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THESIS APPROVAL SHEET

Title of Thesis: Improving Institutional Partnerships for Science & Stewardship: A Case Study Between the Smithsonian & Black Churches in Baltimore, Maryland

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NOTE: *The Approval Sheet with the original signature must accompany the thesis or dissertation. No terminal punctuation is to be used.

Curriculum Vitae

RYLEE WERNOCH

A science and society boundary-spanner with expertise in participatory science.

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EDUCATION

Master of Science: Geography and Environmental Systems Anticipated May 2024
University of Maryland Baltimore County, Baltimore, MD

- Thesis: *Improving Institutional Partnerships for Environmental Science and Stewardship: A Case Study Between the Smithsonian and Black Churches in Baltimore, Maryland*
- NSF Trainee, Interdisciplinary Consortium for Applied Research in the Environment (ICARE)

Bachelor of Science: Biology, Bachelor of Arts: Environmental Studies, Minor: Africana Studies
Hobart and William Smith Colleges, Geneva, NY

- Team Captain, Division III Women's Soccer
- Chapter Leader, Public Leadership Education Network (PLEN)

WORK EXPERIENCE

Participatory Science Graduate Fellow 2022 – Present

Smithsonian Environmental Research Center (SERC) Edgewater, MD

- Identify and recruit partners and serve as the primary liaison for communication and collaboration among federal scientists, educators, and community partners, facilitating interdisciplinary decision- making and supporting SERC accountability through events, meetings, emails, reports, and presentations.
- Collaborate in transforming community needs and priorities around climate adaptation into research questions.
- Coordinate with a variety of stakeholders, engaging in participatory science best practices and with input from subject matter experts, to develop a network of faith-based organizations monitoring their environmental restorations for biodiversity and urban heat changes for climate adaption.
- Support recruitment, training, and program participant assistance, while contributing to program evaluation to measure changes in attitudes towards nature.
- Coordinate and lead youth and volunteer monitoring programs, developing culturally relevant directions for protocols.
- Design and oversee data submission via the FieldScope platform collaborating with community partners and research scientists.
- Mentor and assist in the management of a team of 5 interns.

Interdisciplinary Consortium for Applied Research in the Environment (ICARE) Trainee

University of Maryland Baltimore County, Baltimore, MD 2022-Present

- Developing and communicating a framework synthesizing literature review, case study and interviews to increase interdisciplinary collaboration, and reduce siloing
- Conducting a literature review on shared goals of participatory science and the Black Church, examining the historical role of faith communities in participatory sciences and contemplating the systemic impact of their inclusion.
- Designing, conducting and analyzing 12 semi-structured interviews with leaders from the Black Church and federal investigating the impact of key terminology on interdisciplinary partnerships
- Utilize reflective analysis to compose a case study about the development of the Science and Faith program at the Smithsonian Environmental Research Center.
- Disseminating research findings to scientific and faith-based communities through forthcoming academic publications, community-facing reports, and presentation

Chesapeake Conservation Corps Member 2021 – 2022

Smithsonian Environmental Research Center Edgewater, MD

- Researched and identified local organizations committed to environmental stewardship, cultivating potential partners to enhance SERC's participatory science programming and community-driven science initiatives with a focus on equity.
- Established key relationships with community partners, contributing to grant proposals addressing shared questions on small-scale restorations, particularly on faith-based properties.
- Designed and managed grant reports and community-facing reports tracking engagement, and programmatic activities.
- Piloted participatory science protocols to explore environmental restoration success related to invasive species, water quality, phenology, and pollinators.

Founder 2021

Women’s Sailing Network Geneva, NY

- Completed a literature review, wrote and presented, a community-facing report on how Seneca Sailing Association could become more sustainable socially, economically, and environmentally.
- Proposed, implemented, & led a women's sailing group to address gender inequity in the sport.

Head Instructor Summer 2020 & 2021

Seneca Sailing Academy Geneva, NY

- Created and implemented an education curriculum incorporating sailing, STEM, and arts weekly with 20 students.
- Managed and trained 2 instructors and 10 volunteers.

William Smith Dean's Office Assistant 2019 – 2021

Hobart and William Smith Colleges Geneva, NY

- Organized finances, academic reviews, and communications, and facilitated the annual college-wide award ceremony.
- Assisted with program development and trained new staff.

Interdisciplinary Research and Outreach Intern 2019

Finger Lakes Institute Geneva, NY

- Researched and synthesized the history, socioeconomics, and science of Seneca Lake.
- Disseminated findings to the public through the development and teaching of an interactive traveling display

Office of Sustainability Intern 2019-2020

Hobart and William Smith Colleges Geneva, NY

- Assisted with reporting and evaluation of university sustainability practices
- Implemented and created programs, surveys, and educational materials to enhance student sustainability practices across campus

Undergraduate Research Assistant 2018

Finger Lakes Institute

- Conducted data collection and analysis to explore the relationship between nitrogen loading and harmful algal blooms (HABs) in Honeoye Lake

FIELD & RESEARCH EXPERIENCE

ARC GIS, Story Maps: Maps, Semi-Structured Interview Design, Implementation, and Analysis: Urban Microclimates: Forest Entomology: Water Quality Monitoring: Phenology: Pollinators: Wetlands Research: Bird Banding: Wetlands Geomorphological Survey: SAV Monitoring

COMMUNITY AND PROFESSIONAL SERVICE

- University of Maryland Baltimore County Graduate Student Officer
  - 2023-2024
- Smithsonian Environmental Research Center Women in Science Committee
  - 2021-Present
- Smithsonian Environmental Research Center DEI Community Engagement Committee
  - 2021- 2022

HONORS AND DISTINCTIONS

- Directors Award of Appreciation, Smithsonian Environmental Research Center 2023
- Hai Timiai Honor Society, Hobart and William Smith Colleges 2020

GRANTS AWARDED

- Smithsonian Institution Together We Thrive Implementation Grant Recipient (Assisted) 2023
  - $600,000

- Smithsonian Institution Together We Thrive Pilot Grant Recipient (Assisted) 2022
  - $90,000
- NSF Interdisciplinary Consortium for Applied Research in the Environment Trainee Recipient 2022
  - ~$200,000
- Chesapeake Bay Trust Mini-Grant Recipient 2022
  - $1,200
- Hobart and William Smith Student International Initiative Fund (SIIF) Grant Recipient 2020
  - $800

CONFERENCE POSTERS & PRESENTATIONS

- Citizen Science Association National Conference Discussion Leader and Poster Session 2023
  - "Community-Driven Science with Faith-Based Organizations in the Chesapeake Bay Watershed"
- Baltimore Ecosystem Study Quarterly Meeting 2022
  - "The Black Church and Environmental Justice"
- New York Conference of Sustainability in Higher Education (NYCSHE) 2019
  - "Assessment of the Impact of an Interdisciplinary Travelling Display about the Seneca Lake Watershed"
- Finger Lakes Institute Youth Climate Change Summit 2019
  - "Assessment of the Impact of an Interdisciplinary Travelling Display about the Seneca Lake Watershed"
- New York Six Research Symposium 2019
  - "Assessment of the Impact of an Interdisciplinary Travelling Display about the Seneca Lake Watershed"
- Finger Lakes Harmful Algal Bloom (HAB) Symposium, Geneva NY 2018
  - "Orthophosphate and Harmful Algal Blooms on Honeoye Lake"

Abstract

IMPROVING INSTITUTIONAL PARTNERSHIPS FOR SCIENCE & STEWARDSHIP: A Case Study Between the Smithsonian & Black Churches in Baltimore, Maryland

Increasingly diverse teams are crucial for tackling complex environmental challenges, particularly in cities and among historically marginalized communities. This study examines interdisciplinary collaboration in Baltimore, Maryland, involving scientists, faith-based groups, and local nonprofits. Together, they seek to address common questions about environmental restoration success and support local environmental education. Drawing on literature in environmental justice, liberation theology, and participatory approaches, this thesis highlights unique intersections. It explores emerging partnerships between scientists and faith leaders and examines the role of language in relationship-building through interviews. Reflexive analysis engages with two and a half years of implementation efforts between the Smithsonian and local organizations. The author advocates for radical listening, particularly among scientists, to foster diverse partnerships. Additionally, the author proposes reimagining academic structures to facilitate equitable community engagement.

IMPROVING INSTITUTIONAL PARTNERSHIPS FOR SCIENCE & STEWARDSHIP:

A Case Study Between the Smithsonian & Black Churches in Baltimore, Maryland

By

Rylee Wernoch

Thesis submitted to the Faculty of the Graduate School of the
University of Maryland, Baltimore County in partial fulfillment
of the requirements for the degree of
Master of Science in Geography and
Environmental Systems
2024

Copyright Statement

Dedication

To the trailblazers whose perseverance built the path I follow, and to the emerging changemakers whose vision will shape our future.

Acknowledgements

I would like to thank Dr.Alison Cawood, Terris King II, Alfie Chambers, and Dr. Dawn Biehler for their invaluable contributions to this research, and to my personal and professional growth. This research would not have been possible without this team's insight, encouragement and support.

Additionally, I would like to thank Pastor Mark Montgomery, Pastor Michael Martin, Yorell Tuck, Olivia Pineda, Dr. Justin Nowakowski, Shelley Bennett, Sophia Plancich, Aidan Kirchgraber and Rachael Mady for their unique contributions related to the implementation components of this work. The curiosity, flexibility and knowledge that these collaborators provided was essential to the growth and development of this work to bridge science and faith.

I would like to thank my fellow ICARE trainees for their continuous fellowship as a sounding board and support system over the last two years, with a special thank you to Autumn Powell. The ICARE program would not be possible without the support of many people at UMBC, lead by Dr. Tamra Mendelson.

I want to thank the many children of Baltimore who shaped this project with their vision and insights shared when engaging with the development of curriculum. I also want to acknowledge and appreciate the time, energy and effort of the folks who participated in interviews.

Finally, I want to thank my family, especially Jack, for their unwavering support and many meals prepared for me throughout the pursuit of this master's degree.

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Positionality Statement

I am a 24-year-old white American woman, and I am not religious. I have lived in Annapolis, MD since 2021, and was raised in New Jersey. I have been trained as a biologist and come from a family of scientists. For the last two and a half years I have been working in the field of Participatory Science, an extension of natural science that relies on public contributions for scientific advancement. More broadly, I am interested in solutions to environmental injustices. I think that Participatory Science can be a very powerful tool to advocate for change and justice. I have been putting this ideology into practice as a Program Specialist at the Smithsonian Environmental Research Center (SERC) working on a project called Science and Faith. This initiative connects congregations with the science and environmental education expertise at SERC. I have primarily worked in Baltimore, Maryland with Black Churches and an educational non-profit, Temple X. This thesis engages existing academic literature and interviews to supplement my real-world experiences as a Program Specialist.

Goals of Thesis

In addition to this work supporting my completion of a master's degree in Geography and Environmental Systems, this thesis seeks to:

1. Support the development of programming and partnerships in a project called Science and Faith.
2. Contribute to the broader understanding of interdisciplinary partnerships by outlining a framework of our successes and challenges.

3. Consider how typically disparate bodies of literature amplify each other when in conversation with each other ie: Liberation Theology, Participatory Science, and Environmental Justice

This thesis will utilize a literature review, interviews, and a case study to further explore what collaboration between the participatory science community and the Black Church could look like and investigate where some of the challenges may arise. Chapter 1 will be a literature review that explores a brief history of the Black Church and participatory science and considers where there have already been previous collaborations. Chapter 2 features a series of interviews conducted with scientists and faith leaders and explores how key terminology is understood by each group. This is to further explore how when these two groups overcome many systematic and structural barriers, and get together to collaborate, how language may help or hinder these interactions. Chapter 3 is a case study exploring the implementation of a participatory science partnership between the Smithsonian Environmental Research Center, grassroots organizations, and faith leaders in Baltimore. When this work is completed, the intention is to adapt chapters 2 and 3 into articles for academic publishing, with co-authorship from community partners.

Broader Impacts

Reflexive analysis throughout this research will enhance the quality of the ongoing work of the *Science and Faith* project, ensuring more responsive and culturally relevant programming and partnerships for scientists and faith leaders. Findings will be disseminated through an open master's thesis defense, publication in *Citizen Science*

Theory and Practice, and adaptable formats based on feedback from collaborators. These shared insights will support faith-based organizations in grant applications, enhancing their understanding of environmental science and faith partnerships. This increased knowledge can support faith-based organizations for political advocacy, partner identification, and navigation of future collaborations with scientific partners.

Supporting partnerships between faith-based organizations and the Academy ”can teach academics about the role of faith in everyday life, including the efficacy of the children, adults, and elders engaged within their faith-based organizations, and the social activism, networking, fund-raising, and creative problem-solving that can occur within small, independent faith-based arenas” (Owens et al., 2020). Additionally, collaboration with leadership in the Black Church can be an important learning opportunity for academics to revisit, challenge and revise mission and governance documents to support equity and social justice within the Academy (Owens et al., 2020).

Chapter 1: A Literature Review Exploring the Overlap Between Participatory Science and the Black Church.

Introduction

Partnerships between faith-based communities and academic institutions are an under-utilized opportunity to support shared priorities around science for real-world change, and access to education (Owens et al., 2020). We are at a unique time when faith-based institutions, especially the Black Church, and academic institutions, especially natural scientists, have increased motivations to interact with each other. Black

Churches that led the civil rights movements of the 1950s and '60s have been reimaging their engagement in social movements to continue addressing anti-Black state violence and more intentionally focus on health and environmental injustices in their work (Schneider & Bolger, 2021; Smith-Cavros, 2006). Additionally, Black Churches are facing an aging population and many small independent Black Churches are also feeling the pressure of being near the end of the typical lifespan of a church, which is about 70-100 years (Glaude, 2014: 106; Irwin, 2013). Though nearly 80% of African Americans identify as Christian, nearly half do not associate with historically Black Protestant congregations, and there is decreasing religious affiliation with youth (Pew, 2015) . In general, 18% of African Americans are religiously unaffiliated, but this increases to nearly 30% of African Americans aged 18-29 are religiously unaffiliated (Pew, 2015). Addressing impacts of climate change and environmental injustice is a priority for young people, especially amongst Black and Latino people, and youth are taking action in a variety of ways to address these challenges (Ballew et al., 2021; Marks et al., 2022). However, youth in this movement are often challenged by knowledge gaps and low self-efficacy (Baldwin et al., 2023). The Black Church is uniquely positioned to build on a legacy of, and ongoing commitment to supporting access to education that is foundational to the liberation of Black people (Lincoln & Mamiya, 1990). Priorities around engaging youth, addressing environmental injustices, supporting a legacy of education for liberation and interest in novel funding sources makes building partnerships with scientific institutions an opportunity to address these goals (Dickerson et al., 2008; Owens et al., 2020; Schneider & Bolger, 2021).

Like religion, science is interested in making meaning of the world (Gyekye, 2009). While these two fields share this goal, the secularization of science and the false dichotomies of objective/subjective, cognitive/noncognitive, empirical/transcendental by both faith leaders and scientists facilitated the bifurcation of these ways of knowing (Olshewsky, 1982). When professional science was a fledgling field, there was intentional positioning of science as objective and separate from society during the 17th century to avoid the political turmoil between church and state (Carter, 1991). This positioning has continued to be upheld in popular media and within the scientific community (Carter, 1991). Beyond being seen as detached, science has also been, or perceived as, a perpetrator of harm. A legacy of science or pseudo-science to validate racist practices, events like the outbreak of BSE (mad cow disease), misconduct with the Tuskegee Syphilis Study, and ethical concerns about genetically modified organisms are just a few examples of how science interacting with the public has actively contributed, or been seen as contributing, to public risks and systemic oppression (Brown & Mutegi, 2010; Jones, 1992; Wilsdon & Willis, 2004). Historically and currently there is a practice of information dissemination from science to the public, however this unidirectional engagement has been insufficient to address the legacy of separation, and harm that has been perpetuated by science and has not adequately addressed the complex societal implications of scientific development (Bucchi, 1996; Hall, 1992, 1992; Wilsdon & Willis, 2004).

While increasing the quality of scientific communication is important, it is not sufficient to address the "crisis of trust" that science currently faces, and is inadequate to address the needs of society to understand and utilize scientific innovations (Wilsdon &

Willis, 2004). Integrating the public in science is essential to democratizing science which will produce more ethical, needs-oriented innovation which is more trusted by society and has greater potential for policy and decision making impact (Broerse & Buning de Cock, 2012; Marincola, 2006; Srinivas, 2017). This practice of incorporating the public in Western science has been happening in a piecemeal way for a long time, but gained traction as a movement in the 1990s with the coining of the phrase "citizen science" (Vohland et al., 2021). More recently, the term citizen science is being replaced by the term participatory science to navigate the political association with the word citizen in the United States. SERC has adopted the phrase participatory science to describe what was previously known as citizen science, and I will be modeling that adoption from here on out. Since the 1990s, participatory science has been a powerful way to engage the public in science, but if research is not built specifically in ways that are anti-racist participatory science can reinforce inequities in scientific knowledge production which support racist and classist scientific production (Lewenstein, 2022; Mahmoudi et al., 2022).

In this thesis, I argue that leaders in the field of participatory science should look to intentionally partner with the Black Church when looking to support science that is ethical, addresses public priorities and has the potential to make real world change. Shared visions between the participatory science community and the Black Church around environmental stewardship, access to education and science for change are what could bring these two communities who have been separated through divides between religion and science and often exacerbated by race and class. Leaders in participatory science have the expertise to support scientific education and implementation that is

needed to have data to advocate for a more just and healthy society. And the Black Church are leaders in advocating for justice in the United States and can integrate science into their advocacy. While participatory science has already been utilized as a method in the environmental justice (EJ) movement, I assert that there is an opportunity for further collaboration between EJ leaders at the Black Church and participatory science practitioners (Commission For Racial Justice, United Church of Christ, 1987; Salazar & Moulds, 1996). Together, the scientific knowledge of the participatory science community and community organizing legacy of the Black Church has the potential to address shared priorities around education and moving towards a more just society utilizing science. This literature review will explore the literature gap in the unique potential of partnerships between the Black Church and participatory science practitioners.

Interfaith efforts, such as Interfaith Partners for the Chesapeake and the American Association for the Advancement of Science Dialogue on Science, Ethics, and Religion (AAAS DoSER), frequently employ qualitative methods like interviews and focus groups for non-academic purposes, enhancing program functionality and educational support. Despite their value, these efforts are seldom documented in academic journals. Moreover, grassroots discussions on social media within religious communities are common. My research aims to integrate these conversations and insights into academic knowledge, acting as a bridge between theory and practice.

This review examines the Black Church's history, strengths, and knowledge as environmental justice leaders and considers applying their leadership to broader participatory science communities. As participatory science gains mainstream

prominence to create impactful real-world change, leaders in this movement should recognize the Black Church's leadership in environmental justice. To address EJ issues effectively, participatory science practitioners should collaborate with local Black Churches and leverage their generational engagement and essential knowledge for achieving broader goals in using science for change. In general, there is the recognition that Black Churches are important partners and leaders in EJ work, but the perceptions, ideas, political positions, priorities, and futures of the Black Church are not examined fully. This literature gap leaves room for weakened or broken partnerships, misunderstanding, inadequate appreciation of what the Black Church can contribute, and the potential for Black Churches to be seen as a vehicle for participatory science to be done- rather than as a true partner with a shared mission. This chapter covers the history and goals of the Environmental Justice (EJ) movement, highlighting its strong connection to the Black Church. It briefly explores participatory science's history and goals, concluding with the idea that intentionally forming equitable partnerships with Black Churches is crucial for addressing shared EJ priorities between the participatory science community and the Black Church.

Methodology

To find literature for this paper I utilized search strings, spoke to academics, and connected with leaders in the Black faith community. The search string that included the most results was “Black*” OR “black*” OR “African American*” OR “African American “OR “slave*” OR “enslave*” AND “church*” OR “faith” OR “theology” OR “worship” OR “God” OR “religion” OR “christ*” OR “spirit*” AND “environment* (justice)” OR “political” OR “organizing” OR “environment” OR “Nature” OR

"liberation." I used this search string in Google Scholar and the Web of Science databases. From these searches, I found articles that cited prior works. I read through citations to find more resources for this literature review. Through this, I learned about Black Liberation Theology (BLT). BLT is an essential connection to make between the Black Church and environmental justice. This was a key phrase that I used when identifying which works I wanted to pursue further when looking through citations. Personal connections and suggestions from academic and community leaders led to resources that I did not find with my search string. From academic mentors, like Dr. Dawn Biehler and Sarah Hansen, I was directed to the work of Priscilla McCutcheon, and Christopher Heaney and the American Association for the Advancement of Science Dialogue on Science Ethics and Religion (AAAS DoSER). Terris King, a community organizer in the Black faith community, shared the work of the Commission For Racial Justice, United Church of Christ.

Additionally, I also began utilizing the AI tool Elicit in December of 2023 as a way to search academic literature utilizing everyday words that are not necessarily technical to an area of study. For participatory science literature I utilized suggestions from Alison Cawood and Dillon Mahmoudi for seminal participatory science articles and journals, such as the Christmas Bird Count and the Citizen Science Journal of Theory and Practice.

Literature relating to Black Churches and environmental justice are often published and distributed in a variety of non-academic platforms. Tradition within the Black Church is to share knowledge orally, not through writing, and even less often in academic, peer-reviewed work. Additionally, the academic literature that does exist about

Black Churches is often written from a theological perspective or treats the Black Church as a setting with little to no focus on the broader impacts of faith on the activities or movements. There is limited overlapping literature about the Black Church and environmental justice movements. What does exist largely explores public health issues. Literature relating to environmental justice issues is often shared in social science spaces with minimal focus on the theological, psychological, and scientific perspectives. The overlap between environmental justice and Black churches is often written and talked about in non-academic settings. Therefore, this literature review is composed of work from a variety of disciplines. Finally, this literature review was written in a limited time, and there is still much room for expansion of many of the concepts covered in this brief review.

What is the Black Church?

Defining the Black Church in the United States

To understand the role of the Black Church in society today, one must understand its origins. To do this, I will heavily rely on Lincoln and Mamiya (1990). Their work interviewing more than 1,800 Black clergy members is seminal in the academic understanding of the Black Church. Lincoln and Mamiya define the Black Church as "independent, historical and totally black controlled denominations, which were founded after the Free African society of 1787 and which constituted the core of black Christians" (1990: 1). Today there are Black congregations within white denominations; while these congregations may share many of the values and approaches of Black Churches as previously defined, I will be focusing on the emergence and history of the Black Church

as defined by Lincoln and Mamiya (1990). The unique origins and worldview of the Black Churches is what gave rise to the Black identity found in Black congregations of white churches. The largest denominations within the Black Church are Baptist, Methodist and Pentecostal (Lincoln and Mamiya, 1990: 1). The seven major churches that fit into Lincoln and Mamiya's definition of the Black Church are the African Methodist Episcopal Church (AME),the African Methodist Episcopal Zion Church (AMEZ), the Christian Methodist Episcopal Church (CME), the National Baptist Convention of America Unincorporated (NBCA), the Progressive National Baptist Convention (PNBC) and the Church of God in Christ (COGIC) (Lincoln and Mamiya, 1990: 1). These three denominations and seven churches share a history and mission that has led to what we know today as the Black Church.

A Brief History of the Black Church

The combination of African religions and Christianity in North America created a new and unique religious experience found in Black Churches. While enslaved by Christian white people, Black people learned about Christianity by watching practices of faith, and through deliberate education, both by the proselytizing by enslavers, and from teachings from Black layfolk within their own communities. The African histories of freedom, community welfare, and Christianity in North America merged to create the distinctive religious and cultural phenomenon known as the Black Church (Lincoln & Mamiya, 1990: 3; McCutcheon, 2021). During enslavement, religion was one of the only ways that people were allowed to organize and spend time together (Lincoln and Mamiya, 1990: 7). Thus religious spaces became central to the Black experience and the heart of culture and community. Within the church, people were able to express

themselves, organize, and support each other (Lincoln and Mamiya, 1990: 7). Black Churches were "one of the few stable and coherent institutions to emerge from slavery" and continue to serve as central to Black liberation (Lincoln and Mamiya, 1990: 7; McCutcheon, 2016). According to Du Bois, during the antebellum period, the construction of Black Churches was one of the first "forms of economic cooperation" among black people (Lincoln and Mamiya, 1990: 9). The Black Church remained central to the liberation of Black people and has evolved through time to meet peoples' needs; for example, the AME Zion Church and the AME Church were the first Black publishers (Lincoln and Mamiya, 1990: 8). The National Association for the Advancement of Colored People (NAACP) and the National Urban League- are two organizations that were founded through the support of Black faith leaders (Lincoln and Mamiya, 1990: 9). In fact, Black Churches and these secular organizations often shared leadership as their goals of supporting the advancement of Black people were so overlapped (Lincoln and Mamiya, 1990: 10). Without the support of the Black Church, these secular organizations would not have existed and would not have been able to do political and community organizing that is so important to justice work in the United States (Lincoln and Mamiya, 1990: 10). The Black Church was one of the first pillars of the Black community and remains as central to the Black experience and fight for justice.

Freedom as a Central Principle of the Black Church

The Black Church is different from other forms of Christianity because it is rooted in immediate collective freedom for its people (Lincoln and Mamiya, 1990: 4). This comes from the origins of the Black Church and African worldviews. The Black Church was formed when Black people were enslaved in North America and people

needed real world solutions, and the only way that they could organize to do this was through Christianity. Black Christians' faith is tied to freedom and justice in a way that is not possible for white Christians since they were actively enslaving people and are still profiting off of the disenfranchisement of people of color (Lincoln and Mamiya, 1990: 4). Because of this inequity, Black Christians often understand their devotion as more authentic than their white counterparts (Lincoln and Mamiya, 1990:4).

The Black Church is not only aligned with freedom due to the unequal society that it exists in, but also because of the African traditions that helped to form it. Black Churches in America see their freedom as communal because African traditions know that liberation is tied to the welfare and success of the community (Lincoln and Mamiya, 1990: 5). This is opposed to white people and churches who often view freedom as individualistic and a personal quest (Lincoln and Mamiya, 1990: 5). However, it is worth noting that the practice of faith for Black people is not a monolith. The rise of prosperity gospel with megachurches in the 1980s espouses that one's material possessions in this life are directly tied to their worth- with those who are worth more from a religious sense having more material wealth (Glaude, 2014, p. 104). Though, 96 percent of Black megachurches are involved in voter registration, and 60 percent advocate for particular issues on the ballot with 73% of those associated with Affirmative Action (Glaude, 2014, p. 104). Though there is a strong vein of freedom within the Black Church, the ways that this is approached is diverse, and can be unexpected and perhaps exercising a double-consciousness at times- balancing a modern-day capitalist neo-liberal society while maintaining ideals around freedom and equity.

The Black Church and Social Movements

The Black Church is also not a monolith in terms of approach to justice. Some faith leaders approach justice through traditional Christian principles focused on personal piety, rather than social and political protest (Warnock, 2013). In general, Black churches often view God as "an avenging, conquering, liberating paladin," with strong connections to the idea of divine rescue (Lincoln and Mamiya, 1990: 3). This means that these congregations believe that God will act with divine intervention to correct injustices. However, the traditional Christian view of piety over action is not the approach of most Black Churches (Lincoln and Mamiya, 1990: 151; Glaude, 2014: 97). While some Black faith leaders predominantly do their work through preaching, and praying for divine intervention, most Black Churches believe in action. Following the Great Migration and the civil rights movements of the 1950s and 1960s, many Black congregations were reinvigorated to act and become the Black Church that we know today (Lincoln and Mamiya, 1990: 151). In fact, about 70% of Black Churches have collaborated with social or non-Church agencies to address community challenges related health or voting for example (Lincoln and Mamiya, 1990: 151). The dedication to the freedom of Black people through action is evident through this high level of collaboration with secular institutions.

Black Churches not only rely on internal support but also engage in broader collaborations to address societal issues. Faith leaders confront a double consciousness, balancing resistance against accommodation as they fight oppressive systems through preaching, activism, and protest while also navigating existing structures to provide immediate relief. Despite challenges, Black Churches prioritize community solutions for

justice and liberation, often collaborating with non-faith organizations (Lincoln and Mamiya, 1990: 14). This practice of Black theology is expressed by McCutcheon saying that “Black theology is the theology of a community whose daily energies must be focused on physical survival in a hostile environment (Cone, 1986: 11). Simply, it is a theology that encourages Black people and communities to work to offer temporary solutions, while making clear the hope for a better and more sustainable future” (2021).

Black Liberation Theology

Black liberation theology (BLT) is an ideology that arose out of the Civil Rights and the Black Power Movements that makes clear the tie between Christianity and the Black struggle for liberation (Cone, 2000). BLT has roots in Marxism for its understandings of class conflict and poverty (Roelofs, 1988). BLT investigates the “biblical interpretation for civil rights activism by the African American Church through a scholarly lens” (Glave, 2004). BLT also promotes the idea that “complete emancipation of Black people from white oppression by whatever means Black people deem necessary” (Cone, 2019: 6). This means that Black people get to decide what liberation means, whether that is through protest, investment in Black neighborhoods, education, or businesses (McCutcheon, 2021). BLT is a powerful organizing concept to express the work and worldview that many Black Churches hold and practice. Many churches participate in BLT without naming it BLT (Lincoln and Mamiya, 1990: 169). When clergy are more educated, they often identify with the language and vocabulary of BLT. However, faith leaders who have had less education may not be familiar with the vocabulary of BLT but often still practice its ideology (Lincoln and Mamiya, 1990: 169). This shared ideology and action across clergy regardless of education is likely due to the

influence of the Civil Rights and Black Power Movements, in addition to the origin of the Black Church in liberation (Lincoln and Mamiya, 1990: 170). Whether clergy are familiar with the vocabulary or not, BLT is a useful organizing ideology to convey that liberation is central to the work of the Black Church.

Additionally, it is worth noting the similar work of Latin American Liberation Theology (LALT). LALT has a shared commitment to social justice, especially for those wo are poor (Ammon & Reed, 2016; Sullivan-González & Sullivan-González, 2021). Both BLT and LALT emerged following political and economic oppression, with the Cuban revolution and the Vatican II as foundational to LALT (Ammon & Reed, 2016; Sullivan-González & Sullivan-González, 2021). This shared worldview provides potential for collaboration across a wide range of people in the Black and Latin American communities.

Reviewing the Black Church's role in Environmental Justice

Examples of Black Environmental Liberation Theology Driving Environmental Justice Actions

Black Environmental Liberation Theology (BELT) makes explicit the connection between nature, environmental justice, and Black Liberation Theology. BELT advocates for environmental justice actions guided by the theology and ideology of BLT (Glave, 2004). McCutcheon discusses how land and food are central to the Black Church. More broadly caring for the planet and nature is also important to Christianity and the Black Church (Nadeem, 2022). The Black Church's dedication to both environmental stewardship and social justice positions it as a prominent force in the environmental

justice movement. In Memphis, Tennessee, grassroots efforts by the Black Church advocating for better wages, safety, and health conditions for sanitation workers sparked a citywide strike and boycott. Faith leaders mobilized their congregations to support the workers, significantly contributing to the movement's momentum (Glave, 2004). Reverend Martin Luther King Jr. joined this movement and brought it national attention, where he spoke about the health and compensation of the sanitation workers in context of broader environmental injustices, though not utilizing that language, in urban Black communities (Glave, 2004). This was one of the first examples of a Black faith leader speaking about environmental justice on a national platform (Glave, 2004).

Other examples of the Black Church organizing for environmental justice encompass civil rights and toxic dumping. Reverend Benjamins F. Chavis Jr. and Reverend Joseph Lowery worked in Warren County, North Carolina to stop the illegal dumping of carcinogenic Polychlorinated biphenyls (PCBs) on roadways, and then subsequent dumping of polluted soil in Black communities (Glave, 2004). The Commission for Racial Justice of the United Church of Christ combined social activism and science through protesting for civil rights and completing A National Report on the Racial and Socio-Economic Characteristics of Communities and Hazardous Waste Sites (1987) (Glave,2004; The Commission of Racial Justice of the United States Church of Christ, (1987) identified hazardous waste sites through utilizing publicly available data sources, mapping and statistical analysis they showed that communities of color were disproportionally burdened with hazardous waste sites. In Columbia, Mississippi people organized against the use of the dioxins, Agent Orange, and a variety of other toxic dumping from the Reichhold Chemical Company (Glave,2004). This dumping began in

1977 and the Jesus People Against Pollution (JPAP) began organizing to fight this dumping in 1992 (Glave,2004). In the 1990s Reverend Buck Jones worked in St. Louis to form Helping Other People Emerge (HOPE), following the explosion of a gas tank that led to destruction of homes, and vehicles in a local Black community (Glave,2004). Jones also organized to protest dumping of neurotoxins in local waterways from the US Army (Glave,2004). Jones also organized "toxic tours" of East St. Louis to expose systematic environmental racism (Glave,2004). These are just some of the stories of organizing for environmental justice within the Black Church.

It is important to note that the definition of Environmental Justice is often not the same for the public as it is for the government. The Environmental Protection Agency (EPA) has co-opted the work of EJ organizers to understand EJ work as legalistic, procedural and distributive (Harrison, 2015; Holifield, 2012). The federal approach to EJ work is very focused on checks and balances related to pollution, compared to the more holistic approach as outlined by the public in the 17 Principles of Environmental Justice (1991). The roots of the environmental justice movements are reflected in this document and connect to ideas related to principle 1,

"Environmental Justice affirms the sacredness of Mother Earth, ecological unity and the interdependence of all species, and the right to be free from ecological destruction."

These ideas of ecological unity and connectedness with Mother Earth are not reflected in federal environmental policy, and it is important to be aware of these differences in understanding when EJ can potentially be used as a blanket term for two very different understandings.

The Future of the Black Church?

Understanding and meeting the needs of the next generation is a priority and challenge for the Black Church moving forward (PBS North Carolina, 2022). Across all demographics there is declining affiliation with Christianity, however, the Black Church has remained relatively stable compared to more dramatic losses that other traditions have had (Pew Research Center, 2015). Black Church members have consistently comprised 5-7% of the population since 1928 (Pew Research Center, 2015). From 2007-2014 there were about 16 million adults involved in the Black Church (Pew Research Center, 2015). While 16 million is a relatively stable number, it is likely a decline in percentage of population as affiliation with the church did not increase with population (Pew Research Center, 2015). This means that those who are affiliated with the church are old, and getting older, and the average age of those who are unaffiliated is getting younger (Pew Research Center, 2015). Additionally, while there remains relatively constant religious affiliation with the Black Church, 41% of those who are affiliated attend religious service infrequently or never, meaning that those attending church regularly are declining (Mitchell, 2019). The largest challenges that the Black Church faces are keeping young people engaged and active at the church, and figuring out how to do this is a priority for faith leaders (PBS North Carolina, 2022).

Leaning on the legacy of social action and environmental justice could be a way for Black Churches to engage young people. This may be done effectively through working within faith organizations, like the National Black Church Initiative (NCBI), to organize for social issues, or through secular organizations, the National Black Environmental Justice Network (NBEJN), the secular counterpart to NBCI (*National*

Black Church Initiative - Current NBCI Programs and Program Archives, 2022.; *OUR PLATFORM*, 2022). However, it is important to note that since the civil rights movements of the 1950s and 60s, groups like the Black Panther Party, the Student Nonviolent Coordinating Committee (SNCC), and Black Lives Matter have refrained from affiliating with the Black Church. This is due to several factors, including a desire for more radical change not aligned with the Black Church's views, opposition to its embrace of respectability politics, limited support for feminist causes, and a decline in the Black Church's political influence (Calhoun-Brown, 1999; Rasaki, 2016; Vedlitz et al., 1980). There seems to be a movement away from Black Churches by the young people, but in my opinion the need for the Black Church today remains what it has always been, to provide a path towards liberation, and the increase focus on environmental justice and climate change solutions positions Black Churches as leaders in this work, ready to not only work within their own communities but to teach others how to move forward.

How does faith serve as a resource for social change?

Understanding the role of how faith is contributes to actions is challenging to understand (Pulido, 1998). It is not easy to quantify the importance that faith has on worldview and decision making. It is broadly understood that spirituality assists activists to find power within oneself, to organize with others and to withstand immense challenges (Pulido, 1998). Spirituality has the power to change the path of an individual's life, famously transforming Malcolm X from a hustler to a militant Muslim (Pulido, 1998). In addition to Malcolm X, Reverend Martin Luther King and Audrey Lourde are other Black leaders for social change that found power in their faith and provide some examples of the impact that faith can have on those who decide to act for change (Pulido,

1998). Priscilla McCutcheon writes about how faith might provide some of this power and about how BLT motivates action within Black Churches in Atlanta, Georgia. McCutcheon's work explores the intersections of food, faith, and land. McCutcheon discusses the idea of the "radical welcome table," a shared space, often a literal table, at Black Churches that is central to "truth, reconciliation, and reckoning with the past. It is based on "divine liberation, and those sitting around it speak truth to power" (2016). She also speaks of the importance of eating the food that is provided by the church together, both by those that have provided the free food and those who are receiving it. Spending this time at the "welcome table" is a time to share ideas, build community and continue to pursue "divine liberation" (McCutcheon, 2016). This community that is developed through interactions like this at Black Churches is likely a central component of how faith spaces, specifically Black Churches find power amongst each other to act for social change.

Food and land are central to the Black Church and its role in the community and speaking truth to power. The land surrounding the church is always a site of food production (McCutcheon, 2021). Food production on the property of Black Churches is part of BLT as it provides a stable source of healthy food that is from people's own communities and reduces the reliance on outside aid and struggle for fresh, healthy food (McCutcheon, 2021). Additionally, cultivating the crops and creating meals from this food is a radical act of self-care that rebels against white-supremacist and capitalist systems and aligns with BLT (McCutcheon, 2021; Lourde, 1988). Cultivating what McCutcheon calls "emergency soul food," that is grown, prepared, and shared by Black people is a restorative and community building act that provides opportunity for

experiences with faith to be restorative, liberating and a womb for social change (McCutcheon, 2015). Whether it is scripture, people, land, or the food that brings people together, it is clear that faith provides people with necessary resources to organize for social change.

How Have faith-based communities demonstrated their value as partners in health and social work?

In environmental science, collaborations typically involve various entities, yet faith-based communities are often overlooked (O'Malley et al., 2021). Despite this oversight in the environmental field, faith communities have demonstrated their value as partners in public health and social work (Fulton & Wood, 2012; Werber et al., 2012).

The evolution of public health and faith partnerships, traced from the White House Office of Faith-Based and Community Initiatives (OFBCI) under Bush to the current Center for Faith-Based and Neighborhood Partnerships (The Partnership Center) with the US Department of Health and Human Services, reflects a commitment to collaboration (Levin, 2014). In 2021, Biden signed an Executive Order establishing the White House Office of Faith-Based and Neighborhood Partnerships to broaden its impact (*Center for Faith-Based and Neighborhood Partnerships*, 2023). While initially focused on enabling religious organizations to provide services, these offices now serve as advisory councils on broader public health issues.

The longstanding commitment to working with faith-based communities in public health has revealed that these organizations often lack the operational capacity for collaboration, with service religiosity (i.e., religious elements in staff–client interactions

which could refer to politics or behaviors) creating additional barriers (Fu et al., 2021). To address some of the institutional barriers to accessing money for programming, the Charitable Choice laws made government funds more accessible to faith-based organizations for public health services (Isaac, 2012). Social service and public health programs with congregations have established that partnership success hinges on consistent government funding and regular, formal, and informal communication with all partners (Rogers, 2009). Drawing from lessons in public health and social service partnerships with faith-based organizations and the government, we can apply this roadmap to cultivate collaborative relationships between faith-based and environmental organizations, enhancing our approach to shared challenges.

To embark on environmental-faith partnerships, it is crucial to build upon the legacy of the work that the Black Church. Although there are documented partnerships between the Black Church and environmental scientists, there has been relatively little academic study of the benefits and challenges arising from these partnerships. The leadership and work of the Black Church should be instructive to the development of interdisciplinary teams to address environmental and social challenges. Including faith communities, specifically the Black Church, will aid in identifying key environmental challenges and provide context so that solutions are culturally relevant and responsive (Pulido & De Lara, 2018; Smith-Cavros, 2006).

What is participatory science?

When considering how faith-based communities, specifically Black Churches, and environmental scientists can collaborate, participatory science is a powerful

framework that provides a variety of opportunities for collaboration. Broadly, participatory science is engaging the public in the scientific process for knowledge creation (Lynn, 2000; Vohland et al., 2021). Public participation in science can mean engaging in some or all of the processes associated with science like data collection, observation, analysis, troubleshooting and forming questions (Kullenberg & Kasperowski, 2016; Vohland et al., 2021). Often this is done in association with a professional scientists, or a scientific institution and encompasses areas related to biology, environmental science, astronomy, geography and health (Kullenberg & Kasperowski, 2016). Participatory science is useful umbrella term for a variety of traditions and practices that involve incorporating the public in science, and is useful for centralizing these practices into a movement (Cooper et al., 2021). A non-comprehensive list of some of the terms that fall under the participatory science umbrella are: Community Based Monitoring (CBM), Community Based Participatory Research (CBPR), Participatory Action Research (PAR), Volunteer Monitoring, Civic Science, Volunteer Mapping, Open Science, Crowdsourcing, Public Participation in Scientific Research (PPSR), and Neighborhood Science, lay monitoring, volunteer GIS, cooperative monitoring, co-production of knowledge, student-science monitoring, community observatories, Community Owned and Managed Research (COMR) (*Explore AAPS | Association for Advancing the Participatory Sciences*, 2024.). Each of these terms has their own specific approaches to public engagement in science and falls somewhere along a continuum of research that is initiated by the community, or by a professional scientist.

Classic participatory science is a top-down process that begins with a professional, paid scientist who has a question and then they integrate the public in ways

that make sense to answer this question; often this involves data collection or processing (Vohland et al., 2021). Conversely, community science, CBPR, community monitoring and other forms of participatory science starts at the grassroots level, often with a question that is a priority to the public, and then regularly involves professional scientists in helping to answer this question often through methods design or data analysis (Conrad & Hilchey, 2011). A common thread across most participatory science projects is that the public is involved with data collection (Conrad & Hilchey, 2011; Vohland et al., 2021).

Participatory science offers several benefits, including enhanced democracy in science, increased scientific literacy among participants, and improved understanding of systems that might otherwise go unstudied, providing valuable scientific evidence for political advocacy and enhancing scientific advocacy and social legitimacy (Conrad & Hilchey, 2011; Couvet et al., 2008). However, it also presents challenges such as managing and owning data, defining clear project outcomes and decision-making processes, navigating short funding cycles for long-term projects, providing sufficient support for participant training and facilitation, conducting systematic evaluations, and ensuring equity and inclusion in project design (Mahmoudi et al., 2022; Mitchell et al., 2017; Roche et al., 2020; Vohland et al., 2019).

Participatory Science for Environmental Justice

Previously I explored how the Black Church has interacted with science, and here I will explore how science has interacted with the Black Church. Generally, places of worship, especially the Black Church, are often forgotten, or if they are remembered seen as a place to recruit volunteers (Little, 1983; Smith, 1984). Little highlights the work of Max Weber, Ernst Troeltsch, A.S.P. Woodhouse, A. D. Lindsay, William Ebenstein, and

James Luther Adams as leading sociologists who have examined the roles of religion in society, and encourages a return to this intentional way of thinking. Additionally, Pulido supports this idea that faith offers a unique, and hard to quantify element to partnerships that is often unaccounted for (Pulido, 1998).

O'Malley et al. (2021) with the AAAS Dialogue on Science, Ethics and Religion (DoSER) notes that when engaging with science through religion, it is important to remember that folks with underrepresented identities in science are often mistrusting of science for past and ongoing inequities it is contributing to.

In general, scientists treat communities of faith as a building with people in it, and fail to acknowledge the complex and rich worldviews and histories that faith spaces offer (O'Malley et al., 2021). Even in academic literature about religion, a primary metric of study is attendance of church which is a limited view of how people interact with their faith and congregation (Krause & Krause, 2022). Eldson-Baker go on to say that even if interactions with faith go beyond numbers, frequently interactions with faith spaces are treated with a large assumptions of worldviews and beliefs that do not reflect the complex geopolitical, cultural and social contexts that underlie the religious setting (2022).

When engaging with faith spaces in participatory science it is important to remember that these spaces hold unique and individual social, cultural contexts that are not just numbers for a study. And that collaboration for EJ work involved authentic engagement in a co-creation process.

Conclusion

In summary, faith can be a catalyst for social change, and this can be amplified through thoughtful, collaborative partnerships with participatory science. Black Churches serve as an important hub for community organizing and activism around longstanding traditions of shared meals and land cultivation. The efficacy of faith-based communities as powerful partners is evidenced in a slew of public health initiatives. Building on momentum within the Black Church to support justice work through the environmental stewardship, and a reckoning within the scientific community on the need to engage in more ethical science there is an opportunity for collaboration through participatory science. However, it is important to remember when pursuing these new partnerships the legacy of harm that science has caused, and to be mindful of the extractive, one dimensional way that faith spaces are often treated as in the Academy. If we can overcome legacies of separation between science and faith and enter partnerships with an understanding of past harms and commitment to listening and being responsive there is possibility for partnerships between the Black Church and participatory science to be transformative for environmental science research, STEM education and the EJ movement.

Chapter 2: Interviews about Key Terminology with Scientists and Faith Leaders.

Introduction: Considering barriers to collaboration beyond structural siloing.

Building interdisciplinary partnerships is important to solving wicked social and ecological problems, but working across disciplines is also notoriously challenging due to different ways of addressing and answering questions (Cohen et al., 2021; Waigner et al., 2023; Wainwright, 2010). Communication across disciplines and expertise is an essential first step in a more collaborative research process, yet is also one of many challenges that potential partners face (Monteiro & Keating, 2009; Somerville & Hassol, 2011). Breakdowns in communication can not only be frustrating, but can also lead to a lack of trust, and exclusion of knowledge that is essential to addressing problems (Paretti, 2011; Rademacher et al., 2023). Experiences and worldviews impact understanding of language, and those coming from an academic perspective are acutely trained to understand words with specific definitions to complete rigorous research and be recognized in the academic community (Rademacher et al., 2023). While utilizing of field-specific terminology can be efficient in communicating complex concepts to other experts, this language can "impair people's ability to process scientific information, and that this impairment leads to greater motivated resistance to persuasion, increased risk perceptions, and lower support for technology adoption" (Bullock et al., 2019).

Jargon and acronyms are often understood to be problematic in communication, however words that are used colloquially, yet hold deeper meanings may be even more challenging (Bullock et al., 2019). For example, guidelines and toolkits have been made

to decode some of the words that may be understood differently by scientists and non-scientists (Hassol, 2008). While many interdisciplinary partnerships in the academic space can be challenging to work across disciplines it is important to use language that is accessible to the broader public to implement real-world solutions from academic findings (Nkoana et al., 2018; Reyers et al., 2010).

One example of language as a challenge for scientific and community collaboration is with Public health professionals and indigenous communities in the Yukon and Northwest Territories of Canada have explored the importance of language in collaborations. There are challenges in accurately conveying the risks of disease and benefits of treatment due to "different ethnic and linguistic backgrounds that may widen the gap between ways of talking and thinking about science" (Colquhoun et al., 2013). Communication challenges at minimum slow the speed of research (Colquhoun et al., 2013). If unaddressed, these challenges may lead researchers to tackle questions not raised by the community, overlook cultural sensitivities, or fail to implement solutions (Colquhoun et al., 2013).

Another example of language as a challenge is with science and policy which is explored by Rose et al. (2013). In policy settings confusion around language can result in the misinterpretation of scientific findings, hindering of collaboration between scientists and policy makers, confusion around decision making and setting policy, and difficulty in implanting regulations. In the 1990s policy makers coined "biologically significant" to decide implementation impacts of the US Marine Mammal Protection Act, but this phrase has little significance or shared understanding to scientists. Because of the lack of specificity and meaning in this statement, the approach of the Natural Resource

Committee was to embark on null hypothesis testing. The report that was submitted opened with the statement “No scientific studies have conclusively demonstrated a link between exposure to sound and adverse effects on a marine mammal population. . .”. Though the report went on the clarify that it is not yet known what the impacts are of sounds on marine mammals, this opening line was then highlighted in reports by the gas and oil industries. This instance of miscommunication from policy makers with imprecise language, which was then amplified by poor scientific communication of study findings not only made legislation intended to protect marine mammals ineffective, but it was also used as evidence for opposition to conservation efforts.

Though there is broad understanding of language as important to partnerships, and these are two rich examples of policy and public health challenges that can arise through language, there is limited literature available exploring this more thoroughly. This research addresses the literature gap by considering the role of language in science and faith partnerships with an environmental justice lens. This study investigates how natural scientists at the Smithsonian Environmental Research Center, and faith-leaders in Baltimore- several of which are part of the Black Church- understand key vocabulary in interdisciplinary partnerships and considers how these perspectives may be considered collaborating.

Methods: Interviews and Analysis

Methodology Overview

This research was qualitative descriptive work that was grounded in ethnographic principles (Richards & Morse, 2007). The primary goal of this project was to describe how specific vocabulary is interpreted by scientists and faith leaders. The secondary goal of this project was to learn how scientists and faith leaders think that others interpret this vocabulary. The overarching aim of this research was to identify shared phenomena across perspectives, and where there is divergence in understanding. Ultimately this research will support the development of co-produced environmental science research and environmental education between science and faith-based partners.

The Participants

To conduct this research, I interviewed five research scientists and six faith leaders. I interviewed the five newest principal investigators at the Smithsonian Environmental Research Center (SERC). I interviewed six faith leaders, 5 of which were connected through ActNow, an organization that addresses social issues in Baltimore through leadership by faith-based communities. The other faith leader interviewed has been a leader in integrating environmental stewardship into their practices and has been collaborating with SERC to pilot and develop a variety of participatory science and environmental education protocols. Additional, several faith leaders from ActNow, and a few researchers from SERC are collaborating to address shared goals around environment and education. As a program specialist at SERC, working to facilitate this

collaboration, I seek to gain a deeper understanding of each group's experiences and perspectives to support our partnerships.

I chose to interview only principal investigators (PIs), often called Senior Scientists or researchers, at SERC to limit variability in the sample, and because PIs have immense autonomy on deciding what kind of research and partnerships they want to pursue. I assumed that institutional knowledge, of Smithsonian Institution and academia more broadly, and experiences, in education and more broadly in life, will impact understanding and use of language. Therefore, limiting this study to only SERC is an opportunity for an in-depth understanding of how colleagues at my institution may understand key terminology. Additionally, recruiting participants that I have a prior relationship, and institutional tie to, is less challenging than snowball interviews, or cold contacting participants.

At SERC the five earliest career scientists were selected because they will likely continue to impact the research at SERC, in the Baltimore area and in their academic fields for several more decades. Additionally, these participants may have shared experiences due to being trained in the natural sciences in overlapping timeframes- which may make it more possible to identify shared phenomena. In addition to having the same level of training (PhD) I chose to only interview Principal Investigators, and no other SERC employees, because they dictate the direction of their research, have lasting influence workplace culture at SERC and have impacts on academic culture beyond SERC. Additionally, four of the five researchers interviewed are actively engaged in participatory science. Therefore, I thought that they would be more likely to participate in

interviews, as maintaining and understanding the best ways to engage with non-science partners is relevant to their work.

Furthermore, I have professional relationships with many of the PIs that are involved in this interview process. I work closely with two of the scientist participants through establishing a new community-driven participatory science initiative. I have served on a Diversity, Equity and Inclusion Committee focused on Community Engagement with another scientist. The other two scientists are colleagues who I see a few times a year at SERC wide events. Sharing the same community with the participants allowed me to speak in acronyms and reference other work that we had shared knowledge of. Additionally, interviewing folks who I share a community with likely introduced bias when analyzing data as there may have been themes or concepts that present that I took for granted as I share academic experiences and institutional knowledge.

Three of the participants were women, two were men. All participants were white. Additionally, I am also a white woman. The lack of racial diversity in the scientist that were interviewed is a limitation of this work.

I interviewed six faith leaders, five of which are connected through the ActNow network, three of whom are from the Black Church, specifically Baptist Black Churches. One leader is from an Evangelical Free church, another from a Pentecostal tradition, and one identifies with mystic African beliefs. My choice to primarily interview Black Church leaders was deliberate, aiming to leverage shared cultures, history, training, and ideology for better insight. The Black Church's prominent role in the environmental justice movement, especially in addressing environmental injustices faced by their communities, makes its leaders logical partners when bridging science and faith (Bullard

& Wright, 1990). Given Baltimore's demographic composition, where over 60% of people are Black engaging with this community is crucial (*U.S. Census Bureau QuickFacts*, 2024). Thus, the *Science and Faith* initiative has cultivated relationships with Black faith leaders through Temple X's guidance and network, leading us to ActNow. Faith leaders outside the Black Church were interviewed based on their shared interest and action in environmental stewardship, aligning with the Black Church's legacy and traditions.

The pastors interviewed all work in the city of Baltimore, with most located in central or West Baltimore, and one in east Baltimore. Specifically, the Pentecostal faith leader interviewed serves the Latino community and is located on the east side of Baltimore. This geographic diversity reflects the broad reach of ActNow's influence within Baltimore's various communities.

The alignment among five of the six faith leaders in their views of stewardship is evidenced by their inclusion in a SERC grant related to environmental science and education. This grant allocates up to $30,000 for seven partners, five of whom were faith leaders interviewed, to support environmental restoration actions, with $7,000 specifically designated for partnering with SERC. While engaging in this research was not a condition of partnership with SERC, the shared motivation to build partnerships and interest in the research likely attracted most participants to these interviews.

Of the six faith leaders who were interviewed, five are collaborators in *the Science and Faith* program. The one faith leader who isn't, is an Igbo priestess, a leader in mystic ways of knowing and the only female faith leader interviewed. I met her at an ActNow meeting where she was primarily attending as an environmental educator. Her

unique blend of roles as an educator, faith leader, and professional experience in environmental science made her a valuable contributor to this project. Additionally, her connection to African faith beliefs adds depth to our understanding, highlighting the distinctiveness of the Black Church.

Data Collection Procedures

The interviews were completed one on one, and conducted by me, Rylee Wernoch. I am a 24-year-old woman, currently a master's student in the Geography and Environmental Systems department and a program specialist at SERC. As a master's student at University of Maryland Baltimore County I took a Qualitative Methods course which prepared me to conduct these interviews. The course, taught by Dr. Sarah Chard, trained me on qualitative methods and how to conduct and analyze interviews.

Participants that were scientists were recruited for this study through direct email to their Smithsonian account with the request that they join a one time, 60-minute interview about vocabulary in partnerships. Five participants were invited, and all agreed. Participants were given the choice of completing interviews in person at their office or over Zoom, all chose to meet over Zoom. Participants completed the interviews either from their home, or their office. In one interview a participant was also taking care of her toddler who was sick at home, all other interviewees were alone. Interviews were semi-structured and completed in 45-65 minutes. Interviews with PIs occurred between April 6th and April 17th 2023. Prior to the interview participants were sent the consent form. When joining the Zoom call, I reviewed the written consent form and answered any questions that participants had. I asked my last two participants to rename themselves

participants 4 and 5 respectively and then began recording the calls. Participants 1-3 were manually renamed manually in transcripts.

Participants that were faith leaders were recruited through a variety of in person, online and over the phone solicitations. Several of the faith leaders were part of exploratory, informal conversations throughout collaboration during early 2023 for the *Science and Faith* initiative that informed interview question formation. During these conversations, I asked a few of the faith leaders if they would be interested in participating in formal interviews to delve deeper into these questions around vocabulary in partnerships. In July 2023, partner for the *Science and Faith* project, and community stakeholder with my NSF traineeship, Terris King, communicated with all seven different pastors who received funding through the SERC partnership, to let them know I would be reaching out to interview them for this research. Ultimately only five of those seven participated in interviews. At a Keystone meeting, a project associated with ActNow, on August 2nd 2023, I created a plain language summary, shown in Appendix C, of my research proposal, and asked to find time in the fall to schedule interviews. I followed up with pastors via email, phone calls and reminders via Terris King. Interviews were completed from September 2023-December 2023. Pastors were given the choice of completing interviews on Zoom, or in person at their building. Three pastors chose to complete interviews at their faith spaces, three pastors completed interviews via Zoom.

Calls were saved to my password protected online Smithsonian Zoom server. Zoom provided automatic transcriptions associated with the video and audio recording of the interview. In person interviews were recorded with a audio recorder on my password protected phone, and identified. Using AI I transcribed these interviews. A copy of these

AI generated transcripts from Zoom and phone were uploaded to Nvivo, and reviewed/edited for correctness, often several times in key locations, while I listened to the audio. When cleaning interview transcripts, I coded for different, key vocabulary terms identified, prior to the interview, and noted some themes along the way that I had heard.

Interview Questions

Interview questions were informally piloted with project collaborators for a month prior to the first interviews. Following meetings to develop co-produced research I asked two pastors, one environmental educator and one non-profit director about their interest in research that explores how a variety of stakeholders understand key vocabulary. Overwhelmingly I received feedback that there was interest in this, and that they had felt there were challenges in partnership due to vocabulary. While speaking to a pastor I asked him what he thought that data meant to scientists, and he replied “money.” I was surprised by that answer, because that is not how I thought scientists would understand the word data. Following my own experiences with challenges in interdisciplinary partnerships following misunderstanding language, interest in this question from others and an interesting response from a pastor I decided to proceed with this work.

Prior to the interviews participants were told that they were participating in a study about vocabulary but were not given questions ahead of time. In interviews with scientists, I began by asking the participant to speak generally about any experiences that they have had where language has been notable in a partnership. This was to help participants to begin thinking about how this research might be relevant in their own work, since scientists may not always see language as a central aspect of their work.

Opening interviews with faith leaders, since discussing the importance of language seemed much more central to their work, I often opened interviews with faith leaders asking about their experiences with science or nature, and why they were interested in pursuing a connection now. It is worth noting that all pastors shared times that language was important to them throughout the interview, and all scientists shared the roots of their science identity in the interviews.

I then followed up with 7 terms that I asked them say what the words meant to them, and what they think that the words might mean to others. In the initial question I framed partnerships as interdisciplinary, or within their own communities- scientific or faith. The words that I asked participants to make meaning of for themselves and for others were community, data, ecosystem, ethic, justice, research, and science. Words were listed alphabetically and asked in the same order every time. Throughout each interview I repeatedly framed the questions in a professional setting, saying things like "Tell me what this word means to you as a researcher/faith leader?" or "As a scientist/faith leader what does this word mean to you?" It is worth noting that when I interviewed scientists, I asked them broadly to define terms for "others" and then "faith leaders" for two reasons; one is that I had initially considered including representatives from boundary organizations in this study, and the other was to help provide opportunity for broader definition. When speaking with faith leaders, I only framed the supposition questions as "scientist" since we had decided not to include boundary organizations in this study at that point.

The words to focus on were refined with myself and my research advisors. I created a list of words that I had noticed or experienced causing misunderstandings in

meetings over the last year and a half of project development. I originally had a list of about 10 words, half of which were from the environmental field, and the other half from the faith communities. We selected 3 words from the environmental side (data, science, and research), 3 from the community perspective (community, ethic and justice) and a word that seemed to have special meaning to both groups (ecosystem). Ultimately, we spent between 3-15 minutes discussing each word in each interview. At the end of each interview, I asked participants if there were any words that I should have included on this list that weren't there, or if there was anything else that they would like to add to this interview. Often, the stories that folks opened with were personal stories they wanted to share or contained examples of words that have been particularly of interest in the past. At the end of each interview, I told participants I was not planning to share the transcripts, though they could have a copy if they were interested, but would share back the final report, and future work that is connected to these interviews. I did not share transcripts as I had no requests for them, and participants did not contribute to the findings.

Data Analysis and Findings

It is important to note that I completed interviews with all the scientists before I interviewed pastors. I did this because I wanted to learn how to do interviews with people who I had a stronger prior relationship with, to be more organized and professional when interviewing faith leaders. Following interviews, I was the primary coder of this data and collaborated with my classmates and academic advisors to work through my initial impressions, interview notes and to refine my codebook. Participants were anonymized by numbers; numbers were assigned based on interview order completion. I shared

anonymized transcripts of some scientist interviews with two other classmates in Sociology 619, Autumn Powell and David Avruch to get their thoughts on any themes that they noticed in the interviews with scientists. Through conversations with them I realized that they were interpreting scientists' delayed responses caveated answers as dishonesty. This was inspiration for further coding about worldviews and relationships with uncertainty that scientists have. Additionally, I talked through my interviews with my academic advisors, Dawn Biehler, Alison Cawood and Sarah Chard to formulate my own thoughts and consider how these interviews worked to tell a story.

The codebook was formatted with 20 different codes, 7 of which were identified prior to interviews when choosing which vocabulary to ask participants about, 13 of which were identified during or following interviews. Generally, the codes can be broken into two categories: understanding vocabulary and worldview.

While I had tried to interview two more pastors, data saturation was still reached when specific details of worldview were occurring across interviews of science and faith respectively, and when the way that participants were making meaning of language became consistent across interviews. I also completed a word consistency search with Nvivo to confirm key words match with themes I had identified. While reviewing the data light editing occurred, I noted laughs or smiles by participants. Finally, I chose to include lengthy quotes from all participants, especially from faith leaders, to offer direct evidence for my analysis to readers with specific cognition around my bias and shared demographics with many of the scientists compared to that of the faith leaders.

Key Findings

Understanding Vocabulary

Community

Scientist Participants	"Community" Meaning
1	"I think of it in a biological context. So, I think of it as all of the different **species** that occur within the **geographic region,** right? If I were only thinking about people, it becomes more complicated in my mind because that's a single species right? So-but rather than it just becomes to me the diversity of **different kinds of people that live within a certain geographic area."**
2	"Yeah. I mean, I I think you know I use it for 2 things. It's either the the array of **species living in a particular area** and you know. When we're talking in an ecological context, or you know the community of **people living in an area or interested in a particular topic**. So we- those are probably the the main 2 ways, because it or the you know community of scientists. But that fits into the people. But yeah, I mean, those are the 2 main ways that we use that term."
3	"So if I were sitting at like an ecology meeting, and somebody said community I would be like, oh, you're talking about the collection of organisms in your study system, and you're specifically talking about what the **species** identity are, and the you know, relative abundance of all of those things, and how those you know **vary through space,** or time, or whatever. If I were sitting you know at Stillmeadow or in any kind of meeting with you, and we said community, someone said community, I would think that we're talking about **the people who live in an area that's relevant to a place where we're working.**"
4	"So because I was just thinking about words that I use as a as an animal ecologist that might not translate direct like other scientists might not pick up on like. And and I was thinking, okay, non-plant ecologists, non... like a biogeochemist, might not immediately be intimately familiar with what we mean when we say assemblages, or community structure. Maybe they are. Maybe they will be. But so, you know, community we often use. To you refer to a you know, **a set of a group of interacting species in an area right?** But increasingly we also, and and some of this interdisciplinary work, we use a community obviously to refer to local communities of of

	people in in the areas where we're studying. So, so I use it both ways and and have to kind of make sure that the- that is qualified and and and the specific context. Yeah, so it could be people or groups of animals."
5	"So I think community we're much more likely to use in terms of like microbial community or plant community, right? **So the organisms that are in the environment that I'm looking at."**

When describing what community means to them, researchers discussed organisms with related geographies, and but only one noted that humans with a shared connection also make up community. When discussing scientific understanding of community, researchers often noted species, or a variety of species. They also said that these organisms had shared groupings, either through their geography, time or through grouping by the researcher.

Many of the researchers noted people as a secondary understanding of community that may be used in interdisciplinary meetings. Some participants mentioned how humans are only one species but have diversity in other ways than species. When considering human communities, researchers all noted connection was another important part of community, whether that was geographic, shared interests or grouping by the study.

The main categories relating to community were organisms, either species or people, that are connected, by geography, interest or by researcher.

Scientist Participant	How Scientist Think Others Conceptualize "Community"
1	"So I think it would **refer to the context**… If we're talking about this like science, I would assume that they were talking **about the animals and plants that live within that waterway**. If we were talking about the surrounding **neighborhoods**, then I would assume that they're talking about **the people** who live around those waterways."
2	"You know my assumption is that it is that most people use it more in the second sense of you know, a **community as a a group of people with**

	shared interests or you know, shared shared interest of some kind, or **shared geographic location** or living in…I mean, I I think the community of people sort of with shared interests, if you consider religion an interest, which a faith leader may not agree with. But but yeah, along along those lines, you know, **a community of of people with the same beliefs**."
3	"Sometimes when we say community we mean **the people defined by a space**. Sometimes when we say community, we mean this **people defined by a culture** and so you can kind of slice and dice it in lots of different ways. That's really **context dependent**. The community, at Stillmeadow you know, might be like the people who go to the church, or it could be the neighbors around that it could be like a certain segment of the population like it. Could. It can mean lots of different, different things."
4	"So I don't think they're going to be using it to talk about a group of interacting species in a given area. But I think you know-so the way that we use it as a and and some of these interdisciplinary science pieces is probably different than how I would imagine, and faith leaders would use the word community. I think that it probably has a much... so like we have a we have a paper that's accepted right now where we we talk about the the effects of protected areas on local community, you know, local communities near protected areas and metrics of well-being and all this but we're just, you know, we're using it broadly to define a spatially circumscribed group of people in a in a set of surveys. Right? You know that's that's a very utilitarian use of the word. I think faith leaders are probably using it in a, in a much more and more and more deeper meeting, **where they're talking about people, that are in an area, but it interacts with each other and have, you know, relationships and and and shared culture**. Maybe."
5	"So I think that you think much more about like the human side of that, right like human community and not like we use community for yeah microbes or plants, but they **use it only for humanity**…I think the people I know that are faith leaders use community in 2 different ways, right? So there's the community of like your church or your synagogue, or whatever, they all, those people. And then you also have, that is **a community within a broader community**. Cause often they're trying to do, you're trying to not just be insular, you're trying to reach out beyond that as well. I basically, in terms of work, I never use community that way at all."

Broadly, scientists recognized that other people, specifically faith leaders, are likely to focus their definitions of community on people rather than non-human species. There is some understanding that communities may be defined by shared geography,

interest, culture, belief, or faith. Scientist 5 also notes that there are likely levels of community, from more connected, perhaps within a faith, to others that are less closely connected.

Faith Leader Participants	"Community" Meaning
1	"Well, community for me just starts it starts for me **it starts with the family** because I believe **the family, church, then the community, all really are connected**. And so when I started in the community, I think of people that are family and and church family. It's all family for me. And so we start thinking about community particularly like our church, where our community is one of the things I shared with them about congregations, that my belief is that the Church should be the hub of the community where the things that are beneficial and things that are helpful the things that are enjoyable should spoke out from the church into the community… It doesn't end there if if you have the ministry, space and ability to reach not just a certain neighborhood, as our church would do. But you can reach across the city then, by all means**. Let your church go as far as it can, and the community incorporates everyone.** It's it's not just based on ethnicity, race it's not even based on religion or creed for me, anyway. **It's it's because if people come within your sphere of influence, you offer them what you believe would be best to help** them be successful as well just embraces everyone."
2	"Those people that are not necessarily related to, but **you practically live in a space where your lives are affected by each other**. So community is not necessarily people who share my beliefs, but because we here in this area, their lives are affected and should be impacted by our existence on this planet. Community are those that surround us, community are those that I believe should be impacted by the benefits of the community of this church. So they they are around the location we have. **We are impacted by one another. That's community**."
3	"I think we use community very um general but also um very specific actually to be the church is to be a community of believers and so we use community in a sense of **an identify people that have some type of bond** or characteristic um, commonality. "
4	"When I think of community, I think of community in 3 parts…. So, community for me begins with, as is a personal conversation, **first**

	community of self. And then to the extent that you're able to be that you are a healthy community within yourself, **you can foster healthy relationships** which will allow you to build community, and for me, **community with people outside**."
5	"Community to me is **a group of individuals that relate with one another**. Overcoming their social, religious, ethnic backgrounds, to me that's true community. Not a bunch of people living in a community or neighborhood that don't relate to each other, don't talk to each other, don't see each other."
6	"For the most part, it's one or two things. Its either people that, again, as a pastor, **people you are in cooperation with because of a higher purpose**, and we purposefully gather together and work together, et cetera. And, or um, that happening on a **community on a geographic level**, right? And so, um, community and at that level is tied to neighborhood, and those things are somewhat um, synonymous."

Community for faith leaders is broadly exploring the connection that people have to each other. For some faith leaders, this connection is rooted in who impacts each other, and that makes up community. Pastors 1, 2, 3, 5, and 6 all noted that community is people with some sort of connection to each other, that impacts each other's lives. All these pastors noted that religion can be an important part of this connection, but it is not essential to be in community to share religion.

Pastor 4 began their definition about community starting with oneself, that community begins on an individual level and taking care of self is an essential step towards building community with each other. Pastor 1 noted that for them, community starts with family, and then church and then a broader community. There are some shared ideas about community coming in layers.

Sometimes this connection is geographic in nature, or through faith-based communities. Pastors 1, 2, 5, and 6 noted that geographic connection can mean a shared neighborhood, city, or planet. Though, pastor 5 notes that pure geographic connection is

not enough, there must be relationships that go beyond living in the same neighborhood to make a community.

Pastors primarily discussed community as connections between people, that often share a geographic space that results in people having impacts on each other's lives.

Faith Leader Participant	What faith leader thinks, scientists think about "community"
1	"I think they **come with their bias** about it, you know, whatever area they're going in that is just that that **certain demographic of people**. And for me, you know, I think they think very narrowly and they will start missing other parts of the "community" because they're not bringing in the other people that are that are part of it that are impacted by it. Any change or anything like that, whether it's whether or not it's you know, positive or negative. That people, if they're fair enough part of, let's use the word study of a study or something. And they say, "Okay, we went in and with this community. And we studied this." **But you only studied a certain group of people in that community, and you excluded other people because they didn't fit a certain demographic that you're looking for.** Then you haven't done a complete study. I would say you did a partial study. You might have gotten some good information from it, but it wasn't a complete study. And so I think when people think in a very narrow kind of term. They miss what I consider to be the overall, the broader community."
2	"I think there's **very little difference for the scientists who between population and community**. They think about population-specific **zip, phones, geography, where that population resides**. Then I think we're talking about community. yeah, I think they see the same thing. Really, I don't think there is much difference. **Think the only difference-mainly is the impact piece.** Think when you start talking about impact and how science impacts, I think science looks at and says, you know, "how can we examine?" Not so much impact. But how can we see a community? How do we examine that? What does it mean in terms of our analysis?"

3	NA
4	“I think they're thinking of **the complete opposite of what I'm thinking of**. They are looking at the macrocosm, the community depending on what their their area of expertise is. The conservation biologists is going to look at ecosystems, the health of ecosystems as it pertains to things that are living inside of it and to the extent that the environment is healthy…But both faith leaders and scientists are doing **one thing in common, and that's they're looking at the health of a community when we think community**.”
5	“I think scientists from my perspective, I think scientists are **always looking at the community as a whole**. Scientists have the tendency to focus too much on data. And so generally speaking there's this overview of of collecting information**, strategizing implementation of information and data and whatever strategic stuff without really touching the people**…I think it's like the rookie cop, you know. He he gets hired and he gets a manual and reads the book, and he's gone. Ho! What's gonna happen? Everything like that. And and and I've learned the facts of life, is that books don't cover everything, you know. And it's a fallacy for you to think that you are now stepping in, and you're going to change the world. When at the end of the day it's the world that changes you. And the immense pressures that you get from outside may cause you to succumb to those pressures, or rebel against those pressures.”
6	“I feel like with them (scientists) right (community is) an **observable study case or cases**, that that's what I have that's what I started getting. And I think as we all interacted, that got fine-tuned. I think also, in some cases, it got **changed, um, that they realized that we weren't willing to be test case** or, you know, that kind of thing, and that community meant, if you're going to examine us or work with us or teach us or whatever else, you gotta be with us. Right? Um, one of our guys from Forest Service, he tells the story that Pastor was working with him in the very beginning, and stated to him, you seem to be very comfortable hugging trees, and you you want me to be your conduit it to people**. If you ain't gonna hug people, you ain't gonna be here**, you know, and so, and I didn't even

	necessarily mean physically, but **if you can hug trees, you can hug people.** **And if you are part of a community that includes trees, we demand that you be part of a community that includes people** that are not your peers, right? Neither your subjects, you know, that you're examining, like, with a microscope, that magnifying glass, you know, for ants. No, you're gonna have to come alongside of us. I'm, I'm gonna take a bite of apple. And you can take a bite too. Not so much literally, but we're, we in this together, or we ain't in it at all."

Pastor 1 notes that they think scientists come with too narrow of a definition of community, that they are focused on "demographics" and that can mean they miss the true connections that build a community. Pastor 2 reiterates the demographic focus, noting that they think scientists group demographics with phone numbers, zip codes and geography. Pastor 2 notes that impacts, meaning what the communities will feel or benefit from, as something that scientists do not include in their definitions, while pastors do. Pastor 5 and 6 echoes this by saying that when communities are defined by scientists, this is often to be studied, and they assert that communities are often viewed as the topics of studies. But both pastors 5 and 6 reiterated the importance of scientists working with the people, and being with them, not above or separate from them.

Discussion of "Community"

All groups understand that community means connection. For a community to exist, there needs to be some shared factor that brings individuals together, or relationality. That was described as space, time, neighborhood, city, planet, culture, beliefs, or religion. Faith leaders emphasized humanity in this community, and focused on different aspects of the community, in terms of relationship to self, family, and church

and exploring the different affinities and types of communities. Scientists considered non-human species in their definitions of communities, but most recognized that this inclusion of non-human species is likely unique to their positionality as scientists and that others likely only considered humans in their definitions of community. When considering how scientists might understand the community, several pastors noted that their definitions are likely too narrow. That they focus too much on geography, and previously defined demographics rather than authentic connections and relationships that cannot be quantified by models and studies. Pastors reiterated the importance of scientists developing relationships with people to engage in more rigorous, holistic, ethical, and impactful science.

Data

Scientist Participants	"Data" Meaning
1	"So to me, data is like the individual number or sequences that are **to be analyzed to answer a specific research question.** That is often how I think about it when I consider analyzing data."
2	"You know pieces of **information.** Yeah, I mean it it can be, can be **numbers**, like **measurements** or **weights** or things like that. It can be **photographs** or **videos**, you know. Those are those are probably some of the main, the main things that we would consider data."
3	"Data just means **information** about something that you're working on most broadly. When I talk about my data, the data that I care about are like **anything that I'm storing on a computer**, right? So it could be, which is mostly like physical data. It's mostly like **nutrient concentrations** or the **amount of water**. I've also worked with, I've also worked with social science data before as well. So sometimes I've used data that are like **media** data. Sometimes it's **interview** data or **survey** data, any kind of metadata about that stuff. So again, very context specific."
4	"Data? What is data to me? **Data is information. It's the way to which we can, which we can answer the questions we're interested in.** So it's the it's it's the the **rows of numbers** in a, in a, in a

	spreadsheet from a data science perspective right. Data comes in all kinds of different forms, but it and it comes through all kinds of different instruments and pipelines. It comes from satellites. It comes from the sensors. It comes from eyes on the ground but **it ultimately ends up in R. In a data frame with rows and columns,** you know."
5	"**It's a piece of information that tells you something about whatever it is you're investigating**- Yeah. So I'll say, data is usually numbers it's. You know, the **number of plants** sort of the **weight of plants**, or the **number of carbon molecules**, or like a **pH measurement**, is, you know another kind of data, or the **depth of the water**. The **degree of temperature** or something like that."

In general, researchers understand data as pieces of information that help to investigate something. Sometimes data is framed to do scientific research, others frame it just to make choices, only sometimes referring to science. Most respondents describe the different types of data that they use in their work. This indicates the different types of information that may be considered when thinking about data. Most mention some form of numbers, spreadsheets, and processing within a computer. Scientist 4 mentions that data can come from "eyes on the ground" and scientist 3 refers to social science data, referring to less structured forms of data beyond empirical information.

Scientist Participant	How Scientist Think Others Conceptualize "Data"
1	NA
2	"Thats a good question, I haven't thought about that one too much. Yeah, I mean, hope, hopefully like **information** that's at least information and **potentially information that's been vetted in some way by experts**."
3	"I also don't really know. I think I think this is one of the things where it's like. I'm not sure I could make a good guess, because **I think we don't really know what- how people see systems**. And I've interacted with enough people in my life to know that. And this might also be shaped because I've heard you guys talk about this, too. but I think a lot of times like **even within the sciences like I don't know what someone else's data looks like**. Like. I have no idea what Justin's data is like. I know he uses some spatial data, but I I couldn't tell you like, what what do the numbers represent. I don't know. So, I think, like I I would assume that

	people, I think it's like scientific data broadly, but I'm not sure that I mean, I'm not going to make assumptions that people know what kind of data I'm collecting."
4	"I think, yeah, that's hard for me to answer. I suspect that it's used much more broadly to refer to information. You know **information that's useful for decision making**, you know like "Oh, that that a tough decision, I need more data, you know, to back up this decision." So I don't know. I I would suspect that the average person doesn't think about data from a a data science perspective, you know, as as as a matrix that can be manipulated, and and you know, bended to one's analytical will."
5	"I generally assume that non science folks don't use the word data much at all… I think they're still talking with the same like a **collection of information that describes a particular topic**. I think, in that it's not **necessarily like numbers per say, it could be something a little bit more abstract. It's all information being used to answer a question or to make a point**… I would say you could have data on like you know **how many people are participating** in you know your services versus your other events versus you know how much outreach are you having in the community just to throw in some other words. But **I don't don't know if they would use data in that context** or not. But that's kind of how I could see data being used, I guess."

Scientists generally believe that non-scientists, including faith leaders, see data as a synonym for information. Some think that others view data as information to help inform decision making. However, there seems to be shared uncertainty about what others view as data- most understand that it is not the same number matrix that scientists use, and that it might be more related to people, funding, or events.

Faith Leader Participant	Understanding of "Data"
1	"So, whatever's going on in that community will impact them one way or another, and if they are excluded, then the data that comes back, it becomes skewed. Yeah, I mean, it's **you might get good data back, but it's not complete data, because you're missing a part of the community that should have been a part of the study in the beginning**, and I'm I'm looking at your words and the one thing about data, I know I am talking to scientists, **but it can be manipulated** for that very reason.

	And and we have to be very careful that if we're trying to get to the the bottom line, so to speak, to get the real information that the absolute truth out of study, then we have to make sure we're not doing, **we're not biased in who we study, or who we exclude from the study, or the information that we extract from the study, so that all of the data can be presented**… When you start out with study, they they actually have a thought of what you want to accomplish with this study. And I think sometimes that people want to accomplish what they said right at the beginning this study will discover XY and Z. And they seek to discover it, but if the study starts discovering PQRS. T. It gets pushed aside. **For me, let that data come in because you're researching it.** So it is **not telling the story you wanna tell, tell the full story.** And that's that's what I'm asking, when it comes to data."
2	"**Data comes in two forms that's qualitative, quantitative**. It's it's it's **a measure**. It's as an element is to look at you and decide what individual or group, what findings we come up with for for that particular group. Here's here's the data is, **here's the numbers and or verbiage by which we can measure the results** of a community or a population or a country or beyond… I think the religious community thinks about data, when it when if you were **talk about it's of the is size of membership, if you were to talk about size of giving. And it doesn't call it data**. That's what they talk. Yeah, **they talk specifically about what they're talking about.** They say, how does money got it? How many people came to church? But that is data interesting."
3	"Generally, when you hear data, you think about **numbers**, you think about **quantity**, you think about, you know, taking numbers and information numerically from something someone or somewhere um whether it's **how many people coming to church** it's it's just numbers to the average person data is numbers um to for a pastor when you get to talking data I'm thinking **finances** thinking **money** thinking **membership** um um I'm thinking numbers again related to specific entities whether it's how many desks do you have how much space do you have in your church in terms of volume um. How many people coming in, how much money do you bring in. **Often data is very singular for the average person and for the church**… But for us, data has just always been singular that always how many people we have how much money you're bringing in um but if we could understand the power of data from a scientific standpoint we then can impact change in any area of life that becomes applied science… We use data because, you know, churches are being researched daily about **what topics, with themes, what theologies to preach, why people aren't coming**. We started with a data point that churches now research. But in terms of data for the church in general it's very, very, it's very

	singular. And we don't think about owning data, but we, we are the producers of some of the world's most utilized data, even the black church."
4	"I say, **data data. I cannot make bricks without clay**. So I, data is information. And **no matter what you're doing, if you are not collecting data the efficacy of your work is at stake**. And you need to collect data constantly about your clients, about the community people that you're serving in order for you to be efficient, and that to be efficient in your service as a faith leader. Because some things are rather static. Some when I say static. I mean some truth that we hold. That's, you know, kind of fixed data or data that's given. **But then there's other data that's very, it's constantly changing, that is an open, living document.** Which are, you know, the people that we serve, and we need to update that constantly to be efficient in our service to others as faith leaders."
5	"Decept- **deception** is the quick answer. I think that we..I.. know for a fact that **we can collect data and manipulate it to fit our agenda**. It. It it is easy. Data is good. Don't get me wrong. Data is good. But if you don't analyze it with an open mind and you have an agenda, and the questions that you're asking are leading towards your agenda. Are you really getting clear, transparent information? Or are you setting yourself up so data, you know 75% of the people in Baltimore think that the kids, you know the kids need to go to jail, lock em up, throw away the key, and get rid of them. Well, what was the question that you asked before? So to me, **data is is, is is to a certain degree it's dangerous because people in power can use that for their own personal goals.**"
6	"Ha ha ha. The infamous data. Um, it's fun one to get into I-I think of **data as information, intelligence and results** what do you mean when you say results I mean something has been being done something has been being studied something is being you know examined, and the the I wanna know, in fact**, I may start using this word the results. I wanna know the results.** I don't just wanna, you were hinting at this near our beginning, but, you know, I, you know, for me, I loosely use the word, but I'm probably always meaning. We just did big stuff. We examined something, um, we were, you know, researching stuff and in the context of scientists and us, and **we were doing it here, and you got permission to do it here, and the only reason you want to do it here is because there's some value in doing it here.** And so, um, my irritation, almost with the word is that I really, and I hope this is helpful, I realize I really, almost always, **by the time I'm using that word (data), is because I'm offended**, because I came into relationship with you, or with whoever, right? With right? And they seem to be intelligent, right? **And why would they think that they can come on our property, or they can interview our people, or they can dig in our dirt as strangers** and not naturally- didn't- honestly, a colloquialism, **Didn't your mama teach you any manners, right?**

	We invited you to our table. Um, you ate, sat back, burped, and put up a cigar and then left. You're not gonna go in the kitchen and tell my mother how wonderful the food was? You're not gonna sit and talk with us or something. Do you understand what I am saying? And so it's at that level of offensiveness for me, um. And so I think that's what I wanna finish- I wanna finish the conversation. **That's what data is to me. I wanna finish the conversation. I wanna finish the relationship. I wanna finish the evening.** You can't just come in here, eat my pork chops and just walk back out. There's a rhythm to all of this, right? We're having coffee afterwards. We're we're talking about stuff that maybe we don't usually talk about, because we have a different set of people. Um**, we're not feeding you- we're entertaining you, we're relating to you. And so to just grab a sandwich and go, that's what, that's, I think, why the word data.** And I thank you for this process, because it's really helped me really refine. **Why kind of get so upset? It's like because they came, they ate and ran…** You wanna talk to my kids, or as a pastor, you wanna talk to our people, whatever else. Um, are you respectful of this? Are you honoring this? Um. **And is your insensitivity just not incompetence, but maybe, um, culturally incompetent or communicatively incompetent**, um. And what I found out is, most of the time, that's what it is."

For some faith leaders, data means information, for many data is also inseparable from deception, extraction, and a legacy of broken trust. This is noted in pastor 6's opening reference, calling it "infamous data." Pastors 1,2, 3, 4, 6 reference data in relation to results, as something that can be informative, as a measure, to show results, to remain responsive to needs and goals in the work that you're doing. Several of the pastors note that the word data is not something that is often used in faith-based communities, rather people typically refer to the metric that they are discussing. Across examples and definitions, and explicitly by Pastor 2, data is understood as both qualitative and quantitative. Several pastors mention membership, money, or theology as different forms

of data that faith-based communities regularly consider. Pastor 4 expands upon the importance of ephemeral data compared to consistent information, noting the importance of maintaining a working understanding of how data about a community may change, and the duties that faith leaders have, to be responsive to that.

When asked to define what data means to them, half of the pastors associated data with deception of manipulation. Pastor 5 began their interview by saying that data is deception. Pastor 1 reiterated in several ways the importance of designing studies to produce data that truly represents the community. And Pastor 6 noted that by the time they are bringing up the word data with environmental partners, they are already upset about lack of transparency with results.

Faith Leader Participant	How Faith Leaders Think Scientists Conceptualize "Data"
1	"I believe majority of them, and including myself. You **just want to get to the bottom line of do the right thing**. Do the right thing. And and you know, I'll swing this all the way back to data. You know, if the data's telling you something. then **let that truth come out instead of hiding it.** If not, what you're doing, start losing its credibility to a certain extent. Because you're not telling me the whole truth, you know, I don't know if you yeah, I've been around people that say, **"You don't have a need to know."** I'm sure you've heard that term at least. **Yes, I do.** Is the truth, What's wrong? Why, why hide the truth. And and so when, when when people find out that something has been done and a part of the truth has been hidden and and then go back to the other word I use data is being skewed to to say just one thing. Then they feel like things are unethical, and so you need to have that ethic there where you're always gonna present the full story. Give me the, tell me, tell me, tell me I can handle it, **I can handle it. And if I can't, I'm sure you, being the scientist, you can help us handle it.** And that. So that yeah, that's that's the big thing. Just do the right thing. Tell the absolute truth. Tell the full story."

2	"**Data comes in two forms that's qualitative, quantitative**. It's it's it's a measure. It's as an element is to look at you and decide what individual or group, what findings we come up with for for that particular group. Here's here's the data is, **here's the numbers and or verbiage by which we can measure the results** of a community or a population or a country or beyond… **"Yeah, would you say, it's the same for researchers?"** "**Yeah** (inaudible)."
3	"But when you talk scientifically, data isn't just numbers, but **data is impact, data takes on this duality form**. Data actually, um, for scientists, has always been a a **part of the profit margin** in the bottom line is that when you can get data you **have greater proof to verify whatever you're claiming."**
4	"They're not making, **they're not doing any inference**. If they're good at what they do, they're not doing any inferring they make-they're using the scientific process, and it's very, very clean. Step by step, and they so that they can just **be as objective as possible, as unbiased as possible, and collect what they see**. A good scientist is going to do that. Yeah, just observe and collect the data, because at that point in the scientific process, you're not, you know, you're not making any conclusions. Just collecting the data. That's it. **So that's the part where we are the most honest.** That's all. You will often tell, **hear that that scientists say when they're arguing in peer review, just show me the data because the data is unbiased.**"
5	"I think scientists from my perspective, I think scientists are always looking at the community as a whole. **Scientists have the tendency to focus too much on data**. And so, generally speaking, there's this overview of of collecting information. **Strategizing, implementation of information and data and whatever strategic stuff without really touching the people.**"
6	"**Scientists don't think they have anything to actually learn from other people, unless it is data.** Maybe there needs to be more discussion and training, not about whether and how and the purity of the data, but the **purity of the permission and the relationship related to acquiring data**. Cold, hard facts and results that I and my institution, or whatever need. They do not think that data has multiple elements, size, sides to it. **They think data means my book, my paper**, um. And they don't think of data- they **don't even imagine that data and the accumulation of it can be a conduit to other worlds, other people, other relationships**. They don't think that the gathering of data in and of itself, rightly, can be another data point."

Most pastors recognized data as a central component to the work of scientists, and while several noted the aimed objectivity of data in science, there was concern about the manipulation of data in nefarious ways, and data as a barrier to authentic relationships. Pastors 1, 2, and 4 note their view that scientists engage with data in an attempt to be objective. Only half of the respondents noted that they think scientists think about data as a way to try to objectively evaluate the world.

Many pastors noted their view on scientists' approach to data. Pastors 5 and 6 shared that they think scientists use data as a barrier to building authentic relationships with people and communities. Pastor 1 implied that they viewed scientists as not always being transparent with their data by reiterating the importance of sharing all the information. Additionally, pastor 3 noted as data as central to the profit margin of science.

Discussion of "Data"

Unlike other words, all scientists and faith leaders had clear ideas, opinions, and thoughts on the word data. Data evoked some of the longest, and most detailed responses. While every scientist responded saying that data is pieces of information that help with investigation, only half of the pastors noted this pursuit of information and objectivity as a way that scientists think about data. It is imperative that the goals, and intentions with data are outlined at the onset of partnerships between science and faith communities- since data is essential to answering scientific questions, but is viewed with skepticism at best, and intentional deception at worst, by many faith leaders.

Defining what data means in specific instances is important to building trust in science and faith partnerships. Scientists noted that for them, data can look like anything

from temperature measurements to photographs- and is often anything that they are analyzing to find truth. They also noted that there is high variability across scientists and projects about what the data looks like. Scientist 5 shared that they don't think pastors often think about data in the way this same way, and that is confirmed by pastor 3. Generally, pastors think about data relating to numbers of people associated with the church, or finances- not data that lives in a matrix the way that many of the scientists described.

Additionally, it is important to note that the way data is defined can and should be a collaborative practice in science and faith initiatives. Several pastors noted that they view data as a way for scientists to separate themselves from the people or spaces that they are studying. Pastor 1 also noted that the way that scientists define their parameters of data is often not reflective of what is happening in the community. Having conversations early in collaborations about what real-world change the partnership is hoping to affect, then considering what sorts of specific data are needed to meet this change could combat this. Involving pastors, will help to ensure the scientific parameters are more reflective of reality, and provides opportunities to consider how scientific data could support the ephemeral data that faith leaders must be in tune with to best serve their communities. Additionally, having early conversations about the life cycle of data, how it will be stored, who is using it, how it may be used, is an important step towards building trust between partners. When in partnership, it is likely valuable to refer specifically to the types of data that partners are referring to, whether that's members of the church, or pH of the soil, to increase clarity and transparency of the work.

Ecosystem

Scientist Participant	"Ecosystem" Meaning
1	"So actually this is funny, but like in a job interview for my PI position, one of the biogeochemists asked me what parasite impacts were on ecosystems, and to me **an ecosystem is the community and the abiotic factors that influence it**. So if you change any of those you're having an ecosystem level impact. He didn't further explain himself in that interview, but I could tell that I was not answering his definition of an ecosystem. But it didn't seem like an appropriate time to say like, "what is an ecosystem to you," right? Well, then, I reached out to someone else who was a chemist, who then described this to me, and I went. "Oh, My gosh, that's what they were talking about!" because in the chemistry world ecosystem change is when you change how chemicals flow. through an environment. And I went. "Oh, so you're completely excluding all biology from your definition of an ecosystem."
2	"I I typically think of it (ecosystem) in the **environmental context of yeah, we'll say like a habitat or a group of habitats.** So like, things like sea grasses, or oysters, or mining groups, or trees, or grasses, or whatever, and **all of the species that live there and sort of all of the physical forcing that happens** from light to temperature to water flow, and how salty it is, and all those kinds of things, biotic and and abiotic matter and processes going on within. You know **some defined system that can be relatively small or could be big**, but that's the not so short definition that that I tend to to think of it, as you know. But while being aware that it it sort of that, it has other broader meanings, you know, like within a financial ecosystem or you know, whatever where you're you're sort of meeting the institutions and people and the ways they interact."
3	"I use an ecosystem in a in a very kind of textbook ecology way, which is to say that it's the kind of **interacting biological and abiotic components of a space that is defined by a researcher**. So it could be a little, little tiny thing, or it could be the whole entire globe."
4	"Well, I mean that, yeah, I mean, the the textbook kind of definition is is a collection of of is the the **abiotic, and biotic components of the system that are in an area in a given area.** So you know, that's that includes the, yeah native plants and and animals of a given system, you know, like a a forest ecosystem. Here we have, you know, kind of an oak hickory I think, dominant forest ecosystem, and then they're all the you know that's depended on the soil conditions and the topography, and and the native animals that are associated with that floristic assemblage."

5	"**A bunch of interconnected pieces of the world at all fit together**? But, like I would think the system in like a natural world, right? So your like **plants and animals and water and soil altogether**."

When discussing what an ecosystem is, consistent ideas included biotic and abiotic factors as well as shared spaces. What constituted a connecting space was defined by the researcher and could be a "little, tiny thing or it could be the whole entire globe" as noted by scientist 3. Additionally, scientist 1 noted that their definition of an ecosystem, as a biologist, was not the same chemists and this caused miscommunication since neither of them asked for clarification during a previous interview, only afterward. It is also noteworthy that compared to shared understandings of community, ecosystems included abiotic factors while community did not.

When scientists are talking about ecosystems, they are specifically including abiotic factors. It is also important to note that researchers understand that ecosystem may be used as a metaphor by others, as shared by Participant 2, or with less specific bounds as noted by Participant 5. When communicating about ecosystems among scientists, it may be fruitful to clarify when speaking about a specific set of biotic, abiotic, and geographic features, or more broadly about things and their connectedness to each other.

Scientist Participant	How Scientists Think Others Conceptualize "Ecosystem"
1	"I suspect, and I have never actually explicitly asked this. But I'm going to suspect that when most people think of the ecosystem they think of, by and large**, they think of what scientists refer to as communities**, so they're **not thinking about nutrients and like changes in abiotic factors**. They're thinking about the stuff, that that when we communicate science is just the (air quotes) "cooler" part of science almost, and and the things that are just easier for them to see and hold, and you know, participate in that's that's what I suspect people mean when they refer to as an ecosystem."

2	"I mean. I I think it's **it's kind of one of the jargon words that I try not to use, and I define it if I use it like in a presentation**… I try to be really sensitive about words that only like environmental scientists would use. I mean more broadly, only scientists would use, you know. But but ecosystem is one that **if you're not in environmental science, you probably don't use it the way we use it**. So I you know I try to avoid that or define it when possible… **I assume they would be thinking about, yeah, like their congregation**, or whatever the term they use for that, but also their you know, there the sort of larger organization outside of their particular, you know church or synagogue, **or whatever the other sort of regional network** of those. As you kind of go up the the hierarchy of various religious structures. Yeah, that's I imagine that would be one way they they might use it. But also possibly their sort of their churches and congregations world **within their their broader community** of yeah people who may or may not be of the same religion, you know, I can imagine it being used in a couple of different ways."
3	"So this is one of those other words, it's like kind of gotten taken into like the the broader English language, and so people do use it as kind of like. Oh, yeah, the ecosystem of blah blah blah, which just means like **the entire space of a of a thing and kind of like how it works and often includes**, like, maybe maybe things that would be more (airquotes) "accurately" defined as like as like **culture**, like, like we could talk about like the ecosystem of SERC, which is kind of like how the system works, including kind of like cultural things within it. That's how I think it's usually used. But I haven't actually looked up how it's **used as like a "Good ol' English Word."** I just know that I've heard people use it that way… And the other thing, I guess it's important to note is that **some people include people within ecosystems, and some people do not.** And so I think that's something we have to be explicit about. "Do you include people?" **"**It depends on my question. They're always kind of indirectly involved, at the very least, if not directly involved, but often directly involved."
4	"**I think a lot of people would use it in a similar way that scientists use it**. I think it's a pretty, you know, I mean. I think we we learn more or less what an ecosystem is pretty early on in, and you know, in primary- high school, maybe, if not earlier. So I I don't think it's a concept that's necessarily yeah, super is, **I don't think it's restricted to the the halls of Academia**, **and it's kind of in general about how people understand what an ecosystem is.** But I think you know that that's another word that has more broader meaning, more colloquial meaning in terms of you know, there's people use the term information ecosystem. They use. **They apply it to kind of non-ecological** and non-ecological **settings**.

	So faith leader to an ecosystem? Yeah, I don't. I don't like I. It's hard for me to answer that question other than to suspect that a lot of folks would just use it in a similar way… think there's probably a general sense that the it's you know **referring to a large natural system or semi-natural system, where there's interactions among the the components of that system, I don't think people are probably generally referring to the flows of of of energy through that system or the the the cycling of nutrients.**"
5	"Oh, yeah, I mean, I think I could go either way, **I think if it's if it's literal again, it would still be the kind of like environmental side of it**, but in terms of like it's not quite even metaphorical, but, like **you can also use it for anything that are connected and depend on each other** right like that's the key part of the ecosystem that **all the pieces are intertwined, and if you adjust one, the other ones are going to have a response** so like I mean I'm pretty sure. I've heard, you know, like **funding ecosystems** right like when you're talking about, you know, trying to find money for your nonprofit or whatnot."

All of the scientists think that nonscientists, including faith leaders, interpret the word ecosystem in two ways: either in an environmental setting or a social setting. Scientists 3 and 4 note that they feel the word ecosystem is accessible to non-scientists. Scientist 4 shares that it is a word introduced early in education scientist 3 says that it is a "Good ol' English word." Before this statement, scientist 4 explained that "Good ol' English Words" tend to be those that can cause the most issues when communicating, because they are words that have specific technical meaning but can be interpreted as colloquial, so the point of the speaker may not get across. This sentiment of concern about the full meaning of the word "ecosystem" getting lost in interdisciplinary communication is echoed by scientist 2, who notes that they begin talks by defining ecosystem, since they have experienced it is a concept that is not understood universally across audiences.

Several of the scientists share that the non-scientific definitions of ecosystem likely include culture, people, and funding in ways that the scientific definition does not.

And likely excludes abiotic factors like nutrients and flows of energy that are included in scientific definitions.

Faith Leader Participants	"Ecosystem" Meaning
1	"I'll just take from the **church congregation perspective** that that's that's **an ecosystem within itself among many ecosystems.** So the church itself is one place where people are, they're developed, they are nurtured. And then, you know, you have **schools that Ill consider that to be another ecosystem.** If people learn, and so forth, and gain understanding of things and become whoever they are, because that helps them to become whoever they want to become. And I go back, as I was saying, about community, they have their family, so all of these things have different influences into people's lives. And so **when it comes to the ecosystem of nature, for some people that doesn't influence them in any way, shape or form.** They they see trees outside, and they just say, "Oh, that's a tree." They they know it's a tree, and they kinda keep it moving. But they don't understand the importance of the tree, or maybe the vine that's trying to grow up the tree and what it can do to it because it's it's not important to them. **So within our ecosystem, we we know that we have certain influence over people's lives**, and then and then they move on to the next ecosystem, and at that next space they get influenced."
2	"Ecosystem, so to me is **the environment that you're working with, all inclusive partners, and programs**. For example, **there's a healthcare ecosystem**. **Part of my goal is to ensure the we make the church as hubs and recognized part of the healthcare ecosystem** that that scientists and and doctors and CEOs of health care systems need to get the fact that we are a major factor in looking at the health care ecosystem period. They gotta consider health care does not take place, health issues within our hospital alone. That much of this happens when you leave the hospital. And so the church, as a recognized part of being able to influence the the the actions that you take that affect chronic diseases, when you leave that hospital are critical to the healthcare ecosystem. But they are just coming to grips with that. Yeah, they're just starting to understand."
3	"It's **not just the environment, but it's the inner working of the environment, the atmosphere, the animals the existence of it all working functioning. Humans are part of the ecosystem**, animals are part of the ecosystem**. Our houses are part of the ecosystem. Anything that affects just the overall existence of all living organisms is a part**

	of the ecosystem system um were fascinated and study **the ecosystem of the Black Church and that it um that intersects science and intersects government and intersects education and higher**. That is built into the framework of the Black Church and **one might contend that the ecosystem of the Black Church has impacted anything we consider Black**. Anything that can be considered Black is a by product of the Black Church ecosystem. **Black Baltimore, is what it is because of the ecosystem of the Black Church.** Actually, you're sitting, as I said before, at one of the key, at the, at the keystone of the Black Church ecosystem in Baltimore, founded in 1856 by Black people for Black people, and with the people of this church have moved you when and where they move, you can follow the social migration and progression of Black people in Baltimore."
4	"Oh, I would say, that's **the same for me as community**, because but instead of it being but the community of self **I think of the ecosystem of my body** like because there it isn't, **it is its own ecosystem, in a way**. And so I think of all of the things that that allow it to do what it does every day without me thinking about it. So I think about that and what I think that ecosystem for scientists begins with things that are outside, not things that are inside. I have to. I would say that for the faith leader we're always with **ecosystem would have to has to start within yourself your physical body, your spiritual body, your emotional body** your concept of spiritual guides in your home, even if if it as an extension. If there is an extension from the body or from the or the body, the body of spirit, that you are the community of spirit, that you're a part of the your home becomes the ecosystem that you invite spirit to be with in your, to be in with you so definitely your body definitely the home, but for a faith leader, unless they have a particular assigned background. Not so much outside."
5	"No, we we don't. **We don't use it (ecosystem)**.And again, I wear many hats. So if I am mostly dealing, it could be with business folk, it could be, you know, administratively, with other people outside of the church. Yes. in the church rarely. And I'm talking to you black, brown, white, whatever in the church that's **not really a conversation or a word that comes up**, maybe in an Anglo church, maybe. but it's not a **it's not a word that we we use in our vocabulary**, **unless, again, I'm in a meeting with some CEO or some other folk from other places that that we talk about that."**
6	"Ecosystems means to me, um, this **this strata, that everything, everything connected at one level, is ultimately collected at a multitude of levels.** Um, so it goes up and down and it goes around. That's how I think of it, right? Um, I like the visual. And so, you know, in the back of my head, I wanna just go ahead and yell out, **there's ecosystems to me, is sort of like a it's community is, is, is a form of community**."

For many faith leaders, ecosystem is a word that holds similar meaning to community in referring to connections between things, but also includes non-human aspects of the world as well. Pastors 4 and 6 specifically note the connection between the words community and ecosystem for them. Pastors 1, 2, 3 and 6 share that, a central component of ecosystem is people, animals, plants, and spaces having impact on and connection to the things around them. Pastor 1 reiterates similar themes from their response about community, noting that ecosystems have layers, and can be connected but not the same.

Pastors 2 and 3 explore the ecosystems of healthcare and the Black Church- both systems that relate to nature and well-being. It is noteworthy that pastor 5 shared that they do not use the word ecosystem, unless in a meeting with partners who are not part of their faith community.

Faith Leader Participants	How Faith Leaders Think Scientists Conceptualize "Ecosystem"
1	NA
2	"**I really don't know in terms of an environmental scientist**, I guess what they would look at is all whats **inclusive from policy to impact within an environment.** And from **those who are impacted**, to those who decide the **rules that could reduce the negative impact** or increase the positive impact to those that are behind the causes that results in the impact." "What are tangible parts of impact?" "My water."
3	"They're talking about just **the overall functionality and framework of entities that play a role in, in the existence, even the self-determining aspects of nature**."
4	"**So I think about that and what I think that ecosystem for scientists begins with things that are outside, not things that are inside**. I have to. I would say that for the faith leader we're always with ecosystem would have to has to start within yourself your physical body, your spiritual body, your emotional body."

5	"Well, they could be I **I'm not clear and maybe what they mean (when they use the word ecosystem).** You know**. I'm not sure if it has to do with, you know, with water, with air pollution**. This that I'm not.I'm not quite sure where they're coming from, **depending on the context of their conversation of their sentences then I can package that and understand** where they're coming from. I think that when it comes to speaking to faith base when it comes to speaking to inner city folk. And especially those that don't have let's just say in education because their lives have been a survival mode and not advancement mode. **You need to simplify that, even though that's not a complicated word. But maybe you can, you can use another word.**"
6	"I think it only has a scientific research study definition for them in terms of how they've come at things with us. So that is, it is a **strict, there's no synonyms, you know, like community, et cetera. It is strictly scientific, um, it is to be managed and even manipulated**."

Many of the faith leaders think that scientists conceptualize ecosystem as broadly related to the environment. Beyond that, there does not seem to be much consensus. Pastor 5 notes that they would like another word to be used instead of ecosystem, because of the lack of clarity about what that means. Pastor 2 begins their response by saying that they really don't know what scientists mean, and then give a broad definition from policy to implementation, Pastor 3 notes that they think ecosystem when used by a scientist it refers to nature broadly. Pastor 4 notes that scientists are referring to systems that begin outside the body, and pastor 6 understands ecosystems in the view of scientists as something that scientists want to "manage" and "manipulate."

Discussion of "Ecosystem"

Ecosystem elicited a less emotional response from faith leaders than data did, though it did not show a shared understanding of what ecosystem meant to faith leaders. Broadly, ecosystem was understood by pastors as human and non-human entities that

have a connection and impact each other. Though it is noteworthy that two pastors were unsure of what the word meant to scientists, and one specifically asked that ecosystem is not used when speaking with the public to reduce barriers to understanding what they are referencing.

These divergent understandings of ecosystem were anticipated by scientist 2, who shared that they always define ecosystem when presenting because of lack of shared understanding of the word. In fact, scientist 1 tells a story of when they were being hired at SERC, they were asked to discuss what an ecosystem meant to them and could tell that they did not define it the way that the interviewer had anticipated. Upon follow up after the interview, the scientist realized that there were differences in the ecological definition they provided and chemical definition that the interviewer expected. Broadly, however, there is a shared understanding among scientists that ecosystems include biotic, and abiotic factors that impact each other.

These interviews serve as a reminder that ecosystem is a word which should be defined or avoided. The variability across scientific disciplines, and lack of shared colloquial understanding beyond living, and non-living factors impacting each other, not much information is collectively understood about ecosystem.

Ethic

It is important to note that I had specifically asked about ethic, in the singular. This is because this I had heard the phrase used in the singular, on many occasions, by a pastor that works closely with the *Science and Faith* project. Participants sometimes addressed the singular ethic, but often interpreted the question as ethics, plural, and other times referring to ethical.

Scientist Participants	Ethic(s) Meaning
1	"Well. That's all like I have to admit I have not really even thought about that. I guess to me personally. I **I think of ethics and morals really combined**. So it's like, if, like **behaving ethically would be behaving like in a morally appropriate way**. So like being on the up and up doing something that yeah, is morally correct, I guess if that makes sense…Yeah, I definitely think that there is that there are ethical aspects of things that are also like, you know, I mean because it- to me ethics goes beyond like legality, right? I mean, I think that that if you're how do I put this ethics and legality are lines. But then ethics goes beyond that. And so, for instance, that, like in in a **professional setting, this would be the ethics of whether or not somebody should be on the paper**. Right? I'm not going to go to jail if I don't add all the people who belong on a scientific publication. **But to me there is an ethical obligation to making sure that people get credit for the work that they do,** and making sure that all the individuals who met a certain threshold for participation, and that that threshold is explained and understood by everyone; so that if you go above it that you are then offered authorship on a particular paper. That's where like that would be. One example, I think of where I consider like the ethics and what I do."
2	"Yeah. yeah, I mean I in the...on the day to day side. I guess we think about it **(ethics) in terms of animal care** and, you know, have to write formal policies, at least for things with the backbone. And then I, you know, I think we we sort of think about it from like a a research ethics standpoint of, you know, **not making up data.** You know, analyzing things, you know, analyzing your data and interpreting it in in good faith. Yeah, some some of those kinds of things. **And then you know, there's like the some of the broader, broader cultural contexts that can be sort of related to conservation or or animal care beyond sort of the specific procedures of you know, are we.. is.. is the is the research that we're doing of.** You know, if we're if we're doing something where we need to to interact directly with animals, is that is that research valuable enough and and justified..justifiable is a… in creating information that will help that species. Or you know the ecosystem or community more broadly, even though those individuals are being interacted with or harmed. But you know, sort of the those kind of high, level, high level ethics related to yeah animals, but also, you know, communities of **fishermen or conservationists, or you know fishery managers, you know, trying to to balance sort of the different perspectives and needs, and and respecting the the different groups of people that we work with and their interests and things**."

3	"(long pause) So I it's so funny. I don't think of like ethic a lot specifically, but, like other versions of that word. So, like ethic as a noun. So I think of ethic as like-the like, **the right way** do- so like the ethic of of doing something would be like how you approach **doing things in a good way, in a right way, but in in a right not being like technically correct, but like morally kind of correct.** And so like, when I think about ethics in research, there's like different scales of it, right? So there is, you know **you don't fake your data.** You like are honest about the quality of your data and gaps in your data and limitations of your data. So there's like kind of just like core- not being a bad scientist of ethic. And then I think there's a broader, a broader context. Which is that you know it's really special, and it's a **real privilege to be a scientist**, especially like a Federal scientist. But I think that's just bananas that, like you know, taxpayers are paying my salary. And even even before I was a Federal scientist, right, I was getting money from the National Science Foundation (NSF), and so taxpayers were paying for my research, and even before I had NSF money it was like taxpayers of Idaho were paying state taxes that funded my salary, and also my research. And so I think that creates **a real obligation to do work that's meaningful,** which is hard to do sometimes, because then it's that it creates this real tension with like- the beans that we have to produce in terms of papers and money and stuff. Because those are necessarily that's not necessarily the research that, like provides the greatest good for society."
4	"I would say initially, **our main ethical concern is how are we going to sample these wild animals?** And if we have to handle them if we have to do some experiment and you know, thinking about the ethical treatment of animals and their well-being and and...Steer away from protocols that are going to require manipulating animals right? And it's just like that's my personal preference, you know, the further along I go in my career. But you know there there is where we consider ethics a lot like the how we're using organisms, especially vertebrates in research. More recently, as I've gotten into some of these interdisciplinary studies around conservation interventions, there were in in including social scientists and social surveys. You know it…my kind of ethical considerations around our research approaches is broadened considerably, and and I think a lot more about- okay. Well, we need to make sure that we're not doing, you know, kind of this colonial science approach where we we parachute in and and do these studies, but that we have, you know, folks from these areas involved in the in the research process so that **there's there's you know, perspectives from these communities, and there's more inclusivity in the the research process, you know.**

	But even before that, you know, there's you know. I guess there's you know. I I think, that they tried to think, from a **ethical perspective about the research teams that we build, to make sure that there's diversity and inclusion amongst in those research teams.** But you know, especially in thinking about working with local community members, you know. I think that's and I think that's that's a place where your ethics coming to play very heavily."
5	"**It (ethic) means doing the right thing.** So like in my work in terms of like, you know, you have to actually, **whatever your data says, that's what we need to do** right. So thinking about that, it **basically means being a good person, not because breaking societal rules... like you do, have to be ethical in science. But it's not a word I think about it.** No."

When discussing ethic(s) there were consistent mentions of concerns about animal wellbeing, honesty about data, morals, the responsibility of science to society, and inclusivity. Many of the participants initially responded connecting ethics to morals, and the interest in doing the "right thing." Often scientists provided examples of doing the right thing in their work by treating animals well and being honest about data. Scientist 1 also noted the ethics of properly crediting work on academic papers as an ethical concern. Researchers prioritize using limited contact and least invasive practices when interacting with wildlife to adhere to ethical standards. Less frequently participants responded about the responsibility of science to society, scientist 3 noted that they were interested in the science that could do the most good for society. Participants 2 and 4 consider the people that their research impacts, and how their work might impact others' lives. Inclusivity is another concept that was considered with ethic(s), internally when making staff decisions and externally when thinking about who their science serves.

Scientist Participant	How Scientists Think Others Conceptualize "Ethic(s)"
1	"That's a good question. **I bet there is a I, that there's a religious component to what they consider ethical right**. So, and I I will caveat this by saying that i'm a practicing Methodist, so that is an aspect of things that I do consider in my, you know, personal and professional life. And so

	I I suspect that then ethics would go, you know what what you believe. That is the right thing to do based on your Christian value, right? And and I say that also, realizing that "Christian values" vary right when you just say like, **"What would Jesus do?"** That is interpreted differently across different religions. So I think that you know that that could vary even based on, upon what faith you were describing. But that there is a a an ethics to that, and **following those values in the way that you think is most appropriate**. Yeah. I think that's a good, that's a good one, because I I don't know. I think about scientific ethics and ethics in my work. But how that like would be described more broadly, I yeah, I've not thought about that."
2	"Yeah, I mean, I I imagine, in different ways. Also, I mean, certainly, in a way that that's sort of the **the code of ethics that their particular religion** adheres to and espouses as an adhere to which can vary greatly. (Long Pause) Yeah. I mean, I I would imagine that **a lot of their their use of ethic is sort of founded in that for the for the particular religion and sort of expands out from that."**
3	"Yeah, I don't know. I mean like, **I can imagine someone saying, you know, like you know, within the Christian ethic, you know we try to blah blah blah, but I don't know what those things would actually be**. I I've spent very little time in church spaces or any kind of religious spaces, so I don't I don't I don't I don't know I would I would guess that it kind of **alliance generally with this idea of kind of the kind of rules of how you do things, yeah, in in a right way**."
4	"But I would assume that they absolutely-Yeah, because yes, I would assume that they they are, it. **it (ethic) means something different (to faith leaders). What exactly I don't know**, but I would assume that it means, you know, something less related to how one does research, you know, but more to their experience and their focus, but i'd say I would assume that more broadly. It also has to do with, you know the you know the **effects of our actions as as individuals, and as as organized as entities** of of groups of individuals. How those actions effect you know people within that community and outside, I mean."
5	"I think, more broad, or again, the like **doing the right thing, but a more broader aspect of it right.** Like, all kind of portions of their life. I also can see faith leaders like, **ethics coming up more often, I guess, than science, which is interesting, because, like you do, have to be ethical in science. But it's not a word I think about it.** No."

Generally, scientists think that ethic(s) for faith leaders is tied to their religious beliefs and are much broader than their own definitions of ethic. There seems to be a shared lack of understanding of what ethic(s) means to faith leaders beyond this.

Scientists 1, 3, 4 and 5 all think that ethic(s) relate to actions for faith leaders. Scientist 5 notes that they believe that ethics come up as a concept more often for faith leaders, than for scientists.

Faith Leader Participant	Ethic(s) Meaning
1	"I believe majority of them, and including myself. **You just want to get to the bottom line of do the right thing do the right thing**…."
2	"I think **ethic, as the root of ethics**. Ethics has to do with **"Am I doing the right thing for the right reason? Is it ethical? Is it right? Is it positive? Does it have a positive impact at the end of the day? Is it an ethical process?**" Ethics are are the right... **It's about motivation**. **It's about intent**. It's about even when you see something during the course a process that may not carry with it the right impact -your version, my version of impact, not how often is cited, **then my ethic causes me to make a change. So for you others that ethics drive action and your your ethics.**"
3	"I think we all should have a similar ethic which is **to do what is best by by everyone to do what is right by everyone."** "How do you know what that is?" "I think that ties into um this idea **of doing what does not infringe upon the humanity and existence of others** and when it does infringe upon the freedom to self-determine and to exist and be what you wanna be that's when, justice comes in. And so justice says, "I have to do, I gotta do this balancing act," but ethic says that "**I consider what my goal is, and that it doesn't infringe the good of others so this set of principles and practices that are mindful of of all who all and everything that exists.**" And that's what what what ethic is….**The ethic of the Black Church is doing what's right for people regardless of the institutional systems and I think when you work within the system and for a very various agencies, you don't have a choice to do that.**"
4	"oh, ETHICS ethics. Well, that's a big big one…Ethics are the **your governing, your governing principles for yourself in dealing with yourself, and in dealing with others.** The principles that you, the standards that you hold true, the principles that you hold true, the values that you hold true that you hold yourself accountable to that you believe spirit holds you accountable for, and that you hold others accountable for, because you are being held accountable as well. So **ethics is something that people use to govern themselves and to and to stabilize themselves in terms of their expectations for each other.**

	And that includes spirit. It's unspoken, but it's it's it speaks large, it looms large."
5	"I think that's that's a very powerful word. and one that I constantly am fighting for. **Do things in order, do things with integrity and transparency have ethics.** And what you do not, because someone may or may not find out what you did or didn't do. **But I believe that there is a God in heaven, and he's watching our behavior, and every man and every woman will be held accountable for his or her actions.** So I think that my yes should be yes and my No, no, and I need to do things properly whether you're in my presence or not."
6	"And my, my initial reaction is, I almost never think about ethic. Almost always think about ethics, right? Which is kind of a diff, those are different affects. And so, um. For the most part, if I stick with what I really live with, which is ethics, um, I think of it **as a series of values, um, the the organization of your value system. And, um, your decisions about how to live and how to act and organize in a way that you can draw on them in specifics.** You can communicate them specifically."

For faith leaders, many of their understandings of ethic(s) incorporated a sense of principles that someone lives their life by, and in this considering how one's actions impact others. Pastors 1 and 2 specifically refer to ethics as "doing the right thing." Additionally, only pastors 3 and 4 noted ethics as explicitly connected to their faith. It is important to note that every faith leader associated ethic(s) with actions and saw ethics as a guide to how people should act, and that ethic(s) is associated with people doing something positive in a way that's beneficial for others. Pastor 5 noted accountability as an important part of ethic(s).

Faith Leader Participant	How Faith Leaders Think Scientists Conceptualize "Ethic(s)"
1	"I believe that folks that aren't pastors, they **they do have a a good ethic**. But it what happens is again, that you know they're thinking they want to get to a certain conclusion, and **if they get there it's well and good, and they'll share that information**. But sometimes I think there's some other discoveries that again they leave on a table. Maybe for a later study for themselves, or just because the data just didn't seem like it really panned out enough for them to be able to put it out and remain "credible. And so **it gets left behind and then, when other people hear it**, and the stuff

	that they left on a table, they they discover it. They so **they'll say about the the scientists**, in the first place, **that they weren't completely ethical**. And I hopefully, scientists would do all that they can present all of their data. And that way people know that they are given their best at this, and they somehow are trying to be as ethical as they possibly can that's that's the only way do again. I go back to, you know, just present everything that you have. Tell the whole truth and let the people have to deal with it."
2	"I'm approaching my people with interventions that address- There were issues for such a time as this and I think seeking to find answers **to their problems that are their problems are not to my financial gain is an ethical issue.** I think that science would say, in the course of doing that, **"do no harm"** and I think there is an understanding of the ethics"
3	"In the academic world you **don't really talk about that (ethic(s))** too much you just kind of **accept it for what it is.**"
4	"Scientists are funded by whoever and **whoever they are funded by, becomes the the source for the ethical standards** that they ultimately have to refer to or default to. so they may have their own code of ethics, certainly. As scientists to **do no harm like and to have integrity around, leaving things as you as they as you have it, as they as they occur in nature, so that you're not disturbing nature**. But okay, that's kind of your personal ethical standard. Once you have to take on the funding, the money, the resources from corporations, from governments **your ethical standards now get absorbed inside of the corporate standard because the money that you're getting to do your work is not going to- is not going to be there if you don't follow their rules** or their criterion to get the funding. So scientists often find themselves in conflict with their personal ethics because of the the agenda of the people that are paying them, or the institutions that are paying them, and so they often feel very conflicted, and some of them just say, "Oh, it is what it is! This is my job. I have to report on only the data that's gonna continue the narrative that my funders have," and some of, and or and some stay. And they say, whatever this is, it's a job, and **some of them leave because they're ethical standards go beyond their willingness to maintain funding**…So if the ethical standards of a scientist come into question, it doesn't have anything to do with them being a scientist it has everything to do with who they are and where their values are for money or prestige, or whatever. So I think **ethical standards are core enough that your job doesn't disturb that.** But you may not know what those standards are unless your money is in question."
5	"**I really don't know** because II have not been in in that side of the aisle. But I think again, **I think the fact of being transparent and being real is so vital and so important.** I don't know the ins or outs you know. Like. Let me- I'm doin a survey, and the guy that's paying me to do the

	survey. You know he's he's inclined that his his political party looks favorable and I'm as an a scientist, I guess, whatever the again, my my constant battle is a lack of integrity in every sense of the word. And I don't know if scientists do that or not. I cannot dishonor anyone, because I do not know. **But sometimes the conclusions that I see them coming up with, and my reality…**"
6	"**Moral. Can I sleep at night and can I stay out of jail?**"

Some themes that faith leaders identified as part of how scientists might consider ethic(s) are the split between personal and professional ethics and the weight of the institutions that scientists work for impacting their ethic(s). Pastors 1 and 2 note that they believe scientists include "do no harm" as central to their ethic(s). Pastors 1, 4, and 5 all noted how institutions and their missions may pressure scientists to violate their ethic(s). Pastors 3 and 6 expressed that they believe that scientists likely view ethic(s) in a fairly simple way, either accepting the norms of "what it is" or thinking of ethic(s) as "Can I sleep at night? Can I stay out of jail?"

Discussion of "Ethic(s)"

A common understanding of ethic(s) across all scientists and faith leaders interviewed is that ethic(s) inform actions, and that actions are representative of ethic(s). One of the ways that pastors 1 and 5 wanted science to act ethically was through data collection, and by reporting on all data honestly, and scientist 2 and 3 specifically noted that honest data collection and sharing of results as a way that they view and consider ethics in their own work.

Additionally, pastors frequently discussed ethic(s) in a way that considers the impact that one has on other people. Similarly, scientists often also considered this, but more frequently considered the impacts that science has on non-human species.

Pastor 3 noted that they do not think that scientists think about ethic(s) often, and Scientist 5 noted that they do not think about the word ethic(s) often. Additionally, four of five scientists thought that ethics would be connected to faith for pastors, and only two of six pastors explicitly noted this connection.

In general, it seems that there is a shared understanding about ethic(s) dictating actions across both scientists and faith leaders. However, it seems that faith leaders hold some skepticism towards the ability of scientists to maintain their personal morals within larger institutions. Perhaps, when considering the ethic(s) it is important for all parties in a partnership to be transparent early on about where, and how this shared work meets different goals for each person's work. Where does this collaboration have opportunities for personal career growth, what are some of the boundaries of institutions that scientist serve within, what are parts of faith leaders ethic(s) that must be respected to make this partnership work?

Justice

Scientist Participants	"Justice" Meaning
1	"Yeah, I mean, okay. So in a so professionally I think of **justice as like legality** to me it is about like, like in a professional sense. If if I'm thinking with my like objective science, that on it's it's literally like what is legal and what is not legal; and I think more of like a justice like a, a lawyer and a judge, and what that means… Yes, then, then to me **it means fairness**. So like making sure that the same... you know that i'm that I'm being... **equitable and equal when when that is equitable,** and making sure that I'm treating everyone fairly…I think about it as the combination of the 2. So in sort of okay, so i'm gonna, you're not using this term, but I'm gonna insert it for you. So like, when I think about environmental justice, I think about it as the fairness of how policies have been applied across different settings and **the ability to use the legal system to apply fairness or to use data and provide data and outcomes and research that would allow... that would point out inequalities in fairness, and then allow that to be used either in a**

	legal sense, or in a I guess, I guess, like not necessarily in a courtroom, but in a public setting where those inequalities could be portrayed and then dealt with."
2	"In on the research side we've been trying to sort of choose research projects and collaborators let's say to the extent we can, though that might be a cop out, to to to work on a range of issues, and with or you know, from the **providing information that can be used by, you know any different community or or stakeholder that is interested in a particular issue**. So you know**, trying to increase the knowledge base for everyone to make decisions about a particular issue rather than trying to to do research that defends like one side of an argument** or something like that. So that that's one way we think about it. We've tried to work with different **we've tried to start working more writing proposals with different communities who've, maybe had have been underrepresented in sciences or haven't had as much opportunity to interact with science, to provide information, to help with their own decision making.** And and so the work with the the tribe is is one example of that where we have sort of overlapping, their their interest for their community in **bringing back some of the the traditional species that they used to fish for and consume, and you know, and have as part of their cultural identity overlaps with our interest in trying to help recover ecosystems that that and species that have been impacted**. And also, you know, intellectual curiosity, probably on both sides. **So trying to find opportunities where where those overlap**. Yeah, some some of that's balanced with a need to pay the bills. So, you know it's, you know, recently and to find we're we've been much more proactive recently, and trying to find grant opportunities that we can apply to that fit, **building these collaborative projects with a a broader range of different organizations and communities than we've done in the past**."
3	"**Justice is like fairness, but maybe more in that.** There's an element of of kind of creating greater equality or or kind of moving from not just not just saying, oh, everything's fair, but like **moving from injustice towards justice**, and creating a place where kind of wrongs are righted. I think that's the kind of connotation that I think of it's it's a **writing of wrongs and and creating a space where where where future wrongs are also can be, can be fixed** to the extent that they can be. And then how I think about it in my own work...**science is a really unjust place**, and kind of benefits from a lot of the kind of structural problems that the entire Academy kind of faces. And so I think the thinking that I've been doing about this is like, where, where do I actually have a lot of the kind of like…. big structural things, are really hard to tackle as a as an individual."

4	"So, functionally I think it is, you know, at a basic level we're just talking about, **we think about how our our actions, and then the (pause) I think it is just about the the, the way I think about it is just the fair and equitable application of of norms and and laws. Yeah."**
5	"Okay, so people think it means equality, even though it doesn't **it means equity**. So just making make sure that there are **equivalent opportunities for people** and this probably comes into like hiring right, like keeping in mind that different people at different backgrounds, for various reasons that are not always up to their own control. And so I think about that sort of aspect."

When speaking about justice scientists spoke broadly about equity, the law, and fairness. Scientist 2 viewed doing work that is honest and not biased as a form of justice and doing that work with communities that have been underrepresented in science. Scientist 3 discussed how science as a field is unjust and how moving toward justice is a process. Scientist 5 noted equity in hiring as a form of justice and alludes to historical injustices but does not deeply explore them. Many scientists referenced institutions, either the law, or the Academy, as avenues towards justice or conduits of injustices.

Scientist Participants	How Scientists Think Others Conceptualize "Justice"
1	"I can't say that I thought about this like I think in some sense I do think that that **religious leaders would think about fairness**. But when I, when I apply the legal context in my mind**, there's an aspect of that that is judgment**. And in a religious sense- in a religious sense, it's not my place to judge right in a religious sense like that. Judgment belongs to God and God alone. And so then I start to struggle with it more. If I start to like, add the religious component to it in terms of thinking about the legalities, and like adding a judgment. But I still think there's fairness applies. And if if I'm interpreting well my interpretation of how Jesus responded to people, if we're talking about, at least Christian faith leaders. Because I realized Hmm. You're going to go beyond, faith leaders is a big group**. But that there, you know, was an aspect of fairness to what he (Jesus) did, and pointing out to various individuals like in in in embracing those individuals who are not necessarily embraced by society.** Let's put it that way. So I I think that

	there was like part of what he did, and part of his message was pointing that out."
2	NA
3	"Because I think the people use justice within the context of injustices, and so **like what justice means and what justice looks like depends on what the injustices are have been continue to be**, etc. And so so I think it probably varies a lot. I think it looks like I don't know I would. I would assume it **looks like tangible things**, right? Yeah. So like **allocation of resources, and acknowledgments at the very bottom acknowledgment**. And then allocation of actual resources, to to yield outcomes that are kind of tangible evidence of justice. And those could take. Those could take lots of different forms again, kind of depending a little bit on the injustice, yeah, at the moment or of the specific situation and of course, **like there are layers and layers of injustices and so it never ends**."
4	"I think you know that **they are going to be thinking about these deeply ingrained institutional injustices that pervade and how those can be you know, rectified."**
5	"I think you know people care more about climate change or things like that when they understand how it relates to them…same or similar to the way the environmental nonprofits are in some way, but with that of like a climate change focus. So again, trying to **filling gaps for things that are unequal or inequitable between groups like it's identifying groups are part of the community that need resources more and trying to solve some of those problems.**"

Broadly, scientists think that others, including faith leaders, see justice as a process towards fairness that seeks to right past and current wrongs. Scientist 1 references religious beliefs as part of the root of where they think faith leaders could develop their understanding of justice. Many scientists believe that faith leaders' vision of justice is shaped by whatever the injustice is, often referencing the systemic, historical, or environmental injustices as examples of perceived injustice.

Faith Leader Participants	"Justice" Meaning
1	"I can't just think of any off top of my head. But I'll I'll go to what I was talking about earlier, about not using pesticides and stuff on my lawn. **Those scientists, they knew that the pesticides would create cancer. It will cause cancer. And and and now they're paying the**

	price for it. But but here's the injustice is is the fact that they're the same companies that are making the cancer curing medicines as well. How lot of folks don't understand that. That's that's unjust. I don't. That's that's not justice. And so again a kind of justice. And I said it a minute ago. You know, spills over from having good ethic. You have a good ethic. You want to do the right thing. If you're doing the right thing, you don'- what's just and equitable for everybody concerned? You're not just saying, Okay, we're going to do this particular thing so that only these people that are invested go back to a particular company. They gonna make money hand over this because they gonna make money because one product we sell that causes a cancer. They gonna make money off the product. We sell that cures the cancer, or at least try to to cure it. So that's that's that's not justice, and so. you know. We do the right thing for all people concerned, and and this goes back to the whole gathering data from a study. And you're studying everybody, within a particular community or area. You come somewhere around my church, there's couple of corner stores. So go back to that. You have to. Not just. I'm studying the people that are in the area. **But those owners of those stores, because they spend the majority of their day in that space and in that environment? And so how is it impacting them as well? And then the results of whatever the study is? If it's given to the people, then some justice will happen.** That would be just whatever direction we go, based on the data that comes from that study. **And everybody can say, "Well, I was included. They thought about me."** And so if this is what's best that comes out of this study, I understand it. **That's the only way you get to justice. If it's for everybody. And you're not just trying to get information from one group of people…**Start with the ethic. **You have a good ethic and you want it, and you present everything, you'll be at a place where there justice can happen**."**
2	"I think I think I think I think at the end of the day justice is **really about legally and morally, and ethically right versus wrong**. There is legal and moral processing that when you look at them they're just unjust. I think prime example **comes up on the health care perspective is during the height of COVID**, Dr. Fauci takes the podium and he says **"Black people are dying at a much higher rate because of health disparities" standing next to President Trump. "They got secondary conditions like that diabetes other issues," he said, 'when Covid hits them, their system just causes them died at much higher rates." Everybody goes okay. He says no plan to address that.** No way (inaudbile) it is what it is. Okay. injustice is when you flip, that, you know. If he had gotten up there and said, "White people are just dying at a much higher level.II mean, they they

	just adapt-they don't have enough melanin in their skin, and they're just dying.You know it is what it is." No plan as to how to address it. We're focused on the Covid issue. These people are dying to me. That's a prime healthcare example of injustice. **I think it's an injustice that we've been talking about health disparities for over 3 decades, 3 decades, and there hasn't been a nationally focused scalable project to address the issue. That's an injustice.** "So knowing somethings wrong and choosing to do nothing about it is how you would define injustice?" "Yes, that's the perfect way to put it. You know this is wrong- wait a minute- what are you doing! To me, that's a terrible injustice."
3	"Abrahamic religion tradition and a Christian faith, when you read the book of Genesis and God makes nature, he makes nature, and He makes humanity. And when you look in the terms of of what a lot of marginalized and brown and black people, their experience, a lot of them face, you know, the injustices of police brutality and and heightened homicide and and crime and one may raise the question of **how can you be jailed for killing a dog, but you aren't jailed for killing a human how can you um be penalized for polluting a community um or or or you know this pollution period but when it comes to polluting certain communities you're not and that's because there's a disconnect between nature, the, the atmosphere, agriculture and animals in humans.** And so I have a commitment to kind of bringing some sense of harmony, um, and connectivity, and showing, that humans are a part of nature in which science often separates, so, from a spiritual standpoint, but then also from a social a sign a social science standpoint emerging humans back into the ideal of nature and showing that faith in science don't have to compete God who liberates from a Hebraic standpoint. **They believe that faith means to act.** I know we believe when people say faith, we just, or believe it's or what you think, what you're convicted about, what you're persuaded about. But the the Hebrews that he breaks language says, "I believe, therefore act" and so as **Black Christians, we take on that same he break concept, "I believe in a God who acts, therefore I act." And so then fighting for justice isn't just a something to do socially, it becomes my spiritual and biblical order to, to act accordingly**. And so then we read justice throughout the Bible in a different way... So you feel like you kind of got like, I mean, justice is, isn't always, **justice is writing wrongs, correcting errors, but justice is also a balancing act**, it's a balancing act **where the well-being of all living organisms are weighed in such that no one has an excruciating or a debilitating deficit**. And sounds crazy, but kind of put it in layman's terms, where **taking care of my family does not destroy the terror or**

	diminish anything from your family, and so trying to create an, environment, **where nature can self-sustain and humans together and insects and birds and schools and plants can grow and food can grow.** I think that's the balancing act of environmental justice and justice period. It's a balancing act."
4	"Wow! That's a big word, well, justice as a faith leader for me, and I could answer this in a lot of ways depending on which which, faith, I'm going to reference. But I'll use the I'll use one that's going to be my catch all for all of them….**Justice is something that we all want to have. But justice, the justice that you give yourself is first on the list before you can get justice from anyone else**."
5	"**Justice is extremely important to me**. I am, I, did so my, I've done so much activism throughout the years. Justice I feel, is, social justice discrimination, racism, sexual abuse-I think that **we need to have the courage, number one is, stand up and demand justice.** But for me, demanding **justice doesn't mean burning your house.** Now I think that **there is power in my words.** I've learned especially working in Washington, DC. For so long that sometimes it's not about the numbers that you get down there. One United States Senator told me. Listen, Bishop. Every week we have a different group out here protesting. he said "To be honest, I walk right by them. Bishop, there is so many." So they have. What do you call those people that go in and talk to them lobbyists, lobbyists? He said. "It's easier. It's more easier to have lobbyists speak to me about something than to hear to to have the crowds." However, it's still in my book. **It's (marching) still a hard core thing that must be done.** Because my premise is Mart is Martin Luther King, Junior, and how he marched. And I think that we need to continue to march. I have worked with the King family. I have been acknowledged by the King family for my work. And so yes, we must- justice must prevail. And I think that we **we have to stop victimizing the abuser.** So I come. Well, I mean, I put myself, somebody comes rapes, a woman gets caught. And the next thing you know, you got politicians and other people saying, "Oh, the poor guy! He grew up without a father, he grew up in the street. We need to help him out." What about that woman? What about that rape? Are we going to address that, or we're just going to send her a therapy. So I think that in today's society too many people get away with stuff and **they need to be held accountable**. Justice must prevail, now, **when it comes to the faith-based side of it also, justice hand in hand with mercy**."
6	"**It means being willing to resolve injustice.** And I think what I said it is American. I don't, I think, if I-I don't know as an African American

	um i is i THINK cause that's what I think first is like **not letting things go unresolved** and right and and I think **purely justice is balancing things appropriately**, that kind of thing. But I think for us in our history, it's kind of natural to go**, no, it's bringing being things back up to somewhere, its resolving.** Right where ancient Greeks somebody would just, you know, they were starting from zero. Let's make sure that this **stays fair or equitable**, right?"

Most of the faith leaders responded that justice is extremely important to them, with pastor 5 explicitly opening with that. Pastors 1, 2, 3 and 5 all provided examples of injustices that they have experienced or observed, with environmental science, health, or civil rights. Pastor 1 highlighted how injustice is the same people that cause problems, profiting from the solutions. Pastor 2 noted that injustice is choosing to do nothing when the issues are known. Pastor 5 notes that addressing injustice means using your voice, advocating for change, and requiring accountability.

Pastors 3 and 4 note that for them, justice is rooted in their faith. Pastors 3 notes the unique views of Black Christians, where action for justice is central to the way that they understand their religion. For pastor 3, this does not just mean correcting past wrongs, but also thinking about justice in all the choices that one is currently making and ensuring that taking care of oneself does not negatively harm others. Faith leader 4 notes that for them, and their faith, justice begins internally before it can be got, or given to others.

Across most responses, faith leaders emphasize that an important part of justice is righting past wrongs to work towards fairness and equity.

Faith Leader Participants	How Faith Leaders Think Scientists Conceptualize "Justice"
1	NA
2	"**I think usually by the letter of the law**. If theres a law..in my own world, occupational science, we look at healthcare injustice,

	occupational in justice and occupational justice. Not only from the perspective of what the law is, but also we go back to that writing. That's the way we we see it, or laws that prohibited occupational justice for a culture to use certain methods to use certain methods to improve my health and well-being if there are certain challenges environmentally or in the ecosystem that provide a challenge, thats an occupational injustice, that's an injustice."
3	"I think scientists understand just when we talk about **environmental justice, doing right by, or righting wrong, correcting wrongs that have been done by environmentally, like climate change, you know, like trying to improve the heat index. But when one goes to do environmental justice, and it's only seen from a sense of, impact on nature, then one isn't doing environmental justice,** environmental justice from the onset, which the EPA recognized with the sanitation workers movement down the Tennessee, one understands is it really becomes a, the intersectionality of environment, economics, education, it becomes more so of a, and I don't think public health can be used as the greatest identifier of what it is. But true environmental justice is focusing on the aspects of environment and their intersectionality between what we call nature, what we call humanity, what we see as community, what we see as just, you know, **a functional space where no one is exploited, nothing's exploited, land air, animals aren't exploited, humans aren't exploited.** And everyone benefits from an environment together. Now we know in an urban city, it's kind of hard to do that, especially without resources, you have a lot of impervious services, you have a lot of land spaces that aren't necessarily well taken care of, **but in the perfect world, environmental justice is going in a community removing the harmful things, removing the deadly things, and creating an environment where every living organism can thrive**."
4	"**So justice for them begins with them getting what they believe they deserve from the people that are paying them.** And the people that are say they are serving, instead of saying. "You know what there's a lot of injustice around that I don't control. But what I'm gonna do is be just to the people that are ignorant of this information by giving them what they need to have per, my going out, getting the data, using the skills that I have and serving my community in a way of giving the and disseminating the information when needed." "**So science communication is a form of justice?**" "**Yes**, and because because you have the skill, you can be the agent of justice in your community by giving the information. **But, I'm not finding scientists doing that not as much as I would like.**"

5	"**I don't know. III really I really don't know.** But I think that. And and maybe I'm off left field. But I think that **sometimes we break things down to such a degree…** Example, I keep bringing these examples, keep popping in my head. Example, you remember, I think it was Rodney Howard (King). Who was it? The black man in LA. That got beat up by the white cops, but no, the one that became real real famous a number of years ago. They videotaped them, getting beat up and everything. I forget his name anyway. **So they videotaped him getting the the living daylights beat out of him**. And I mean by several cops.Okay? So in La, all the cops were charged with. you know, violating his civil rights, etc., etc., etc., etc. So the defense of the cops they hired a **lawyer who brought in a specialist, I don't know if you will call him a scientist. But he took the video and he focused on what is it? Picture by picture, layer by layer. And he argued that in court, scientifically proven according to him, it was the victim's fault that 6 cops beat the living day lights out of him,** and had him in a hospital for 3 months. **So that's that's my fear** that we, you know…but again I don't know if I could answer that appropriately, but that would be probably about the best that I could do for you."
6	"You ask me the question- **I don't think they think about justice**. I think they think they're, and I don't think so consciously, but **"Not my not my thing, not my responsibility, not- it's too imperfect. It's too much of a moving target. Um its too emotional, and I'm a scientist."** That's what I really think."

At best, faith leaders think that scientists view justice through an environmental justice lens as noted by pastor 3 and have justice for the environment as a central component of their understanding of justice. At worst, as noted by pastor 5, scientists have the potential to undermine justice through the manipulation of data.

Faith leader 4 notes the potential for scientists to contribute to justice through prolific science communication but currently does not think that they are meeting the full potential of what science communication could do for justice. Pastors 2 and 6 share that they feel scientists are ambivalent about justice, either not considering themselves as part of it, or only thinking about it in the letter of the law. Altogether, it appears that faith leaders think that scientists are not engaged with justice.

Discussion of "Justice"

Faith leaders view justice through a lens intertwined with their religious beliefs and moral convictions. For many, justice is not merely a legal concept, but a principle rooted in their faith traditions. They emphasize the importance of addressing past wrongs, advocating for change, and ensuring accountability. Justice for the pastors extends beyond the law to encompass environmental, health, and civil rights concerns. Notably, pastor 3 highlights the unique perspective of Black Christians, for whom action for justice is not just a moral imperative but an integral aspect of religious practice.

Additionally, faith leaders underscore the significance of personal responsibility and internal reflection in the pursuit of justice. Pastor 4, for instance, emphasizes that justice begins internally before it can be extended to others, reflecting a belief in the interconnectedness of individual actions and societal justice.

Scientists approach the concept of justice by focusing on principles of equity, fairness, and honesty within their professional sphere. Their perspectives are primarily shaped by scientific methodologies and institutional contexts. Scientists recognize injustices within the scientific community itself, including biases in research and underrepresentation of certain communities. They advocate for equitable practices, such as inclusive hiring, and acknowledge the need for greater diversity and representation in scientific endeavors. Additionally, scientists perceive justice as an ongoing process, acknowledging the systemic challenges within the scientific field and the broader societal context.

Despite differences in their the details of what justice is, both groups see justice as a way to address past wrongs, and for promoting fairness and equity. There is also a

shared recognition of the role of institutions, whether religious or scientific, in perpetuating or rectifying injustices.

However, there are also notable divergences, particularly regarding the underlying principles and sources of authority informing their perspectives on justice.

Research

Scientist Participant	"Research" Meaning
1	"It means like **investigation**. It's it's **exploring something new**, examining something to try **to answer a question or find something that has not been found before**. Or with like, let's say, public engagement, where we have set up an activity where we know the answer. And so we're having folks kind of go through the process to experience an aspect of research. But I wouldn't personally define that as research, because the answer has been defined right. There is a right or wrong answer, like when you go through and like, do a mathematical equation in school. **And so if you know the answer, then it's not research to me."**
2	"You know most often it means. Yeah, **collecting data to answer questions** or to yeah, can also mean to like to track progress of. You know, **track how something is changing over time.** But you know it also. Yeah, it also means **reading a lot.** It means, yeah. So there's yeah, those things which are sort of gathering information, but but certainly, you know, saying, like I'm, a researcher is is broader, or a scientific researcher is is broader, and **includes the writing and communicating and writing proposals** and like the the other aspects of research as a job versus research, as you know, an activity that's part of that job, I guess."
3	"**Research means gathering information to answer a question."**
4	**"Research is (pause) answering questions and hopefully answering questions in a way that can be useful to society in some way."**
5	"I got a whole range of them. So in the **beginning it's like reading**. What research other people have done to figure out where there are gaps or getting inspiration or being like. Oh, yeah, this is how I could implement this idea that I have. And then there's actually, you know, **implementing** it right? So a lot of what I do is building experiments with that running for a while and see what happens. So like this kind of yeah **planning**, **there's building things and there's collecting data.** So again, all those numbers that'll add up to something. And then there's **figuring out what it means, and disseminating it** right like. I think the final part of the

	research cycle is that like it doesn't really matter if you have cool data or cool conclusions that no one knows about them right.”

The scientists categorized research to answer questions, to understand something new about the world, to learn how things change, as a process and as a career. Fundamentally there was an understanding that the aim of research is to better understand the world and learn new things. To some scientists this began with reading and learning what others have done first. Additionally, many scientists noted that a component of research is communicating. That in the cycle of research it begins and ends with communication- either sharing or listening.

Scientist Participant	How others understand “research”
1	“**I have no idea.** Honestly. Yeah, I've never thought about that. Yeah, I don't know.”
2	“I I imagine it depends on yeah sort of their their experience with that, I mean. I I think, you know. I I imagine a a lot of people are thinking about, you know, **gaining information in some way**, you know, **maybe going out and catching fish** since I'm researching fisheries or talking to fishermen, or yeah, you know, doing, **reading** and then coming up with, you know, **coming up with with new information to share with people about.** Yeah, a fish or a crab or something related to environmental management.”
3	“I think people, I I assume that people generally mean it, that **they're going and collecting some kind of information to answer some kind of question**. But people use it broadly, like “I'm researching, you know what new car I want to get.” And they're you know they have a question "what new car should I get?" And they have like parameters, and they're collecting data. They are going in like finding specific things about these things. **It's not scientific research, because it's not a scientific question, because there's no correct answer to "what kind of car should I get?"** So I think people do use it kind of broadly. And and I when i'm on the academic space, you know, and I talking to a friend and say, "oh, yeah, I'm. You know, researching flowers. I want to plan my garden." I I think that's how how people use it, and kind of like the “good old English word” sense.”
4	“What do you think people think you do when you tell **them your researcher?**

	"(Laughs) **No idea**. You know the average person on the street. I have no idea. I just told somebody today, and they're like **"oh, that sounds good."**…Along the way we just talked, and they asked what I did so I said "I'm a research ecologist and I you know study the effects of climate change on you know, on animals, on wildlife," and they said "oh, that's that's cool. I'm- I used to air a navy pilot. I flew A4s and you know F14s." You know, that was the exchange. **I have no idea if there there was any understanding of**…so I I just have no way of knowing, often because that's that's usually how the exchange goes. "Yeah, people think like, oh, that's cool. (shrugs) Okay?" "Exactly. Yeah. Scientists, probably, you know **working in a lab somewhere doing something that is not interesting enough to them to to want to ask more about.**"
5	**"**Oh. I think l**ike collect data about whatever topic is probably what people would** guess. I think that about how that- what that actually looks like. You know that it is, you know hours of pouring water into little vials and running them through an instrument, or whatever, I don't think that's what people think of. But and then the general big picture **of collect data to answer questions is probably a reasonable definition**."

In general, scientists are not sure what others, including faith leaders, think when they are speaking about research, especially as it relates to them, or their research. Scientist 2, 3 and 5 expressed that they think others view research as a form of collecting information- potentially by reading or collecting things like fish and water. Scientist 3 notes that research is not always scientific- if it is to make a choice and not to answer a scientific question.

Faith Leader Participant	"Research" Meaning
1	"**Research for me is is really having an idea. You you being someone who has an idea about something that you taking time out to see if your idea is true.** But II have to say it to to make your research complete and full, all of the other discoveries that you learn along the way need to be presented. So that you know, it's it's a complete research. It's it's not not just focused on your one idea that you had. You know, you want to research why the leaves turn yellow and red and green brown. In the fall of the year.They find out that there's some that turn red. Okay? And you learn why those turn red instead of yellow or

	brown you should present that data and and that because that's your research, you you took time out to study one thing, and **you found information about other things, and all of that should be presented**."
2	"I think, **to the community research is something to fear**.I think, really served **because of its history in the African-American community it is something to be avoided**.**I think research is the use of people that others view as inferior and research is problematic. I think part of the challenge of leaders like myself is to turn research into possibility**. **Possibility for growth, possibility for development, possibility for improvements in our community that we can participate in and volunteer in research projects that are helpful to us as a community**. And we shouldn't view them always with a negative intent in mind that because your intention is different than the person or the entity that may be launching the research does not mean that we can't come together to create a common goal. That it can be- that research can be done for the good of us. That that is a real possibility."
3	"So research for the "scientists" is often going into the unknown, peering off into what could be possible based off a previous experience. **But for the believer, research should be what has previously happened creates a pathway for what can be possible**…Most people say the number one industry in the world is sales. **I argue, the number one industry in the world is research**. Okay. They say sales because it's money and economic. **They don't say research, because they don't want people to realize that research is the voice of knowledge**. **It's the, it's, it's the source of understanding, it's the mechanism that allows you to control and determine what happens next.** And the government determines what's valid research and what's not, (laughs) you gotta, you gotta have a IRB **for it to be substantiated leveled research somebody, has to give you permission is the irony**. Of course somebody, has to give you permission to do the research!.."
4	"Oh, that's it's everything. I am a I am a committed researcher. I think that **research is inextricably linked with ethics**. The integrity of your work. If you're not doing research to so to give yourself the right information. **If you're not doing research on the people that you're serving**, if you're not doing as a faith leader, if you're not doing research on the people that you're serving, **then you're just doing things because you want to and hope that it will, that people will like it, or people will benefit from it**. **So research isn't just knowing the the culture, the people, the community, the environment. But it's also staying current with things that affect the community current with current events.** For example, so I am a part of the Black community. I was born in this community, and I serve this community. I serve the the community at large, but this is certainly a community that I'm committed to serving the black community as a community. I'm committed to serving just because I was born in it. I

	live in it. I work in. It doesn't mean. I know everything about it. There's, in fact, a lot of things about this community that I'm living in, that I don't know. So I have to ask questions. There are so many different kinds of people within the Black community. There are so many different cultures, subcultures, spiritual approaches to things, concepts about God and Spirit and all of the all of the rights of passages that we do. There's so many differences in our community that **if you, I don't do research that I'm going to always be stuck in this pigeon hole**, where I can only serve certain people that know what I know how I know it."
5	"**Important. Very important. Never speak about something you don't know, you know**. **Do the research find the information, don't jump on to everything that you see in the media**, Google do the proper research. It's amazing when I, when there's an issue in this country and I will check other media outlets from other parts of the world. you'll be surprised at different stories that come up out of the same, out of same incident…**I believe that you need to do research and you need to do it properly and then, and only then if you have a public platform then you speak.** And even if you do, be careful what you say, how many of these politicians-I don't know how you keep up with the news- But how many of these guys got to retract? How many these guys got to take it down from Twitter, or or it's called X now, how many of these people gotta take it off of Facebook because they jumped, **immediately they saw something, they jumped. And the next thing we know they gotta go back and delete it. Some of them say I'm sorry some of them I don't. So, as far as research is concerned. For me, research is extremely important**."
6	"**Being willing to dig beneath the surface in all kind of applications**, just being, being, honestly, being, I was gonna say excited, but **understanding you're excited because you understand the value of digging belief beneath the surface**." "Would you say you do research as pastor in that way?" "**I do it theologically, right? And, you know, preparing stuff and, and deciding how, what I believe and how I think about what I believe.** But the, the, the other thing that's real, true over the last five, six years, um, is that **I've been dragged by my interest and my desire to make good decisions.** I've been dragged into two or three new education realms. So, I-I gotta listen to words like bio-swale you, know what I mean and then I?..Like, oh, the, the, the phrases, you know, the, and **I actually get a little irritated that I gotta learn enough about trees to be able to ask secondary and tertiary questions.** I have to, I have to learn enough about bioswale and all of that, and the flow of this and that and the other to be able to- not even because my goal is in intelligent conversation per se.- it is. I have to make a lot of decisions, right**? I have to know what I**

	need to know more about, or what questions to ask, et cetera, et cetera. Um. So I have to conceptualize, which means I have to take in more. I wasn't, I got grandkids. I really wasn't expecting at this point in life to have to learn, write more things. And I equate that in research, in the in in this context."

For faith leaders, the practice of research is essential to addressing the largest questions and challenges of life, however the systems and larger practices that do research are reason for fear and distrust. All the pastors mention the potential that research holds to learn more, better respond to the world and opportunities around them, anticipate what could happen next, and a tool to find truth. However, pastor 1 notes the responsibility of those who do research to be honest about the whole truth, and be open to what is found, even if it was not what you were looking for. Pastor 2 begins by saying that within their community, the African American community, the legacy of research being exploitive, and extraction is something that they combat while trying to use research as a way to provide solutions and new opportunities for the community. Pastor 3 discusses the irony that the Academy, which upholds many systematic injustices, is responsible for providing validation and approval for, and determining what counts as academic research, is troubling. Additionally, pastor 3 emphasizes that knowledge is power, and that research is an essential step in this process.

Pastors 3, 4 and 6 note research explicitly in connection to religion. Pastor 3 expresses that for believers, understanding how people prior to you solved problems, is a form of research. Pastor 4 notes, that an important part of their leadership in faith is research to stay connected with the communities and people they serve, to work to ensure that their ministry is relevant. Pastor 6 notes that research of theology and scripture is central to forming their religious beliefs. Whether or not research is part of how faith leaders engage with scripture, all noted the importance of the practice of research to be an

informed, engaged person- and many noted the concerns of the legacy of exploitation and bias institutions that do research.

Faith Leader Participant	How Scientists Understand "Research"
1	NA
2	"**In the scientific world research is simply is the end to a mean**. **It's the method that we use to determine, find the outcome, conclusions. Limitations, generate hypothesis.** I have an educated question run an intervention or a research project or research projects where I gather data that has been reviewed by the IRB to ensure that the method applied has the right ethic. And it concludes. And so research takes me. **It starts with an educated question. And it it it answers it through research**... **I think, research in an informal way can be used by people who are not scientists**. In an informal way that could happen."
3	"So research for the "scientists, is often **going into the unknown, peering off into what could be possible based off a previous experience**… **I think they see research as an ongoing a ongoing process of discovery**. **For other dominance to say they know predominance to determine how things work in the future.** I-I think it's it's research for knowledge base and determination, it's more so from like I said a dominant, **a place of dominance a place of authority a place of control** um. Because why would- and this is where the you get into conspiracy and you'll probably get into other a quarrels with government agencies why are you researching why are you why why are you looking into this in such a way that you know- **but we never know, and we always find out too late.** I think that's across the board. **So when they say knowledge is power, they do research because they want to have the power, the control. And that's also predicated on this linchpin, that decisions are based off of research, and if decisions are based off of research, then you want to have that, you want to have the deciding factor for all decisions.** Mainly, **you wanna know how things are decided, why things are decided, and when things are. It's a control mechanism there's no way around it.** That's I'm not saying I completely feel that way I'm just saying just looking at it critically one can one can assert that (long pause) Black and brown people don't trust the government and when you look at the idea of (inaudible) when you look at the idea of invading um just going in and you know planting people in organizations to turn it upside down like you always on a quest to **know to be ahead to be able to determine** and to be able to there's no way it's just like. No way around that when you look at it."

4	"Well, science is built on prior knowledge **so there is no science without research**. You can observe, as **you observe the world**, and you have questions as you pursue those questions. **That's research**, you're doing research. So there is no science without research. I think that environmental scientists use, when they think about research**, they think about the way they have to justify the money that they're making**. The thing that can make or break their careers. I think that sometimes they fear their research. **Think there's a lot of fear around environmental research, especially now, because if you if you find something you don't want to find, then you you're you are you could be in conflict about what to do with what you find.** So I think that scientists are very, a lot more careful about their research now, because they don't want to feel conflicted about finding things that they know they're going to find, and not and and know that they can't do what they want to do with it without great consequence**. I think research is a scary thing where it used to be something we were excited about. I think it's a little scary now.**"
5	"**I think it's important for them, too**. I think that **one of the things that scientists do is that they do a lot of research.** At least, II believe they do, yeah, what they're supposed to do. You know, they do a lot of research and and again they get the information they get the information**. But you need more than information**, I mean, I've been how many times I've been interviewed on on television and so many places. An you say one thing and they cut you off. They edit your comments. and you're like, "Wait a minute. But but but but"
6	"**Everything. Okay, I think research to scientists is, is Jesus.** You know what I mean? **I think research, to scientists, is the Holy Grail…** And my observation is, **my opinion is that far too many of them get lost in the research**, and maybe that means that they're defining it too narrowly gotta gather up- we gotta go-we're gonna analyze what we gathered out there, but everything is in a bigger picture."

Broadly, faith leaders think that scientists understand research as central to their work. Pastor 6 goes as far to say that for scientists, research is "Jesus" or "the Holy Grail." Pastor 4 notes that without research, there is no science and expands on the idea that research is how science is done. Pastor 4 also notes that research is how scientists justify the money that they get paid. Pastor 3 notes that research is viewed as "an ongoing process of discovery." Pastor 2 notes that research is how scientists generate conclusions, limitations, and hypothesis.

While faith leaders do not seem to be conclusive on whether scientists are conscious of this, there are concerns about how the research is done, and how it could be biased or used negatively. Pastor 3 expresses that often communities find out about research too late, and that research is a method of control that communities are often left out of. Pastor 4 notes concern about how environmental scientists determine what to research, noting that there is filtering to not ask questions that might provide favorable results. Pastors 5 and 6 note that scientists who do research are often not seeing, or including, the full picture. Faith leaders understand research as a process that is central to how scientists do their jobs, but have concerns about how this research is designed, shared and who it impacts.

Discussion of "Research"

While both scientists and faith leaders acknowledge the importance of research to understand the world and address complex questions, there are differences in how they conceptualize and engage with "research." Scientists view research as fundamental to their work, it is seen as a cyclical process that begins and ends with communication, and ideally results in the creation of knowledge. Some scientists expressed uncertainty about how others, including faith leaders, perceive research, concerns were raised about biases, limitations, and ethical considerations within the process of research.

Faith leaders recognize the value of research in addressing existential questions and informing their practice. They emphasize the importance of research in understanding historical contexts, addressing societal challenges, and staying relevant in their leadership roles. For many faith leaders, research is not only a means of acquiring knowledge but also a tool for addressing community priorities and engaging with diverse

partners that can help to solve problems. However, there is also skepticism and concern among faith leaders regarding the institutional practices and biases inherent in the research process. There is a disconnect between the ideals of research and its actual implementation, with concerns, primarily from faith leaders, about exclusion, bias, and the potential for research to be used for control or exploitation.

Efforts to increase community involvement and accountability in research on a project-by-project level can help build trust and mitigate concerns. Additionally, integrating ethical considerations and principles of justice into research practices can help align the goals of both scientists and faith leaders in advancing knowledge and addressing shared community priorities.

Science

Scientist Participant	"Science" Meaning
1	"It shouldn't be that hard to define (chuckles). But I mean, you know it's funny. I don't normally define science. If that makes sense**, I usually define the disciplines within it** so? Which is why I'm struggling to be like what I would to find like this. And then I went, and then I'm immediately in my head, being like. No, I wouldn't define it like that, because that excludes **engineering and technology, which I would also consider science**. So I guess I- I- do think of it as as pretty broadly like. If we're talking about science in general. **To me it would be like biology and social science, and like the study of anything would be like any time**. You're actually studying something. You're doing science. **If you're trying to understand something that is science**." "How are science and research the same, and different -to you?" "I think science is the umbrella term that we use to define research within disciplines. Right? So like to me to me. **Research starts to get more at, like the process right of like, how you do something, whereas science is the, the broader term used to define what it is you're doing it on**, or why you're doing it, or rather than the how. If that makes sense."
2	"Yeah, I mean, I think, I guess I I think, in many ways I think of. I probably most often think of them (science and research) as yeah in

	similar terms. But you know I also…Sometimes I'm thinking of **science as a profession, you know, with this sort of you know the community of people doing it.** You know, doing research. And yeah sort of the scientific societies that bring together people to share what they're doing and share best practices and those sorts of things and then probably even less often, although **I probably should think of it more sort of sciences as a I guess, a an endeavor or way of knowing thing**s and an approach to you know**, an approach in approach to sort of understanding how the world works.** Yeah."
3	"There is not a consistent definition for science. So like when we learn a scientific method in like elementary school a lot of science, including a lot of the science that I do does not fit in that framework like there's **lots of observational science that's not necessarily like identifying a hypothesis and like experimentally testing**. And then there's lots of stuff that you know would fit. So if you make, if you make the definition broad enough to include all the things that people would say like, Yes, that's science. Then you include a lot of things that are. People would say, that's that's not science. It's. I think it's a really hard. **It's generally a system of making observations to kind of learn more about the natural world**."
4	"**Science is the, flawed, but best way that we have as human beings of understanding the world around us**. But science is, I would say, is a broader concepts and research that includes a lot of lot of things around the the philosophy and and fury of (pause) science. Whereas **research is probably more of a, I would say, the means by which we accomplish what we set out to do and the realm of science."**
5	"That's one of those things of like. I know what it means in my head. But how do you actually define it**.** I remember I told you there was where it… I think I mean it's… **it's understanding how parts of the world get together**. I think it's kind of the definition I'll go with."

Scientists understand science as a way of making meaning of the world. There was no consensus of what does and does not count as science. Scientist 1 noted that they refer to specific disciplines rather than to science because science can be a variety of things to different people. Scientists 1 and 2 explore the idea of science as a community of people who are endeavoring to learn more about the world through shared practices. Scientist 4 notes that research is the way in which science gets done, to better understand how the world works.

Scientist Participant	How Others Understand “Science”
1	“My like broader extended family, **there are definitely individuals who do not think that science is objective, or even attempts to be objective**. They believe that scientists have an agenda, and **that you are monetarily motivated in every way beyond ethical consideration**, and that that is, that **that science is like very tainted, and not the quest for knowledge that I think science really is supposed to be.** But I also think that that to a lot of people... I think a lot of people often refer to like if I were to to walk up to someone and say that I’m a scientist, they're **going to assume that I am a biologist because I feel like that's a lot of the science that we do**, and and **or they're going to assume that you do like something directly related to people like medical science**, kind of a thing, and there... And if I started to expand like, well, what about like, Who made your computer? What about who built this range? What about like your other components of science? **And they probably go like, oh, yeah, yeah, okay, engineering, sure that science right** like. **But I think right off the bat people are gonna like look outside and be like thats science because it's what's right in front of them.**”
2	“Yeah. Well, I mean, I I think so, I my guess is the you know, **maybe most often they're thinking about science in the context of you know, a way of knowing things, maybe a different way of knowing things than than religion**. But you know **an approach to to learning about how the world works** and maybe secondarily sort of the the more day to day, like **science is an activity** of yeah, more like what I said it for research, like **going out collecting data and those kinds of things**, you know. I would guess, maybe less often, **the science as a community**, a community of practice way of, you know, way of thinking about science.”
3	“I’m not sure. I I assume that a lot of the public, just based on like kind of how people interact with me, **think that science is like knowing a bunch of things about the natural world,** and less of like a process of exploration and creativity. And more, I just like like when I first like, started identifying as a scientist, I I have, like a friend, my roommate, my my former roommate from college. She called me. She's like, "So I heard an owl. Do you know what it is?" And I was like, “I have no idea” and she was like “But you’re a scientist**.” It was like this assumption that, like as a scientist, you should just know all the things. Like, you know the names of all the things, and you can identify them. And you know why things work the way the that they do**. Yeah. And so I think a lot of people think of scientists that way.”
4	“You know, I think, you know I, my my answer is probably fairly broad. They might, you know. I I would suspect, like **ecosystem**, **a lot of people**

	have a basic understanding of, you know, the scientific method and hypothesis testing, so they might say something about, you know we ask questions, we can test hypotheses and collect data. I I would suspect a lot of folks would have that little understanding. But I don't. I I wonder. (pause) You know I don't know. So I I also suspect people, **the general public view science with a bit of distrust**. You know it's like a not as a **and in some some cases maybe, probably probably rightfully so**; but as a kind of (pause) you know it is less of a way of seeing the world, and in and processing information and making decisions based on information. You know, I suspect that **people sometimes see science as a kind of a a threatening term, or maybe you know something that's to be looked at with a little bit of distrust, especially more and more as we enter this post truth kind of media environment."**
5	"I think I probably stick with the same **like how the world works** definition. Yeah. And I want to keep saying it like how the natural world works. I can't quite figure out that's actually how I think how people think about science, but that's just, I'm very. This is the science that I do right. It's very into that world. So maybe that's just why I I keep thinking of it." "Yeah, when you say natural world, are you counting people in the natural world or not? **"**I'm not counting people Well, I mean, i'm telling people in terms of anthropogenic impacts. But i'm not counting people in terms ofhow they interact with each other… I guess, like environmental justice is where it (faith leaders) comes in a lot just to it's more of a worth keep talking about, **Like trying to understand what's happening in certain parts of the world where certain people are, and why. I think it's one of those connections there, or what can be done to stop things, or how to predict what's going to happen in the future from the point of view of like people live there. And how do you make things better for them.**"

Scientists think that others, mainly faith leaders, view science as a way of processing the world, and this understanding may include asking questions and testing them. Scientist 3 noted that others may view science as just knowing a lot of facts about the natural world, rather than the process of inquiry. Scientists 1 and 4 noted that there is distrust around science, and some with good reason. Scientist 2 shared that they think faith leaders might understand science as a community of people. Scientist 5 noted that

faith leaders are likely viewing science from an environmental justice perspective and likely see science to improve the lives of people living in a shared area. While there may be some distrust in science, and some opacity around what the process of science is, scientists do believe that others broadly understand science as a way of interpreting the world.

Faith Leader Participants	"Science" Meaning
1	"Does science and research? Do they mean the same thing to you? Are they different things to you? **"**No. How. How say **they, partner things, They shaking hands a lot**. You know, for me, science is, you know, I'm kind of all over the place because I'm a nature kid, anyway, **so that science is going outside and like, I said, turn over a rock is doing science work. Not necessarily for research per se. But you're you're discovering something that you wouldn't have discovered if you didn't turn that rock over** and and I'm you understand what I mean by that? Because when you turn rock over, you know this so much of a life that you're not going to see on top of the grass. And so, you know, they just turn a rock over. And so. and **science could be so many different areas**, of course, that you know the science is. And but I think the other thing that comes when you say science to people is that you know it, it it **it it kind of scares them because science is like a little bit of the unknown,** you know, **because not an area that I've studied personally and so I'm I don't know it, I'm a little afraid of it**. **But science, I think, is something that should be embraced and and it should be respected.** That's why I think, go back to a couple of our other words. Everything should be done in an ethical way and in a just kind of way, because this connects back to research, because at some point there will **be a scientist that will want to study something or research, something to give us a better understanding of what's going on around us in the area that he or she is studying.** **Science is very important, to kind of continue to also inspire others to, you know, not limit themselves.** Let's just use a couple of academic terms study humanities, you know, of course. Yeah, you want to read. You know that kind of thing and be engaged in literature. **That's that's well, but we you need that other person that's engaged, and looking at the earth,** looking at the oceans, looking at the universe, and so forth,

	and and reaching beyond where we are and and just seeing it, we, we do the same thing in humanities. This is same thing. Different thoughts are coming up based on what someone may have learned and read from another particular person engaged in humanity studies and so forth. And **so science is important.** Bottom line."
2	"**I think science is one degree of the 360 degrees that the intelligent being who calibrated**-(interruption) the intelligent being that calibrated **and created earth** (interruption) Right? (Science) It's it's it's a logical approach to a problem. **Its gaining knowledge as it relates to a certain area.** It's an area of knowledge. It's a degree of knowledge as relates to a certain area. **And is one degree of knowledge that has tremendous, as you follow science, depth.** In my mind science began with the intelligent being that calibrated our (inaudible).**Science begins with the intelligent being that calibrated our creation and utilized evolution to cause us to currently be in existence.**"
3	"However, I do think that. **The world we live in has made science its own world. Therefore we don't see the work we do in the environment as scientific**, but if **we were to look at asking questions and solving problems as science, then every organization every entity participates in science** um and **for you know the church science is often seen as the competitor to our faith** it's the opposite of faith um **not realizing it takes faith to do science it takes faith it takes belief to say that if I ask a question or identify a problem I'll find a solution so**. Scientists have always had faith, but we as Christians believe that everything is faith, when truth of the matter is, a lot of it is faith, made known through science. And I think that's what the journey of life is. It is a sign life**. Life is a scientific experience, not experiment, but life is a scientific experience.**"
4	"But science helped me, when I said stabilize my life I meant that whatever chaos was happening, you know, in my family, or with my parents, or with their marriage, or whatever, **science is, the thing that I always used as the anchor to understand them.** So that's I actually started being interested in social sciences because of the challenges that my parents were having in elementary school. Okay, that so that I could make sense of them arguing. So social science was my first passion cause it would, it just helped me anchor and anchor myself in a you know, family troubled situation, and I it helped me to have compassion and love for them both, and understand them both… **I'm very clear in terms of how I went about my life from very young age, that science was the answer to every problem**, and **if I could figure out what the science was to the problem, then I wouldn't have to be upset, that I could deal with what it needs to be done and do what needs to be done… I would say that science is nature**. Yeah, that's it. Science is nature. **And I think that as a faith leader and a scientist I get to love science because it's how I came to love nature**. I it's how I came to

	learn about myself. **It's how I, what I use to relate to God and and and to experience spirit and heal others. So science to me belongs to me without the modern context, it is nature.**"
5	"I don't know, when we were little science meant **laboratory** with a a you know, **white coat and and mixing stuff together**, and and you know and I don't know **opening up a frog and and and and dissecting it**. That was, that was what was for us. **Now we know that that has evolved**. And I think that there's so many different areas when it comes to science. So that that's where you know, that's where it's so so open ended. **It's very difficult to to define what a scientist today is."**
6	"Right to me **science is the in many ways it is the research the discovery the calculations the rendering of the universe and of earth** in particular you know, maybe not in particular, but but in Earth. And, you know, in, I don't remember exactly with 1314, 1500s, um, **a lot of science was sponsored by the church**. It it and people either forget that or, or don't know it, and don't pursue understanding that. And so, um, **it's probably only the last hundred plus years, or something like that, where there has appeared to be, or even literally been, this gap or separation between those two**, um, the Church, the Catholic Church, the the Protestant Church, um, patriots, patrons, patrons of scientists, and Galileo and those others. **We were interested because our idea was, this was created, there is a creator. We wanna understand and know more about it.** We don't know what all those stars in the Milky Way in this, right? And it's like, how does the universe work? Um, and going up and wide and going down deep and narrow, right? And so it's the study of bugs and there, so in everything in between, um, there's a passage of scripture describing **King Solomon, who was King David's son, and how much he knew he was, seems to have been an extraordinary, brilliant man, an extraordinarily curious guy. And he kept real good notes. He he, um, summarizes, in his scientific, what we call now, scientific curiosity about nature, about animals or insects and all kind of stuff.** I think of it is as a pastor um is I'm gonna say this that it **(science) is a friend not an, enemy and in its purity it is working to make as many things make sense as possible.**"

Broadly, most of the faith leaders view science as another way of understanding the world. Pastors 3 and 6 noted the shared roots of science and faith, and that faith spaces are where science started, but now there is perceived tension that science is the enemy of faith. Pastor 1 noted that it's important to have others to do science with, and pastors 2, 3 and 6 shared the importance of integrating science with other ways of knowing as essential to gaining a full picture of the world. For faith leaders 1 and 4, there

was explicit connection between science and nature. Faith leader 6 shared about the importance of records in faith, and in science, as a commonality in practices. It is important to note that pastor 5 shared that he knows his view of science as a lab dissection is too narrow, and that it has changed, but they are not sure to what. Pastor 1 also shares that science can be scary and intimidating since they don't have training with it, and pastor 3 notes the challenges that have been made by having science become a world of its own, and not connected to people. Overall, faith leaders see science as a piece of how the world should be viewed, but do not have a shared understanding of exactly what that looks like.

Faith Leader Participants	How faith leaders think scientists understand "science"
1	NA
2	"I think there's a battle. I think there's currently a battle between those who view science as an impediment to their freedoms. An instrument of harm to their well-being in community and throughout the country. I think that's how they see science. **I think science often sees itself as the only mechanism to finding screws that exist in the world. And when science doesn't open itself up to those, I think its to its detriment**."
3	"I think when they say science I think they mean to **to go in and ask questions and solve identify a problem and solve it um following of a certain it's a certain method.** You ask the question you go in then solve it."
4	"I think because I think scientists, I wanna say**, I think scientists know that science is nature**. I think they know that I think they believe that they may not. **They may not use that language. I think they're very clear that science is the study of nature, the natural world. I think they're very clear about that.** But I think that what they are, **how they're using science it's too distinguish themselves away from others. So that they get to say what's true beyond what people actually are actually observing.** I think science is you is now, very often used as a tool to manipulate the term **science is used to manipulate common people.** Average people to come. I think science is, **scientific terms are used to confuse and to to**

	mislead. I think it's a way to **divide a group of people away from other people** so that they can say, **we have the we have the science, we have the understanding that you don't have**. We have the skill set that makes what we what we see true and what you see untrue. Unfortunately, **I don't think that it's used in the most efficacious way in the most ethical way**. Now I think it's used as a tool. **Science, as a word is now used as a tool to divide and to confuse and to manipulate.**"
5	"I hope you know it used to be, it used to be, and you correct me, cause you probably know better than me, **it used to be that the scientists concentrated their efforts on research, data, information, etc., and stayed there.** And now we have **a new generation of scientists** that that do that, but are saying, "Okay, so what happens with all my work? What happens with everything I put into this? Is it gonna be on a a on a report. **Is it gonna be on a shelf, is it? No, no, I want more.** IIII want to see the results of of all my effort and all my work."
6	"**Proving their hypothesis**, in some kind of way. In, from my perspective, **science became about proving things that they literally can't prove, right**. And so sometimes they talk about the, um, like science, or related word is like, you know, um, repeating something, right, and being able to do it again or demonstrate it again as a right. And, but there's so much about the universe that we haven't proved. We can't recreate, we can't put it under a microscope and I-I find it disingenuous and fascinating that I don't hear more about that how many things are we saying happened and we have a we can't and we can't know, right. A real, easy example, um is, well, real easy definition for me is um being willing **to include the word I don't know, like scientist seems to like, feel like I don't know, is, is cursing or something**. And so the universe is, you know, I don't know how many bill, millions of billions, really? How in the heck, how can you prove that? How do you really know that? How do you even sort of know that, right? And what you define as, you know, the rules. You're, listen, I'm crazy. **You're breaking the rules by being that definitive about that.** One simple thing."

Faith leaders think that scientists view science as a singular and calculated way of viewing the world that is removed from the general public. Pastor 5 notes that there is a generational shift in science occurring, where more scientists are interested in engaging with the public. Faith leaders 2 and 6 share that they feel that scientists use science to overstep what they can say about the world- either by not incorporating other world views, or by claiming too much confidence.

Discussion of "Science"

Scientists view science as a multistep, endeavoring to make sense of the world through iterative inquiry and shared practices. There is recognition among scientists that science encompasses a range of disciplines and approaches, which makes it difficult to define precisely. Despite this, there is a shared understanding that science involves the systematic exploration of questions and the pursuit of knowledge about the natural world. However, scientists also acknowledge the skepticism of and distrust towards science, which comes from a legacy of misconduct or misunderstanding. Some scientists also shared that they think faith leaders may view science as a narrow-minded or discipline that does not concern itself with broader society.

Faith leaders generally view science as another avenue for understanding the world. There is recognition among faith leaders of the historical connections between science and faith, as well as the shared emphasis on records and documentation in both domains. However, there is also a perceived tension between science and faith, with some faith leaders expressing concerns about science making claims that it cannot substantiate, or a lack of willingness to incorporate other ways to make meaning of the world.

Discussion and Recommendations

This research takes an unconventional approach to interviews, asking participants to explore their own understanding of words, and then share what they think that others think. Through this exercise, which provides practical insights for implementing partnerships with members of these groups, this research allows me to explore the concept of relationality that is shared by scientists and faith leaders.

Relationality refers to the interconnectedness and interdependence that individuals have with each other, and society, with specific emphasis on connections, interactions and networks which help to develop culture and identity (Roseneil & Ketokivi, 2016; Yeganehlayegh, 1981). While ideas of relationality are highlighted across responses, faith leaders are much more conscious of these concepts, and explore them intentionally and in depth. Scientists engage with relationality on a much more implicit bases, and do not explore these concepts as deeply. Scientists tend to see relationality in terms of concepts related to ecosystem, considering how biotic, abiotic things are related, and occasionally thinking of humans as part of this relationality when they play a role in the way that nature interacts with each other. Faith leaders explore relationality across terms, and consider relationality in almost all answers, underlining their views on the connectivity of all things.

Scientists and faith leaders have shared understanding around the importance of connectivity and shared responsibility when discussing community. Faith leaders highlight the importance of relationships amongst individuals when defining community, and this is shared by scientists acknowledging the interdependence that species have with one another. Ethic(s) is another area where relationality is explored by participants. Both scientists and faith leaders express that ethic(s) are directly tied to actions on individuals, and communities, with scientists often noting fairness and faith leaders exploring concepts of equity. In conversations around ethic(s), justice, and community the impact that individuals have on those around them is a reoccurring theme that is shared by faith leaders and scientists showing relationality as a central, shared concept that is held by faith leaders and scientists.

My advice for scientists and faith leaders is to consider the unique position that you both hold from a relationality perspective. Both scientists and faith leaders are pillars of society, across time and cultures, even though these roles have gone by a variety of names and titles. As these pillars, there are cultural weight and expectations that others have of you which may or may not be aligned with what you actually do or believe in. Additionally, both groups hold positions of trust for some, and distrust for others. Scientists and faith leaders are looked to, to help make decisions in times of crisis, to plan for the future, to support the development of society. Being a scientist or a faith leader is a unique life choice, seen as a calling for some, that is seen as an important way to make meaning of the world, with those in these roles having a responsibility to society to supporting connections of networks and ideas that work towards the self-actualization of a society.

This research examines human relationality both among humans and in relation to nature. Some scientists indicate that this varies depending on the model they consider, while certain pastors express personal or community-based fears of nature. Nevertheless, there's a consensus on the importance of the natural world. Particularly among some faith leaders, such as those in the Black Church, there's an acknowledgment of a historical and religious connection to the land, known in academia as Black Ecological Knowledge. Roane & Hosbey (2019) suggest that exploring these historic ties to the land can foster discussions about climate crisis preparedness and the necessary adaptations to support vulnerable communities, especially Black, Brown, and low-income groups. This convergence of perspectives is where scientists and faith leaders intersect, considering humans' role in nature and the potential for science to assess the effectiveness of faith

leaders' actions in advancing justice and upholding the legacies of Black Ecological Knowledge. This theme is connected to the basis for engaging with this research and builds upon the active environmental stewardship that is ongoing at faith spaces and the role that science might have to support it by helping to evaluate its impacts.

However, science and research are not without concern and come with a legacy of exploitation, and erasure. Through dialogue about the words science and research, I identified the role of uncertainty in science as something that may be causing additional apprehension in partnerships. Faith leaders shared that they often felt that scientists overstate their findings, or conversely are dishonest and do not share everything that they find. While scientists expressed that they understand the lack of trust in science, they largely see science to make meaning of the world, and research as the process through which that is done. In responses from the scientists, I identify that for them, science is an iterative process, and a way to learn things. And with that- being uncertain is a feature of this work. The training that scientists receive emphasizes honesty about limitations, and what is known or not known. This is evident in the standard practice across many scientific fields is to conclude academic papers with areas for future research. However, could come off as being falsely humble- or as overstating what is known when prior findings are disproven. This means that science, even when it is working in ways that are equitable, which does not always happen, can come across as dishonest or changing the story. These concerns are shared by faith-leaders in the interviews. Additionally, this model of finding truth can be narrow, and values evidence in the form of facts and inarguable evidence.

This can make science come across as dishonest, and exclusive to the way that some view the world. What is important to note for scientists and faith leaders entering partnerships is that when entering these partnerships, both groups of people are likely withholding at least some concerns or judgements about the others way of interpreting the world, and being brave to try and meet others where they are at, which is not widely supported by the institutions that they are in, to meet each other. I advise scientists to especially remember that there is a legacy of science not only being seen as the enemy of religion, but also being a tool in validating and upholding systemic racism and classism. And I encourage faith leaders to consider that scientific training does not often teach how to engage other ways of knowing, and to become PhD researcher individuals just need to master one specific, Western scientific process. Additionally, for many scientists engaging with the public to conduct research, and especially faith-based communities feels like a taboo thing to do. However, the scientists interviewed showed interest in understanding other ways of knowing. While there is likely selection bias in the group interviewed due to their choice of employment at an institution that engages with the public, and value of many ways of understanding the world.

While scientists and faith leaders viewed ethic(s) as "doing the right thing" scientists viewed this as with the law or institutions, and faith leaders more closely aligned this with their morals. Both groups understood that ethic(s) dictate actions and viewed justice as the potential to right past wrongs. However, faith leaders had more thorough understandings of what justice could look like, as straightforward equity and righting past wrongs. When beginning partnerships, I implore faith leaders to consider

concepts like ethic(s) and justice and make clear what this means for you, and how you expect scientific partners to act to uphold this vision.

Finally, it is important to explore the diversity of science, institutions that do science and motivations for science. Many faith leaders shared that at least some of their apprehensions around science were concern about the motivations of scientists and the institutions that they work for. Despite my efforts in interviews to focus on environmental scientists and federal or academic scientists- there was often a view of science as a monolith by faith leaders. It is important to note the differences in cultures, and motivations across scientists who work for corporations and are primarily motivated and application by profit of their company, scientists who work for academia who often explore theory, scientists who are in academia or government whose interests tend to lie in applications of science. The mission of the institution is directly tied to benefits or limitations that scientist may have. When engaging in partnerships, scientists should prioritize transparency of what the motivations of their institutions are, and how that bias might impact their research. Additionally, they should share what the potential benefits there are to them personally for engaging in this relationship. This could help to dispel or moderate misconceptions about what motivates scientists, and support trust building in partnerships.

Limitations

Limitations of this study include racial diversity for scientist participants and shared training and institutional affiliations between myself and the Participants. All

scientists were white. All of the scientists at SERC are white, and to increase racial diversity I would have had to connect with people outside the institution and would have lost the shared institutional identity that I was interested in at SERC. This racial homogeneity likely impacted the scope of worldviews that I learned about.

Additionally, I have a BS in biology and have worked at SERC since 2021. I share my undergraduate training and worldview with many of the natural scientists that I interviewed so I likely share some of their biases and way of understanding the world. I also collaborate closely with two of the participants and I am up to date on much of the work of all participants, so we have been able to speak in abbreviated terms with each other. I also may have made assumptions about how folks were approaching concepts or ideas due to this shared training and institutional affiliation that were not there.

For faith leader participants, there are limitations on gender diversity and my own ability to understand their responses due to differences in identities. The Black Church, and Christianity more broadly has a largely patriarchal power structure that means there are fewer women in positions as faith leaders than men. I considered including women who may be involved in traditionally unseen labor like wives of pastors, or heads of organizations with congregations, but was limited by my capacity for research at this time. Going forward I would recommend that other studies explore the unseen work of women in these translational activities.

Additionally, my own positionality as a 24-year-old white women, not raised in any religion and not from Maryland means that I do not share much in the case of demographics with the faith leader participants who range from early 30s- likely early 70s, who are pillars of the community in Baltimore, many of which have been there for

at least one generation. Additionally, I do not share the faith context that many of these participants use as a guiding principle in their lives so I may not understand the weight of these references.

It is important to note that I had also planned to complete focus groups with faith leaders and scientists following the one-on-one interviews. There were a variety of plans to do this, ranging from mixed groups of scientists and faith leaders, solo groups, online or in-person, and integrated into meetings or not. Ultimately, there was miscommunication about the strict parameters that are needed to define a focus group in an academic setting. The logistics of getting consent, recording, having a closed room of particular participants, having at least ninety minutes of time for discussion did not align with community framework of integrating this into an ActNow meeting, which was the final plan. Instead, I led a guided conversation. I posed a question, and asked faith leaders to respond. Though there were others in the room, the faith leaders were the primary respondents. I recorded detailed notes in my notebook, and immediately transcribed them into online notes. These notes were shared with faith leaders as an opportunity to provide feedback. The idea behind doing this was to try and correct biases and lack of understanding that I have around faith, and Black culture.

Chapter 3: A Case Study Through Reflective Analysis of a Participatory Science Initiative.

Introduction: The conceptual framework for the *Science and Faith* Initiative

Since the spring of 2021, I have led the *Science and Faith* initiative at the Smithsonian Environmental Research Center (SERC) to address social and environmental challenges utilizing community-driven science. Community driven science is what I have coined SERC's approach to this project as. All other participatory science projects at SERC have questions that are decided and designed by research staff, and volunteer scientists are only brought in for data processing. When compromises between volunteers and science need to happen, science almost always takes priority. The Science and Faith initiative seeks to include the public in the determination of what the research questions are and help set priorities for the research. However, this project is not truly community science because it originates at SERC which is a quasi-federal organization, is primarily facilitated by SERC, and the scope of research is limited by the expertise that SERC is able to offer (Cooper et al., 2021).

This initiative collaborates with community-based organizations, educators, faith leaders, and scientists to tackle shared environmental health, scientific, and education priorities. Our efforts involve establishing a network for environmental science data collection to assess the impact of congregations' environmental restoration work, with a specific interest in urban heat and biodiversity. Through collaborative monitoring techniques, we hope to bridge gaps in natural science literature related to small-scale restorations in urban settings. There is currently limited understanding about the impacts

of environmental restorations, often monitoring is not undertaken at all due to limitations on time and resources, and widespread held beliefs that restoration is inherently a good thing and therefore monitoring is unnecessary (England et al., 2008). Additionally, when monitoring does happen it often focuses on piece meal short-term successes, and does not focus on broader ecosystem-specific indicators or the account for several restorations across sites (Herrick et al., 2006; Wagner et al., 2008).

Additionally, *Science and Faith* supports environmental education programming, providing materials and regular instruction for all ages at congregations, and has initiated a paid high school internship program focused on identifying environmental issues, engaging in the scientific process, and communicating findings.

This study examines *Science and Faith* collaborations as a model for interdisciplinary work in environmental science and faith, addressing the literature gap on partnerships between faith-based organizations and environmental science, which is adjacent but separate from literature on partnerships between faith and public health, and social work (Fulton & Wood, 2012; Werber et al., 2012). Building on challenges identified in public health and social service partnerships with faith-based organizations, the research focuses on understanding unique features that may arise from partnerships involving faith-based institutions addressing environmental issues. This will expand upon the existing understanding of challenges around secular versus religious worldviews in partnership (Fu et al., 2021). This research explores two and a half years of collaborations between scientists, faith leaders, and community leaders- reflecting on key moments in the partnerships, and sharing lessons learned.

Through reflective analysis, I will evaluate two and a half years of collaborative social and scientific initiatives in Baltimore to explore the model's adaptability across systems. As the primary researcher and the program manager for Science and Faith, I have an intimate and unique inside perspective on program and partnership development.

Methodology

I will analyze my two-and-a-half years of work with *Science and Faith* using ethnography, participant observation, field notes and, a three dimensional collaborative mapping activity, CoNaviagtor. I have spent at least 120 hours in meetings, which occurred online and in person at SERC and in congregations in Baltimore. These meetings looked like site visits, congregation green team meetings, weekly one-on-one meetings with partners, data sharing meetings attendance to broader groups like Keystone, ActNow and partner celebrations like Founder's Day and Juneteenth celebrations. I have spent at least 260 hours on protocol piloting and environmental education with community members, primarily with students at Stillmeadow Community Fellowship in West Baltimore. Often, this occurred on Saturdays from 8:30am-12:00pm and during weekday mornings in the summertime. Some protocol engagements also occurred at Liberty Grace Church of God in Baltimore and St. Lukes Episcopal Church in Annapolis, MD. At all data collection engagements, I was integrating into existing programming with a partner, the large majority of which were elementary aged students with Temple X at the Baltimore Forest School on Stillmeadow's Peace Park. I also worked with Youth Workers, the Canopy Crew and Silviculture Interns from Stillmeadow and a group of high school interns supported by SERC in the fall of 2023 at Stillmeadow to engage in participatory science. Field notes were often taken at in person

meetings in a notebook, at online meetings in online notes and occasionally after in person protocol engagements either online or in person- but most often captured through photographs.

In February of 2024, my ICARE team comprised of Terris King II, Alfie Chambers, Alison Cawood and Dawn Biehler collaborated on a a three-dimensional collaborative mapping activity, CoNaviagtor. The goal of this session was for these folks, who have all been heavily engaged in the respective 120 hours of meetings and 260 hours of implementation, to identify components of our work that could not be left out of this case-study. I took photographs of this map and wove the themes across the analysis, most

in this chapter and some in chapters one and two.

Figure 1. CoNavigator 2024

This collage includes all the tiles that were created at the CoNavigator Session. Each of the five group members wrote elements of our work that they thought needed to be included in this thesis on individual tiles. Each participant shared what they wrote down, and then an explanation of what they meant. Together, the group worked to connect tiles with related themes. Then each person received a colored pin, and placed these pins in tiles that they thought were most important. This session lasted two and a half hours.

I follow the qualitative research best practices outlined in Richards & Morse's *ReadMe First for a User's Guide to Qualitative Methods* (Third Edition, 2007). I utilized

qualitative methodologies for their adaptability to emerging findings, suitability for exploratory research, and their capacity to generate hypotheses. Qualitative research facilitates an in-depth understanding of individuals, systems, and phenomena, incorporating contextual understanding and participant perspectives. These techniques have practical applications for the collaborative efforts of *Science and Faith* partners and others interested in similar environmental science and faith partnerships. Analysis of notes, photos, the CoNavigator session included reflecting on shared themes, and instances of examples for these shared themes through challenges, triumphs and pivotal moments.

Practical Advice

When considering what needed to be included in this case study, the result was a mixture of advice for practitioners, and contributions to theory on participatory science. Below is a list of practical advice for folks from academia or research institutions looking to engage in similar work. This list was compiled by myself, my academic advisor Dawn Biehler, partner mentor and SERC supervisor Alison Cawood, and community stakeholders and SERC collaborators at Temple X, Alfie Chambers and Terris King II. The prompt was “what cannot be forgotten in a case study about our partnership.” I synthesized these contributions and added some of my own.

1. Words matter. It is important to use an environmental justice framework when engaging with an EJ community, or community that has been over studied to establish common understandings and build trust.

2. There are existing relationships and histories in all communities, and often between scientists and the community. Take the time to learn this history to try and avoid past mistakes.
3. The best partners may not be the most obvious ones. Take the time to learn about the ethos of organizations and consider with a critical eye if their real-world impacts match their stated priorities.
4. When you identify partners who do align with your ethos, it takes time to get to know each other, and build trust. Show up to events with no agenda, and just listen.
5. Relationships are everything. It is important to establish a foundation of trust for when conflicts arise.
6. Conflicts are a necessary part of partnership. Figure out what is non-negotiable for each partner, and where there can be some flexibility. This may take several conversations.
7. Who partners are, and their level of power matters. Are you connected to someone who decides what happens on their land? Or do they need to get several peoples approval before anything can happen? Are you someone that can navigate academia to find the necessary resources?
8. Academia and research institutions were not built for community engaged work. Processes are slow, cumbersome and do not reward the types of labor required for most community engaged research.
9. Pay people. When its possible, write grants with your community partners. Budgets are an indication of priorities.

10. Community partners need to lead priorities, and important decisions should not be made in a vacuum. What is an important decision is not the same to everyone, and this should be navigated with an abundance of caution initially.
11. Have several relationships at each institution. Grant funding, and life, are ephemeral. Be intentional about building robust relationships that are supported by more than just two people to support longevity.

Theoretical Implications

To expand upon some of the underlying principles and experiences outlined in the practical advice, I offer a theoretical approach to review the science and faith partnership. Themes of power and relationality are woven across conversations about partnerships and data. This builds upon the work of Heaney et al. (2007) who explores the importance of community based participatory research (CBPR) and the role that it can have in addressing health disparities, promoting social justice, enhancing research quality and building capacity within communities to engage in sustained research to advocate for health and foster a sense of ownership. Bell & Lewis (Bell & Lewis, 2022) go on to say that though universities claim to support community engaged research, their systems discourage it through established structures and power dynamics which are hierarchical and reinforce the epistemic biases, neoliberal ideologies, and gender and racial biases. This case-study offers examples of community-driven science that navigates existing institutional structures and seeks to benefit the community in the ways that are possible as outlined by Heaney et al. (2007).

Partnerships

There is a fundamental asymmetry in relationships between academia/research institutions and faith-based organizations. This asymmetry is reflected in timelines, and institutional structures.

Institutional Structures

Showing up for partnerships can look a lot of different ways. One example of this is what it looks like to get together. For many community organizations, lots of the work gets done in informal get togethers, or authentic conversations and brainstorming happens at events with other stated purposes. For federal or academic organizations, sharing happens in much more structured ways, through meetings. To build partnerships with faith-based organizations and Temple X, I showed up to a variety of events like Saturday clean ups, faith leader round tables, and site visits where I was mostly there to listen and planned on being flexible to stay later for conversations. Additionally, when we were collaborating on events, I also planned to stay later to have important conversations about visions for the future. However, this informal meeting structure proved challenging because there were often choices about priorities that were being discussed which was above my ability to influence, or I did not have answers to questions because I was not prepared. To build trust and implement our vision, it's crucial to schedule regular meetings with partners. These meetings can take place either during wider congregation Green Team gatherings or through one-on-one sessions, where detailed notes are taken. Flexibility in attending community events remains a priority for me. Detailed notes with follow up summary and to do lists were important for maintaining clarity on partner responsibilities, and visions. However, when SERC employees have federal holidays, and

partners don't, this serves as a reminder of the inequal impact that this work has for partners- highlight that for SERC staff this is a job, and for others it is daily life. To try and address inequities in capacity, SERC has taken responsibility for administrative duties for notes and meeting facilitation, in addition to supporting administrative duties related to grant work.

The structures of grant funding are ephemeral and do not match with consistent communities. One of the tensions that partners in the Science and Faith initiative are always facing is what is the future of these partnerships and relationships. At SERC, we have better capacity to access consistent funding than a small non-profit or some universities, but projects still tend to start and stop on a two-to-five-year cycle. SERC and I have tried to be transparent with communities about our interest in continuing to address goals together and pursue grants to do this work. Prior to applying for a grant with Temple X, we collaborated on programming implementation at Stillmeadow for several months. When we identified shared priorities, we wrote a grant together and are currently funded on a grant for collaboration through 2025. While we continue to consider future funding options, we are transparent with the need to consider what growth and futures look like. I have tried to lead with partnership and goals first, then find funding second. The increasing focus on environmental justice within funding mechanisms, and participatory science fields makes it seem like there are a variety of options for funding currently in my opinion. Additionally, the Director of Public Engagement at SERC is a very skilled grant writer and has a record of successfully bringing in funding that helps to build community trust and internal SERC capacity to do this work. Additionally, when partners learned that the Smithsonian's overhead is about 30%, compared to other

academic partners overhead between 50-70%, this was a point of increased collaboration opportunity. Partners at Temple X expressed the injustice that is evident when large institutions partner with community organizations for grant funding and then take money for administration that the community partners do not receive. While 30% is still higher than what community partners would consider equitable, it is also significantly lower than what most traditional academic partners offer. Additionally, the ability of SERC to provide Letters of Support to partners on other grant opportunities and leverage the trust that there is within institutions for the Smithsonian was another point of collaboration moving forward.

Additionally, the timeline of funding distribution can be a source of broken trust since money often arrives later than expected or needed. Due to Alison's expertise, and prior experience with this grant and institutional knowledge of SERC we were able to accurately estimate when the money would show up. So while federal staff were getting paid, our partners were not getting paid until the money showed up. However, to do the work that they were contracted for, they would need to work prior to the school year for example, to have the planning in line so that things would be ready when the money got there. Managing expectations about funding timelines was key to the success of building trust initially, especially following the long legacy of broken trust between science and community in Baltimore- with our partners specifically and more broadly.

There is pressure within predominantly white institutions to promote, and potentially overstate, the work with underserved communities. There is the tendency from predominantly white institutions (PWIs) to want to virtue signal their, often recent, goals of inclusivity and diversity. This has often been seen in PWIs photos in

promotional materials that feature more diverse students than is representative of their student body. In this initiative, we tried very hard to combat this by not writing about the work that we were doing until after it was done. This can be challenging because we do not want to work secretively, but we also want to be selective about who we partner with. When done incorrectly public facing writing about the work can break trust. Because of this SERC has opted not to create our own webpage about this project and has intentionally kept both scientific and community partners relatively small. This is to develop trust and a shared vision, but also to work towards prioritizing community voice and leadership in communication about this work. Ultimately, when our partners feel that it is appropriate or would be helpful for the Smithsonian to release media about this work- we will do that. The community and SERC partners are planning, for this summer after 3 years of work on this project to create a SERC webpage for this project that highlights this initiative. The content about our partnerships and how we interact with community partners will be carefully crafted with their input. At a conference that we co-attended, I presented at a poster session about this collaborative work, and though I was trying to be mindful about not taking credit for organizing pastors, or students- in my efforts to efficiently summarize to an interested individual- it was perceived by a community partner who overheard me that I did. This broke trust. The conference that was supposed to be an act of collaboration with our parties, and a way for our community partner to learn about participatory science was an instance where I broke trust. I think that because I had asked for input on the content of the poster previously, and that this was an instance where I was talking to an individual casually rather than a group it was recoverable. But it reiterated what we already knew about the importance of being

intentional about community voices leading our collaboration, and not taking credit for work that we did not do.

For the Science and Faith initiative, some components of partners that have made this initiative work so far are as follows. We did not try to convince faith leaders of the importance of science; nor did we try to convince scientists of the importance of working with the community. Identifying scientists for this initiative meant looking for folks who are interested in community-engaged work, power sharing, and other forms of knowledge, and are at a place in their career where they are adding projects and looking for partners. Scientists that are in this position are often either early career or late career, so they have the flexibility to develop new things as they see them. This can be challenging as new career scientists are balancing many competing priorities and late-career scientists may not have the career longevity that communities are looking for. Faith leaders in this initiative are open to engaging with scientists, see nature as something that should be stewarded, are interested in taking actions to work towards this vision, and have land that they are interested in modifying to work towards sustainability. Community partners are interested in working with communities of faith, and scientists, share a vision for education, science and faith overlapping. Another element of success for identifying partners is for them to have a supportive supervisor for these unconventional partnerships. I have had the advantage of reporting to Alison and Dawn who understand that this is not a linear process- there will not be deliverables all the time, trust me to make informed decisions, and I trust them to support me when things are challenging. Additionally, Alison has a supervisor who trusts her and is open to new opportunities. Finally, SERC has had program staff, including myself who are flexible

with their personal/professional time to be available on the community schedule, makes lots of efforts to understand both scientific and community ways of knowing, are highly organized to try and coordinate collaboration opportunities, is skilled at seeing the big vision 5-20 years down the line, but also understands the steps it takes to get there.

One of the challenges that we face is mission creep- when partner organizations are growing in ways that do not align with your scope, or potentially don't. Or, when many issues are pressing, it can be tempting to divert your own priorities. It is important to review any new commitments and consider how they align with existing priorities and consider when it is important to be flexible and support while not overcommitting or establishing false promises. For example, the Smithsonian cannot engage in policy work because it is a federal entity. So that is an easy, and clear boundary to draw. Other boundaries, like how we support science programming are more challenging. Initially, we had planned to create a set of participatory science protocols that were largely implemented by program staff at congregations after brief training programs. We learned with the congregation that had higher science identity and more adult volunteers, that was led by a volunteer that used to be a research scientist, that congregation was able to self-facilitate and collect data more easily. The congregation that is newer to scientific research needed more support for protocol implementation. My responsibilities shifted towards leading all the participatory science data collection.

Over the last two years I have integrated into a variety of programs at congregations to support data collection. One of the boundaries that has been challenging to navigate is doing my job as SERC program staff, and not serving as staff for a partner institution. Many of our partners are, and will continue to be, small organizations with

minimal staffing. We want to strike the balance of building authentic relationships that are flexible and meet community needs, while also not setting up unrealistic expectations of consistent support for activities that do not align with our shared partnership. For example, committing to being part of Saturday Forest school programming from 8:30-11:30 that was entirely nature based was not what was initially envisioned with this work, but fit within scope of bandwidth that I have, and I am able to engage with participatory science with students for most of this time. However, support programming at summer camp was a bit trickier. The structure of the days was more flexible, and I am not able to commit to coming for a whole day. While I was there, I did not have as much routine or as clear goals for each day. Another challenge was making sure that I was spending my time teaching participatory science and limiting the amount of time I spent helping students eat lunch, or engaging in other nature-based activities that were not participatory science. This flexibility in my days, missions and schedule was a source of tension since I loosely defined my commitment as "mornings" and I booked a commitment with another partner at 11:30am, when my first partner who had expected "mornings" felt that I was not respecting my commitment. This lack of clarity around boundaries when developing new relationships can be emotionally exhausting and can lead to broken trust if there are not opportunities for regular communication. We are still figuring out boundaries in terms of time, and responsibilities.

Finally, it is important to note that success looks different for different partners. For scientists, this may mean publishing papers, for community partners, this may mean having people in the forest. Establishing what goals are important is essential to understanding motivations and ensuring that wins are celebrated across the team!

A challenge for SERC with grassroots partners is knowing who the right people are to contact for which piece of the project. While we may share goals, everyone has different responsibilities and holds different ideas of how they would like to be communicated with. For example, when learning how to use camera traps- I wanted to set some up inside research plots that the US Forest Service has on the property of Stillmeadow Community Fellowship. Unsure who to reach out to- I connected with the local director of the US Forest Service to get permission to put camera traps in the plots. He sent me to the pastor, with whom I already had a relationship. From there, I got permission to camera trap and share the data back with the pastor. A few weeks later, the pastor had forgotten that he gave permission for me to deploy the traps- and we had a tough conversation where he thought I was taking information from his land without permission. In a later conversation we were able to recall the permission that he had given, and because of both parties' interest and willingness to work together we were able to move forward. I also made sure to not only share the raw data, but the presentation and data summaries that went along with it.

Conclusions and Suggestions

The Science and Faith initiative is an example of asynchronous relationships, co-creation, and genuine efforts from unlikely partners to work together. From logistical challenges like scheduling meetings, to cultural differences in approaches to relationship building the Science and Faith initiative is an example of people who want to work together, and the benefits of community-driven initiatives with academia and government organizations.

From this initiative, I have a variety of recommendations to make this work more possible for others in the future. Through a partner meeting at Stillmeadow, Dr. Laundette Jones, a faculty member at the University of Maryland, School of Medicine, shared her idea to have Community Faculty. I would like to amplify her vision here and share my support for it. Dr. Jones' vision was to have interested community leaders become faculty at universities so that they can reap some of the benefits that faculty have, like sending their children to associated universities. This can also be a powerful opportunity for more widespread sharing of university resources, like space, libraries, and transportation, with the community through these relationships. In addition to Dr. Jones' Community Faculty idea, I would like to propose a Community Institutional Review Board. One of the duties of Community Faculty could be like the existing IRB, but instead of protecting the institution, their goal is to protect the communities from the harm that research could do. The community review board would have veto power on all research projects. This could be transformational for repairing relationships of over-studied communities.

Additionally, I would like to note the geographic limitations of knowledge production. As expressed by Loukissas (2019) there is the false idea that information, especially in the form of data, is "discrete, complete and portable." Instead, Loukissas (2019) asserts that all data is local, attached to a place and that all data are indexes of local knowledge. Sole & Huysman (2002) highlight that within this connection to place of data, that information moves and develops more freely in connected communities, than these that are not connected. So, when thinking about next steps, and future partners for this work it is important to remember that there will be boundaries to the scope of what

one organization, like SERC, can take on in terms of familiarity with local people and organizations. Instead, it might be useful to think of next steps of this model as sharing this work in Baltimore, with other organizations who can use this model to inform their own work to ensure that it is locally, and culturally responsive.

Finally, there is an ongoing need for policy implications from community-engaged research to address climate change policy and vulnerability readiness. A related important mechanism to continue funding this sort of work could be some cost-savings modeling to show what the financial benefits are of these interdisciplinary relationships when they work. Why it is important to invest in partnerships between science and faith, why it is important to have resources for novel research and implementation.

Appendix A

Interview Questions

1. Is there a time that you can remember language being a point of conversation or challenge when working in interdisciplinary partnership?
2. Tell me what the word community means to you?
    1. What do you think people outside of your professional field mean when they use the word community?
3. Tell me what the word data means to you?
    1. What do you think people outside of your professional field mean when they use the word data?
4. Tell me what the word ecosystem means to you?

    1. What do you think people outside of your professional field mean when they use the word ecosystem?
5. Tell me what the word ethic means to you?
    1. What do you think people outside of your professional field mean when they use the word ethic?
6. Tell me what the word justice means to you?
    1. What do you think people outside of your professional field mean when they use the word justice?
7. Tell me what the word research means to you?
    1. What do you think people outside of your professional field mean when they use the word research?
8. Tell me what the word science means to you?
    1. What do you think people outside of your professional field mean when they use the word science?

Appendix B

Code Book

1. Community
2. Data
3. Ecosystem
4. Ethic
5. Examples of Language as a Barrier
6. Justice
7. Research

8. Science
9. Connection between ethic and justice
10. Connection between research and science
11. The Two Hands of Science- Relationships of certainty
12. Humans as part of the natural world?
13. Other words that cause misunderstanding
14. Pastors think scientist interpret as…
15. Scientist Identity
16. Religious identity
17. Examples of Language as Barrier
18. Impact of Training/Worldview
19. Personal Connection
20. Resources
    1. Time, money, knowledge

Appendix C

Interviews to Understand How Faith Leaders, Scientists and Boundary-Spanners Understand Key Language

Research Overview

While working to connect environmental science researchers and faith-based communities, I have noticed that there may be some differences with how groups of people use key vocabulary. When developing new partnerships across science and faith, a

shared understanding of vocabulary and concepts is essential to building trust and working collaboratively. Through a series of one-on-one interviews and focus groups with faith leaders at Black Churches in Baltimore, scientists from the Smithsonian Environmental Research Center, and faith leaders I aim to identify if, and where there may be variability in understanding key vocabulary. This research will be part of my master's thesis at University of Maryland Baltimore County, with intention to be published in peer reviewed academic journals. All responses will be anonymized. This research aims to support the execution of the new Smithsonian project "*Youth in Environmental Science in West Baltimore"* and to provide insight for others who may be interested in engaging in similar efforts to connect science and faith.

Note: It is NOT compulsory for you to be part of this research to engage with the Smithsonian through the "*Youth in Environmental Science in West Baltimore"* initiative.

<u>Request</u>

If you are interested in participating in this research, the commitment would be 2 interview sessions. You may opt to just complete the 60 minute interview, and not the focus groups, but participants cannot be part of focus groups without completing a one on one interview.

1. A 60 minute one on one interview in the location of your choice (in person at a location of your choice, over zoom, or over the phone). This interview will focus on how you use and understand 7 key terms: *community, data, ecosystem, ethic, justice, research,* and *science*.

2. A 90-minute focus group with other faith leaders, scientists and boundary spanning professionals. There will be the option to join remotely via Zoom or in person in Baltimore. This conversation will follow the completion of one-on-one interviews and reflect on early findings and provide opportunities for clarification, correction or more in-depth thoughts on earlier concepts.

Compensation

Following the completion of each interview, participants will be given a $100 gift card. In person interviewees will have the gift card handed to them, remote interviewees will have the gift card mailed to their address. Completing both a one-on-one interview and a focus group would result in a total of $200 payment in VISA gift cards.

Scheduling

1. One on One Interviews will be completed between September 11th- October 31st. Please schedule an interview using this link:

   https://doodle.com/bp/ryleewernoch/vocabulary-one-on-one-interview

   or by scanning this QR Code:

2. Interviewees will participate in 1 of 2-3 Focus Groups that will occur between November 14th and November 17th with a mixture of faith leaders and scientists. Please complete the google form below to indicate which dates and times work best for you, and what format you would prefer to meet in (in person or online). Final format selection will be chosen by most overlapping dates, times and format preference.
    a. Google Form Link: https://forms.gle/f4oXLj6Hu6Ngv6Vx6
    b. Google Form through a QR Code:

Citations

Ammon, L., & Reed, R. (2016). *Liberation Theology In Battleground Religious Education*. https://www.semanticscholar.org/paper/Liberation-Theology-In-Battleground-Religious-Ammon-Reed/8f50548ab30786040885a38ba0ea605ebb4cf5c2

Baldwin, C., Pickering, G., & Dale, G. (2023). Knowledge and self-efficacy of youth to take action on climate change. *Environmental Education Research*, *29*(11), 1597–1616. https://doi.org/10.1080/13504622.2022.2121381

Ballew, M. T., Pearson, A. R., Schuldt, J. P., Kotcher, J. E., Maibach, E. W., Rosenthal, S. A., & Leiserowitz, A. (2021). Is the political divide on climate change narrower for people of color? Evidence from a decade of U.S. polling. *Journal of Environmental Psychology*, *77*, 101680. https://doi.org/10.1016/j.jenvp.2021.101680

Bell, M., & Lewis, N. (2022). Universities claim to value community-engaged scholarship: So why do they discourage it? *Public Understanding of Science*, 096366252211187. https://doi.org/10.1177/09636625221118779

Broerse, J. E. W., & Buning de Cock, T. (2012). Public Engagement in Science and Technology. In R. Chadwick (Ed.), *Encyclopedia of Applied Ethics (Second Edition)* (pp. 674–684). Academic Press. https://doi.org/10.1016/B978-0-12-373932-2.00017-X

Brown, B. A., & Mutegi, J. W. (2010). A Paradigm of Contradictions: Racism and Science Education. In P. Peterson, E. Baker, & B. McGaw (Eds.), *International Encyclopedia of Education (Third Edition)* (pp. 554–564). Elsevier. https://doi.org/10.1016/B978-0-08-044894-7.00124-X

Bucchi, M. (1996). When scientists turn to the public: Alternative routes in science communication. *Public Understanding of Science*, *5*(4), 375–394. https://doi.org/10.1088/0963-6625/5/4/005

Bullard, R., & Wright, B. (1990). *The quest for environmental equity: Mobilizing the African-American community for social change: Society & Natural Resources: Vol 3, No 4*. https://www.tandfonline.com/doi/abs/10.1080/08941929009380728

Bullock, O. M., Colón Amill, D., Shulman, H. C., & Dixon, G. N. (2019). Jargon as a barrier to effective science communication: Evidence from metacognition. *Public Understanding of Science*, *28*(7), 845–853. https://doi.org/10.1177/0963662519865687

Calhoun-Brown, A. (1999). No Respect of Persons: Religion, Churches and Gender Issues in the African American Community. *Women & Politics*, *20*(3), 27–44. https://doi.org/10.1300/J014v20n03_02

Carter, C. (1991). Science-technology-society and access to scientific knowledge. *Theory Into Practice*, *30*(4), 273–279. https://doi.org/10.1080/00405849109543512

Center for Faith-Based and Neighborhood Partnerships. (n.d.). HUD.Gov / U.S. Department of Housing and Urban Development (HUD). Retrieved December 13, 2023, from https://www.hud.gov/offices/fbci

Cohen, J. J., Azarova, V., Klöckner, C. A., Kollmann, A., Löfström, E., Pellegrini-Masini, G., Gareth Polhill, J., Reichl, J., & Salt, D. (2021). Tackling the challenge of interdisciplinary energy research: A research toolkit. *Energy Research & Social Science*, *74*, 101966. https://doi.org/10.1016/j.erss.2021.101966

Colquhoun, A., Geary, J., & Goodman, K. J. (2013). Challenges in conducting community-driven research created by differing ways of talking and thinking about science: A researcher's perspective. *International Journal of Circumpolar Health*, *72*(1), 21232. https://doi.org/10.3402/ijch.v72i0.21232

Commission For Racial Justice, United Church of Christ. (1987). *Toxic Wastes and Race in the United States: A National Report on the Racial and Socio-Econimic Characteristics of Communities Associated with Hazardous Waste Sites*.

Cone, J. H. (2000). Black Liberation Theology and Black Catholics: A Critical Conversation. *Theological Studies*, *61*(4), 731–747. https://doi.org/10.1177/004056390006100406

Cone, J. H. (2019). Whose Earth Is It, Anyway? In *Ideals and Ideologies* (11th ed.). Routledge.

Conrad, C. C., & Hilchey, K. G. (2011). A review of citizen science and community-based environmental monitoring: Issues and opportunities. *Environmental Monitoring and Assessment*, *176*(1), 273–291. https://doi.org/10.1007/s10661-010-1582-5

Cooper, C. B., Hawn, C. L., Larson, L. R., Parrish, J. K., Bowser, G., Cavalier, D., Dunn, R. R., Haklay, M. (Muki), Gupta, K. K., Jelks, N. O., Johnson, V. A., Katti, M., Leggett, Z., Wilson, O. R., & Wilson, S. (2021). Inclusion in citizen science: The conundrum of rebranding. *Science*, *372*(6549), 1386–1388. https://doi.org/10.1126/science.abi6487

Couvet, D., Jiguet, F., Julliard, R., Levrel, H., & Teyssedre, A. (2008). Enhancing citizen contributions to biodiversity science and public policy. *Interdisciplinary Science Reviews*, *33*(1), 95–103. https://doi.org/10.1179/030801808X260031

Dickerson, D. L., Dawkins, K. R., & Penick, J. E. (2008). Clergy's Views of the Relationship between Science and Religious Faith and the Implications for Science Education. *Science & Education*, *17*(4), 359–386. https://doi.org/10.1007/s11191-007-9099-1

England, J., Skinner, K. S., & Carter, M. G. (2008). Monitoring, river restoration and the Water Framework Directive. *Water and Environment Journal*, *22*(4), 227–234. https://doi.org/10.1111/j.1747-6593.2007.00090.x

Explore AAPS | Association for Advancing the Participatory Sciences. (n.d.). Association for Advancing Participatory Sciences. Retrieved March 6, 2024, from https://participatorysciences.org/

Fu, J. S., Cooper, K. R., & Shumate, M. (2021). Do U.S. Faith-Based Social Service Organizations Resist Collaboration? Examining the Role of Religiosity and Operational Capacity in Interorganizational Partnerships. *Nonprofit and Voluntary Sector Quarterly*, *50*(2), 241–261. https://doi.org/10.1177/0899764020952167

Fulton, B., & Wood, R. L. (2012). Interfaith Community Organizing Emerging Theological and Organizational Challenges. *International Journal of Public Theology*, *6*(4), 398–420. https://doi.org/10.1163/15697320-12341252

Glaude, E. S. G. (2014). *African American Religion: A Very Short Introduction*. Oxford University Press.

Glave, D. (2004). Black Environmental Liberation Theology: The Historical and Theological Roots of Environmental Justice Activism by the African American Church. *Griot*, *23*(2), 61–70.

Gyekye, K. (2009). Relationship between religion and science. *Legon Journal of the Humanities*. https://www.semanticscholar.org/paper/Relationship-between-religion-and-science-Gyekye/3b323d28dcd56bb4e44f30811df3e05cb7e78795

Hall, B. L. (1992). From margins to center? The development and purpose of participatory research. *The American Sociologist, 23*(4), 15–28. https://doi.org/10.1007/BF02691928

Harrison, J. L. (2015). Coopted environmental justice? Activists' roles in shaping EJ policy implementation. *Environmental Sociology*, *1*(4), 241–255. https://doi.org/10.1080/23251042.2015.1084682

Hassol, S. J. (2008). Improving how scientists communicate about climate change. *EOS, Transactions American Geophysical Union, 89*(11), 106–107.

Heaney, C. D., Wilson, S. M. (Sacoby M., & Wilson, O. R. (2007). The West End Revitalization Association's Community-Owned and -Managed Research Model: Development, Implementation, and Action. *Progress in Community Health Partnerships: Research, Education, and Action*, *1*(4), 339–349. https://doi.org/10.1353/cpr.2007.0037

Herrick, J. E., Schuman, G. E., & Rango, A. (2006). Monitoring ecological processes for restoration projects. *Journal for Nature Conservation, 14*(3), 161–171. https://doi.org/10.1016/j.jnc.2006.05.001

Holifield, R. (2012). Environmental Justice as Recognition and Participation in Risk Assessment: Negotiating and Translating Health Risk at a Superfund Site in Indian Country. *Annals of the Association of American Geographers*, *102*(3), 591–613. https://doi.org/10.1080/00045608.2011.641892

Irwin, G. (2013). *Toward the Better Country: Church Closure and Resurrection.* Wipf & Stock Publishers.

Isaac, E. P. (2012). *Expanding the Boundaries of Adult Religious Education: Strategies, Techniques, and Partnerships for the New Millenium: New Directions for Adult and Continuing Education, Number 133*. John Wiley & Sons.

Jones, J. (1992). *The Tuskegee Legacy: AIDS and the Black Community*. https://doi.org/10.13016/ZFZL-KDLL

Krause, N. M., & Krause, N. M. (2022). *Exploring Communities of Faith: An Exercise in Pure Sociological Thought*. 73–100. https://doi.org/10.1093/oso/9780197587652.003.0004

Kullenberg, C., & Kasperowski, D. (2016). What Is Citizen Science? – A Scientometric Meta-Analysis. *PLOS ONE*, *11*(1), e0147152. https://doi.org/10.1371/journal.pone.0147152

Levin, J. (2014). Faith-Based Partnerships for Population Health: Challenges, Initiatives, and Prospects. *Public Health Reports*, *129*(2), 127–131. https://doi.org/10.1177/003335491412900205

Lewenstein, B. (2022). Is Citizen Science a Remedy for Inequality? *The Annals of the American Academy of Political and Social Science*. https://www.semanticscholar.org/paper/Is-Citizen-Science-a-Remedy-for-Inequality-Lewenstein/df25176573d9a98a2dc5756dcce27211a4aba085

Lincoln, E. C., & Mamiya, L. H. (1990). *The Black Church in the African American Experience*. Duke University Press.

Little, D. (1983). Response to D. H. Smith's Paper on Contemporary Voluntary Action Research. *Review of Religious Research*, *24*(4), 304–307. https://doi.org/10.2307/3511007

Loukissas, Y. A. (2019). *All Data Are Local: Thinking Critically in a Data-Driven Society*. The MIT Press. https://doi.org/10.7551/mitpress/11543.001.0001

LYNN, F. M. (2000). Community-Scientist Collaboration in Environmental Research. *American Behavioral Scientist*, *44*(4), 649–663. https://doi.org/10.1177/00027640021956305

Mahmoudi, D., Hawn, C. L., Henry, E. H., Perkins, D. J., Cooper, C. B., & Wilson, S. M. (2022). Mapping for Whom? Communities of Color and the Citizen Science Gap. *ACME: An International Journal for Critical Geographies*, *21*(4), Article 4.

Marincola, E. (2006). Why is public science education important? *Journal of Translational Medicine*, *4*(1), 7. https://doi.org/10.1186/1479-5876-4-7

Marks, L., Laird, Y., Trevena, H., Smith, B. J., & Rowbotham, S. (2022). A Scoping Review of Citizen Science Approaches in Chronic Disease Prevention. *Frontiers in Public Health, 10,* 743348. https://doi.org/10.3389/fpubh.2022.743348

McCutcheon, P. (2016). The 'radical'welcome table: Faith, social justice, and the spiritual geography of Mother Emanuel in Charleston, South Carolina. *Southeastern Geographer, 56*(1), 16–21.

McCutcheon, P. (2021). Growing Black food on sacred land: Using Black liberation theology to imagine an alternative Black agrarian future. *Environment and Planning D: Society and Space*, *39*(5), 887–905. https://doi.org/10.1177/02637758211032975

Mitchell, N., Triska, M., Liberatore, A., Ashcroft, L., Weatherill, R., & Longnecker, N. (2017). Benefits and challenges of incorporating citizen science into university education. *PLOS ONE, 12*(11), e0186285. https://doi.org/10.1371/journal.pone.0186285

Monteiro, M., & Keating, E. (2009). Managing Misunderstandings: The Role of Language in Interdisciplinary Scientific Collaboration. *Science Communication*, *31*(1), 6–28. https://doi.org/10.1177/1075547008330922

Nadeem, R. (2022, November 17). How Religion Intersects With Americans' Views on the Environment. *Pew Research Center's Religion & Public Life Project*. https://www.pewresearch.org/religion/2022/11/17/how-religion-intersects-with-americans-views-on-the-environment/

National Black Church Initiative—Current NBCI Programs and Program Archives. (n.d.). Retrieved November 6, 2022, from https://www.naltblackchurch.com/environment/index.html

Nkoana, E. M., Verbruggen, A., & Hugé, J. (2018). Climate Change Adaptation Tools at the Community Level: An Integrated Literature Review. *Sustainability*, *10*(3), Article 3. https://doi.org/10.3390/su10030796

Olshewsky, T. M. (1982). Between Science and Religion. *The Journal of Religion*, *62*(3), 242–260. https://doi.org/10.1086/486943

O'Malley, R. C., Slattery, J. P., Baxter, C. L., & Hinman, K. (2021). Science engagement with faith communities: Respecting identity, culture and worldview. *Journal of Science Communication*, *20*(01), C11. https://doi.org/10.22323/2.20010311

OUR PLATFORM. (n.d.). National Black Environmental Justice Network. Retrieved November 6, 2022, from https://www.nbejn.com/our-platform

Owens, M., McKnight, J., Tiner, M., & Dunlap, M. R. (2020). The Black Church and Liberal Arts Institutions: Forming Reciprocal Relationships for Thriving Urban Communities and Churches. *Metropolitan Universities*, *31*(3), Article 3. https://doi.org/10.18060/24058

Paretti, M. (2011). Interdisciplinarity as a Lens for Theorizing Language/Content Partnerships. *Across the Disciplines*, *8*(3), 1–10. https://doi.org/10.37514/ATD-J.2011.8.3.13

PBS North Carolina (Director). (2022, October 7). *Full Episode | Black Issues Forum | The Evolving Role of the Black Church*. https://www.youtube.com/watch?v=QnlkGvkSHkI

Pew. (2015). *America's Changing Religious Landscape | Pew Research Center*. https://www.pewresearch.org/religion/2015/05/12/americas-changing-religious-landscape/

Principles of Environmental Justice (EJ). (n.d.).

Pulido, L. (1998). The sacredness of "Mother Earth": Spirituality, activism, and social justice. Annals of the Association of American Geographers. *Annals of the Association of American Geographers*, *89*(4), 719–723.

Pulido, L., & De Lara, J. (2018). Reimagining 'justice' in environmental justice: Radical ecologies, decolonial thought, and the Black Radical Tradition. *Environment and Planning E: Nature and Space*, *1*(1–2), 76–98. https://doi.org/10.1177/2514848618770363

Rademacher, A., Cadenasso, M. L., & Pickett, S. T. A. (2023). Ecologies, One and All: Singularity and Plurality in Dialogue. *Environmental Humanities*, *15*(1), 128–140. https://doi.org/10.1215/22011919-10216195

Rasaki, T. (2016). From SNCC to BLM: Lessons in Radicalism, Structure, and Respectability Politics. *Harvard Journal of African American Public Policy*. https://www.semanticscholar.org/paper/From-SNCC-to-BLM%3A-Lessons-in-Radicalism%2C-Structure%2C-Rasaki/3a62150522673a253b00935490c6ce10f9182214

Reyers, B., Roux, D. J., Cowling, R. M., Ginsburg, A. E., Nel, J. L., & Farrell, P. O. (2010). Conservation Planning as a Transdisciplinary Process. *Conservation Biology*, *24*(4), 957–965. https://doi.org/10.1111/j.1523-1739.2010.01497.x

Richards, L., & Morse, J. (2007). *ReadMe First for a User's Guide to Qualitative Methods Third Edition*.

Roane, J. T., & Hosbey, J. (2019). Mapping Black Ecologies. *Current Research in Digital History*, *2*. https://doi.org/10.31835/crdh.2019.05

Roche, J., Bell, L., Galvão, C., Golumbic, Y. N., Kloetzer, L., Knoben, N., Laakso, M., Lorke, J., Mannion, G., Massetti, L., Mauchline, A., Pata, K., Ruck, A., Taraba, P., & Winter, S. (2020). Citizen Science, Education, and Learning: Challenges and Opportunities. *Frontiers in Sociology*, *5*, 613814. https://doi.org/10.3389/fsoc.2020.613814

Roelofs, H. M. (1988). Liberation Theology: The Recovery of Biblical Radicalism. *American Political Science Review*, *82*(2), 549–566. https://doi.org/10.2307/1957400

Rogers, R. K. (2009). Community Collaboration: Practices of Effective Collaboration as Reported by Three Urban Faith-Based Social Service Programs. *Social Work & Christianity*, *36*(3), 326–345.

Rose, N. A., Parsons, C., & Wright, A. J. (2013). ENVIRONMENTAL REVIEWS AND CASE STUDIES: The Science-Policy Disconnect: Language Issues at the Science-Policy Boundary. *Environmental Practice*.

https://www.academia.edu/21479719/ENVIRONMENTAL_REVIEWS_AND_CASE_STUDIES_The_Science_Policy_Disconnect_Language_Issues_at_the_Science_Policy_Boundary

Roseneil, S., & Ketokivi, K. (2016). Relational Persons and Relational Processes: Developing the Notion of Relationality for the Sociology of Personal Life. *Sociology*, *50*(1), 143–159. https://doi.org/10.1177/0038038514561295

Salazar, D. J., & Moulds, L. A. (1996). Toward an integrated politics of social justice and environment: African American leaders in Seattle. *Society & Natural Resources*, *9*(6), 617–631. https://doi.org/10.1080/08941929609381000

Schneider, R. C., & Bolger, D. (2021). Between the Prophetic and Priestly: The Role of Black Pastoral Authority in Health and Science Promotion. *Journal of the American Academy of Religion*, *89*(2), 530–561. https://doi.org/10.1093/jaarel/lfab044

Smith, D. H. (1984). Churches Are Generally Ignored in Contemporary Voluntary Action Research: Causes and Consequences. *Journal of Voluntary Action Research*, *13*(4), 11–18. https://doi.org/10.1177/089976408401300408

Smith-Cavros, E. (2006). Black Churchgoers, Environmental Activism and the Preservation of Nature in Miami, Florida. *Journal of Ecological Anthropology*, *10*(1), 33–44. https://doi.org/10.5038/2162-4593.10.1.3

Sole, D., & Huysman, M. (2002). *Communities of Practice and the Role of Location: Revealing Limits of Virtuality and Knowledge*. International Conference on Interaction Sciences. https://www.semanticscholar.org/paper/Communities-of-Practice-and-the-Role-of-Location%3A-Sole-Huysman/0a648f2617369389c11edbde1a207f5be1aa95fc

Somerville, R. C. J., & Hassol, S. J. (2011). Communicating the science of climate change. *Physics Today*, *64*(10), 48–53. https://doi.org/10.1063/PT.3.1296

Srinivas, K. R. (2017). Why Public Engagement Matters in Science. *Trends in Biotechnology*, *35*(4), 281–283. https://doi.org/10.1016/j.tibtech.2017.02.004

Sullivan-González, D., & Sullivan-González, D. (2021). *Liberation Theology in Latin America*. https://doi.org/10.1093/acrefore/9780199366439.013.955

The Sociological Study of Science and Religion in Context | Semantic Scholar. (n.d.). Retrieved March 7, 2024, from https://www.semanticscholar.org/paper/The-Sociological-Study-of-Science-and-Religion-in-Elsdon-Baker-Mason-Wilkes/c416c598b1fa482c5ea3d9ddc24436c97a1386e5

U.S. Census Bureau QuickFacts: Baltimore city, Maryland; United States. (n.d.). Retrieved February 2, 2024, from https://www.census.gov/quickfacts/fact/table/baltimorecitymaryland,US/POP010220

Vedlitz, A., Alston, J. P., & Pinkele, C. (1980). Politics and the Black Church in a Southern Community. *Journal of Black Studies*, *10*(3), 367–375. https://doi.org/10.1177/002193478001000310

Vohland, K., Land-Zandstra, A., Ceccaroni, L., Lemmens, R., Perelló, J., Ponti, M., Samson, R., & Wagenknecht, K. (Eds.). (2021). *The Science of Citizen Science*. Springer International Publishing. https://doi.org/10.1007/978-3-030-58278-4

Vohland, K., Sauermann, H., Antoniou, V., Balazs, B., Göbel, C., Karatzas, K., Mooney, P., Perelló, J., Ponti, M., Samson, R., & Winter, S. (2019). Citizen Science and Sustainability Transitions. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3511088

Wagner, K. I., Gallagher, S. K., Hayes, M., Lawrence, B. A., & Zedler, J. B. (2008). Wetland Restoration in the New Millennium: Do Research Efforts Match Opportunities? *Restoration Ecology*, *16*(3), 367–372. https://doi.org/10.1111/j.1526-100X.2008.00433.x

Waigner, L., Read, D., & Blair, E. (2023). *Enhancing Chesapeake Bay Partnership Activities by Integrating Social Science*. University of Maryland Center for Environmental Science Chesapeake Biological Laboratory. https://cbtrust.org/wp-content/uploads/UMCES_Social_Science_Final_Report_w_Apps_2.7.23.pdf

Wainwright, J. (2010). Climate Change, Capitalism, and the Challenge of Transdisciplinarity. *Annals of the Association of American Geographers, 100*(4), 983–991. https://doi.org/10.1080/00045608.2010.502439

Warnock, R. G. (2013). The Divided Mind of the Black Church: Theology, Piety, and Public Witness. In *The Divided Mind of the Black Church*. New York University Press. https://doi.org/10.18574/nyu/9781479864102.001.0001

Werber, L., Derose, K. P., Domínguez, B. X., & Mata, M. A. (2012). Religious Congregations' Collaborations: With Whom Do They Work and What Resources Do They Share in Addressing HIV and Other Health Issues? *Health Education & Behavior*, *39*(6), 777–788. https://doi.org/10.1177/1090198111434595

Wilsdon, J., & Willis, R. (2004). *See-through science: Why public engagement needs to move upstream* [Report]. University of Sussex. https://sussex.figshare.com/articles/report/See-through_science_why_public_engagement_needs_to_move_upstream/23401352/1

Yeganehlayegh, J. L. G. (1981). On the Relational Perspective. *Central Issues in Anthropology*, *3*(2), 55–69. https://doi.org/10.1525/cia.1981.3.2.55