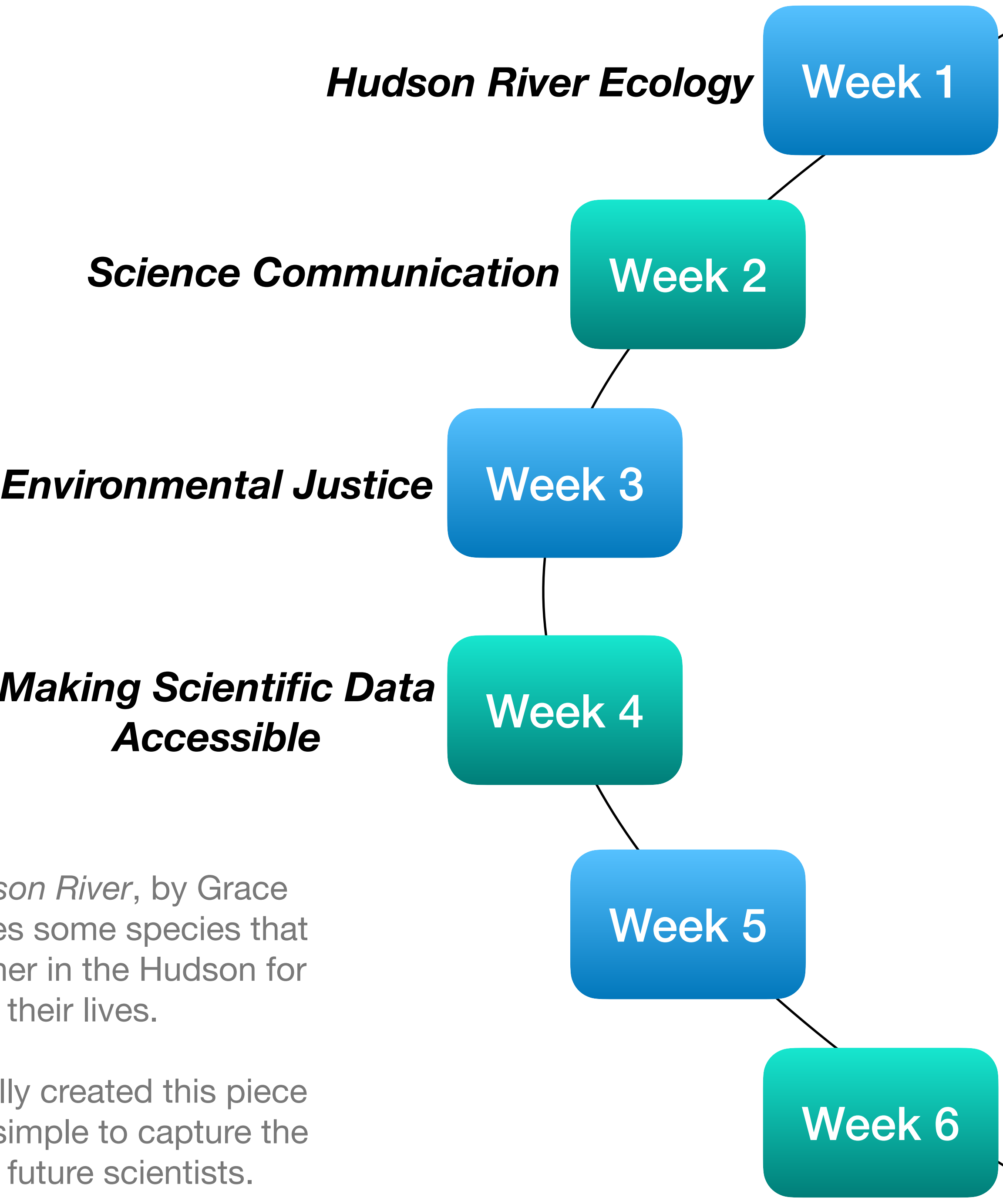


Hudson River Bingo Game Jam Created by Tenin Sidime, Mika Pierre, and Jed Roth



*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.





# 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

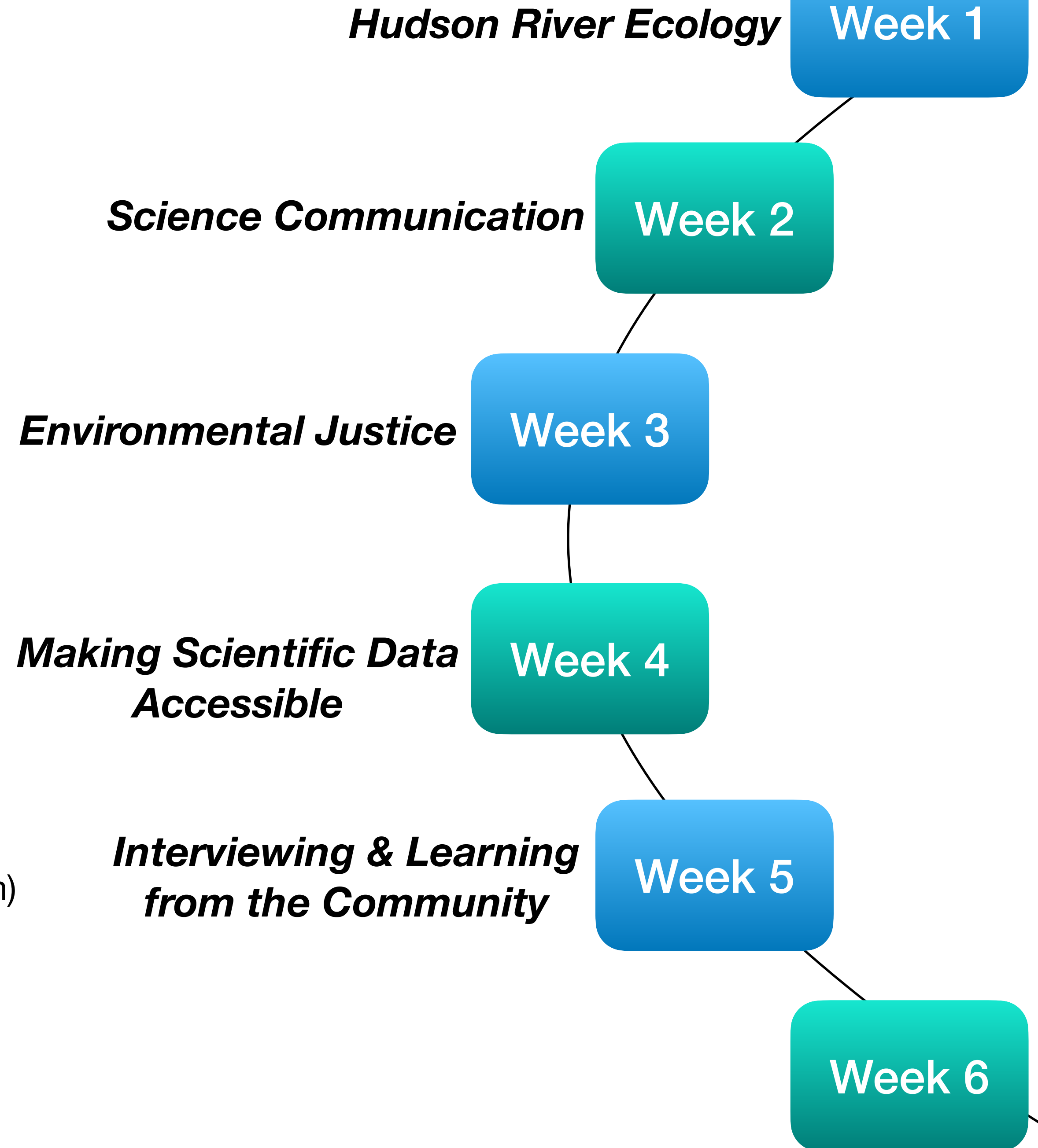
## Experiences:

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





State of **the Planet**  
EARTH INSTITUTE | COLUMBIA UNIVERSITY

AGRICULTURE CLIMATE EARTH SCIENCES ECOLOGY ENERGY HEALTH SUSTAINAB

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**EDUCATION**

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

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BY **MARGIE TURRIN** | AUGUST 31, 2020

[f](#) [t](#) [e](#) [+](#) 1 [Comments](#)

State of **the Planet**  
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**EDUCATION**

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

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BY **MARGIE TURRIN** | SEPTEMBER 4, 2020

[f](#) [t](#) [e](#) [+](#) 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

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<https://blog.Ideo.columbia.edu/piermont/>

