



Bridging the Gap into Geosciences for Underrepresented Pre-College Students: A Perspective of How Hurricanes and Storm Surge Impact Coastal Areas



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Background Information

- Climate change is leading to increased risk of natural hazards including sea level rise and an increase in the number and severity of hurricanes.
- Geoscience is the study of the earth and is comprised of many fields including meteorology, oceanography, and geology.
- Historically there has been a lack of awareness and diversity within the geoscience field.
- This program aims to introduce more students to the geosciences earlier in their academic career.

Research Purpose

Strike engagement of the geosciences with pre-college students in informal learning environments by creating summer camp activities to bring awareness of environmental challenges that affect coastal areas with the hopes of increasing diversity within the geoscience field.

Sample Pre/Post Program Survey Items

Sample Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I have heard of geoscience before.					
I want to go to college after high school.					
I know what storm surge is.					
I know how to properly prepare for hurricanes.					
I know how hurricanes affect coastlines.					

Discussion

- Begin camp with an activity to engages students' prior knowledge about climate change.
- Introduce students to historical data on annual number of hurricanes and the severity of storms.
- Discuss methods to reduce coastal damage from storms.
- Students participate in activity of building a house and testing it against storm damage.
- Students participate in activity of developing a coastline and testing it against storm damage.
- Expected results:
 - More knowledge of the impacts of climate change on hurricanes.
 - Know proper precautions to manage coastlines.
 - Who are geoscientist and what do they study.
 - Create long-term interest in the study of geoscience among the pre-college students.

Sample Activity

Designs That Survive Storms

Name: _____ Date: _____

Instructions: Build your model house and test the winds!

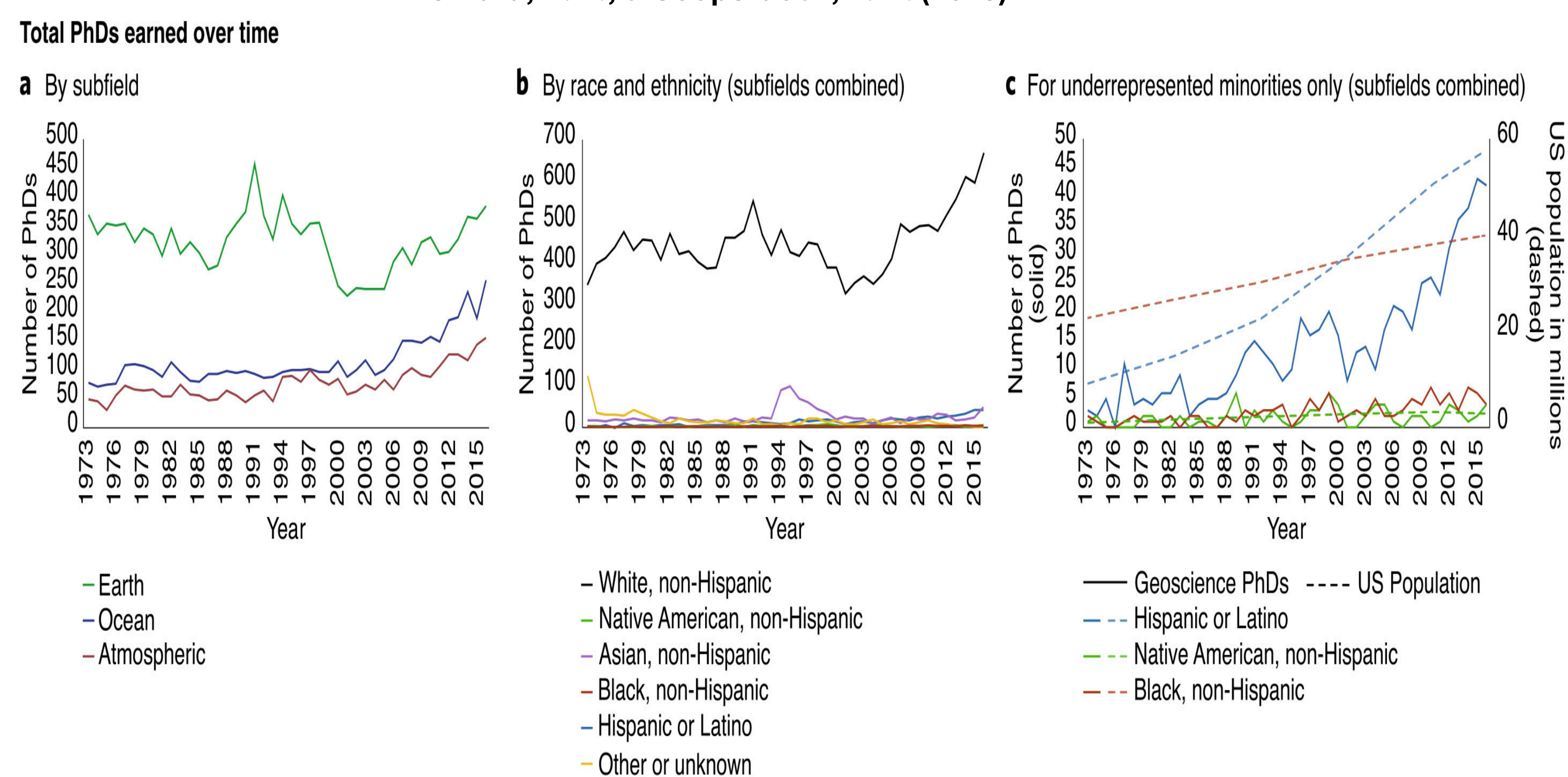
- Gather materials to build a house and engineer storm-resistant features!
 - House: cardboard, scissors, ruler, house template, tape
 - Weather hazards: fan, large tray, water, measuring cup, water pouring device, sponge, measuring cup
 - House upgrades: attaching material (e.g., playdough, string, paper clips, glue, hot-glue, tape), waterproof material (e.g., plant leaves, foil, paint, waxed paper), lifting material (e.g., playdough, blocks, chopsticks, small rocks).
- Follow the instructions on the house template to create a model.
(Note: The house template provides a suggested house design, but you can design your own.)
- Place the house on an open surface and direct the fan in its direction. Test the structure and strength of your cardboard house by turning the fan on at low speed. Increase the fan speed to model high wind conditions.
 - What happened at low speed?
 - What happened at a higher speed?
- Turn the house so that different sides face the fan and repeat step 3.
 - Is there a difference? Describe what happened.

(SEA), S.-E.-A

- Think of a modification to help your house survive better in strong winds and write your hypothesis below:

Hypothesis: If _____ then _____
- Make the adjustments from above to your structure using the upgrade materials listed in #1.
- Repeat steps 3-4 to test your modified house against the high winds.
- Observe and describe what happens.

Bernard, R. E., & Cooperdock, E. H. (2018)



Methods

- Population of interest: Pre-college, underrepresented minority, High school students who are participating in a summer camp at the Boys and Girls Club of the Big Bend.
- To develop this activity, I conducted a literature review and used the information to modify a hands-on activity designing a house that survives storms.
- Conduct a pre-program and post-program survey that measure students' view of the program and their future interest in the geoscience field.

References

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