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Every Kid in a Park Climate Change Academies:

Notes from the field

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Students from Minuteman High School learn to take salt marsh cores at Cape Cod National Seashore during the 2016 Climate Change Academy program. | NPS

Introduction

National parks serve as living laboratories, where the effects of climate change can often be readily observed or demonstrated. Furthermore, the diverse array of places and history protected within the national park system provides the chance to explore the topic across space and time. As outdoor classrooms, parks offer opportunities for experiential, place-based learning that can inform our personal understanding of—and response to—a warming world. Thus, youth engagement was included as a key tenet of the National Park Service (NPS) Climate Change Response Strategy (NPS 2010).

In 2015, President Obama introduced Every Kid in a Park (EKiP), an initiative that invites every fourth grade student in the United States—and their families—to enjoy one year of free admission to federal lands and waters. The program continues to thrive, but under another name. In March 2019, the *Every Kid Outdoors Act* authorized funding to continue the EKiP program, and subsequently changed the name to Every Kid Outdoors.

This field note illustrates the impact of one project, the Climate Change Academies, which launched in 2015. The NPS Climate Change Response Program entered into an agreement with the nonprofit No Barriers USA (No Barriers) to design and implement an immersive EKiP experience. The goal of the pilot program was to encourage active learning among traditionally underserved students, with an emphasis on the critical issue of climate change at two national park sites in the continental United States.

Parks and schools

The project launched with an open call for applications from NPS units interested in hosting an EKiP Climate Change Academy program. Fifteen applications were received and screened against several rating criteria, including current investment in climate change programming, strength of engagement with K-12 education institutions, proximity to diverse local communities, and staff capacity. Through the selection process, Indiana Dunes National Park (Indiana Dunes) and Cape Cod Nation-

"This program will definitely have me rethink the major I want to take. I definitely want to have science connected to my career." — *2016 EKiP Climate Change Academy high school participant*

al Seashore (Cape Cod) were identified as the pilot parks for the initial year.

Students attending schools within a one-hour drive of Indiana Dunes and Cape Cod were then invited to apply as prospective participants. Aside from location, eligibility criteria included the availability of a dedicated lead teacher, the ability to implement a preparatory classroom curriculum, and a commitment to support student-driven service projects related to climate change after returning from the experience. Following the end of the application period, one high school and one elementary school from each area was selected to participate.

Indiana Dunes schools

Phoenix Military Academy (*Chicago, Illinois*).The Phoenix Military Academy is a public military high school just west of downtown Chicago. Of the 560 students, 96% come from low-income homes; 8% have some type of disability and 3% are English language learners. Ninety-nine percent of the students do not identify as white or Caucasian (Illinois State Board of Education 2017). We selected 22 students to participate in the pilot project at Indiana Dunes.

High school students from Phoenix Military Academy capture images of climate impacts during a photo hike in Indiana Dunes National Lakeshore (now, National Park) during the 2016 Climate Change Academy program.

John Ivan Meister Elementary School (*Hobart, Indiana*). John Ivan Meister Elementary School is 16 miles southwest of Indiana Dunes. Currently 363 students attend the school. More than 70% of these qualify for free meals. In terms of diversity, 60% are nonwhite, 9% are English language learners, and 7% have some type of disability (Indiana Department of Education 2017). We selected 51 elementary students to participate in the Indiana Dunes Climate Change Academy.

Cape Cod schools

Minuteman Career and Technical High School (*Lexington, Massachusetts*). Minuteman Career and Technical High School is a public vocational high school about 115 miles northwest of Cape Cod. There are about 670 students enrolled at Minuteman, 20% of which come from low-income homes. More than 50% have been diagnosed with some type of disability. Twenty-three percent of the students are nonwhite (Massachusetts School Profile Report 2017). We selected 27 students to participate in the Cape Cod pilot project.

Teaticket Elementary School (*Falmouth, Massachusetts*). Teaticket Elementary School is about 50 miles east of Cape Cod. The school has 313 students enrolled; 36% come from low-income homes, 13% have a disability, and 25% are nonwhite (Massachusetts School Profile Report 2017). We selected 71 students to participate.

The pilot program

Over the course of several months, the project lead team developed the structure of the EKiP Climate Change Academy program. The collaboration resulted in a model that leveraged the strengths of both the NPS and No Barriers organizations, similar to the partnership model proposed in Susan Newton's chapter in *America's Largest Classroom* (see Newton 2020). The team built the content for the program, using placed-based climate change education principles, which is explained in depth in Shawn Davis and Jessica L. Thompson's chapter in *America's Largest Classroom* (see Davis and Thompson 2020). Specifically, the climate change academy pilot program included: (a) place-based, experiential learning, (b) a three-phase experience based on *thoughtful preparation*, *transformative field experience*, and *meaningful impact*, (c) high school students serving as "student scientists" assisting with fourth grade student visits, and (d) opportunities for students' personal growth and development of community leadership skills.

Each of the EKiP Climate Change Academies started with three pre-site classroom presentations to prepare students for an in-park field experience. These sessions included introductions to the host park, the NPS response to climate change, and the tenets of the No Barriers Life (a guiding philosophy that underscores all No Barriers programming.)

In-park field experiences were crafted to meet the differing ages and abilities of participating high school and elementary students. High school students participated in an immersive three-day, two-night field experience at the host park. On Days One and Two, the students were engrossed in climate change monitoring techniques and leadership development activities. On Day Three, fourth grade participants arrived at the park to enjoy a single-day field trip. During this experience, elementary students were guided through a series of citizen science stations and facilitated activities, led by their high school peers. Through the exchange, fourth graders enjoyed place-based, experiential activities under the guidance of the newly minted junior scientists, and the high school students reinforced their understanding of climate change through interactions with their younger charges.

"I think the program inspired me to pursue a job I am passionate about as well as help me improve my leadership skills and step out of my comfort zone."

— 2016 EKiP Climate Change Academy high school participant

The citizen science and activity stations developed for each site included:

Cape Cod stations	
Carbon storage peat coring	Extract and analyze peat layers from coastal marshes to estimate extent of past carbon storage and potential vulnerability to rising seas.
Sea level rise and marsh grasses	Collect data on marsh plant distribution in relation to tidal action to understand the possible implications of sea level rise.
The water cycle	Explore the water cycle and understand the role of aerosols in cloud formation and reflection and absorption.
Greenhouse gases	Use field instruments and demonstrations to understand the role that CO2 and methane play in contributing to climate change.

Indiana Dunes stations	
Karner blue butterflies	Collect air, soil, weather, and organism data to learn about microhabitats and their significance for specific species.
Bird monitoring	Use the eBird app to collect data on various bird species and understand the role of citizen science in monitoring and research.
Mapping and water levels	Use a variety of maps to understand the relationship between rising lake levels, climate change, and human activity.
Project Budburst	Collect phenological data for various plant species and explore what impacts climate change may bring.
Photo voice	Take photos of anything of interest in the woods, and then link the images to climate in order to understand the breadth and depth with which climate change exerts an influence.
Recycled art	Create art using recycled objects as the means to discuss the role of recycling in promoting sustainability and slowing climate change.

Following the in-park field experience, students engaged in a variety of climate-related projects in their local communities. These projects were an opportunity for the students to deepen their learning and connect themes identified in the park to issues in their neighborhood. These projects included:

- Building a raised-bed community garden and planting a variety of vegetation, including food for consumption.
- Conducting field work to remove an invasive species, the glossy buckthorn, that contributes to local biodiversity loss.
- Implementing a school-based recycling and composting program.

The outcomes

A total of 122 elementary students and 49 high school students participated across both programs. Program evaluation surveys were administered to all high school and elementary school participants, yielding an 85% (n=42) and 75% (n=92) response rate, respectively.

No Barriers uses a standard evaluation survey and implementation protocol developed by partners at Brigham Young University. They have been using this protocol to gauge the relative impact of No Barriers programs for several years. The survey is typically administered only once following a field experience using a "retrospective pre-test" method that helps safeguard against response shift bias. Several questions about climate change and national parks were added to the standard evaluation survey to assess participant learning and growth experienced during the EKiP Climate Change Academy.

We administered the survey to high school participants following the conclusion of the field experience. This survey was not, however, appropriately

"I think this program will have an impact; it will help me invent something that will stop climate change."

— *2016 EKiP Climate Change Academy elementary school participant*

A student from Lindsay High School leads 4th-grade students through a "create-a-creature" activity at Sequoia National Park during the 2018 Climate Change Academy program. | NPS

accessible for the fourth grade participants, so a shorter version focused on the one-day pilot program was administered to all fourth grade participants.

Elementary school results

During the pre-experience survey, a majority of fourth grade respondents reported having little to no familiarity with either climate change or NPS (57% and 66% respectively). Post-experience surveys revealed a significant gain in understanding, with 97% of respondents reporting familiarity with climate change, and 100% of respondents reporting familiarity with NPS.

Additional survey questions sought to highlight elementary school participants' understanding of climate change impacts to ecosystems and human communities, possible solutions to climate change, and the role of personal responsibility. Results demonstrated a range of improved understanding (7–22%) across all questions (see Table 1).

High school results

Through the survey instrument, high school participants indicated positive outcomes regarding program impact on effecting personal change (90%) and influencing one's personal future (96%). Additional survey questions attempted to capture the participants' personal growth across six leadership areas, including vision, reach, perseverance, teamwork, resilience, and responsibility. Results demonstrated a range of growth (20–32%) across all six areas (see Table 2).

Survey question	Pre-experience	Post-experience
"I know how climate change affects the earth."	75% Agree	97% Agree
"I know how climate change affects animals and people."	88% Agree	95% Agree
"I know some ways to solve climate change problems."	68% Agree	78% Agree
"I am responsible for leaving the world a better place than I found it."	88% Agree	96% Agree

Table 1. Fourth grade students' knowledge of climate change, pre- and post-experience.

Survey question	Pre-experience	Post-experience
"I have a vision that I am passionate about."	67% Agree	93% Agree
"It is important to get outside my comfort zone."	62% Agree	93% Agree
"Difficult circumstances present opportunities for innovation."	64% Agree	90% Agree
"I see value in working with others."	75% Agree	100% Agree
"What is within me is stronger than what is in my way."	56% Agree	88% Agree
I am responsible for leaving the world a better place than I found it."	78% Agree	98% Agree

Table 2. High school students' personal growth, pre- and post-experience.

Subsequent debriefing sessions with program leads and staff at both host parks revealed a few anecdotal surprises. Park education staff welcomed and appreciated the personal leadership dimension that emerged among students through the influence of No Barriers involvement. Though the cultivation of leadership qualities is not typically an aspiration of environmental education programs, this aspect was perceived to be a significant benefit to the students.

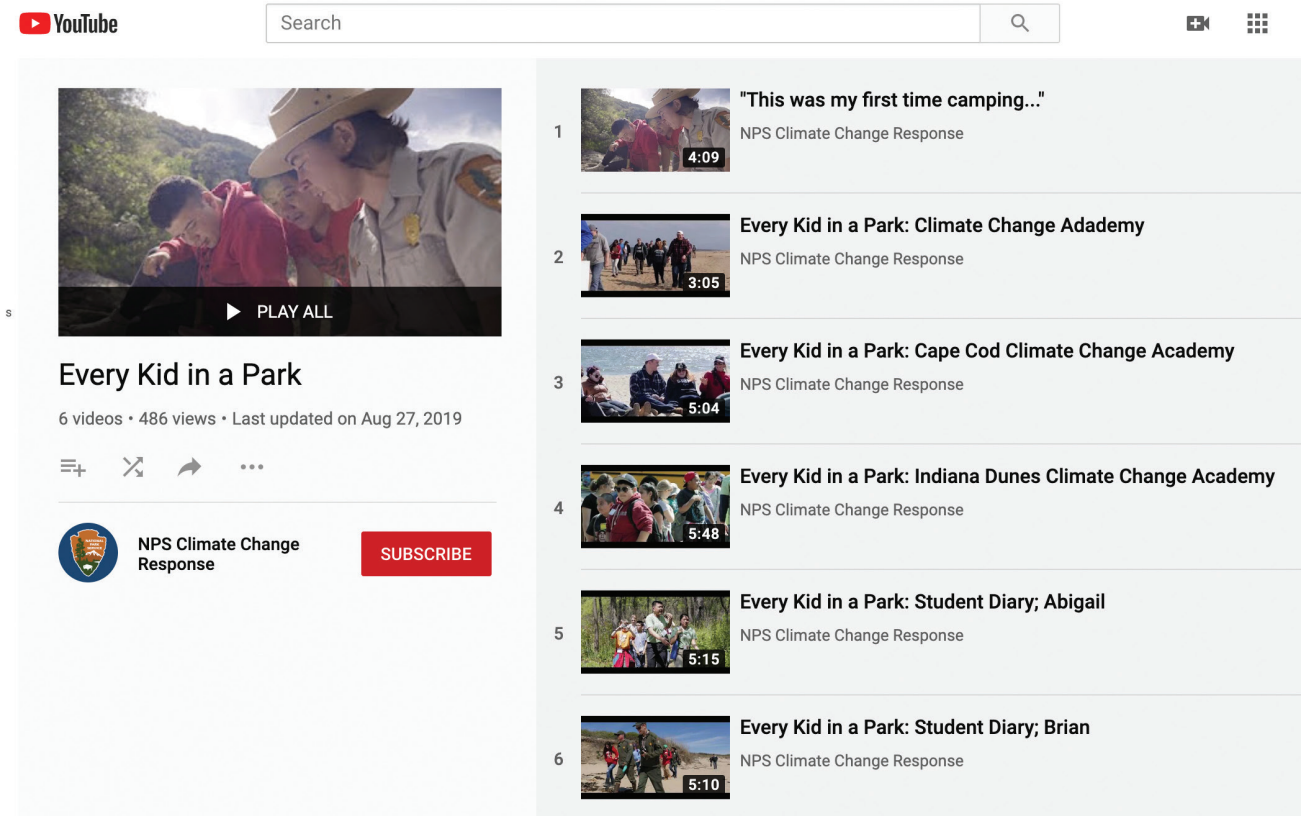
Furthermore, the interactions between high school and elementary students were perceived to be quite powerful for both. Fourth grade students seemed acutely attentive and engaged during lessons offered by older peers. And through personal interviews in the wake of the field experience, several high school students expressed a newly acquired desire to work with younger students again in the future and—in some cases—as a professional career.

Both programs were chronicled in a series of six short videos available on the NPS Climate Change Response Program YouTube channel, and feature samplings of the aforementioned interactions and outcomes.

Since the pilot

We hosted a second EKiP Climate Change Academy at both Indiana Dunes and Cape Cod in 2017. During the second iteration of the program, particular focus was placed on documenting the arc of experience for visiting fourth grade classes. Media assets created from the academies were coupled with site-specific, curriculum-based lesson plans to create several new distance-learning opportunities for use by the parks.

In 2018, project leads worked with park staff to host a Climate Change Academy at Sequoia and Kings Canyon National Parks. That program resulted in the development of new place-based curricula and supporting video content. As in earlier years, application of the No Barriers program model drew surprising results from our participants. As captured in a summary video of the event, the students experienced growth in personal awareness, culti-



YouTube playlist: Screenshot of the six videos created to illustrate the EKiP Climate Change Academies.
See: https://www.youtube.com/playlist?list=PLr8uf42JALwc-Bfs1vjQvnehqRiRNPmPo

vated various leadership skills, and expressed the desire to work within their communities and with future generations.

As we design curriculum and park experiences, we have an opportunity to help students and visitors understand how to meet the increasingly difficult demands of a warming world.

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