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Title: Stories of Impact: Scientific Narratives and Climate Justice

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Abstract: Climate justice involves recognizing the deeply intertwined relationships between people and their environment, along with the recognition and validation of the fact that climate change has a disproportionate effect on the most vulnerable populations on the planet. This poster session shares the design and findings of a Climate Justice Map-mediated Scientific storytelling project designed to support students' learning and action of climate justice by deepening and personalizing their involvement in locally situated climate issues.

Introduction

Climate justice involves recognizing the deeply intertwined relationships between people and their environment, along with the recognition and validation of the fact that climate change has a disproportionate effect on the most vulnerable populations on the planet--historically marginalized communities and other living things. Thus, issues related to climate change need to be addressed by approaches that allow for important conversations of equity (racism, patriarchy, economics) alongside climate change science. Climate Justice Map-mediated Scientific storytelling (CJMAPS) is one such approach that supports student learning and action of climate justice by deepening and personalizing stakeholder involvement in locally situated climate concerns. This poster discusses the design elements that make the CJMAPS approach a way to address issues related to equity alongside science. The poster will also present findings from data collected during Spring 2022, when the first iteration of the approach is implemented.

The CJMAPS learning environment is designed around the driving questions: How do we organize and build relationships with people and natural world in a time when the climate is rapidly changing everything in our immediate and distant environment? Relationship building between and within communities for a cause is not an easy task (Krishner 2015). The related attitudes and behaviors are complex and dynamic, and are likely influenced by personal experience and knowledge as well as cultural and political knowledge and values systems. For example, research has shown that cultural and political values play an important role in how individuals understand climate science (Leiserowitz et al., 2012). Similarly, building connections to the natural world also requires people to reflect and attend to their own identities and positionalities and to the consequences caused by their actions. Through the CJMAPS program, learners use their lived experiences and construct a story using ArcGIS Storymaps software. The learners will: explore an issue related to climate change; research the personal, socio-cultural and political aspects of the issue; and then create a story using the ArcGIS software that will reflect their understanding of how the issue is connected to self, their community members and land. For the first iteration of the study we have asked students to seek out how birds (local and migratory) have been impacted by climate change.

Birds connect people of different racial, ethnic, and socioeconomic communities by virtue of nesting and migrating through several different places. However, birding exists within the racialized context of a society in the U.S. that normalizes whiteness and white identities in the outdoors, the environmental movement, and science. This context was exemplified in the U.S. news in May 2020 when Christian Cooper, a Black man who was birdwatching in Central Park in New York City, asked a white woman to obey park rules and leash her dog. The woman called the police to say he was threatening her. Cooper took a video of the incident, which went viral and prompted increased attention to the racialized experiences of people of color in birding, the outdoors, and STEM fields (see e.g. #BlackBirdersWeek2021). This context highlights the need for climate justice education to attend to the sense of belonging and identities of educators and participants in the learning environment. Bird ecologist J. Drew Lanham (2013) talks about his experience as a Black bird watcher in the United States, satirizing about belonging and identity. Thus, although researching about local and migratory birds might at face value seem a neutral activity, like every scientific endeavor researching birds is also a segregated and racialized activity. We hope that through building stories about birds and birding students will be able to understand the socio-cultural and political dimensions that surround their research on climate change and birds.

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Theoretical background

CJMAPS seeks to use technology mediated tools to create space for racially and ethnically diverse students to explore authentic climate justice issues while also strengthening their relationships with the land and their communities. Students' exploration of their relationships with land and community are central to learning environmental science (Tuck et al., 2014). However, environmental learning is often framed by Western scientific meanings of place (e.g. land ownership versus reciprocity) and ignores the historical and ongoing eradication of Indigenous peoples who inhabit or formerly inhabited lands and the history of forced landlessness among chattel slaves (Engel-Di Mauro & Carroll, 2014). In contrast, CJMAPS draws upon land-based pedagogies and centers students' and community members' voices and perspectives to provide space for multiple epistemological understandings to be incorporated to students' sensemaking. When learners are supported to understand how scientific content interacts with the socio-cultural contexts of their lives and in particular with their relationships with land and communities, science learning and engagement flourish (Bang et al., 2014). Each ethnic group has their own socio-cultural and political history that impacts their interactions with land and community. For example, historically African Americans were denied land ownership. As Smith (2007) discusses, "Forced for generations to work the earth without just reward, without the right to own land, without even the freedom to travel, what meaning could they find in America's pristine wilderness? Locked in a struggle for social justice, what interest could they have in the claims of nature?" (p. 3). African Americans have a long tradition of caring for land in ways that are distinct from other Americans (Finney, 2014). All students need space and time to understand their relationship with lands they inhabit. Map-mediated storytelling fosters students' exploration of their unique relationships with the land and their community. Mapping these relationships supports their visualization and development of their stories within a climate justice and community-driven context.

Prior research that examines participant learning in locally relevant science identifies the following: students draw upon multidisciplinary understandings of science and local communities to develop relationships with selves (identity development), nature, and their local communities (Bang et al., 2010; Schindel Dimick, 2016); and students leverage community-driven science understandings when learning is situated within place (Birmingham & Calabrese Barton, 2014). Incorporating place-based science and structuring science learning for multiple voices to contribute to meaning making provides significant opportunities for students from diverse and historically marginalized backgrounds to engage in science (Bang & Marin, 2015). This work has implications for understanding how map-mediated stories and what aspects of these stories influence how students make sense of place-based climate justice.

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