

Caring for Place in Science, Academia, and at Home

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Abstract

Place mentorship consists of embodied experiences. It is through looking at Indigenous geographies of place we can see clearly how relationships, responsibilities, and reciprocity are learned from and within landscapes, waterscapes, and other places. Through place we learn how to be and coexist respectfully in reciprocal relationships. Place is more than a location site for human interactions, but an active agent in building epistemologies, ontologies, and cosmologies, combined with the spiritual and metaphysical that inform, teach, and demand our moral behaviors in ways that are emphasized in relationships, responsibilities and reciprocity manifesting in place mentoring. Place as mentor is a theory that suggests place educates and informs humans how to be good relatives through actions and interactions, observations, and experiences. Through looking at mentoring in education, mentoring from community, mentoring in activism, and mentoring from place itself, this paper speaks to the importance and influences of mentoring to care for place, the value and purpose of education, and to the critical importance of teaching care for place ethics to Indigenous youth and to non-Native mainstream society.

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Chapter 1: Introduction

LiSiWiNwi

I have not always lived within my Shawnee community. My family moved back and forth between the white dominate world and our Shawnee and Kickapoo relatives in Oklahoma. I had to adapt to living in very different worlds with conflicting worldviews and moralities. I had the privilege of camouflage as a white passing native to blend into the settler colonial mainstream spaces and had social-cultural capital to be recognized as belonging to my Native communities. I moved back to Oklahoma almost twenty years ago now and I am deeply dedicated to and engaged with my Nation, Tribe, clan, family and culture.

My truths are influenced by KoKoFiNum¹, MaTaLaTeKi,² and all my relations, human and more than human that make me who I am and hope to aspire to be. Place is the foundation of our being and influences our ways of knowing, cycles, and ceremonies. We Shawnee had to relocate to survive extermination at the hand of the United States Government. We are experienced at adapting to new spaces by creating new relations to place wherever we go. Everything I do as an Absentee Shawnee includes prayers, respect, reciprocity, relationships, and recognizes my responsibilities to all my relations. It is from this place I choose to weave who I am as a SiWiNwi³ with personal and academic experiences as part of my research paradigm and writing. I am centering our way of knowing and being as best as I can, being constantly aware that I must hold the responsibility of my words carefully.

My experiences in academic spaces are intersectional between Geography, Indigenous Feminisms, Sciences, and Education, and has been wrought with pain, conflict, and settler

¹ Ancient first Grandmother

² Creator of All Things

³ I am a citizen of the Absentee Shawnee Tribe of Oklahoma

colonial violence. It is the love, support, and guidance from family, friends, mentors, Native students, and community that guides and gives me strength. Research and activism for me is ceremony as there is so much responsibility in what I write, how I represent what others share with me, and how I care for each of the relationships I have with the relatives I advocate for. My Elders and Native community will hold me accountable and I honor them for do so and will be responsible for my actions and own my own words with humility.

HoWaSe LaSeMaMo

Something as simple as a greeting can change the way someone feels. Our SiWiNwi greeting asks “how you are feeling?” This isn’t asked as small talk but as an act of providing needs of those asked. Whatever your need, we do our best to care for you and one another. We created a way of being that is nurtured and guided by relationships with all our relations of place. Shawnee means southerner, or people from the warmth in Algonquin, as we were the southern most People of the Algonquin speaking Peoples. We were woodland river people who traveled out to exchange trade with Peoples near and far from our settled homelands in the Ohio and Tennessee river valleys. We cared for place as we cared for each other. All life had equal agency to exist and our people respected all forms of existence in all manifestations. Even the things we feared had respect; we had rituals, songs, medicine and other ceremonies to protect us from the known and the unknown.

There were fewer monsters before the colonizers came and settled. We were the first of the second wave of displaced Peoples. The Shawnee People were encroached upon by settlers until our five divisions agreed to move west of the Mississippi. Our relationship to place was shifted, but not severed. Eventually our People separated and moved first to Kansas, then to Oklahoma. The governmental policies, warfare, and murder of my family and nation reduced our

numbers from tens of thousands to a few thousand, total. Still, we kept in touch, stayed close together, and desperately fought assimilation, disease, starvation, and separation of our families, to maintain who we are. This brief walk of history brings me to here and now. Why does this matter one might ask? It has been the absolute tenacity, adaptive skills, and ability to combine what we knew of other places and build new relationships with other places to survive.

I am Absentee Shawnee, of the PeQuaLiWe division, PeLiWe clan, Big Jim Band, and Blanchard family. I am a mother of two and grandmother to one. I have my Shawnee name and participate in our ceremonies. I have not always grown up in my Shawnee community, but I am deeply embedded in our community and have been for many years. Everything about who I am comes from my relationship to my community, extended and immediate family, and where I live. The water, land, trees, birds, plants, and all the things about what makes this space our place also guides my actions and behavior. The cycles of life direct our foods, ceremonies, and so many other rituals. I carry these ways of being with me and look to these social and cultural norms in almost everything I do.

I approach learning and research from these places of physical being, social/cultural being, and being interdisciplinary and multidisciplinary. I am unapologetic in centering my worldview as a mixed-race Shawnee, Two-Spirit, cis gendered, grandmother and human. My spirituality and culture guide me in all aspects of the work I do. I allow my intuition and emotions to influence my questions and analysis. I look to dreams and ceremony to deeply consider whatever aspect of the research process I am doing. I nurture the relationships I have built over my lifetime and throughout academia to answer questions that have come from my own journey in science and academia. It is because of these reciprocal relationships with other Native/Indigenous students and mentors I am still here, physically and academically.

Throughout the document I will use Native/Indigenous/tribal interchangeably in reference to Turtle Island First Peoples, legally defined as American Indians. Any First Nations references are of Canadian First Nations original inhabitants I will reference places as beings with personalities, with descriptive names that are active, reactive and alive. I ask my ancestors and guides to protect and look over me during this period, as the academic system was never intended to educate us as equal, but erase, replace and/or assimilate us (Adams 1995, Battiste 2009, Tuck and Yang 2018, Wolfe 2006, James 2001). I reflect and analyze how my own journey is not unique in the challenges faced in pursuit of the agency of academic ‘credibility’ with intention to help Native Peoples and their places. In the process, I look to literature on Indigenous Geography, Environmental Justice, Indigenous Feminism, and Indigenous education from both place-based knowledge and western mainstream education system to build my understanding of how Native Peoples use knowledge in leadership and mentoring for environmental protection and activism.

My interest in this project came from my own experiences as a mixed race, white passing, Native woman and student whose interest was not originally in science. I started my journey in a summer Research Experience for Undergraduates (REU) at Haskell Indian Nations University in 2011. Students were instructed to choose a project about a Native issue and climate change. We were encouraged to design our research project and taught to do research and write about what we questioned and learned from the literature. We were being taught how to mimic the colonizers methods and paradigms for validity of our work as ‘academically rigorous’.

During this same time frame, I was mentored by Dr. Daniel Wildcat and part of what was then the American Indian and Alaska Native Climate Change Working Group, later called Indigenous Peoples Climate Change Working Group in 2013. The more I learned about the

challenges faced by Native/Indigenous/Aboriginal/First-Nations Peoples, the more driven I became to do something to help make a difference and find some way to better the lives of all Peoples, humans and more-than-humans, and the many places in the world that are loved and cherished. It became a responsibility for me to advocate for Indigenous ways of knowing and being and to protect places with which we have relationships. I became especially influenced by climate change, variability and extremes and the people I met doing climate related work both inside academia and in communities. This relational network of likeminded Natives and allies I met, shared meals with, shared stories with and laughed with has grown into lifelong relationships -- an extended family of sorts.

I found myself on the front lines of resistance movements like *Idle No More* in 2012-2013, then later with Standing Rock in 2016. Natives created teach-ins in communities and on campuses educating people on climate change causes, effects, and what we can do to make a difference. There were opportunities for me to engage in conversations with scientists at many levels of their careers about what they studied and how it mattered to Native/Indigenous communities. The most incredible things that came from these interactions was having Native Professors and mentors who guided and protected us students, connections to other Native students all trying to survive a system designed for our oppression, the love and support we shared, and learning and doing research in ways that made sense. Our research was activism, ceremony, place-based knowledges, traditional ways of beings and doing, and even some Indigenous science. The most fascinating thing for me was seeing Native women and youth leading activism, rising as leaders in their communities, and some leading in institutions and universities.

Intentions, Relevance, and Benefits

My dissertation seeks to show how blurred or nonexistent the boundary is between activism and research for Native students and faculty and how the ethics of care are foundational to the desire to advocate and care for places. Research is ceremony as we are in constant states of restorative relationships of place and reciprocity. I use one of the research projects to inform how and why Native students do and do not stay in Earth-related sciences. My own experiences working with local Tribes in Oklahoma (Riley et al. 2012), Tribes in the South-Central Climate Science Center Region (Blanchard 2015), and nationally with the University Corporation for Atmospheric Research (UCAR) and the Rising Voices meetings (2013-2018) allowed me to build relationships with diverse Indigenous Peoples over years, positioning me to reach out to our networks to have discussions through interviews with Native students and junior scholar's doing work in climate-related fields about positive and challenging experiences in their education and careers. While there are multiple themes, I focus on their experiences and why they choose to leave or stay in academic spaces, but why many of them go further by placing themselves in highly visible spaces of violence in frontline environmental justice and/or activism. From these discussions and interviews, I will author a publication on the challenges and opportunities of Native student and junior scholars in earth sciences in *Centering Native Voices within Earth Sciences: An Inquiry into Opportunities and Challenges Experienced by Native Students, Early Career Scholars, and Scientists*.

One of the many themes that has come from these interviews is the influence Native role models and mentors has on Native students. Mentoring is a critical part of the success or failure of Native students in academia, especially in Earth sciences (Downs and Windchief 2015, Windchief and Brown 2017, Martin N. Davidson 2001, Stevens, Andrade, and Page 2016,

Bergstrom 2012). The role of Native faculty is critical and underappreciated but these faculty members are often overworked and often the point person for diversity within institutions; expected to be the expert on all things Indigenous and the voice for all Indigenous People's, as all while maintaining their workload expectations for their institution of faculty, mentor, advisor, researcher, and many other expectations beyond their faculty and department peers. What I learned from the interviews and discussions on Native students' academic and scientific challenges and opportunities with UCAR informed a publication on the critical mentoring needs that support diverse ways of knowing and doing. This involved looking critically at education, Earth sciences, and settler colonial impacts on Native students and faculty. I took what was learned and crafted a document that investigates mentoring Native students and faculty for needs, challenges, and best practices for mentoring.

The next article is a theoretical look at care of place and place mentoring. It looks at what drives care of place and how places are themselves centers for mentoring and lessons important for grounding how one builds reciprocal relationships with place, forms and perpetuates caring for places, and how places have agency and ability to mentor us on many things especially ethical relationships. I look at disciplines outside of Geography to understand the ways in which care of place is enacted and embodied and how place mentors humans and other beings on place relationships.

Finally, in the last publication for my dissertation I will be interrogating education, purpose, and specifics on why women environmental activists protecting place choose to put themselves in places such as front-line work or academic publishing which can be places of heightened physical, emotional, and spiritual violence in their activism/advocacy. I interviewed Native women in differing levels of leadership and advocacy for their very different

geographical places as well as in various phases of education types (traditional, community, place-based, Western mainstream academic) and levels, to understand what drives their decisions to physically protect place. I interviewed them about why they each push back against environmental degradation and what influences them to make decisions to protect the places important to them.

The common thread connecting this research is place, relationships, and how Indigenous people choose and value learning, as well as how education is perceived and sought by Natives and other Indigenous Peoples relevant to their activism and advocacy of environmental and place protection. I gained insight to why some Natives find academia valuable and some see it as a waste of time. I share discussions related to why we stay in academia, and why we choose to leave. Our cultural identities compels us to find ways to fight to protect our homelands even in the face of adversity. Those who came to Standing Rock or followed online reports and videos, watching and supporting the water protectors from their homelands need only to recall their experiences or memories of NoDAPL in North Dakota at Standing Rock Oceti Sakowin camp to see the extent to which Indigenous People and allies will go to fight for what they believe in and value beyond monetary resources. To understand this requires deeper and more meaningful dialogues because place matters for many reasons and I want to understand other decisions to engage in environmental justice beyond my own.

I believe understanding the intersections of gender and its role in environmental vulnerability and empowerment contributes to why women appear in more leadership roles. My theory is many Indigenous women are compelled to balance our worlds and are responsible for protecting life which I believe is part of the relationship between women and land, culture and place, relatedness and responsibility. This research shows how activism at any level, for some

Indigenous people compelled to advocate for environmental justice, is valued whether in community, academia, or in place at the site of direct actions. The differences are scale, time, and place. But the purpose is consistently similar. Culturally, socially, spiritually, politically, and economically Indigenous Peoples are tethered to place and the responsibility to protect all our relations, academically or on the front lines; either way, time is not a luxury we can afford, which often leaves only immediate and direct action.

This research is relevant because it is important for academia and other education institutions to understand the challenges and opportunities Native students and junior scholars have navigating formal western pedagogies, sciences, and careers. My research is designed to increase the interest, enrollment, and retention of Native students in Science, Technology, Engineering, and Math (STEM) fields by creating safe spaces for students to share their experiences within STEM education and analyzing how improvements and recommendations can be created and implemented. The intention is to make Indigenous Place-Based research methodologies and paradigm's relevant and culturally appropriate while also decolonizing STEM education. Indigenous representation, ideas, and methods are just a few of the ways of decolonizing STEM and STEM education. Creating space and respect for Indigenous science and methodologies are also critical decolonizing actions.

Another benefit is pushing educational and other institutions to be intentional in their hiring and retention practices. Native students need mentors and peer groups that reflect their worldviews and understand the unique social, cultural, and political spaces imposed on their bodies and minds. I hope to explore benefits of generational transmission of knowledge between elders and youth, and educator and students that build and strengthen Indigenous communities on

the local scale, (reservation, urban, and rural) and macro scale (STEM related fields and educational institutions) supporting the transformative nature of quality mentoring.

My research is significant within an academic context as both a Geographer and Indigenous Scholar. Building on research available in other disciplines, I will bring that work into conversation with Geography and STEM to elicit new insights. I hope to fill gaps in the literature and expand and occupy paths set by earlier Native and Indigenous scholars. Within this space, my research will further the privileging of Indigenous Knowledge's and amplify Indigenous voice's. This is important for my journey and for the growth of empowered Native students, as part of our re-claiming of our identities, narrative, and re-valuing our ways of knowing and doing is instrumental in healing past injustices. I hope to relieve other Native students from some of the academic and institutional violence endured. The academic benefits will extend beyond my local community and include other Indigenous communities and build bridges between Indigenous ways of knowing, being, and doing with western systems of science both supplementing and growing innovative hybrid knowledge paradigms.

The Question

My research questions arise from my own lived experiences of activism and advocacy for protecting Mother Earth and how acts of resistance create friction in academic institutions, places of economic greed at the detriment of environment, and in Native and other Indigenous communities to ask Native women and Two-Spirit leaders:

1. What drives your decisions to do the work you do?
2. How would you define the work you do? Activism, advocacy or something else?
3. Has education influenced your decisions? How or why not?
4. Has gender influenced the work you do? How or why not?

Idle No More was started by four women, three Canadian First Nations women and a non-Native ally, as a flash mob round dance movement that started in Canada and went viral with social media inspired groups of Native women organizing teach-in's on academic campuses and in Native and Non-native community centers and churches across North America. Native women organized rallies at provincial and state capitals across Canada and the United States. Indigenous Peoples were becoming increasingly visible. After Idle No More slowed down, Native women were still working locally to advocate for water protections, environmental protections, trying to find ways to strengthen the sovereignty of tribes. Then there was a call to all Natives to come help stand in solidarity with the Standing Rock Lakota/Dakota Nation in Cannonball, South Dakota. That changed the world for many of us that answered the call. It changed me.

Standing Rock was a local resistance that received world-wide attention because of the complete and utter social and legal injustice and accompanying violence. I went in early October 2016, the second year of my PhD program. I was excited to be part of something bigger than anything I had ever experienced before. It was an overwhelming experience on so many levels such as size spatially, population numbers, diversity of tribes represented, and the love; the love in every task, word, and action. I sat in an all-women sweat with prayers and songs for four hours. I was full of communal love and grounded in spirituality. Even in a space so grounded in spirit and love, the heavy vibe from militarized hyper-militant law enforcement and the brutality of "security" hired by the oil company, we Natives and allies were there in non-violent prayer and love.

I left the Sunday before the law enforcement started using unprecedented violence against the Water Protectors by. So, as I watched (from afar) in horror as women, children, youth and

elders were attacked indiscriminately by law enforcement and private security with the most extreme forms of “non-lethal” force. I was back in my routine of classes and “normality” and watching from the safety of my computer. People I had made relationships with were being attacked and injured. It was in these moments of conflict I had clarity. *What is it that drives Native women, youth, and Two-Spirits to put themselves in spaces of increased violence as environmental activists and water protectors?*

While the term “spaces of violence” is a debated discussion due to diverse definitions especially across disciplines, for Indigenous Peoples it is much more tangible in that Indigenous Peoples are subjected to settler colonial violence on the own lands in such ways that violence is normalized. This normalization of violence against Indigenous People’s becomes more intense and visible in women, girls, and Two-Spirit people to the point that in Canada and the US missing and murdered women cases were not investigated and counted for years, thus normalizing violence against Indigenous women, girls, boys, and Two-Spirits. In an article by Holmes, Hunt, and Piedalue (2014), they discuss how spaces of violence are centered around settler colonial and neo-colonial concepts of land, racial hierarchy, gender, sex, and power. They argue that as activist scholars engage in knowledge production and legitimization there is the possibility of how they understand violence and resistance by centering Indigenous ontologies that are not accounted for in dominate discourses of violence and colonialism (Holmes, Hunt, and Piedalue 2014, 540). More specifically, under a scheme of normalized violence, there is no accountability for power holders and policy makers to protect those affected, or to repair the system, thus it expands into how land, gender, and “othered” people are impacted and be labeled unworthy of safe spaces.

Chapter 2: Literature Review

2.1 Indigenous Feminisms and Environmentalism: Re/Claiming Relationships and Responsibilities

Why are Indigenous women, who often are already subjected to poverty, violence, racism, sexism, and settler colonial heteropatriarchy, putting themselves or their families in harm's way as environmental leaders, advocates, or water protectors? What drives these women to be on the front lines of violence to protect the environment? Do they do it out of responsibility or duty, or is there another explanation? Why are women most visible in these spaces?

Indigenous feminisms argue that the methodologies and methods of Indigenous feminism have always existed as part of different Indigenous communities and expressed in different ways (Tickner 2015). Through colonization, many Indigenous communities have lost part, but not all, of the practices and rituals that accompany traditions relating to gendered justices and equity. Influenced by settler colonial patriarchy and Christianity, the roles and customs of gender and sexuality were inflicted upon and reproduced within Native communities, eroding the balance values of Indigenous structures of gender identities, roles, and fluidity. There are still mechanisms within Indigenous communities and ways of being that carry-on and revitalize traditions. Through the writings of Indigenous and non-Indigenous peoples I explore how Indigenous women are reclaiming their power through remembering, revitalizing, reconstructing, and writing about their own knowledges. I believe it is through these traditions, stories, storytelling, art, songs, and other practices women are rebuilding what colonization and heteropatriarchy attempted to violently erase and destroy.

Using interdisciplinary literature to re-construct how our medicines, spiritual and physical, were stripped from us and how these sacred ways of being and knowing are being

reclaimed, I hope to show how Indigenous women are re-empowered and re-discovering our voices. Academic institutions and “sciences” are where colonial violence exercises its influence (Harding 2009), so through these and other spaces I explore how our sovereignties and autonomy, individually and collectively, within many Indigenous communities is eroded and replaced with neocolonial systems. I look especially closely at the work of Indigenous academics on Indigenous feminism, de/anti-colonial theory, and Indigenous environmental activism, leadership, and how the re-construction of traditional and contemporary systems being re-claimed from within the academy and in communities, both rural and urban, manifesting itself in art, stories, ceremonies, activism, and in peer reviewed journals, in our own voices is part of the very necessary decolonial process.

2.2 Settler Colonial Racism and Heteropatriarchy

“Settler colonialism refers to a particular structure of colonial oppression in which the colonizing society seeks to dispossess Indigenous peoples of their territories through erasing the histories and presences of Indigenous peoples in these territories” (Meissner and Whyte Forthcoming 2017). Settler colonialism has a long history of white supremacy (Bonds and Inwood 2016), heteropatriarchy (Maile Arvin 2013), and sexism (Smith 2005a) toward Indigenous women, children and even men. These attitudes are the foundation of colonial settler violence in its drive towards power, control, and capital. The colonizers use violence to accomplish their goals.

The worldview of the colonizers was and continues to be based in individual wealth and power, often employing the most heinous acts of genocide on Indigenous peoples to access the land, resources, and labor (Dunbar-Ortiz 2014). The violence employed by the colonizers are well-documented and no one was spared the violence; young or old, male or female; they were

all subjected to the brutality. The colonizers traveled the world conquering every people they could including North, Central, and South America. While the histories of these places may have similarities, they are indeed unique in that the peoples in each of these places have been affected differently over the long term. One of the common threads that is woven throughout these different places is how Indigenous women have been impacted by settler colonial patriarchy and violence. Matrilineal societies were often targeted to be attacked by settler colonists (Henning 2007, Irwin 2007). Many Indigenous traditional systems of governance that included women as leaders were attacked and laws and policies were created by settler colonists against American Indian women in any space of authority (Crenshaw 1993, Martell and Deer 2005, Getches 2005, Frickey 1999) because the many Indigenous systems threatened power structures of white males and their colonial authority.

The violence against women, Two-Spirits, children, and men from contact forward is clearly documented by those who enacted the violence as well as those who contested the violence. All sides told a grim tale of brutality that lingers on in neocolonial practices that cause Indigenous Peoples to still struggle with suicide, missing and murdered women, addiction, and multiple other traumas (Dunbar-Ortiz 2014, James 2001, Smith 2005a, Smith 2005c, Crenshaw 1993). Around the world, women are reclaiming their power through activism, leadership, and through Indigenous feminist actions (Barker 2017, Kukkanen 2007b, Green 2007b, Arvin, Tuck, and Morrill 2013, Trask 1996, Eikjok 2007, Barker 2006, Maracle 1996, John 2015, Kauanui 2017, Suzack et al. 2010, Gaard 2014, Dulfano 2017, Irwin 2007, LaRocque 2007, Goeman and Denetdale 2009b, Hall 2009, Goeman 2009, Jeffries 2015, Moreton-Robinson 2000, Natividad 2014, Castillo 2002).

2.3 Relationships with Place

Indigenous identities and knowledge are place-based and sometimes gendered (Eikjok 2007, Green 2007d, Henning 2007, Irwin 2007, DeLeeuw, Camerson, and Greenwood 2012). In many Indigenous groups, there are gender-specific relationships and responsibilities to knowledge (Tohe 2000). For example, in my own Absentee Shawnee community we have seasons that are managed by the feminine and masculine. During their season, each is responsible for certain parts of the work, games, songs, and ceremonial responsibilities to all their relatives, human and more-than-human.

Barker (2015) points out that Indigenous feminism “begins in/on Indigenous territory and with the unique governance and cultures of the Indigenous peoples there, peoples who lived then and now in distinctive systems of (non) human relationships and responsibilities to one another.” The biggest differences between Indigenous feminism and other theories of feminism is that settler colonial systems still oppress and subjugate through racism, sexism, xenophobia, white supremacy, and land dispossession. Much of the resistance is in direct opposition to imperialism and colonialism by Indigenous and allies alike (Barker and Pickrill 2012). Even with the best intentions of non-Indigenous people to assist Indigenous peoples, problems arise (deLeeuw 2012). Place identity is a major aspect of indigeneity and provides a foundation for Indigenous ontology and epistemology (Larsen and Johnson 2012, Larsen and Johnson 2011, Johnson 2012).

2.4 Indigenous Geographies

Indigenous Geography is a complex but deeply important area of study. While early research was mostly done through the lens of the white, male, settler colonizer, Coombes *et al* (2011) outline the growth of this subdiscipline of geography, pointing to specific work where researchers began to critically address early work on Indigenous Peoples and their communities. The most significant growth came when Indigenous Peoples began writing and publishing about

their own experiences and knowledges. (Coombes et al. 2011, Coombes, Johnson, and Howitt 2012, Coombes, Johnson, and Howitt 2013). Indigenous geographers have addressed contemporary issues Indigenous peoples are experiencing.

Indigenous geographers and other Indigenous scholars sought to study other major challenges of Indigenous knowledges and rights (Johnson et al. 2007, Castleden, Mulrennan, and Godlewska 2012), research ethics (Louis and Grossman 2009, Norman K 2008, Rundstrom 1999), mapping and cartography (Sletto 2009, Louis, Johnson, and Pramono 2012, Pierce and Louis 2008), and environmental and climate change issues (Whyte 2013c, Whyte 2013b, Clarence et al. 2011, Cameron 2012, Crate 2009, Davis 2010, Dittmer 2013b, Douglas Nakashima 2012, Voggesser et al. 2013, Hanna 2007, Hardison 2013a, Houser et al. 2000, Boyle, Redsteer, and Eggers 2013, Julie Koppel Maldonado 2014, Julie Koppel Maldonado 2013, Krakoff 2008, Blanchard 2015). While not all these scholars are geographers, the opportunity for Indigenous researchers to speak about Indigenous issues resonates with me as an Indigenous geographer and as a Native woman. Interdisciplinary discussion about Indigenous people and Indigenous place lends heavily to the holistic conversations necessary to why Indigenous women are in leadership roles relating to place.

It doesn't matter where we go, we take with us our experiences, lessons, identity, language, food, and other important connections learned or characteristics built from place (Johnson 2012). Local scale is the space most necessary to survival of mind, body and spirit for many Indigenous peoples. Post-colonial research addresses some Indigenous historic and contemporary problems (Coombes, Johnson, and Howitt 2013, Harding 2009, Soja 1993) but how can Indigenous People be "post-colonial" if not only are we still occupied, but still suffering settler colonial violence? Indigenous Peoples around the world are working towards

decolonizing their lives and communities as action and not merely as “metaphor” (Tuck and Yang 2012). While some researchers study the goals of decolonization, there are others that suggest anti-colonial methods (Coombes, Johnson, and Howitt 2013, Johnson et al. 2007, Shaw 2006) would be better suited to support Indigenous individual and communal autonomy (Todd 2016).

While many of the cited scholars here may not be geographers by discipline, their work is often very relevant to Indigenous place issues. Indigenous challenges to survive are not limited to specific areas of research, but to every area of research as well as other areas not always immediately connected such as law, literature, and art. Geography allows space to explore the multi-cultural, multi-dimensional, interdisciplinary intersections of Indigenous Peoples’ place, epistemologies, and ontologies. As a Native woman doing Indigenous geography, I have found gaps in the literature discussing Indigenous feminism, ecology, and mentoring in geography especially in relation to women leading environmental and other place-specific resistances.

2.5 Indigenous Feminism’s

Indigenous feminism is unique from western feminism discourses in multiple ways that focuses on settler colonial heteropatriarchy (Barker 2015a, Green 2007c, d, Harawira 2007, Lugones 2010, Maile Arvin 2013, Maracle 1996, Natividad 2014, Tuck and Recollet 2016) and the ways in which Indigenous women continue to be affected by racism, sexism, and settler colonial dispossession of land and resources. Indigenous feminism also advocates for place and place agency, and the agency of other beings (Maracle 1996, 2015, Simpson 2017, Simpson 2011, Simpson 2016). Indigenous feminism is not embraced by all Indigenous women. Some argue that traditional gender roles and respects are a much older concept than feminism and that

the term feminism itself is a western white settler colonial word loaded with politics (Barker 2015a, Denis 2007, Green 2007d, Smith 2007).

Indigenous feminism is not without its critics, especially when it comes to traditional Indigenous systems of equity and balance (Maracle 1996, Barker 2015a). This Indigenous feminism I focus on addresses alternative perspectives of oppressions relating to gender, identity, and place relations. A unique component of Indigenous feminism is that it includes settler colonial violence and dispossession, making the intersection of these themes valuable and useful in the process of decolonizing our minds, bodies, and reclaiming our powers as Indigenous Peoples. Barker (2015) explains:

“An Indigenous feminism committed to anti-imperial, anti-racist coalition likewise rejects the notion of the great white director providing grand narratives and male heroes of liberatory emancipation from oppression to Black, Indigenous, and other racialized people as if they have no stories and no heroes of empowerment on their own. It rejects the binary constructs of good/bad, victor/victim, hero/loser, revolutionary/traitor in understanding the histories, cultures, and life choices of Black, Indigenous, and other racialized people. It rejects the idea that any woman—Black, Indigenous, or otherwise—needs a man to save her from her shackles to the white male master lest she be fated to live as his slave. It rejects the salvation narrative and fate of heteronormativity.”

The reclamation of our traditions, “place-thought” relations (Watts 2013), art, foods, medicines, songs, languages, and stories in our own voices as Indigenous peoples is foundational to the process of healing our communities, selves, and each other from historical and generational traumas. Settler colonialism inflicted far more pain than racism or heteropatriarchy alone. This is painfully clear in how colonization and settler society has imposed itself figuratively and literally on women and “nature” in attempts to possess, control, claim, and commodify our places and people’s bodies (Kukkanen 2007b, Gunn Allen 1995, Mihesuah 2003a, Mihesuah 1996a, Mihesuah 2003b, Prindeville and Bretting 1998, Whyte 2014b, Gaard 2014, Smith 2005b, Martell and Deer 2005). Most Indigenous groups have some level of

reverence and respect for the varying gender roles and how those relationships deeply connect people together and to place (Lang 1997, Carpenter 2011, Calhoun, Goeman, and Tsethlikai 2007a, Denetdale 2006, Fernandez 2003, Barker 2017, Anderson 2000, Williams Jr 1989, Sharp 2005, Kauanui 2017, Newman et al. 2004, Noel 2011, Meissner and Whyte 2017).

Most individuals who employ the phrase “Indigenous feminism” are academics, while outside the academy the term is used significantly less frequently, if at all. Those within the academy who choose to identify as Indigenous feminists, often define the term for themselves, arguing that to control the nature of the term from being co-opted by non-natives or defined by non-Indigenous people, they must be intentional with defining for themselves what the term means. Those who identify as Indigenous feminists work to define and develop methodologies, methods, and theories as a lens to critique Indigenous issues and a framework for responses. Indigenous scholars across disciplines work collectively to collaboratively explain Indigenous feminism as empowerment and a reclaiming of traditional responsibilities and relationships’ balances and positionality within larger communities. Green and others detail the importance of appropriating the label and defining it as Indigenous feminist scholars (Green 2007b, Green 2007a, Green 2007c, Green 2007e, Green 2007d). Green is not alone in her stance as there are a significant number of Indigenous women intellectuals writing about Indigenous feminism, situating the theory as well as the framework it provides (Cunningham 2006, Jeffries 2015, Mohanty 1984, Green 2007b, Green 2007a, Mohanram 1996, Ross 2009a, Eikjok 2007, Barker 2006, Barker 2015b, Smith 2006, Suzack et al. 2010).

Indigenous feminism is emerging as a method of action for Indigenous women in Latin America, and the Zapatismo are an example of Indigenous women reclaiming their power within their communities (Castillo 2002, Castillo 2010). Castillo (2002) shares how women in Central

and South America fight back against systems that oppress them, especially in their fight for land and democracy. Natividad (2014) conducted a comparative study between Indigenous women in Colombia and Wounded Knee protestors using “Third World Feminism” as a frame to “reconceptualize resistance by theorizing about the complexities of oppression” while unmasking power structures omissions or erasure of Indigenous histories and experiences and unpacking the legalities of how the state interacts with Indigenous Peoples.

Other methods women are utilizing to express their resistance to settler colonial heteropatriarchy in culturally significant ways are poetry, art, storytelling, and writing in first person (Ross 2009b). These methods are disregarded by western systems of academia as inappropriate or unacademic because they do not follow the rules and guidelines created by Eurocentric researchers who are often white and/or male. Sadly, there are significant works such as the work of Leann Simpson (Simpson 2011), Lee (Maracle 1996), and Vine Deloria Jr. (Deloria Jr. 1997, 2002), to mention a few Native scholars, that are dismissed by many non-Native academics because they do not glorify the work of earlier white Eurocentric scholars or because they do not conform to the structures of rigorous academic research standards as created by the colonial heteropatriarchal power holders.

In general, Indigenous feminism is about sovereignty and autonomy (Goeman and Denetdale 2009a). It is meant as a philosophy to reclaim social justice that has been eroded in Indigenous societies by settler colonial heteropatriarchy and white feminism (Lugones 2010). It is meant to decolonize our communities by creating tools and using them the ways that work best for Indigenous communities for well-being social, spiritually, and physically (Calhoun, Goeman, and Tsethlikai 2007b). Part of reclaiming equity and justice will require changing laws specifically aimed at disempowering women and other genders.

In her paper on intersectionality, Crenshaw (1993) critiques identity politics and violence against women of color to address two dimensions of male violence against women; rape and battery, looking at the intersectionality of racism and sexism and the laws and politics that protect males. McIvor (2004) also analyzes how the laws in Canada are targeting Indigenous women with the laws created to disempower them and how they are fighting back to reclaim their places in the communities and advance women's rights in the process. Other Indigenous women are addressing the legal universe, writing on ethics of decolonization by using their voices to challenge the legal system that is designed to oppress them (Martell and Deer 2005) and to reclaim control of land and laws that protect our bodies and lands (Deer 2015, 2009, 2004a, b). Indigenous women's voices challenge the systemic racism and sexism of settler colonial powers

This empowerment of the feminine is clearly visible in many places, including the Pacific Islands through Hawaiian nationalism and reclaiming of their place of justice and equity within their communities as well. Settler colonial heteropatriarchy has had a significant effect on Hawaiian culture through land dispossession, mapping and renaming places, and imposing laws that are incompatible to Native traditional ways (Trask 1996, Kauanui 2017, Hall 2009). Hall (2009) discusses remapping as a form of reclaiming which is consistent with work by Louis, Johnson, and Pramono (2012). This is just one point of reclaiming the status of women as the resurgence of storytelling of history, science, and other traditional knowledges are being revitalized by not only Hawaiians, but Maori women in New Zealand too (Trask 1996).

Chapter 3: Indigenous Methodologies and Methods

I come into this project with my culture influencing my methods, methodologies, and philosophies. Part of the interest in this work stems from my involvement in activism at Haskell Indian Nations University and then in Oklahoma during the Idle No More movement when I was in my master's program at Oklahoma University where I participated in teach-in's on campus and direct action at the capital and mall's doing round dances. I went to Standing Rock in October 2016 to participate in actions against the Dakota Access Pipeline and brought supplies and assisted where needed. I also contributed to the Oklalawa camp in south-eastern Oklahoma, also resisting the Black Diamond gas and oil pipelines. It is through this work I make connections and long-term relationships with other Natives and allies.

One of the specific areas I will focus on relates to my time with University Corporation for Atmospheric Research (UCAR) and the National Center for Atmospheric Research (NCAR) and their Rising Voices (RV) Program. I was first introduced to UCAR and NCAR as a Haskell student with Dr. Daniel Wildcat and the Indigenous People's Climate Change Working Group (IPCCWG) formerly called American Indian and Alaska Native Climate Change Working Group which I will refer to as the Working group. As a student from a tribal college (Haskell Indian Nations University (HINU)) the Working Group made an impression on me. Being at such an institution as NCAR/UCAR was enlightening for me as I was introduced to a level of science, I was not aware of and quite frankly was shocked to see the extent of the work being done there. I was impressed and overwhelmed.

This first experience led to other opportunities with the University of Oklahoma (OU) including another project from UCAR/NCAR called Diversity of Women in Science where I spent a few days with my mentor Dr. Renee McPherson who was the Oklahoma state Climatologist. When Rising Voices (RV) 1 happened, I was quick to jump on another chance to

participate in climate-related work as a Native with other Natives either doing climate science or climate-related work. This first meeting was small but started a foundation for continuing collaborative meetings over the course of 10 years building a network of like-minded Indigenous scholars, Tribal Environmental Professionals (TEP), climate scientists and other people interested in climate and Earth science related work. I met and built relationships with Indigenous Peoples from around the world. I was so excited to be part of such a group.

As I engaged in diverse projects, I discovered how scholars and activists work to protect and adapt to place in the face of climatic changes and extreme variability. In my own work at OU I was working with climate scientists and tribes on climate issues. To say I was invested was an understatement, I was enthralled in the work I was doing, as its relevance was central to my own tribe; so seeing and learning from others doing similar work was timely. RV was a valuable space for Indigenous Peoples to talk about climate science in culturally relevant and appropriate ways with elders, youth, university students, faculty, and scientists in new ways that resonated with many of us. It was for many a safe place to build relationships, scholarship, and discuss place-based Indigenous Knowledge (IK) that extended beyond Traditional Ecological Knowledges (TEK). TEK is the place-based knowledge that is passed down across generations within a tribal community.

Not only were Indigenous Peoples discussing TEK, IK, and science, it was being done in ways that expanded ethical research methods and methodologies, blurred the boundaries between disciplines, and emphasized the importance of collaboration and community participatory research in a place that, up until these meetings, were minimal at best in terms of engagement with Native and other Indigenous Peoples. To many of us at these meetings this work had and continues to have potential. For many years, I have continued to engage with participants who

have, or still participate with RV directly and indirectly. These relationships have built significant trust between many of the participants and have become central to leaders of RV deciding to ask me to work together on interviewing other participants of RV to critique the experiences Native students and early career scholars on their experiences navigating climate related sciences and education.

I was supported by UCAR/NCAR to reach out to Native students, early career professionals, and junior scholars for interviews. This opportunity supported the interests I have with my own research on Indigenous place-based climate science and education, the value and critical need for mentoring Native students like myself and others, and environmental justice activism. One of the things I have learned is that many Native students were also advocates for their community and homelands, and had deep understandings of the problems faced by their communities and homelands and were leveraging various means to protect, revitalize, and build resilient communities.

My engagement with Idle No More in Oklahoma expanded my perspective of social environmental justice. I spent time with other like-minded Natives doing teach-ins where Native student activists were educating non-Natives and allies on the environmental injustices in Canada, the United States and locally in Oklahoma. We took on the gas and oil industry since Oklahoma was ground zero for early oil and gas extraction and negative impacts on Natives in Oklahoma (Boxell 2021). We talked about the histories of relocation, land, erosion of sovereignty, and long-term physical, emotional, cultural and spiritual effects of the oil and gas industry on Native bodies and communities. We talked about climate change and weather extremes and variability. We engaged in round dances to raise awareness in public places. We built coalitions.

During my education, I was deeply involved with blurring the lines between activism, advocacy, and academic achievement. These various relationships all seemed to smoothly intersect for many I met who were doing similar work. It was a very exciting time and the passion became purpose for many Native students, community members, and even climate and Earth scientists. Everything seemed to make sense. Until April of 2016. A call went out over social media for anyone who could to come help stand against the violations of land, Peoples and sovereignty of the Standing Rock Tribe in North Dakota by the Dakota Access Pipeline (DAPL).

While DAPL was not the first major movement against a gas and oil pipeline in recent history (protests against the Keystone XL pipeline followed the Idle No More movement) it was the largest. What caught my attention was the women, elders, and youth that, like Idle No More, physically put their bodies in the way of progress of DAPL. What grabbed the world's attention was the militarization and police brutality that followed. As a Native student activist doing climate work with Indigenous Peoples, I was compelled to pay attention and act in solidarity. This movement was heart wrenching and inspiring at the same time and is where all the interests I had changed into where I was in my education and where I want to be professionally for the rest of my life. I want to be in the blurred boundaries of place-based science education, mentoring, and environmental justice activism.

While I would follow the climate thread of research with tribes, it was the rise of Standing Rock and allies against the DAPL on the heels of Idle No More and Keystone XL Pipeline fights, that guided my decision to focus on the leadership of environmental justice movements, especially those organized by and often managed and led by Indigenous women. Indigenous women have been marginalized in some research and their knowledges and participation within communities downplayed or outright oppressed focusing only on men's

knowledge and attributing information collected as from men since contact with colonizers and scientists. In using an 'anti-colonial' Indigenous feminist framework and methodology to critically look at the gendered power structures and how these structures play out with Indigenous women in leadership roles in environmental and social justice movement became important to me and the work I wanted to do. I wanted to learn from them, especially since those in leadership roles were not always educated in western academic institution or varied in their education levels and disciplines. What was the connection with place-based education? Is there a connection with mainstream education? I decided to combine what I have learned in academia and activism with my desire to better understand what drives Indigenous women into activism leadership in environmental justice movements and what role mentors play in places of activism and academia.

This qualitative inquiry will contribute to the growing field of Human Geography, especially Indigenous Geography, as well as supplementing the literature of Feminist Geography. This interdisciplinary research will also contribute to Indigenous Studies as contemporary issues and Indigenous Feminism. In the social sciences, this work will assist sociologists and feminists to better understand the influence of settler colonial systems on Indigenous women and place, as Indigenous women voices are minimal, if not absent in the work within these disciplines. This research will be intersectional with multiple disciplines that rarely intersect but should, such as Indigenous Studies, Indigenous Feminism, Indigenous Education, Place-Based education, and Geography. Indigenous issues should not be siloed into only Indigenous Studies, as most all the challenges Indigenous peoples face are at the hands of the settler colonizers' Eurocentric patriarchal systems of everything from religion, science, politics, education, and relationships between peoples and places.

Part of this process is my own work to decolonize myself and my own thinking as a Native woman in academia. How can I continue to indigenize and decolonize except through the work I choose, the questions I ask, the authors I cite (of which most will be Indigenous) and the lessons I learn along the way? This story is as much about me as it is about those I reach out to interview and ask for their peer review. Part of my peer review will be from those Indigenous voices I amplify in this work. Through my lens will I analyze the stories I am given using the academic systems methods expected of me and still implementing Indigenous methods and methodologies of protocol, etiquette, respect, reciprocity, building on relationships already made, expanding into some new ones, and coming into communities with humility knowing I am always the student, as well as the visitor.

In doing this research I anticipate challenges. History has shown the relationships between Indigenous Peoples and researchers has not always been favorable for Indigenous Peoples. I hope this work contributes to building understanding between geographers, scientists, academics, and other Indigenous peoples who are all working to effect change through their work protecting Mother Earth. I expect not all will agree or understand this project or the work I am trying to do, but diversity is good, and I welcome the dialogues.

Indigenous Methodologies

In 1999 Linda T. Smith published her book on Indigenous Methodology (Smith 2012b, 1999) which has expanded how and why research is done within and in service to Indigenous Peoples and the places they live, work, and play. I will lean heavily on this work as framework and theory for my own approaches. I will also rely on Margaret Kovach's Indigenous Methodologies book (Kovach 2010b) and Shawn Wilson's "Research is Ceremony" (Wilson 2008) to situate my methodology and guide my methods as well. A significant component of this

project will build upon ideologies from these books and Indigenous feminist theorists to guide me. I also have reached out to my extended network of fellow Indigenous women leaders and activists I have been influenced by and built relationships with to identify who to interview (Shotton et al. 2018). Based on traditional ways of building relationships, I will need to spend varying amounts of time communicating with individuals and possibly going to their community in some cases to interview them in person (Castleden, Mulrennan, and Godlewska 2012, Johnson et al. 2007, DeLeeuw, Camerson, and Greenwood 2012, Wilson 2008). I want to ease any financial responsibility away from participants as to accommodations and travel by being the one traveling and setting up my own accommodations at my expense. I expect to spend longer in a place if the collaborator has places to show me (Larsen 2017, Casey Dec, 2001, Larsen and Johnson 2012, Watts 2013, Tuck and McKenzie 2014, Johnson 2012, Tuck and McKenzie 2015) or other people to visit with. Time can be irrelevant or cyclical in seasonal responsibility to many Indigenous Peoples, so I must be flexible to their schedules and time needs.

Because some participants identified still live partially subsistence lifestyles, I must plan around their calendars of activities such as hunting, fishing, or gathering. I also anticipate the possibility of being asked to come to where some of these people will be onsite at a protest, a place they are protecting, or in the field hunting and/or gathering. It might be necessary to put myself alongside some of the participants on location of active resistances (Coulthard and Simpson 2016, Tuck, McKenzie, and McCoy 2014, Johnson 2012, Tuck and McKenzie 2015).

Using protocols respecting those whom I interviewed and their places, I went to them and spent time with them in their homelands in a conversational setting. In as many cases as possible I offered gifts such as cedar, tobacco and/or sweetgrass as well as foods like dried venison jerky or other foods to share as reciprocity (Windchief et al. 2018b) to gift, opposed to only taking. I

asked open ended questions that allowed participants to share their interests, encouraging them to share their own stories (Dawson 2014) as responses to open ended questions (Wilson 2008, Rick H. Hoyle 2002, Creswell 1998). None of the questions were about anything sacred or culturally specific as to cause no harm and low to no risk to community or individuals. I was prepared for any refused questions (Mihesuah 1998, Michelle M. Jacob 2018, Tuck and Yang 2014, Coburn et al. 2013). There was no need or requests for group discussion or focus group discussions, although I was prepared to accommodate as best as possible in a timely manner (Drawson, Toombs, and Mushquash 2017, Michelle M. Jacob 2018).

I expected to have follow-up interviews and continuing communications with participants throughout the process, being sure to give them proper time to review what they had said and how I present it in my work for their approval. My training as an Indigenous Geographer requires me to adhere to strict ethical research guidelines and protocols as defined by the Indigenous Peoples Specialty Group (IPSG) of the American Association of Geographers (AAG)(Grossman et al. 2010). This training in combination with etiquette learned within my Absentee Shawnee community is the foundation of my cultural competency which guides my behavior as an Absentee Shawnee woman and an academic. I had limited knowledge of the cultural protocols of knowledge and understanding of customs of those I interviewed. Understanding this as a challenge, I reached out to participants and asked how they would like me to be informed of their cultural expectations of me as a visitor with them and their place. Some of the interviewees are respected elders in their communities and I was always attentive to any special needs as well.

I did not interview anyone under 18 years of age or of a vulnerable population as defined by most Institutional Review Board (IRB) mandates. I built onto my own IRB document that

included University of Kansas IRB standards and what I have learned from other Indigenous IRBs which included what participants ask for or expect of me to protect their culture and other sensitive or vulnerable information. The IRB document was extensive in terms of giving control over the interviews back to the person they belong to. I will not keep them because it is and always will be their story. I did not collect tribally specific knowledge. All collaborators had a thorough and informed understanding of the project through any aspect of the project they were part of or asked about. I got informed and prior consent before enacting any research or data collection. My main objective is the protections of the people and communities I talked with.

Methods

Interviews are the main method of data collection. I rely heavily on already existing relationships with Native community members, students, early career, and junior scholars. There are a few reasons I did this, one being trust. I have spent time with many of the people I look to for their perspectives on experiences in science education, place-based education, relationships and responsibilities with place, gender, mentoring, leadership and activism. Each of those I have identified as relevant to the research have similar characteristics: citizens of Native nations and recognized by community, engaged in work to protect their community, place-scapes, and culture, do collaborative participatory research with or for a tribe, engage in place-based and /or western science education related to Earth and/or climate related impacts.

In my experience with environmental justice, I observed women and gender to be significant because in my own tribe we have knowledge that is specific to women and knowledge specific to men. In my own tribe women are often farmers and have direct relationships with plant foods and medicines. I also noticed the high number of women in the activism I have been part of and engaged with who have their own feminine knowledge of the

places they come from. While I do not exclude men, women are centered. This decision reflects the literature on decolonization (Miheuah 2003a, Tuck and Yang 2012, Martell and Deer 2005, Miheuah 2003b, LaRocque 2007), Indigenous feminism (John 2015, Barker 2015b, Smith 2006, LaDuke 1994, Suzack et al. 2010, Gaard 2014, Cunningham 2006, Green 2007e, Smith 2007, Stewart-Harawira 2007), and settler colonial heteropatriarchy (Barker 2012, Bonds and Inwood 2016, Arvin, Tuck, and Morrill 2013). My choice supports elevating the work these people are dedicated to through leveraging my agency in the academy to make space for them to share their work in their own words. I do this to support their work, bring more awareness to their efforts, and to honor them and their sacrifices to protect their people and place. Kovach calls this resistance research being “integration of a decolonizing theoretical lens that positions Indigenous inquiry” (Kovach 2010b, 18) thus my intention of centering Indigenous knowledge and research. I want the information shared to contribute to the community through raising awareness and putting the needs of the community at the forefront of the discussion instead of the acts of refusal and resistance. I do this because it is important to recognize how activism can be expressed through research (Coburn 2013, Drawson, Toombs, and Mushquash 2017, Tuck and Yang 2014).

Interviews were conducted in person or over the phone and recorded by video and/or audio; and when in person interviews were conducted in places recommended or requested by the participants. I also employed participant observation. Conversational interviews asking open ended questions allowed for organic conversations between the participants and myself. This style of interview allowed for participants to share their memories, which is story as method (Kovach 2010b, a) and a re-claiming and reframing of responsibility, relationships, and reciprocity with place in the negotiations and strategies of protecting all of their relations of place.

Using snowball sampling allowed me to meet others in the extended network of the participants. I will utilize relationships have built through my previous work with climate sciences (Riley et al. 2012, Blanchard 2015) and the network of Native/Indigenous students I built relationship with independently and through University Corporation for Atmospheric Research (UCAR) and their Rising Voices program. I leveraged relationships with Native/Indigenous Peoples I have met and built relationships with through activism I have engaged in. Many of those I reached out to who were briefed through conversations were willing to be interviewed by me on the topics I had outlined, and I explained the research project to them. Feedback was positive and there was significant interest and willingness to contribute. Leveraging the already existing relationships of trust and reciprocity are important to Indigenous research methods. “Centering relationality in validity practices are necessary toward our efforts to refine models that serve and empower Indigenous communities and scholarship” (Shotton et al. 2018).

In collaboration with Dr. Heather Lazarus (UCAR) and Dr. Julie Maldonado (University of California Santa Barbara) we wrote a short white paper for funding of what we thought would be an easy research project to submit to UCAR/NCAR, to evaluate how Natives experiences in atmospheric and climate related sciences. I have worked with these women as allies and activists within the research science spaces and within Native communities. I am one of only a few people to attend all RV meeting and the only one to participate in all as a student. This unique insight positioned me to reflect on my own experiences navigating climate sciences and climate science communities throughout my journey in graduate school as I ask others about theirs. To inquire about

the issues Native People's experience in the process of education in atmospheric or any science is best done directly with those impacted.

For one of the publications relating to Natives in atmospheric and related climate sciences the questions attempt to investigate atmospheric science specifically. I found no Native students, Native faculty or early career scientists I could identify that could fulfill criteria for the questions. Atmospheric sciences historically have not been successful in recruiting or keeping Native and other minority students. We had to broaden the scope of the questions to include Native students, scholars, and junior faculty who all are directly engaged with climate related sciences.

This sampling of participants ended up being from nineteen different sovereign Native nations from fifteen different institutions. This included three participants each from the states of Washington, Oklahoma, and Minnesota, two each from Alaska, and Colorado, and one each from Wisconsin, Idaho, New Mexico, Michigan and California. There were 13 females, 6 males with some identifying as Two-Spirit adding to the diverse discussions of science. Only two of those interviewed had not attended a Rising Voices workshop but had heard about it from a peer or advisor. Each participant was offered \$125 gift card per person after interview so as not to cloud their purpose or engagement with the study. Only one refused to accept the stipend as they felt they didn't want it and suggested it be shared with another participant. One participant backed out of the study and the data was deleted.

All were offered options to either write responses to developed questions or to be interviewed using the same questions. Half of the participants wrote responses to the questions, many of which felt it necessary to think about the questions and reflect before responding. The other half chose to be recorded over the phone or have in-person conversation interviews with

me as the interviewer. All mentioned having a feeling of safety talking with me or having me represent their responses being of extreme importance. Participants agreed to share stories with me knowing their words are being shared through the lens of another Native student with whom they have a secure relationship, meaning I have built friendships and extended family relationships with the participants.

Indigenous methodologies require there be trust built between people before anything is exchanged and reciprocity is part of the etiquette. I am held ethically accountable by my peers, mentors, and extended Native community, in that they hold me responsible for protecting our Peoples, sacred knowledges, and honoring their words as well as my own in the representations presented. All participants have final authority on what they say and how it is represented by the investigators of this report.

Ethical Considerations

There are several culturally sensitive issues, one being the communities participants come from. While participants are practicing what could be considered a blend of communal and independent autonomy, there are still the protective measures necessary for working with each community on their terms according to their cultural protocols and traditions. I researched each community and asked for participants' permission and expressed my accountability for the information that was shared with me. I kept all recorded interviews in digital video and audio formats. All raw data was kept in a locked office and all backups were protected in multiple places such as a personal external hard drive and on the university server that are all password encrypted.

The study was explained verbally and in written form so all participants fully understand who I am, who I am working with, where my funding comes from, who 'owns' the data, where I am from as an academic, what my goals are for the project as well as ensuring that participants have an opportunity to influence the work in their own way. There will be a thorough prior and informed consent process and I will collect both a written and verbal acceptance or refusal of participation.

All interviews will be returned to the interviewee or deleted after the project. Participants will have an opportunity to review my finished document before submission to review how they are quoted and how their comments are represented by my writing, to check for accuracy and appropriateness. The participants' voices and comfort are a priority for my work personally and professionally.

Chapter 4: Centering Native Voices within Earth Sciences: An Inquiry into Opportunities and Challenges Experienced by Native Students, Early-Career Scholars and Scientists

Abstract

Native scientists and students are grossly underrepresented in the Earth Sciences. A review of relevant literature examines the colonial history of science and science education. Both are steeped in inequity and exclusion and are historically centered in Eurocentric methodologies, consistent with their colonial history. Interviews with Native students and early career scholars working in climate related sciences document their experiences navigating science and science education. The documented challenges center around four themes: 1) the relevance of and motivation for research by Native scholars, 2) the multifaceted and intersectional identities of Native scholars, 3) equity and access to science, education, and support activities, and 4) mentoring. The paper highlights inclusion, policies, appropriations, mentoring, and the 7 Rs as methods. The 7 Rs are respect, relevance, reciprocity, responsibility, relatedness, relationships, and redistribution (Montgomery and Blanchard 2021). The paper suggests the need for a shifts in science culture relating to diversity and decolonization, and the importance of seven generations thinking.

Indigenous Story as Summary

“Once upon a time an Indian princess wanted to go to college. She was invited to all the most important balls, hosted by the most important federal organizations. She was to sit and look pretty while the hosts talked about how great it would be to have diverse thinking in their organizations. She was told her nation was sought-after, and goals of these hosts were inclusion and equity in knowledge bases. As she posed for pictures, she looked around and didn’t see any spaces for these knowledges to go. After the first ball she went home confused but hopeful the next ball she could be heard. So, she created a plan, dress more like them, talk more like them, then they will listen. After the second ball she went home more confused yet still hopeful. At the third ball she had a different plan, dress up like an Indian princess, give them what they want, but this plan backfired, somehow this plan rendered her more silent and

talked over. This continued to happen for many years, she posed for all the photos, but all her words seemed to expire at the end of each ball. So, she went home and changed her email and lived happily ever after.” (Participant 15)

1 Introduction

There are disproportionately few Native scientists and students in science, technology, engineering, and mathematics (STEM) and even fewer Native practitioners of Earth sciences (Van Cooten 2014). Bernard and Cooperdock (2018, 292) stated that there has been “no progress on diversity in 40 years” for “ethnic and racial diversity” of students pursuing and earning “...doctorates in earth, atmospheric and ocean sciences.” The factors are likely due to a history of inequality and exclusion and the Eurocentric methodologies and methods privileged in these fields (Kidwell 1985). Historically, science institutions have marginalized Indigenous and other non-Eurocentric knowledge systems (Pruett and Stromberg 2003, Deloria Jr. 2002, 1997, Bang and Medin 2010, Medin and Bang 2014). When Indigenous knowledge systems are considered legitimate, it is mainly because practitioners and scholars appropriate Indigenous knowledge as their own (Dunbar-Ortiz 2014, Weatherford 1989, Johnson and Murton 2007). To mend these historical acts and address the needs of Native students and scientists, strategic actions are necessary.

The story at the beginning is a traditional Native way of expressing the experiences of one Native woman in her journey through science and academia. Her experience is common to Indigenous and Native Peoples in science education. This reflection of a larger experience is indicative of the silenced challenges faced by many Native Peoples in navigating science education. In this paper, I seek to make the spaces of science and science education more diverse by highlighting the challenges and opportunities specific to Native Americans and other Indigenous Peoples of North America. Throughout this document, the term Native will be used

interchangeably with Indigenous to refer to the many diverse, sovereign, and original First Peoples of North America.

There is little literature and research on Native students and early career scholars and scientists' experiences with earth and atmospheric sciences. Responding to this gap, my research conveys insights from interviews with 18 Native undergraduate and graduate students, and early career scientists. The Indigenous research approach I used allowed Native participants, in their own words, to critique their varied experiences across science disciplines by sharing candidly from their firsthand experiences within science and science education.

One unique aspect of this article is authorship by a Native doctoral student working with Native communities and scientists on climate issues, which is rare in the broader literature on diversity and STEM. I share both personal experiences and center the accounts of other Native students and early career scholars and scientists within scientific and scholarly spaces of earth sciences. I provide the background that led to this research study and frame the study within the history of exclusion of Indigenous peoples in science and science education. Based on what participants shared, the results section focuses on four key themes that were articulated: identity, relevance, access, and mentoring. The themes provide foundations for the ways that Earth scientists, scientific institutions, and science disciplines can address institutional policies and structures to better engage and support Native persons.

2 Background

Indigenous Peoples are diverse cultures that value their connections to place and are sovereign governments. Science and scientists must recognize they are on stolen lands. The information Native Americans have about place is deep and relational. White supremacy prevents many people from recognizing that Indigenous "Americans" are thousands of years

older than the concept of America. We have languages, cultures, political and other social structures that have existed and continue to transcend the colonization of the Americas.

Spirituality, relatedness, responsibility and relationships to their places are some of the uniquely specific differences Native Peoples have (Bonds and Inwood 2016, Pulido 2015, Smith 2012a).

The aforementioned ideas are widely discussed in Native communities, even if not every Native individual subscribes to them.

The Earth and its climates are changing drastically from human behavior. Given their valuing of connectivity to place, Indigenous Peoples are not only observing climate change but experiencing climate changes. Though they have little responsibility for the factors responsible for the recent spike in global average temperature, they are taking actions to adapt to and mitigate climate change given they are among the populations most impacted by climate change. (Maldonado, Colombi, and Pandya 2014, Maynard 1998, Durkalec et al. 2015, Federation 2011, Maldonado et al. 2013, Whyte 2015, 2013a). Native Americans have been discussing climate extremes and variability for generations, prior to the current climate change ordeal.

In my work as a Native person in earth science, I began to question how earth science institutions were supporting Native engagement. More importantly I asked, “Why are there so few Native students and scientists in Earth and other related climate sciences?” This question led me to examine the colonial history of science. In my review of the literature, I found that scientific institutions have been organized in ways that erase Indigenous peoples in their own homelands. Erasure is a key component of settler colonialism. In the Americas, settler colonialism is a form of land-centered permanent settlement which started over five-hundred years ago by monarchies in Europe. Settlers, past and present, have sought to justify the attempted genocide of Indigenous peoples by eradicating the traces and memories Indigenous

cultures, technologies, and languages. Settler colonialism is a structure, not an event, by which Indigenous sovereignty is occluded (Kauanui 2017, Wolfe 2006). Settler colonialism is entwined with science. Historically, scientific fields were deployed to legitimize forced assimilation and genocide. In U.S. settler colonialism, assimilating Native children through boarding schools or forcing Native adults to become particular kinds of farmers were intended to “kill the Indian, save the man”(Pratt 1892). Again, different scientific fields such as medicine and anthropology played roles in these processes of genocide.

Education and science policies have far-reaching and continuous impacts on Native students. The “institution” of Science continues forced assimilation through the erosion of sovereignty and self-determination. When scientists do not recognize Indigenous land rights, treaties, and rigorous knowledge systems, they perpetuate settler colonial structures that earlier Eurocentric scientists used to conquer, claim, study, erase, replace, and (mis)appropriate Indigenous Peoples, their knowledges, and homelands (Smith 2013). Science erases and replaces diverse knowledges and limits access to the decision-making structures and institutions of science for Native and other marginalized knowledge holders (Pruett and Stromberg 2003). When scientists and their institutions fail or refuse to incorporate, hire, and value Indigenous knowledges, and educate scholars to be culturally competent, interdisciplinary, and able to communicate across multiple groups, scientists and their institutions close opportunities to advance and diversify science and institutions of science.

As white (mostly men) Eurocentric scientists created taxonomies, categorizing anything new to their knowledge during colonization, Indigenous Peoples were not considered humans but included as flora and fauna of place (Blaut 1993, Pratt 2007). Tribes are still under the oversight of the United States Department of the Interior, which is the department that oversees land and

resource management. This reorganizing of the world through the lens of European white men, and later white women, built a system of science that self legitimizes and excludes anything outside of its construct. This system continues to erase and replace Indigenous knowledge by forcing diverse peoples to assimilate to one knowledge system, one perspective, one standardized science. This system also is still dealing with Native lands and bodies through its Department of the Interior. Eurocentric-based science considers itself the authority of legitimizing knowledge. Indigenous relationships with place becomes subjected to the method and methodology of the Eurocentric settler colonial society which threatens the survival of Indigenous Peoples as intact, distinct, place-based, free Peoples (Bonds and Inwood 2016, Burow, Brock, and Dove 2018, Smith 2012a, Wolfe 2006). There exists hubris among many scientists that dismisses the deep place-based knowledges of Indigenous Peoples and other disenfranchised and colonized peoples rejecting any other truths or knowledges as anecdotal and untrustworthy as legitimate science. Science has used its methods and philosophy to justify genocide of Indigenous Peoples.

There are numerous examples of how science continues to erode trust. The research of Native American and other Indigenous scholars on the impacts of DNA and genetic science on tribal belonging (TallBear 2012) and identity (Bergstrom 2012, Montgomery 2017, Terrell et al. Spring 2016) are just a couple of examples. DNA research, as it stands today, continues to undermine and discredit Indigenous stories of origins, identity, diversity, and place-based belonging and knowing. DNA is used in attempts to discredit tribal histories and identity. Mainstream (Whitestream) science has a long history of unethical research with Native Peoples as well as negating or erasing Native knowledge of place (Mann 2002, Barker and Pickrill 2012, Castree 2009, Deloria Jr. and Wildcat 2001, Kobayashi 2010, Thornton 2008, Tuck, McKenzie, and McCoy 2014, Deloria Jr. 1969, 1997). The destruction of healthy ecosystems, environmental

ecocide (Frenkel 1992, Grinde and Johansen 1995, LaDuke 2002, McGregor 2009, Pulido 1996, 2017, 2015, Smith 2005b, Whyte 2018c, 2017a, 2011a), and injustice shrouded in superiority and whiteness (Bonds and Inwood 2016, Barcus and Crowley 2012, Moreton-Robinson 2015, Panelli 2008, Pulido 2002, 2000, 2015, Smith 2012a, Deloria Jr. 1997) are well-established researched issues, but are rarely, if ever, examined in the sciences. This void creates more than misunderstandings between cultures, it allows a complete ignorance that supports a false hubris and racialized oppressions.

For many Indigenous Peoples, the frustrating relationship with colonial scientists is not new. Indigenous Peoples have been trying to educate Western scientists since contact and for generations. Scholars point out the many ways colonists exploited, misappropriated, and *discovered* Indigenous knowledge of place (Dunbar-Ortiz 2014, Deloria Jr. 1969, 2002, Weatherford 1989) crediting themselves for discovering what someone else knew and shared. Furthermore, Indigenous methodologies of decolonialization, used by Indigenous scholars and scientists globally, work to “kill the settler...to save their humanity” (Veracini 2017, 10), and are often rejected by non-Native scientists. Indigenous scholars and scientists resist forced assimilation by deploying science on their own terms and utilizing their worldview and rigorous traditional knowledge to expand Western-based science methods, methodology, and technology (Kauanui 2017, Garrouette 1999, James 2001, Bang and Medin 2010, Mistry and Berardi 2016). By entering Earth science fields, Indigenous Peoples have shown scientists trained in Eurocentric methodologies and methods, that there are other ways of learning from and knowing the world. The challenge becomes: how can scientists and institutions create space for not only Indigenous Peoples in sciences, but also for knowledge other than their own? Science can start to reconcile

its complicit nature by accepting and engaging with diverse Peoples and places and their ways of knowing and doing science.

In the following section I discuss methods I utilized (Section 3) followed by the responses of Native participants interviewed (Section 4 Results) who are directly affected by the settler colonial structure of science, how this structure is imposed on the development, practice, application, and implementation of diverse Indigenous sciences, and how science power-holders perpetuate inequity and injustice on those science is supposed to serve. This research comes out of the noticeable absence of Native students, early career scholars, and scientists engaged in Earth sciences.

3 Methods

In the summer and fall of 2017 I interviewed nineteen Native American Indians, Alaska Native and other Indigenous STEM students, early career scholars and faculty that I knew from my undergraduate education at Haskell, or had nurtured relationships with over six years through UCAR Rising Voices (RV). While I had hoped to focus on Native students in atmospheric science, even with approximately 550 people in the Rising Voices network at the time of the interviews, there were no Native students, faculty, or early career scientists in my network who work specifically in atmospheric science. Climate change and variability are most often researched in atmospheric sciences and Indigenous Peoples are heavily impacted by climate changes and extremes. Atmospheric sciences historically have not been successful in recruiting or retaining Native and other underrepresented students (Van Cooten 2014). Thus, it was necessary to broaden the scope to include individuals who are more broadly engaged with climate related Earth science.

One participant decided to withdraw from the research study due to how their educational and career experience traumatized them. The remaining eighteen participants were between eighteen and fifty years of age. Twelve identify as women, five as men, and one as non-binary. They work in multiple science disciplines and were in varying phases of their education or career. There were three undergraduate and five graduate students, eight early career scientists, and two faculty. Eighteen sovereign Native nations and sixteen institutions are represented in the sample. There were three participants each from the states of Washington, Oklahoma, and Minnesota; two each from the states of Alaska, Wisconsin, and Colorado; and one each from the states of Idaho, New Mexico, Michigan, and California. All but two participants had attended a UCAR Rising Voices workshop, but all had heard about it from a peer or advisor.

Half of the participants wrote responses, because they desired to think about the questions and reflect before responding. The other half chose to converse with me over the phone or on video chat with only audio recorded. Personal interviews were kept to an hour in length. I transcribed and then read through all the transcriptions to structure participant responses into the most common themes. These themes were: relevance, identity, equity and access, and mentoring. As I was reading through the transcripts, there were also sub-themes that emerged. These sub-themes are discussed in more detail in Section 5: Discussion. I then went through the transcriptions and coded for these themes.

The participants' identities are shared with their permissions, at the end of the paper, but specific quotes are anonymous to protect participants from retaliation or concerns about specific connections to persons and place. All participants mentioned the importance of feeling safe about sharing their experiences and having their responses represented in a way they approved. All participants could review how their words were represented in this document and were offered

an opportunity to add to their thoughts, edit for clarity, remove anything from their quotes, or withdraw from the research study.

I developed questions and a research style appropriate for the unique sample group of Indigenous persons who could answer the developed questions specific to climate related science and science education. Margaret Kovach (2010, p. 1) states, “to use an Indigenous methodological framework, the method chosen should make sense from an Indigenous knowledge perspective.” Indigenous sciences are place-based observations and interconnected relationships between humans and place that have been tested and passed on over thousands of generations. Western Earth scientists often dismiss relationships between humans and place as biased and lacking in rigor, whereas Indigenous researchers view relationships as “central to their core epistemology” (Kovach 2010a, 126). In this research I depend on relationships of trust and respect and use Indigenous research methods, such as relationships, conversations, (Kovach 2015, 2010a) and storytelling (Windchief and San Pedro 2019) allowing participants to share their experiences and respond to the questions however they felt most comfortable. The participants own their stories and data they provided for this research. Their interviews will be returned to them and all recorded or written data from participants I have in my possession will be deleted after publication.

I employ rigorous ethical research standards as outlined by the Indigenous Peoples Specialty Group of the American Association of Geographers (Grossman et al. 2010, Louis and Grossman 2009) for working with, and in service to, Indigenous Peoples. This work also adheres to academically designed research protocols and was approved by the Human Subjects Committee (HSC) at UCAR|NCAR and the University of Kansas IRB (Institutional Review Board). I am held accountable to another kind of “IRB” (Indigenous Review Board) of

Indigenous peers to be sure I am doing this work *in a good way*. Part of this responsibility is keeping participant interviews anonymous. To protect this anonymity, the full transcripts of participant interviews are not published, and individual quotes are shared only with consent. Ethically, I am accountable to Indigenous methodologies and protocols first and to put the protection of the Native participants and their communities over the needs of the institution or other parties. This is important for the safety and growth of Native students to do place-based science in culturally appropriate and academically rigorous ways that do not cause harm, and do not ask Native students, scholars, and scientists to compromise their culture and/or ethics in the process of scientific research. Accountability to rigorous academic standards as well as Indigenous research standards, expands mainstream academic canons by incorporating ethical standards as defined by Indigenous scholars and Indigenous communities (Coombes, Johnson, and Howitt 2014, Kovach 2010b, 2015, 2012, Smith 2013). These ethical relationships with Native nations support sovereignty and self-determination by using science and research to recognize and bolster treaties by supporting the self-determined needs of Indigenous Nations, for protecting waters, lands, air, and all the beings of place.

I used conversational and storying methods since they are cultural norms of sharing and storytelling. The individual stories are then woven into a larger narrative of related experiences that weaves a more complete understanding of the participants shared experiences (Kovach 2015, 2010a, Windchief et al. 2018a). Allowing participants to tell the story in their own words supports Indigenous methodologies of self-determination, sovereignty, and respect. The initial questions were open-ended allowing the conversation to be led by participants. This encourages elaborations on subjects outside my own knowledge or experiences. Using conversational methods is not only a basic social norm for many Indigenous groups, it builds and strengthens

relationship ties between myself as a Native researcher and the participants. I take seriously my responsibilities to protect my extended Native communities and relationships with them.

4 Results

The results are framed through Indigenous methodologies. This is important as the stories shared by Native students and early career scholars and scientists are personal and, at times, difficult for those sharing to reveal, as speaking up or out is often outside of cultural norms for Native cultures. On top of these cultural norms, the dominant society, founded on settler colonialism, frequently erases and replaces Native voices in science (Wolfe 2006). Asking these dynamic and diverse Indigenous people to share personal, and often painful, experiences should not be taken lightly. Participants share experiences trusting I will carry their words carefully, in a good way, in prayer, ceremony, and with cautious intent to inform for betterment of all our relations. Indigenous methodology is used in hope that systemic challenges might be decolonized for future generations of all scientists. I ask the reader to consider the careful intentions of how these realities are expressed, and the hope that is woven into equitable, just, and diverse ways of knowing, doing, and being as related to science and knowledge production and transmission.

The most frequent themes that emerged from participants focused around (1) *relevance*: how and why they do research; (2) *identity*: whole-selves who are multifaceted; (3) *equity and access*: to science, education, and supporting opportunities, and (4) *mentoring*: culturally and academically competent and humble teachers, guides, and leaders who reflect and respect who we are as Peoples. There are several other components interwoven within the themes, including racism, navigating academic systems, and having to educate educators. This list is a small sample of the major challenges shared. It is by no means exhaustive. Where possible, I share

direct quotes from participants. The purpose is to hold space for the participants' own words without cluttering their voices with assumptions or altering the integrity of their experiences.

4.1 Relevance

The theme of relevance brings to attention the academic goals of many Native Americans. We go to school not for ourselves, but often for our people and places we call home. The ability to help our people live better lives and protect our ways and cultures are some of the most significant reasons for going to college in the first place (Brayboy et al. 2012). For example, as one of the participants expressed:

"... Many Indigenous students enter the world of academia in order to serve, improve, and/or build capacity within their own communities. It may be difficult to rectify working for companies or organizations that do not serve their or other Indigenous communities needs and or requests... There is also the sense of urgency to address the most prominent issues encroaching the lifestyles of Indigenous communities. These issues warrant immediacy in action within their Tribes, which may be looking to the students to become professionals who aid their community." (Participant 09)

All participants talked about educational purposes. Some talked about going to college to get a better job or break the cycle of poverty. Some spoke of the value of having an education and what that would mean for helping their tribe and community. Then there were those that spoke of their ambition to learn to protect their ways of living and environment. All these stories should remind academics that the work many Natives engage in is not about competitive individualism or transactional knowledge. It is about relationship building and recognizing there needs to be a tangible benefit to the community for any, and all research they take part in.

Relevance is the *why* of research. One key point of Natives in sciences is they often approach science with the immediate needs of their community and homeland responsibilities in mind. The desire to protect place, which includes broader physical and social impacts, starts from community needs. Their science will often circle back to the social, cultural, and physical needs of the community; the drivers for many Native scholars are based on the survival of

community, of all the connections of place, human, physical, spiritual, and scientific, for all our relations. The significant needs in communities are very often grounded in place, focusing on immediate needs of water, land, air, health, sustainability of plants and animals, and essentials to the ecocentric needs of a balanced community. Several participants expressed frustration with Western scientists and their perspectives on relevance.

“The problem was scientists, the majority of them, is they do science just to do science for the sake of science, they don’t do it for practical application with humans. They do it for numbers, for funding, for money, for just curiosity. And I mean there’s a lot of funding out there for science and the majority of that funding, I truly believe, it goes (pause) it doesn’t go anywhere...they all like, (pause) spend millions of dollars trying to explain something we already know...they’re just wasting time and it’s frustrating.” (Participant 13)

“...I feel like almost every time that myself or others have engaged with different conversations, time and time again, it becomes the same conversation and it doesn’t change...it doesn’t change until that person shifts or that organization shifts into recognizing that they do not hold the power and they relinquish...to learn and be helpful, that means giving up power. You know if you really want to help, this is really what you’re going to have to figure out how to do.” (Participant 16)

As noted by several participants, advancing Native students and decolonizing science is a significant challenge in the education system. While European contact, began just over 525 years ago, the human history of this continent dates back tens of thousands of years ago for Natives. What comes from this narrow settler colonial narrative is the dismissal of Indigenous knowledges of place as well as the technologies and wisdom created and implemented in the daily lives of Native peoples. Erasing and replacing history and appropriating Indigenous knowledges are foundational acts of settler colonialism that have had devastating impacts on American Indians and other Indigenous Peoples.

This settler colonial history, coupled with Eurocentric science have been, and still are, the means by which racism, conquest, and genocide are inflicted on Native Peoples (Deloria Jr. 2002, 1969, Dunbar-Ortiz 2014, Deloria Jr. 1997). This historical bias is perpetuated in how contemporary education and science are still taught and practiced (Grande 2008, 36). Native

Peoples are keenly aware of this racial bias and recognize it as a major impediment to successfully and safely navigating many Earth science fields. This causes many to seek other fields such as Indigenous Studies where their knowledges may be better supported and accepted, or leave higher education altogether (Carney 1999, Grande 2018, 2008).

4.2 Identity: Making the invisible, visible

Almost all interviews included critical discussions about Indigenous identity. Historically and currently, education and science support the process of assimilation (Deloria Jr. 1969, Deloria Jr. and Wildcat 2001, Child 2000, James 2001, Dawson 2014), erasure of identity, and serve as a structure for subjugating. The experiences of Native Peoples interacting with and in these systems, substantiates the need for Natives to be hyper aware of maintaining culture, identity, and protecting against the process of assimilation. The struggle to exist within scientific disciplines is amplified when science invalidates and erases our knowledges, histories, values, and ways of knowing. Given the historical and modern impacts of settler colonialism, science practitioners can be viewed as appropriating our knowledges through claiming discoveries of food and medicine plants that they were introduced to by Natives especially during settler colonial expansion, and erasing us to legitimize their claims to our lands, our knowledges, our bodies, and even our identities. This conflicting and oppressive relationship with science, scientists, and research institutions causes stressors that White scientists rarely experience, or even understand.

Native Peoples are often expected to set aside aspects of their identities and are discouraged from bringing their whole selves to their research. This excludes many diverse ways of knowing (epistemology), being (ontology), ordering the world (cosmology), and philosophies

of how we know what we know (metaphysics). The intentional eradication of these systems has destructive and long-lasting effects to Peoples and place-based knowledges (Tuck and Yang 2018, Medin and Bang 2014).

Some participants spoke directly to the challenges of place relations (relationship to land and environment) and their own identities relating to science and science education. Some of these responses point directly to resisting assimilation:

“I was a rez girl at a big university, trying to figure out the path to success while not giving up my identity and staying true to my roots.” (Participant 09)

“In my experience a large portion of Indigenous students who enter the world of academia are first-generation, non-traditional students who come from families who have suffered generations of surviving in an environment of adversity. Entering the world of academia, let alone science, is a foreign experience which may not always bridge the truths of Indigenous traditions and culture with truths of Western Science...All these matters do not even begin to give light to the issues that in academic institutions and the science fields it can be more than a challenge to find reflections of an Indigenous person’s self - be it appearance, worldview, and experience, or even expression of self. This lack of presence may lead to tokenism, biases, and additional stress to someone experiencing what may seem like a repeat of historical trauma inflicted on them.” (Participant 09)

Identity has multiple expressions, as Participant 09 points out. The participants’ discussions of identity relate to Indigenous cultures, histories, physical characteristics, spiritualities, and shared experiences unique to Indigenous Peoples. All participants talked candidly about racism, discrimination, and cultural insensitivity, which were amplified by the intentional and violent acts of settler colonialism. Participants talked about how faculty and institutions are not reflective of who they are, meaning that the faculty, scientists, and institutions themselves are not racially diverse. Participants noted the high concentration of White people, especially men, in leadership, research, and administrative positions. Most of the Native participants do not see themselves represented in the institution, and the institution in turn is not reflective of the person or their communities. One participant explained:

“Sometimes I just wanted to learn like other students and not have to teach...tokenism was disgusting...I seemed to be the only one who could speak to the issues...The cultural

competency of the faculty was atrocious through the various departments I took classes from. The institution puts on a false front/image about diversity and inclusion yet does not require any cultural competency training for faculty.” (Participant 08)

The lack of diverse identities among scientific faculty and staff leads to further marginalization, and makes Indigenous students feel invisible. It generates isolation for students, early career scientists, and faculty alike, making recruitment and retention more difficult (Morris et al. 2012, Pandya et al. 2007). Almost all science power-holders, and the institutions themselves, force Native and other Indigenous students, early career faculty and scientists to conform to a system they see as not of their own, a system they find incomplete, broken, and problematic.

“The cultural barriers are very relevant to these initial questions. Indigenous used as an identity is very much situated in the context of the community one grows up in. This means the designation of youth for many American Indians Alaska Native communities is less a designation of age and more a designation of role. These types of misunderstandings concerning the role culture plays in an Indigenous person’s life spills over into understandings concerning the interface of Indigenous/western Sciences into institutional based sciences...Feeling like you don’t belong because there are very few participating from your community...the answer to the initial question on youth involvement is very much tied to the youth having identifiable role models and community elders involved in atmospheric sciences.” (Participant 03)

Education and science are foundational tools of settler colonialism, genocide, and assimilation. Since contact, little has been done to break the cycles of oppression and exclusion. Native students are subjected to “the clashing cultures of STEM and Native identity that may foster feelings of isolation and alienation in Native students, resulting in the students’ perceived need to assimilate or leave” (C. M. Johnson et al., 2017, pg 40). To successfully support and engage Native students requires the creation of “conditions, structures, and experiences that allow students to maintain their cultural identity” (Johnson et al. 2017). Forcing students to navigate these multiple worldviews without the support of institutional and scientific leadership or quality mentors will continue to produce high rates of failure to recruit, retain, and graduate

Natives (James 2001, Grande 2008, Brayboy et al. 2012, Shotton, Lowe, and Waterman 2013, Bang and Medin 2010).

4.3 Equity and Access

There are many reasons that Native students choose to leave higher education (Adams 1995, Adelman, Taylor, and Nelson 2013, Brown 2018, Carney 1999, James 2001, McClellan, Tippeconnic-Fox, and Lowe 2005, Deloria Jr. and Wildcat 2001) or refuse the university all together (Grande 2018). Every participant brought up the need to address accessibility to STEM instruction earlier in their education. Lacking access to resources that support culturally and place relevant understandings of STEM has created inequity in education and science preparedness.

Several participants expressed how teachers in general, who were often not Native themselves, conditioned students to believe they were naturally not good at math or science, perpetuating negative stereotypes among students and other educators. All participants spoke of how science was taught in ways that lacked purpose, relevance, and culturally appropriate methods.

“...rarely did I understand the connection between my culture and the academic fields associated to natural resources. As a pre-college student, having that explicitly explained and demonstrated would have made all the difference in understanding that my formal education could promote the protection and preservation of my culture, our relatives/resources, and directly benefit my community.” (Participant 08)

“...native students have to navigate the obstacle course that is being multi-cultural in spaces that are monotheistic. They are your experts, un-learning how to use kids and learning how to partner with the future generation is going to take patience and practice.” (Participant 14)

“We completely understand the strength of relationships...University or academic systems or science institutions, they talk about relationships in a very mechanistic way, but they don't really understand relationships.” (Participant 16)

Intentional changes are needed in the entire system to broadly implement methods of science and science education that are relevant to and representative of diverse communities and

places. These shifts in the system must allow cultural capacity to be crafted into the community needs in ways that enhances the values of the diverse Peoples and places they epitomize (Kimmerer 2013, Snively and Williams 2016, Cajete 1994, Deloria Jr. and Wildcat 2001).

4.4 Mentoring

Although the interviews included a mentoring specific question, the topic repeatedly came up unprompted in response to other questions. All participants reflected on their lack of mentors or negative experiences with ill-equipped, mostly non-Native mentors, who often hindered their success, advancement, or ability to stay in school or an institution. These experiences were countered with positive relationships with Native, and a few non-Native mentors who provided significant guidance.

“I think mentoring is one of the key factors but not just a mentor that's an expert in your field, but a mentor that is an expert in navigating the type of path, of a similar background as you that gets what your struggles are.” (Participant 02)

Support around transitioning into the white mainstream academy from their Native communities and education systems is critical as the two systems are not synonymous. Many Native students find that they do not receive helpful guidance in navigating the academic system that requires students to navigate basic needs such as financial aid, housing, food, and tuition and other academic requirements and life necessities that most Native students' families cannot help with. Many find they do not have mentors who understand their experiences of extreme isolation. They have few to no other Natives in a department or on an entire campus to connect with as mentors or peer support, mentors who understood specific social cultural needs, capable of supporting students' identities as Natives with and through Indigenous sciences. These mentors were needed to assist students to also access opportunities and assistance academically,

financially, and culturally were sometimes key factors for students staying in school, especially first-generation students.

"So I think that if they want more natives...more people of color to come into the programs, then they need to make a concerted effort to have more Natives and people of color who are teaching, who are in leadership positions in those spaces, and also just be able to be more sensitive to the different cultural things that they need. Make more of an effort to bring them into the program. Because for me going into the program like it wasn't just the content that was difficult, it was navigating the actual bureaucracy that was difficult. The person that was the administrator of our program assumed that I should know these things that I should know how to navigate the system, when I'm the first person in my family who has done this. So, she would send emails that were very condescending to me insinuating that I was dumb, and I save these emails cuz I'm going to put them in my memoir." (Participant 05)

"...I'm the first generation of my family in college and I imagine a lot of native students are because of historically not having access to college and so for me I dropped out of school four times before I finally went back and finished my bachelor's degree. The main reason I did that was because of financial reasons. I really didn't know how to apply for scholarships and I had someone hand me a student loan one time and I filled it out and when I saw how much money I owed I was so scared I just dropped out. it's that even when I did understand that I could write for scholarships I had a difficult time. I think I realize now that it was cultural..." (Participant 02)

Several participants mentioned the unique need for mentors who provided advocacy and representation, protection for students during deeply troubling experiences of normalized academic, psychological, and social violence. This psychological violence included appropriated knowledge, tokenism, and exploitation of students by advisors or other institutional power holders. One example of academic violence is when faculty leverage student's identity to fulfill diversity quota for their projects and the students really do not benefit.

"I basically had to create a whole network outside of my program of people who were going to advocate for me. Whenever I did that is when I was able to find a couple advocates within my own program that were willing to intervene serve as a buffer That's when I was able to actually study the things I actually cared about, kind of be left alone. Still treated bad in a way but at least not as directly as before." (Participant 05)

"...I guess the burden of the responsibility of having to be the expert on all things Indigenous was pretty big in my mind when I first started versus once I found my advisor and that decreased dramatically...she understood that not all tribes are the same and that different regions have different protocols and different ways of understanding and knowing the world and their knowledge..." (Participant 03)

"...having native PhDs on my committee is really important that there are there. The conversations would not be the same if they were not there and it's funny because I feel like people behave themselves better knowing that I have that backing and that they approve of my

work. They protect me with their agency...that's part of holding that power and using it that way to take care of us too, that's a real mentor though you know.” (Participant 02)

The value of Native science faculty and network with cultural competence is expressed by one participant;

“...some of the best moments for me just meeting them (native scientists). I feel like those were the celebrities to me in the field that I look up to and they inspired me to keep going, to a create whatever I need to do this work. And even now I think my most excellent moment are gatherings where a lot of the people are native people and they are in these fields of science...The exchanges that we have across our community is where I learned the most, I healed the most, and I feel the most inspired and empowered. I feel like when I'm in those spaces it's so exciting because I don't have to do the extra labor of pre educating and I don't have to adapt the way that I'm talking to take care of the other person.” (Participant 02)

These passages suggest that there continues to be major gaps in the science and education fields that continues to marginalize and oppress Natives abilities to advance into higher science education and career fields. These issues are discussed in the following section in order to help the reader understand these experiences and how responding to these gaps might be instituted through inclusion of diverse sciences and practitioner’s, policies for knowledge diversity and protections, addressing education and science assimilation practices, and unique Native mentoring needs. This is followed by the 7 R’s of research that supports and are woven into Science culture shifts, diversity, and the accountability of seven generations thinking. The 7 R’s are as follows:

- Respect – the mutual exchange of acceptance of diverse Peoples and places, and the convergent and divergent perspectives and ideas.
- Relevance – the connected value of research and results to Peoples and Place.
- Reciprocity – Is how the research and researchers give back to the Peoples and place they are in service to.

- Responsibility- Indigenous Peoples have deep responsibilities to all the life and systems of place. These responsibilities manifest in ceremonies, songs, actions of reciprocity with place, prayer, advocacy for place, nurturing plants and animals of place, and defending place and place agency.
- Relatedness- recognition and responsibility to knowing our place beings share life forces physically, spiritually, culturally, spatially, and metaphysically. We belong to the land; the land is within us. Knowing the foods we eat, water we drink, air we breathe, and earth we depend on is related through minerals, vitamins, and other organic and energy based matter and relationships. We embody the places we live.
- Relationships- Recognizing and developing relationships with Peoples and all the place beings. Holding respect for all things having a right to exist as they are and having reverence and reciprocity with place beings beyond dominion, but in equity and justice.
- Redistribution -The ways in which information is given back to communities in manners and forms appropriate, understandable, relevant, and useful to the Peoples and places who need it. Information must be easy to transmit and implement in the communities and places it is crated from and for.

5 Discussion

Earlier sections discussed the challenges of systemic inequality that stem from settler colonial practices in science and science education (Section 2). Engaging with the history, literature, and current experiences of Native American and other Indigenous Peoples with science education and science institutions, allows us to develop local as well as systemic and structural modifications. Below, I provide recommendations on how to structure these actions through changes. I frame these actions around the key themes of this investigation: *relevance*:

how and why we do research; *identity*: whole-selves who are intersectional; *equity and access*: to science, education, and support opportunities, and *mentoring*: culturally and academically competent and humble teachers, guides, and leaders who reflect and respect our diverse Peoples. I follow this discussion section with recommendation's that map ways to implement science culture shifts and methodologies to advance the mutual diversity, equity, inclusion, and justice for Natives and other Indigenous Peoples in science, and Science disciplines. Additionally, some of these recommendations consider and utilize 7 R's of Indigenous research: respect, relevance, reciprocity, responsibility, relatedness, relationships, and redistribution. The recommendations also introduce Seven Generations thinking to enact sincere accountability in Science that is painfully absent.

My own experiences as a Native woman working among scientists from many climate sciences disciplines, coupled with the themes that emerged from this research, frame the recommendations for scientists, scientific institutions, and science disciplines for addressing institutional policies and structures. These recommendations are designed to engage, support, and include Indigenous students, early career scholars, and scientists into science institutions.

5.1 Inclusion - not Integration - of knowledges and values

As discussed in Section 4.1 (Relevance), another point often lost in translation is that many Native students come into academic and science spaces to help their communities and homelands, bringing with them their social experiences of communal work through the processes of “we, us, and ours.” In science they are subjected to individualistic methods of “me, my, and I” canons. Diversity is not achieved by adding brown people and stir but allowing the multicultural perspectives and differing worldviews access to academic and social freedoms that ensure they can safely do science through their own lens (Section 4.1.1 Identity). This allows for novel and

unique approaches to research questions - questions that speak to the situations of climate extremes, variability, and survival (Whyte 2013a, Vinyeta, Whyte, and Lynn 2015, Whyte 2018a, c, b, 2014a, Whyte, Caldwell, and Schaefer 2018, Whyte 2011a) and to the physical and social responses to climate extremes and variability called for by the place specific needs of people and place. For community to support the response, it must have community engagement and relevant needs addressed for responses that make sense. Native Peoples do not need validation of our sciences and knowledges; we have thousands of years of study that confirm our truths. Many participants interviewed for this study substantiate the distrust for science education and its colonial history. One participant stated this clearly;

“Western science still has too many representatives pushing to integrate Indigenous science practices with Western science practices that don’t see the connection between integration and assimilation, and this is the source of the power relationship and knowledge production types that can obfuscate cultural practices and forms of knowledge. This awareness among Indigenous scholars creates an ethical dilemma when it comes to collaborative research, as everything is shaped and defined in Western ontological contexts that can subjugate cultural practices into categories of taxonomic significance.” (Participant 04)

We collectively need to stop training and expecting Native students to assimilate to the settler colonial STEM education system. Eurocentric science’s methods and methodologies often stand in opposition to Indigenous ethical and moral traditions. Science institutions and practitioners should allow academic freedom to explore the world in spatially and culturally appropriate manners and implement methods and methodologies that sustain Native students and the communities they come from. By allowing Indigenous students to utilize tools available for

research encouraging them to think critically through their own lens as Natives, students build self-efficacy and can assess opportunities for innovative ideas without fear of ridicule which supports identity and equity. Participant 09 (pp. 10-11) speaks to the desire to serve and build capacity in their community. This capacity must have foundations in their own worldview to be successful supporting relevance. Science needs to have diverse scientists to think dissimilarly and academic freedom for diverse thinking thus supporting diversity, equity, inclusion and justice.

There need to be more Indigenous scholars in atmospheric and earth science specifically, and the sciences more broadly, who can teach Indigenous sciences and knowledges. Having only non-Indigenous people to teach Indigenous science and other Indigenous knowledges is appropriation, and at its worst misrepresents Indigenous knowledges. Again, the relevance of research by and with Native communities comes with understanding that the current Eurocentric based science must relinquish power. As Participant 03 (p. 6) states, many Native Peoples have deep knowledge of issues within their lands and communities and are best situated to ethically incorporate that knowledge into research. There must be intentional diverse Indigenous representation of leaders, scientist's, and administrators in science education and institutions supporting multiple ways of knowing and doing sciences.

The intentional recruitment, hiring, and retention of multiple diverse American Indian Natives and other sovereign Indigenous Peoples will close a large gap in diversity, but talent acquisition must include justice, equity, and inclusion. These specialized scientists and faculty need to be included but not burdened with carrying the entire responsibility of educating non-Indigenous peers, administrators, and staff (mentoring). There is a need to expand policies that require diversity and other training that not only makes all people aware to the issues, but

accountable and invested in the successful outcomes and solutions. Diversity is intersectionality and the many ways we intersect individually and collectively are foundational to meaningful change.

5.2 Revisit and Revise Policies

Most importantly, in research institutions must engage in cultural shifts and implementation of policies that protect Indigenous Peoples, their knowledges, cultures, and land rights. If the work isn't bolstering and empowering Indigenous sovereignty and land claims, it is perpetuating settler colonial and academic power dominance. Policies that create accountability and recognize Native scholars, Indigenous communities, and place will not only support diversity, equity, and inclusion across science, but will greatly improve diverse thinking and build stronger relationships across multiple cultures. Science is not a singular worldview.

Indigenous knowledge is science within a place-based epistemology and ontology with elders and knowledge keepers being our scientists. While these multiple knowledges are not respected within western science fields there is slowly some growth around the ideas of TEK and Indigenous Knowledge (IK) as supplementary to western science. The ideas around TEK and IK are not shared in K-12 education systems and are taught mostly within very narrow fields of Indigenous Studies not mainstream science courses.

The lack of equity and access is especially apparent in reservation schools where students experience the highest levels of poverty, violence, and racism from teachers and surrounding communities (Grande 2008, 22). One participant spoke of the "No Child Left Behind" policies of the George W. Bush presidency, and how such policies created systems of testing instead of learning. This caused a generation of Native students, as well as other marginalized students, to be unprepared for STEM opportunities (Darling-Hammond 2007, Meier 2004, Beaulieu 2008,

Winstead et al. 2008). Creating and supporting existing Native education curriculums and educating the general public on all sides of the history of America and science, and Native Americans will go a long way in correcting the false narrative of these lands. The United States has treaty and other federal obligations it must uphold, land rights to acknowledge, education to fund, especially at the tribal college and university levels, that will advance and benefit all life. Science must support its own obligations to Native Peoples and lands.

As discussed in Section 2, settler colonialism impacted land claims, treaty rights, and sovereignty, inflicting oppression and violence. In the process of imperialism, settler colonists collected and claimed our lands, resources, and knowledges, and used Western science to justify the erasure and appropriation of thousands of distinct Peoples' knowledges. Settler colonial violence can be addressed by centering Indigenous issues relating to land claims, relationships to place, and knowledges of place. Indigenous Knowledges (IK), also known as Traditional Knowledges (TK) and Traditional Ecological Knowledges (TEK) (Agrawal 2009, 1995, Battiste 2009, Martin 2011, McGregor 2004, Mistry and Berardi 2016, Berkes 1993, Nakashima et al. 2012, Hardison 2013b, Huntington 2000, Tweedie et al. 2009, Whyte 2017b), are place-based and grounded in social and cultural frameworks. The contexts of these knowledges are lost when Indigenous sciences and technologies are appropriated or repackaged by non-Native Peoples.

5.2.1 Appropriation

I have observed and experienced senior researchers, advisers, and faculty co-opting and appropriating Native students' ideas, hopes, dreams, and research as their own. The stolen ideas are devoured by advisors or so-called collaborators in what equates to sanctioned plagiarism. Other scholars have pointed out the problem of voice, agency, and narrative in research and publishing before as Grande (2015, 147) and Swisher (1996, p. 191) discuss the challenges of

American Indian students and scholars in the resistance against “intellectual hegemony and academic colonialism.” Both cite a quote from *Our Voices, Our Vision: American Indian Speak Out for Educational Excellence*:

“Just as the exploitation of American Indian land and resources is a value to corporate America, research and publishing is valuable to non-Indian scholars. As a result of racism, greed, and distorted perceptions of native realities, Indian culture as an economic commodity has been exploited by the dominant society with considerable damage to Indian people. Tribal people need to safeguard the borders of their cultural domains against research and publishing incursions.” (American Indian Studies Center, UCLA, 1989, pg. 6)

The absence of reciprocity or acknowledgement is rampant and normalized in sciences (Mihesuah 1998, Deloria Jr. 1997). Non-Native scientists have used students’ or community members’ concepts, leveraging their diversity for access and/or funding, and claiming sole authorship without referencing the true origins of the knowledge \When powerholders, intentionally or unintentionally, appropriate and exploit Native/Indigenous students and their communities they repeat historical traumas of settler colonialism and assimilation and erase and replace Indigenous knowledges. This is a form of academic plagiarism. This kind of plagiarism, however, is rarely critiqued by science institutions because it has become a norm. Native knowledge is place-based, culturally grounded, and uniquely matched with its Peoples and places. Until the science institutions are held accountable through their policies to protect and support Indigenous Knowledges in an equitable and just manner, this sanctioned plagiarism will continue.

5.3 Mentoring

Mentors who gave social and cultural support for unique community cultural norms, such as extended time away for funeral or ceremony, built trust, and allowed for students to practice cultural norms that are often outside of the mainstream system. Access to culturally competent mentoring is an important topic in education for students of color, especially Native students (Bender 2017, Brayboy et al. 2012, Davidson and Foster-Johnson 2001, Downs and Windchief 2015, Windchief and Brown 2017).

One of the largest contributing factors for the lack of information on Indigenous Peoples in science education comes from the reality that our low numbers create a lump sum affect, a system that lumps all Indigenous Peoples into the same small category of other, that either poorly represents the needs of Native students, or just does not include them in studies (Van Cooten 2014, Brayboy et al. 2012, Medin and Bang 2014). This exclusion ends up further marginalizing and erasing Natives from scientific and education studies. With this larger systemic void creating further inequity for Native students, early career scientists, and faculty, the financial aid and guidance desperately needed for student success is ignored and excluded to the detriment of entire communities of Native Peoples. The United States government has an obligation to provide equitable education support and access for Native students, but like many treaties, this obligation is unfulfilled and reifies existing inequities (Reysner 1999, Getches 2005).

Native youth are very rarely taught in culturally relevant and appropriate ways, which carries deep fears for generations of Native Peoples who are today's elders and parents, many of whom suffered direct and indirect violence within, and from the boarding school system (Adams 1995, Child 2000). As summarized in Section 2.2 (Historical Context: Settler Colonialism), the residual cultural genocide from the boarding schools for American Indian, Alaska Natives, and

other Indigenous Peoples lingers in our social fabric. Many non-Native people are either not aware of this history and often end up perpetuating negative, harmful, and inaccurate stereotypes to all students (Brayboy et al. 2012, Medin and Bang 2014, James 2001, Mihesuah 1996b). Consequently, this perpetuates the false concept of a culturally monolithic Native population, further erases the vastly diverse voices and experiences of Native populations, and harms today's youth by adding additional stress to education (Brown 2018, Daza and Tuck 2014, McClellan, Tippeconnic-Fox, and Lowe 2005, Medin and Bang 2014, Tuck and Yang 2018, Wildcat 2001b). Culturally appropriate mentoring is a key solution to repairing the damage done in the past as well as preparing students to successfully process and transition into leadership roles in science, education, and in their communities. This requires very specific deliberate actions to develop and grow the pool of diverse Native scientists and scholars in science education and science institutions, some of which are discussed in more detail below (Section 4 Findings).

Some Native students go to a university to gain the agency needed to be heard or hopefully effect change by helping our people and lands live healthier such as participants in Section 4.1.3 stated. Rarely do we make it through the educational system, let alone science (Medin and Bang 2014, Van Cooten 2014). Students who have good mentors are more likely to succeed in school and in the community (Shotton, Lowe, and Waterman 2013, Shotton et al. 2018, Bender 2017, Bergstrom 2012, Davidson and Foster-Johnson 2001, Downs and Windchief 2015, Windchief and Brown 2017). Being supported and mentored by a Native leader/educator/advisor who is culturally responsive in many intersectional ways (e.g., history, culture, settler colonial violence, academia, Indigenous science) is one key aspect for creating access and honoring Native identities. Marginalized Native students need and deserve mentors that can relate to Native experiences. It requires mentors who are accessible, carry agency within

spaces of hierarchal power, and can guide, protect, and inspire Natives in Earth sciences and related STEM fields.

Efforts should be made to connect high schools with culturally responsive scientists in Earth science careers and researchers to expand what youth understand as science and scientists. Native students should be reached sooner, especially those from remote reservations and inner city urban American Indian youth where need is highest. Provide Native high school and undergraduate students access to bridge programs or prep courses available online where they can access and fulfill courses not offered in their schools to help them be prepared and competitive for science education and STEM careers. Offering summer science camps that provide hands-on experiences with mainstream and Indigenous science in place will create and grow spaces for Native youth to experience the relevance of science as well as provide opportunities for them to visualize themselves as scientists. Programs such as the Indigenous Sustainability and Development Institute (Whyte, Caldwell, and Schaefer 2018), the Institute for Tribal Environmental Professional's summer internship program (2018) and the program I participated in, the Haskell Environmental Research Studies Program (HERS 2012) have successfully supported students with strong mentors. Many of my early mentors, such as Daniel Wildcat, Kyle Whyte, Renee Pualani-Louis, and M. Kalani Souza, that I met through similar programs, continue to support my cultural, social, and research needs. Mentoring must go beyond the walls of the institution as relationships are critical to foundational cultural norms of Indigenous methods and methodologies.

5.4 The 7 R's as methods and methodology

Scholars have pointed out 4 R's of research with Indigenous Peoples; respect, relevance, reciprocity, and responsibility (Kirkness and Barnhardt 1991). They are a set of foundational

research ethics for others to build on and provide a framework of research protocols that value Indigenous Peoples (Kirkness and Barnhardt 1991, Kovach 2015). I am responsible to employ at minimum the 4 R's, and I choose to add an additional three, making 7 R's: relatedness, relationships, and redistribution. For relatedness, there must be acknowledgment of connectedness to all beings of place and the relationships of reciprocity that exists between all entities of place. In relationships, there must be purpose in what is learned, and it must be redistributed within communities so that all can access, understand, and implement what is learned into their lives. The 7 R's of research: respect, relevance, reciprocity, responsibility, relatedness, relationships, and redistribution support and expand Indigenous methodologies and methods described above.

Individual Native Nations can take up the 7Rs in ways that accommodate their unique place-based needs to do research or to engage with outsiders. It also develops a framework for non-Natives to learn and use in the better understanding of Native students and community needs. Research funding is a powerful means to effect change. By incorporating the 7 R's into all aspects of research, but especially the development of grant proposals and the implementation of funding, science will be accountable to focus on building relationships and centering the questions being asked by Indigenous communities. When asking for knowledge or labor there should be reciprocity, and this must be informed by Native Peoples. When working with Native students, who often ground their work in community and place, the financial compensation and protections for these knowledges shared and labor should be defined by the students as well as their Native communities. This builds trust and strengthens relationships, but it also reduces any burdens on communities since some are isolated or very rural. Providing support and resources, such as food, money, and other supplies, often taken for granted by outsiders, can reduce unseen

hardships. As Participant 13 (Section 4.1, p. 9) mentioned, many felt that the funding spent by non-natives didn't serve anyone in Native communities.

5.5 Science Culture Shift

Contemporary and future science practitioners need to educate themselves on the past and present impacts of settler colonialism and do better than their predecessors (Section 2). This starts with how teachers are taught to educate K-12 and university students. Decolonizing science also requires Western scientists to gain a deeper understanding of relationships and land. And not just the relationships between Native Peoples and their lands, but between all beings and place. One does not need to look far to learn how power and wisdom are situated within place (Basso 1997, Castree 2009, Deloria Jr. and Wildcat 2001, Johnson 2012, Larsen and Johnson 2012, Pierce and Louis 2008, Thornton 2008). Below, I expand upon ways to start honest and sometimes difficult discussions and implement actions that decolonize and create anticolonial policies.

Revisiting policies such as the Institutional Review Board (IRB) and other research protocols which do not go far enough to protect Indigenous Peoples, and their cultural and place-based knowledges is another way of supporting Indigenous research protocols, methods, methodologies, and tribally-created IRB's (Indigenous Review Board). Expanding institutional research reviews to integrate Indigenous Peoples and interests is a key aspect of this. Institutional reviews must consider data sovereignty inherent within place-based knowledge. There must be a recognition of that Indigenous peoples are the producers and keepers of their own knowledges. There are groups like the Indigenous Peoples Specialty Group of the American Association of Geographers who have put together resources of ethical research standards that are developed by

reputable and recognized Indigenous scholars. Indigenous Peoples must be free from knowledge appropriation and be recognized as the producers and keepers of their knowledges.

5.5.1 Expanding and Decolonizing Science and Institutions with Diversity

White men have historically occupied places of power and knowledge in academia and science. Increasingly, white women have fought their way into academia and sciences. While numerous institutions are starting to hire Diversity Officers, increase diversity training and create programs to increase access, the research shows that simply checking these boxes is not enough to create a truly inclusive institution (Kapila, Hines, and Searby 2016, Dawson 2014, Tuck and Yang 2018). These minimal actions can cause harm if leadership does not commit to significant change. Often, poorly planned and executed policies equate to tokenism and further exploit people from marginalized groups (de Leeuw, Greenwood, and Lindsay 2013, Greenwood, de Leeuw, and Ngaroimata 2008). Intentionally hiring and retaining competent, talented, and community connected people in all job categories from as many marginalized and diverse groups as possible supports the creation of an inclusive environment. An inclusive environment values their expertise and is one of many changes that can start to shift inequitable practices in science.

One way to address the lack of diversity is through intentional hiring practices. There are many educated Indigenous scientists and academics who would be assets to any institution (Blackwell et al., 2009; Kapila et al., 2016). Hiring Native and other Indigenous scientists, who are qualified to bridge the multiple systems of science, community, and academia, to assist and mentor Native students is an important part of the process to diversify science. These hiring practices provide a visual signal, through shared identity, that Native students belong. It has the potential to create culturally responsive mentoring, internships, fellowships, and post-docs.

Increasing recruitment and retention of Native students into STEM fields must include access to paid internships and research experiences. This multidirectional and reciprocal exchange also provides access to Tribal Colleges and Universities (TCU), as many Native researchers have connections to these places. Some opportunities can create bridge programs between science institutions and TCUs, opening new opportunities to the TCU students and faculty and research institutions. Access, attention to the unique needs of Native students' identities, and mentoring are supported by hiring diverse staff.

Ensure that Native scientists guide how non-Native scientists and researchers understand their own biases and socially constructed views of Native Peoples and their knowledges by working with Native scientists and students. Dispelling socially constructed perceptions of Native Peoples comes from direct interactions and collaborative work. Utilizing the 7 R's of research (Section 5.4) will allow for diverse thinking as well as diverse people. Suggested changes include hiring qualified Natives that are skilled in interdisciplinary sciences, culturally competent, and have experience working with diverse communities. Hiring Native scientists and researchers in all institutions is necessary to fill the needs to laterally educate peers and colleagues. It creates a point person who might serve as a mentor. When there are Natives in leadership roles, there could likely be someone who can teach and guide colleagues and students on their own Indigenous history, ethics, science, and other aspects that can contribute to multicultural exchanges and education. To have a diversified program, workplace, or system we must intentionally be open to other ways of doing and knowing the world through multiple intersectional lenses.

While the issues of racism need to be addressed it should not fall on the shoulders of Natives to educate their non-Native colleagues on Indigenous issues and the continuing impacts

of settler-colonialism. Educating both peers and colleagues on the multitude of Native issues places unnecessary stress on students and early career scientists and disregards the diversity of Native cultures and experiences. Responsibility lies with the institution to hire experts who can educate their faculty, staff, administrators, and scientists on historical and contemporary issues related to minorities, including Native Peoples. Having people in-house who have the expertise and are paid to facilitate anti-racist learning and action support the process, and is one of many practices needed to address long-term change (Mistry and Berardi 2016, Morris et al. 2012, Stephens 2010, Bang and Medin 2010, Battiste 2009, Brayboy et al. 2012, Dawson 2014, Greenwood, de Leeuw, and Ngaroimata 2008, Pandya et al. 2007, Stevens, Andrade, and Page 2016, Tuck, McKenzie, and McCoy 2014, Tuck and Yang 2012, Whyte 2018b).

5.5.2 Seven Generations Thinking

Seven generations thinking is a philosophy many Native Peoples have when making decisions that will impact our descendants for seven generations; it is accountability to the future. Making choices today will impact our children's children, so it is important we consider future generations, all our relations, and as many factors as possible. Using Indigenous methodologies, I circle back to where this narrative and project started: UCAR|NCAR and Rising Voices (RV). The relevance of RV is imbued in how the program developers and organizers work to provide, and continually evolve a program where the challenges discussed in this paper are addressed, ideas shared, and changes implemented. The goal is to not just to bridge a gap in science and science education, but to someday fill the gap.

One interview question asked about the role of RV in facilitating Native students and junior scholars pursuing scientific careers and explored what more could be done. Participant 9 gave a response echoed by numerous participants on the RV impacts.

“RV has been an exceptional network of professionals, colleagues, and now family in empowering each other in the work we do and challenging one another to elevate our expectations and experiences to address more deeply rooted issues of the systems we work and live in. RV has given me the support system I have been looking for in understanding, educating, infiltrating, and above all decolonizing the narrative of education and science regarding environmental/natural resources sciences. For the last five years I have felt somewhat isolated in my endeavors to break barriers and re-establish norms for Indigenous scholars and communities when it comes to the protection of our relatives/resources. Finding a home within the RV family, a community that understands the broader impacts of reclaiming and proclaiming knowledge that comes from time immemorial, through the generations, the stories, the very ways of life we continue to live, is the approach we need to be taking in education and natural resource sciences to perpetuate cultural values that has, and will, sustain our societies and honor the earth through the test of time. We cannot ignore the very components that have given us the strength and wisdom to establish innate relationships with the relatives that provide life and knowledge to us.” (Participant 09)

Building mentoring relationships with senior scholars, developing peer mentors, and mentoring junior colleagues has been instrumental in the success of participants, including myself. The RV network provides Native students and early career scholars with access to educational, professional, and personal opportunities. The most valued components have been allowing each participant the place to situate their knowledge and research within their cultures, homelands, and community serving needs while among peers and mentors. One of the important things about RV has been its ability to hear the critiques, discuss ways to improve, then realizing and implementing suggestions. The growth and changes of this one group is measurable and visible in the increased diverse Indigenous participants, interest and engagement from non-Native scientists, and institutional support.

The RV group is unique in its diversity of participants, disciplines, and willingness and ability to grow through change to best accommodate the scientific and social needs of its network. There were specific suggestions from participants for the growth of RV. These suggestions could also apply to other programs developed to support Natives and other Indigenous Peoples in science. As Participant 5 noted, RV could benefit from a “Concerted effort to hire Native Peoples, paid internships for Native students with opportunities for future

employment, externships for Natives to work in Native communities that support localized knowledge, and of course mentoring.”

Participant 12 mentioned:

“...there are definitely specific actions that can be taken to ensure higher engagement and a higher presence of Indigenous students in STEM-centered advanced degree programs: 1) it is important to start as early as possible; meaningful hands-on experiences in STEM fields show that there is nothing to be afraid of and that Indigenous students are just as capable as anyone else to do the work that needs to be done. If absolutely nothing else, offering paid undergraduate learning opportunities to tribal colleges provides an in to an intimidating career path and makes it more possible for non-traditional students to participate by not forcing them to choose between an experience and feeding their families; 2) local, Indigenous mentorship is important because Indigenous mentors are uniquely qualified to understand and overcome challenges specific to Indigenous students; these mentors also make the possibility of an advanced degree seem much more attainable and realistic; 3) making it clear that the voice and perspective of Indigenous students is necessary to a project, as opposed to mere tokenization, will encourage us to participate more in conversations that can otherwise be very intimidating, especially when working in spaces that are not specifically Indigenous; 4) networking opportunities like Rising Voices that offer the opportunity to meet respected Indigenous scholars can go a long way toward making these fields seem more approachable, and 5) reinforcing to Indigenous students that participation in these fields can have real life applications that make a difference in their communities can draw on an inherent cultural responsibility present in many tribal values systems and send a positive message that it might be possible for our communities to overcome the problems that we face. Personally, I have begun to consider not just a bachelor’s degree but a master’s and a Doctorate in climate science-related fields and these ambitions can be directly attributed to the experiences that I have had thus far.” (Participant 12)

Hiring Native tribal liaisons and outreach specialists that work with Tribal Colleges and Universities (TCU) is another way to address inequity. Finally, there were multiple participants that suggested leadership of RV and programs like it should be led by Native and Indigenous scholars to advise on planning, facilitating, follow-up’s and especially in evaluation of the program. Over the years, RV leadership has heard these concerns and adjusted the gender balance and included Native leadership into steering committees.

These recommendations are a starting point and not exhaustive of the opportunities to advance science with diversity. These suggestions provide tools to address equity and inclusion in meaningful ways. The bottom line is there must be a long-term commitment to implementing change, and creating funding and space for Native students, early career scientists, and faculty. To quote Roger Fragua from Jemez Pueblo, “change only happens one of two ways; slowly over

time - evolution, or through revolution. Either way things have to change” (Fragua 2013). Change is inevitable and necessary, and we all have an opportunity, or should I say responsibility, to be agents of change.

6 Conclusion

From the shared experiences of Indigenous participants, the existing literature, and my own experiences, I have examined how science perpetuates settler colonialism and racial oppression. I have provided a glimpse into the history of science, settler colonialism, and the ongoing impacts of Western science on Native Peoples (Section 2). I lay out Indigenous methods and methodologies that center Native voices and perspectives showing that there are multiple ways of doing research (Section 3). These Indigenous methods and methodologies reveal insights on the unique challenges, which are articulated in the key themes that developed from interviews (Results Section 4); relevance (4.1), identity (4.2), equity and access (4.3), and mentoring (4.4). In Sections 5 recommendations and suggestions are offered on where changes are needed and how to implement changes. These actions included in discussion Section 5 are inclusion of other knowledges and sciences (5.1) policies for education, science, and knowledge (5.2) appropriation (5.2.1), mentoring (5.3), 7 R’s (5.4), Science culture shifts (5.5), the need to expand and decolonize science disciplines (5.5.1) and Seven Generations thinking for accountability (5.5.2).

To truly address the inequity in science and education we must all consider the relevance of our research and who it serves. These considerations have the potential to create equitable and inclusive science and education. Maybe the next time an “Indian princess” (or prince) goes to

college, research organizations will do more than just talk about diverse thinking, and goals of inclusion and equity of knowledges. If space is created for oppressed people to be heard, instead of silenced and talked over, our knowledges could work to develop diverse thinking and problem solving. Maybe then we “Indians” won’t go home and change our emails.

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Participants

Dominique David-Chavez – Taíno

Thomas Kenote – Menominee Indian Tribe of Wisconsin

Terry “Scott” Ketchem – Mississippi Choctaw of Oklahoma

Ashley McCray – Absentee Shawnee & Lakota

Michelle Montgomery – Haliwa Saponi Tribe & Eastern Band Cherokee

Lisa Redsteer – Dine (Navajo)

Kelda Britton – Wailaki, Nomlaki, Concow (Round Valley Indian Tribes)

Ciarra Green – Nimiipuu (Nez Perce)

Citralina Haruo – Oneida & Stockbridge Munsee Band of Mohicans

Jessica Lackey – Cherokee Nation

Jasmine Neosh – Menominee Indian Tribe of Wisconsin

Lyman Pinto - Dine (Navajo)

Denise Pollock – Native Village of Shishmaref Alaska

Hannah Smith – White Earth Nation Ojibwe

Freddy Olin – Tanana Tribal Council Alaska

Kendra Teague – Fort Peck Nakoda/Dakota

Melissa Watkinson – Chickasaw Nation & Upper Skagit Tribe

Kyle Whyte – Citizen Potawatomi

Chapter 5: For the Love of Place: Indigenous Women, Responsibilities, Relationships, and Mentorship

Introduction/Background

“How we have come to see land and water are closely linked to how we see ourselves and others and how we engage the world” (Goeman 2014, 234).

“The violence’s committed against the earth are committed against our women. I feel like really it’s our duty and obligation as Indigenous women to fulfill these roles and to stand up on these front lines.” – Ashley McCray

For many Indigenous Peoples, place is in one of our most valuable teachers, relatives, and caregivers. We learn that place feeds our bodies, minds, spirits, holds our past, and can guarantee our futures. Place is the foundation of our identities, languages, foods, shelters, relations, and cultures (Kermoal and Altamirano-Jiménez 2016). In respect to our values, place is critical to our being. We are infused with place physically, emotionally, spiritually, and our futures are dependent on place relations. These relationships are reciprocal, as what we are gifted from place we must give back to place so that reverence for all the beings is remembered, reenacted, taught and learned over and over, always growing in understanding, and acted out in wisdoms of place. What happens when place is under attack, violated, and abused?

Native American Indians and other Indigenous Peoples have maintained deep connection to the places they live (Thornton 2011, Basso 1997, Mann 2002, Goeman 2014, Castree 2009, Deloria Jr and Wildcat 2001, Tuck and McKenzie 2015) that directly and indirectly influences their worldviews and relationships with place, each other, and other beings in place (Larsen and Johnson 2017, Watts 2013, Tuck and McKenzie 2014, Castree 2009, Deloria Jr and Wildcat 2001, Larsen and Johnson 2011). This deeply rooted connectedness has been under constant attack since contact with colonizers. Indigenous Peoples have struggled against removal, erasure, and disconnect from the landscape and interdependent relationships built with place over tens of

thousands of years. Settler colonialism has been intent on the destruction and overwriting of the history of place as well as any other claims to the land and resources by Indigenous Peoples everywhere the colonizers went (Wolfe 2006). Indigenous Peoples have been in a constant state of resistance, refusal, and re-membering places (Salmon 2000, Jeffries 2015, Coulthard and Simpson 2016).

Native resistance and activism are by no means new, as Indigenous Peoples of the Americas have been fighting to survive, perpetuate culture and languages, and protect their homelands since contact. Considering contemporary environmental degradation from pollution, fossil fuel and other extractive industries, as well as climate changes, Native Peoples, especially women, have become more visible in acts of environmental and social justice resistance which have grown into larger movements such as those of Idle No More in December of 2012 (Barker 2015a, John 2015) and Standing Rock's NoDAPL encampment in 2016 (Whyte 2017a, Whyte 2016). These direct actions of resistance and environmental justice are not limited to places of direct action, but in places of education where more Native students are focusing their research interests in issues that impact their homelands and communities. Acts of resistance and resilience spur questions of the many ways in which Native Peoples indigenize, decolonize, and reclaim their relationships with and responsibilities to place. The main purpose for this research will be engaging ethical Indigenous research seeking to understand; *What are the ways in which a deep care for place motivates Native women to take action to protect the environment?* In this project I aim to investigate this question by focusing on different dimensions of care for place through education, activism, and mentorship.

Why

It was already unbearably hot at 10 o'clock in the morning as I sat with one of my relatives at a family camp during the time of our spring Bread Dance ceremony in 2011. We adults sat underneath the traditional Oak pillared, canvas-covered camp. Watching the children play and people busy themselves at each camp, my elder female auntie looked up into the trees and said, "If we're going to have bread dance this year, our squirrels will have elephant ears." Struck by this comment I was curious to ask questions and waited until an appropriate time and place to ask her to clarify her statement. She laughed and explained to me how each spring our tribe looks to a specific trees' leaves to be the size of the squirrel's ear as an indicator for our tribe to come together to prepare and perform the Bread Dance ceremony. Then she went on to explain that if I looked at the trees now, they were all in full bloom, meaning we should have performed the ceremony 2-3 weeks earlier. My tribe has been following the phenological signs of spring for thousands of years as an indicator for spring planting. The timing of these blooms has shifted from the first or second week of May—which my elder had identified as when the signs "normally" happened throughout her life—to current blooms happening in the second or third weeks of April. Spring was coming earlier more consistently, and fall arriving later. It was from this conversation that I realized the impact climate change was having on my culture as well as the widespread acceptance of climate change in Native communities, and our vulnerability to it (Blanchard 2015).

This experience is the catalyst that led my desire to care for place through education in the western mainstream academy, learning about climate science, engaging with both Native and non-Native teachers from a multitude of disciplines related to climate science and impacts, so I could better care for my own place. When the process of gaining understanding and

implementing science took too long and was ineffective, I like so many other Indigenous people, turned to activism in pursuit of caring for place.

Another reason was the realization that Indigenous women's knowledge has been overlooked and "less attention has been devoted to exploring Indigenous women's knowledge" (Altamirano-Jiménez and Kermoal 2016, 3). Through intentional actions to reach out to Indigenous women who have been engaged in care of place actions related to one of three locations I hope to show how Indigenous women are connected to place through broader social and power relations and that while community and places are vastly different there are commonalities for the care of place that these women share.

In the next section I review the literature that discusses place and place relationships to understand how others discuss place relations and how that may play into care of place and the unique role women play in the care of place. I will also look at some of the historical and other structures that influence how place is organized and defined within the dominate social constructs.

Literature Review

Settler colonial violence is often justified because "somewhere else" (Deloria Jr. 2003); therefore debasing the place we are now will not matter because heaven is elsewhere. This perspective is foundational to the epistemologies and ontologies of the major religions of the world (Watts 2013) such as Christianity and Islam. Colonial settler values erase our histories, claim Indigenous sacred places for their own, "discover" and therefore claim Indigenous knowledges, Peoples, and places, commodifying everything possible into a capitalist system. This has led to systemic extractions of human and Earthly resources as capital and is very much

linked to the taking of everything Indigenous communities hold dear and are dependent on (Wolfe 2006). Religion was one of the fundamental tools of entitlement of taking and claiming place (Graham 1999, Rose 1999, Deloria Jr. 2003).

Smith (2005a) asserts “Native peoples have been marked as inherently violable by extension and their lands violable as well.” These actions diminished values and limited purpose by settler colonial systems have had drastic impacts on Indigenous peoples, especially women and the lands they inhabit. These repercussions are felt not only on our bodies, it is felt in our lands. Not only have Indigenous and other marginalized peoples been physically violated by the dumping of toxic wastes (Pulido 2016) and resource extraction (McQueen 2018, Whyte 2017a), but victimized by those tasked with protecting American Indians, like the Bureau of Indian Affairs (BIA), through forestry practices (Kosek 2006), mining of uranium, and other examples of ecocide (Grinde and Johansen 1995). This violence is felt on our culture, foods, medicines, political spaces, economics, our bodies, and our environment. These issues and more have, and continue to impact Indigenous People’s health and wholeness (LaDuke 1999, 1994).

One of the ways Indigenous Peoples, especially women, have resisted this and other violence’s against them and their place-scapes is through direct action, academic scholarship, and other forms of resilience leadership. This next section discusses ways in which Indigenous women leverage what they can to advocate for their communities physically, culturally, politically, and spiritually.

Environmental Activism, Scholarship, and Leadership

Changing discourse requires reconnecting the disconnect between the diverse academic disciplines, Peoples, places, and worldviews. Much of the empowerment of Indigenous women

today comes from generations of matrilineal and/or matriarchal traditions passed down over many generations (Green 2007d, Green 2007e, Harawira 2007, Henning 2007, Irwin 2007, Kukkanen 2007a). Indigenous women rising has as much to do with culture and tradition as it does with spirituality and science. Environmental justice requires governance and to some extent activism on Indigenous lands as well as community buy-in and support from academic institutions and universities (Whyte 2011c).

Environmental justice is gendered in that it impacts women and Two-Spirited Peoples disproportionately and is exacerbated by race, dispossession, location, and socioeconomics (Whyte 2011b, McGregor 2009, McGregor 2018, Cantzler and Huynh 2016, Newman et al. 2004, Whyte 2018c). When the discussion turns to that of climate change, women are often the ones most significantly impacted(Whyte 2014a) and most visible in the recovery (Harris 2010). Multiple Indigenous and non-Indigenous peoples work together on multiple research projects with and within Indigenous communities to address environmental degradation and climate variabilities and extremes that carry levels of individual and community responsibilities and varying levels of governmental obligations (Whyte 2013a), relocation and displacement (Julie Koppel Maldonado 2013), food systems and relationships (Dittmer 2013a, Kathy Lynn 2013), culture (Voggesser et al. 2013, Williams and Hardison 2013), health (Boyle, Redsteer, and Eggers 2013) and other issues of colonialism and socioeconomics (Reo and Parker 2013, Gautam, Chief, and Smith 2013). These studies explore the challenges developing collaborative research practices that employed new ethics relating to protecting Indigenous Knowledge (IK) and amplifying previously silenced voices (Louis 2007, Blanchard 2015, Riley et al. 2012). Indigenous researchers were finally seeing their work in high traffic journals sharing their research efforts and collaborations.

There are increasing numbers of Indigenous students entering academia, of which a small yet increasing percentage continue into graduate and professional careers. Significant efforts are being observed of institutions being inclusive of Indigenous Peoples as leaders and future leaders in sciences, law and policy, health, and other scholarship and research. Each successful student graduated who maintains their cultural identity becomes an agent of change for more than themselves. The success belongs to their families, communities and the larger Indian country, as well as the Earth itself. They are the leaders and caretakers of knowledge and responsibilities for the relationships of People and place. It is critical that we are intentional when working toward preserving and protecting traditional ecological knowledges of places around the world. The story has come full circle in that we find ourselves at the place we started, home.

Research Methodology and Method

Methodologies

Home is where we learn who we are and where we come from. This lens is the one in which we see ourselves in relation to the world and other inhabitants. We learn how to be, and this is important when doing work with other Indigenous Peoples and their place-scapes. I come from my own experience with my place-scape and Absentee Shawnee People in my approach to the research etiquette, ethics, and protocols used in engaging in Indigenous methodologies and methods.

I utilize Indigenous methodology starting as a qualitative inquiry involving starting from my own epistemology and ontology as an Absentee Shawnee scholar who is trained in Indigenous feminist methodology and framework, participatory action research and values, relational qualitative approaches such as utilizing time spent building and nurturing

relationship's with people relevant to the research and having mutual trust and respect using methods like kitchen table discourse (Johnson 2008), storytelling (Windchief and San Pedro 2019), other forms of conversations (Kovach 2010b, a) and multiple methods of relationship building (Wilson 2008, Smith 2013).

This system requires I situate myself within the research and recognize my own biases. This work is relevant to my work because I care for place and have utilized different methods such as activism to fight gas and oil pipeline's, support water protections, and advocate for protecting the environment and the beings of place. I wanted to better understand my own deep passions and desires to care for place by understanding others, especially women who are in spaces of heightened visibility and potential violence. It is important to know what women utilize in their care for place and to protect place, to better understand what can be done to support the efforts of other Indigenous women in caring and protecting place.

I reached out to eight women, and seven of them were able to sit with me for interviews. Of the seven who did interview, three I consider elders, two I view as youth, and two as peers. I was intentional in this to create context across generations and places to connect across place and time the relevance and relationships necessary for trust, respect and careful understanding.

In my experience with environmental justice I observed women and gender to be significant. While I do not exclude men, women are centered. This decision reflects the literature on decolonization (Miheuah 2003a, Tuck and Yang 2012, Martell and Deer 2005, Miheuah 2003b, LaRocque 2007), Indigenous feminism (John 2015, Barker 2015b, Smith 2006, LaDuke 1994, Suzack et al. 2010, Gaard 2014, Cunningham 2006, Green 2007e, Smith 2007, Stewart-Harawira 2007), and settler colonial heteropatriarchy (Barker 2012, Bonds and Inwood 2016, Arvin, Tuck, and Morrill 2013). My choice supports elevating the work these people are

dedicated to by leveraging my agency in the academy to make space for them to share their work in their own words. I do this to support their work, bring more awareness to their efforts, and to honor them and their sacrifices to protect their people and place. Kovach calls this resistance research as being the “integration of a decolonizing theoretical lens that positions Indigenous inquiry” (Kovach 2010b, 18), thus my intention of centering Indigenous knowledge and research. I want the information shared to contribute to the community through raising awareness and putting the needs of the community at the forefront of the discussion instead of the acts of refusal and resistance. I do this because it is important to recognize how activism can be expressed through research (Coburn 2013, Drawson, Toombs, and Mushquash 2017, Tuck and Yang 2014).

Methods

7R's

In her book on Indigenous Methodologies, Kovach (2010b) speaks frequently of respect, relationship, responsibility and reciprocity in research with and for Indigenous Peoples. I added a few more relevance, relatedness and redistribution which comes together as a well-developed method/methodology for research practices and methods. These 7R's (Montgomery and Blanchard 2021) are an easy to understand and apply set of idea that promote decolonizing methods and are a decolonizing methodology that can be used as a template to do ethical work. I employed the 7R's in my every action and decision as I engaged with the interviewees. I was respectful of their time and ability to take time out of their daily lives. I depended on already established relationships built with participants that were built in many cases over years. I was intentional to engage the 7R's as often and in as many ways as possible during the entire project. I made sure I was respectful, reciprocal, relational, and responsible with the people and places I

was privileged to participate with. I am also respectful of the other R's; relatedness, redistribution, and relevance.

Again, the 7 R's refer to the following: Respect – the mutual exchange of acceptance of diverse Peoples and places, and the convergent and divergent perspectives and ideas. Relevance – the connected value of research and results to Peoples and Place. Reciprocity – Is how the research and researchers give back to the Peoples and place they are in service to. Responsibility- Indigenous Peoples have deep responsibilities to all the life and systems of place. These responsibilities manifest in ceremonies, songs, actions of reciprocity with place, prayer, advocacy for place, nurturing plants and animals of place, and defending place and place agency. Relatedness- recognition and responsibility to knowing our place beings share life forces physically, spiritually, culturally, spatially, and metaphysically. We belong to the land; the land is within us. Knowing the food's we eat, water's we drink, air we breathe, and earth we depend on is all related through minerals, vitamins, and other organic and energy-based matter and relationships. We embody the places we live. Relationships- Recognizing and developing relationships with Peoples and all the place beings. Holding respect for all things having a right to exist as they are and having reverence and reciprocity with place beings beyond dominion, but in equity and justice. Redistribution -The ways in which information is given back to communities in manners and forms appropriate, understandable, relevant, and useful to the Peoples and places who need it. Information must be easy to transmit and implement in the communities and places it is created from and for.

Interviews

In asking the overarching question “*What are the ways in which a deep care for place motivates Native persons to take action to protect the environment?*” I developed six questions to better understand the process used by Native women in caring and protecting places. The questions were;

- How have education and mentoring experiences in your life affected how you have come to care for place?
- Where did your care for place come from?
- Have you had important mentors in your life that helped you foster and strengthen your care for place?
- Have your experiences in colonially imposed educational institutions affected positively or negatively your care for place?
- Overall, how have your experiences in education and mentorship affected your environmental justice activism?
- How has their care for place played a role in their seeking to pursue science careers, especially climate science?

Sampling: Where, Who, and Why

I started in my own homelands of Oklahoma. I chose this location because of Indigenous stand-point theory (Foley 2006), where understanding others aids me in understanding myself and Indigenous methodology (Kovach 2010b, Smith 2013) of speaking from the experiences of those interviewed to better understand what drives others to care for place. As someone from a tribe forcefully relocated to Oklahoma, it can be said we are climate adapters through forced relocation by the United States Government, and we and other tribes forcefully relocated had to adapt to a new and unfamiliar environment. Coupled with living in a major gas and oil state gives Natives in Oklahoma a unique perspective on climate and environmental injustice. We have been front-line recipients of climate and environmental change and extremes riddled with

numerous injustices for over 150 plus years such as with the Osage Indian murders (Hogan 1998).

In Oklahoma there are several Native women who are climate activist's and I chose two. One is an elder and has been fighting injustice of all kinds since the early 1960's and is someone I look to as a leader and mentor, Casey Camp-Horinek. Casey is a Ponca tribal clan mother, medicine keeper, and tribal leader. She learned from her own mother, grandmothers, aunties, other women and the Earth how to care for place in traditional ways. She was at Wounded Knee and Alcatraz in the 1970's and has continued through today advocating for the rights of Mother Earth and Indigenous Peoples for justice. She is also a mentor to my cousin, who is part Lakota from Pine Ridge and part Absentee Shawnee.

My cousin Ashley McCray was chosen because she has been the leader of direct action, frontline activism, teach-ins, and continues to do work for the Indigenous Environmental Network. I admire Ashley for her passion and fearlessness in running for public office in her pursuit for change in policy and laws. Like Casey, Ashley has been arrested and is on the radar of Oklahoma police and other law enforcement yet refuses to quit the pursuit of educating the public, holding city, state, and federal government accountable to their obligations for environmental protection and caring for place. I was intentional in choosing a woman who is considered an elder and one that is much younger to possibly find if there are differences in methods or rationales between the generations.

The next site was in northern Minnesota, specifically women from the White Earth Tribe of Anishinaabe. This location has not experienced the same level of forced relocation and the severed relationships with place as did those tribes from Oklahoma. There is still a land base and reservation that allows them to continue the cultural, spiritual, political, and social relationships

and responsibilities of their place-scapes even after the terrible losses the People experienced during colonization and genocide (Meyer 1999). The people continue to engage deeply and regularly with place, making the experiences and responsibilities of place unique to that of the other interviewees.

I have existing relationships there with a couple of women, one who is a well-known activist and experienced with front line activism physically, academically, and politically and the other a younger upcoming future leader who I met in my undergraduate program where we were both students who went on to work in the community after graduation. Winona LaDuke and I have a relationship that has grown over several years into a trusted extended friendship. Her experiences as someone who advocates for protecting place professionally and someone willing to physically create a frontline are important to understanding how she is a leader in her community and across Indian country and an inspiration to many youths and peers. One such mentee is Hannah Smith.

Hannah is from the same community of White Earth and she and I met while she was attending a tribal college. Our friendship was as peer mentors and extended family. Hannah's experiences with environmental activism and care were similar to mine when we were attending a TCU (tribal college and/or university) and we experienced some of the same negative experiences in the mainstream university, and while I decided to continue on my academic journey, she chose to go to work on the frontlines and to work for nonprofits and grassroots organizations. Hannah is an amazing rising leader in the work she does to educate communities and protect place. Hannah and Winona have worked together, making these women a unique pair to interview about care of place and mentoring.

The third and final site I chose was based on two existing relationships and one new one with Indigenous Hawaiians, Kanaka, who are each in their own way protecting place. I chose this as a site because unlike the first two sites where people have protected political recognition, Hawai‘i does not enjoy the same level of recognition protection politically for its Indigenous Hawaiians. This creates a unique relationship between people and place that the three Hawaiian women I interviewed each approach their own care of place actions.

I interviewed Diamond Tachera who was a Hawaiian PhD student I met through my fellowship at the University Corporation for Atmospheric Research (UCAR). She was a student struggling to reconcile the gap between her Hawaiian culture and relationship to place and the academic sciences approach to research and community. Diamond uses her cultural perspective to advocate and care for place. Another Hawaiian woman, Renee Pualani Louis, uses her academic education to protect place names and therefore preserve the history and characteristics of places through traditional map making. Renee’s work with cartography and decolonizing space in the academy put her into leadership roles as a teacher and mentor of many students, including myself. The third woman interviewed in Hawai‘i was Auntie Mary Maxine Kahaulelio, who is a respected and loved elder traditional Kanaka (Indigenous) Hawaiian who has fought for justice for Hawaiians and Hawai‘i most of her life and who I was introduced to by dear friends M. Kalani Souza, his wife Julie Stowell, and Uncle Hank Fergusson. I was afforded the honor of interviewing Auntie Maxine on Mauna a WaKea during the occupation and protection of the Mauna.

I was deeply honored to have interviewed all these incredible women in their homelands, and all participants were chosen through existing relationships I have made throughout my own engagement in environmental justice activism and advocacy. These are women I have stood side-

by-side with, in prayer and in direct action to protect the places we know, love, and have relationships with and responsibilities to.

In this section I have discussed the 7R's as method and methodology as I use Indigenous methodology to interview and engage with the interviewees and their place-scapes as a way to decolonize myself and my research. I use the 7R's as a method to empower the participants to use their own voices to tell their own stories and to elevate their voices. I shared the rationale and relevance of the research by explaining how and why I chose the sites and people I did in my attempt to be diverse in the responses I received to the questions I proposed to interviewees. This next section comprises the results and responses to the interview questions.

Analysis

In the earlier section I shared the reasoning for the places and peoples I chose as experts for my study on the drivers for Indigenous women to care for and advocate for place. This section is the responses to the questions I asked and my analysis of these responses. The codes that came out of these responses reflect where these women's care of place comes from and how they have been impacted by these influences in their own ethics of care for place.

"Mentorship is entirely different from education, except in terms of how we're sharing with one another." – Casey Camp-Horinek

Questions and Codes

The intention is to understand what mechanism's support Native women's choices to care for place through frontline activism or in academic places which can be places of violence for Native Peoples, especially women. I questioned if education was a driver and if so, what specifically was it about formal western education or place-based education that supported their decisions to care for place. I specifically am interested in how each woman chose to learn and

apply what they learned about caring for place and where, from whom, and how they learned best for them and their needs. I am interested in how western education and other formalized academic places can support and improve the needs of Indigenous Native women to care for place through multiple methods.

In asking the first question “How have education and mentoring experiences in your life affected how you have come to care for place?” There were four major codes that came out of question one which are Values, Mentoring, Care of Place tribal education, and care of place academic education.

Values were defined through subjects of metaphysical/spiritual, activism and justice, identity, and education and knowledge. Experiences of mentoring were discussed under codes of positive or negative experiences with negative encompassing experiences with bad advisors, navigating mainstream systems and funding issues. Positive experiences were reflected through themes of; empowerment and relevance, community, relationships of care, peer to peer mentoring and funding.

Care of place taught and learned from the tribal community was mentioned in relation to intergenerational knowledge transfer and learned from leaders or as leaders. And the fourth code related to mentoring relates to how care of place is learned in formal academic education spaces and the positive or negatives experiences these women had.

- Where did your care for place come from?

When asked where their care of place came from there were three parent codes of academic, sense of place, and through mentors. Under the code for academic learned care of place a sub code of challenges and problems was expressed. Under learning about care of place that evolved from their own sense of place with deep relationships and responsibilities to place

was the most frequent responses for the parent code of where their care of place came from. The last code was related to mentors which produced sub codes of academic mentors, place mentors, tribal community, and from family.

- Have you had important mentors in your life that helped you foster and strengthen your care for place?

Participants talked about a wide variety of mentors, including community and ally mentors, peer mentors, academic mentors, place mentors and family mentors. Overcoming trauma was an outlier code that was mentioned in response to important mentors who helped the participants. Under academic mentors there were more positive reflections than negative responses. Place mentors had the highest occurrences of responses as did the code for family.

- Have your experiences in colonially imposed educational institutions affected positively or negatively your care for place?

There were interesting responses to how experiences in mainstream school experiences affected participants. Most responses were in relation to activism and advocacy, negative as well as positive impacts and responses to the politics of mainstream education and around the care of place.

- Overall, how have your experiences in education and mentorship affected your environmental justice activism?

Five codes that were identified were: how participants' interest and/or engagement in environmental justice was affected by education and/or mentoring, how IK and TEK were influential and important to them, their interest and engagement in science education, and how influential other women were in the learning process. There was some discussion specifically around Indigenous feminism. Gender influence, especially women relatives, was the most

frequent code in this section. Gender was an indicator of how women are culturally closest to earth knowledges and systems of place.

- How has their care for place played a role in their seeking to pursue science careers, especially climate science?

There were six codes in this question. These focused on preparing the future generations of young people, survival and continuance of their people, culture, and lands well-being, good examples and how not to be examples of mentoring, preparing and being part of the future workforce of place-care careers and responsibilities, and supporting or protecting place and communities.

Coded information

Since most of my questions dealt on some level with mentoring, I coded mentoring uncovered two sub codes: mentoring experiences and mentor types. The first group were the types of interactions or experiences labeled as negative experiences: funding, bad advisors, struggles navigating mainstream systems of school, work, or whatever needs were of interviewee related to mentoring. Positive experiences included relationships of caring, empowerment and relevance, peer to peer mentoring, positive funding experiences and some expressions of what good mentoring was.

The other group code included types of mentors and the experiences relating to positive or negative experiences of which I discovered that there were significantly more expressions of ways in which interviewees experienced specific mentor types. Types of mentors discussed were academic mentors, family mentors especially the importance of the women's grandmother's and mother's, mentor's that help people with differing types of traumas or/and stress, peer or student to student mentorship, tribal community and ally mentors, and the unique mentor, place.

“Mentors I kind of see as people who not necessarily open doors for me, but show me ways of doing things, and being that shepherd of finding those avenues and oftentimes it’s people who’ve gone through those motions before and those processes. The motivation, the inspiration that I have for the work that I’ve done in the past or want to do are friends and people who contribute ideas. So people who are with me on that journey rather than showing me the path. Mentors I think are people who teach me things I wouldn’t have otherwise learned. I pull inspiration from situations, people, and mentors.” – Hannah Smith

“I think by looking up to my role models, to my mentors and watching how they do it in their own way, has showed me I can do it myself.” – Diamond Tachera

Mentoring was an important means of support towards achieving the goals these women had already set in their minds that supports their care of and for place. The desire to improve the lives of their families, communities, and home place-scapes are the foundations of purpose for all of the women interviewed for their activism and advocacy for place. The responses show that the earliest mentoring of care comes initially from immediate family then extended family, then from community, sometimes school, and always from place.

Care of Place Mentoring

“We are responsible to those who nurture us.” Casey Camp-Horinek

In asking about where care of place comes from, participants identified several places: family/community, education/mentoring and from direct experiences with place. It is through each of these places that we are instilled with values. These values and morals are the bases of social and cultural norms that is the lens through which each of us observes and experiences the world through, and these norms are foundational to who we are and how we choose to be in the world. In the following sections I look at the unique ways Native/Indigenous women learn to care from place through their own words and experiences inspired by questions asked specific to their care of place learning. Many of the importance lessons are fundamentally about the relationships and responsibilities of care and caring.

Teaching is about conveying knowledge of a subject whereas mentoring is relational, and experiential based on lived experiences. Teaching is about the how and mentoring is about the why of things. Mentoring is a social\cultural norm more than a professional courtesy for many Indigenous Peoples and is a socially constructed means of knowledge transfer. The responses to the questions validated the importance of mentoring by more experienced women of younger and less experienced women and how care of place knowledge and practices are carried out and continued.

Family and Community

Family and community were deeply connected to tribal and cultural connections and influences and interestingly gendered, meaning that most women learned from their female relatives' actions and behaviors that are foundational in their own ethics and relationships of care for all their relations which include human and more-than-human beings such as, and not limited to, plants and animals. Several participants discussed how they learned from their grandmothers, aunts, mothers and sisters the responsibilities and relationships of place, therefore passing on generational knowledges to their children and grandchildren what they had been taught and what they too had learned throughout their lives, therefore building and expanding dynamic knowledge systems of places specific to them and their people.

“The Indigenous knowledge and community education that I’ve received from my tribal members and Elders, I think has really, really, really impacted the way I see my relationships with the world.” Ashley McCray

“that was part of what I was taught, is how to observe and how to observe in relationship to self. How does one understand that you have to learn to see not just how others’ actions affect you, but how your actions affect others and the circle of life?” Casey Camp-Horinek

Knowledge transfer appears foundational to their ontology and instills a deep sense of place that is relational and carries continued responsibilities as well as an ethic of care. These

ethics of care and relational responsibilities move beyond the family at an early age, essentially as the person interacts with community members beyond their own family units. The community teaches the extended social norms of relational responsibilities through ceremonies and behaviors such as farming or hunting, that perpetuate the cultural social norms associated with these women's tribal communities. It is within the family that women's responsibilities and relationship knowledges and experiences are first introduced and in community enacted in multiple methods and the differences in gendered knowledges really clarified. This is not to say knowledges are an either-or binary, but more of a recognition that there is a wealth of information that is distributed so that diverse information is learned and shared and that each person who holds knowledge is responsible for and to that knowledge so that more information can be cared for and carried forward.

“So, my education has been centuries of understandings and centuries of knowledge they have been passed through me. As the youngest daughter I had to stay close to my mom full time. She spent time with her contemporaries. That put me in the company of her contemporaries. So, I learn from them too, mama, sisters, grandmas, daughters, and granddaughters, because we go by a Clan system... I had brothers, I had a dad, I had uncles, but they had a different way. They taught each other in a different way. And again, observation was how I learned about them and from the women talking about them, making the decisions and teaching them what they needed to know from our viewpoint.” - Casey Camp-Horinek

“My grandmother is probably my most important mentor. She is definitely the one that's taught me who I am, where we come from, and why that is so important.” -Ashley McCray

“the core mentors that I've had that continued to mentor me are definitely hell raisers, right? Would give away women or old Ojibwe grandmas, man, they'll Fuck you up. And then they'll bake cookies and sew until 3:00 am. They'll make you drive them to a protest and then sit and write a grant and then they'll be sewing until 3:00 AM, get up at six am make some harsh coffee... My grandma and stories of my grandma and then other Ojibwe women in my life in my community, there's all these stories of them running around and doing all these important things for the social good... I got to fill these incredible shoes of these bad-ass women.” – Hannah Smith

All the women talked of their parents teaching them to care for people, plants, animals, and place. Caring for place is a social norm in the families and extended tribal communities for each of these women. Each woman's culture held strong beliefs that protected and nurtured place through ceremonies, rituals, and daily practices that often revolved around food, medicines, and

relationships between plants, animals, and all the beings of place. It was most often women who transmitted knowledge to other women on how to care for place. Mother's, grandmother's and auntie's were the first mentors who showed younger women how to nurture and care for others.

The community influence was the next most important factor in how these women came to care for place. Focusing on the extended family and community of neighbors, friends, allies, and even farmers and ranchers in the area teaches others how to care for place. Two types of learning are foundational for understanding place care and the many different ways place can be cared for: learning from their own tribe and then being open and receptive to learning from other tribes on how to be good relatives of place and how to be in relationships of reciprocity and responsibility with all the beings of place. In this learning, multiple methods and techniques are passed on.

“When I was in academia, I had to very specifically search out these people, whereas now I’m in the larger community, people are working together to mentor whole generations. I feel like those mentorships for me and those bridge buildings have been extremely vital to meet not just as an environmental advocate, but also just as a young native woman trying to navigate a colonial system.” – Ashley McCray

“That transition of civil rights, spirituality, environmentalism is all part of one whole. And that is, I believe what you’re calling care of place.” – Casey Camp-Horinek

Ashley, Hannah, and Diamond each discussed how the most valuable mentoring was not in formal educational settings but in the community they're each from, both familial and tribal extended. Another important factor that came from the research was that these Indigenous women all emphasized how the women in their families and communities were the most influential people they learned from and are inspired by. They spoke of how some ways of doing and being are exercised as social/cultural gendered norms and women are often caretakers of the people and the land. These responsibilities to the relationships of place are strong and come from generations of people and place relationships. In short, these women learned how to be Indigenous women from other women therefore continuing the cycles of care and caring. It is

these ethics of care that were and in many ways are the keys to survival and the ability to thrive in a place.

“... For Shawnee people, the dual roles that we have, we have women’s knowledge and men’s knowledge, and it’s not that we’re better or worse than each other, it’s that we both need to carry forth those knowledges in order for our whole community to exist.” – Ashley McCray

Family and community relationships and responsibilities has been shown to be the first influences on these women on how to care for place and one another. Community is the next phase that uses generational experiential information and rituals to instill care ethics and pass on knowledge of place to the next generations. This mentoring sets the most basic ontological practices associated with care ethics and is the foundations of how these women have learned to care for place and be in the relationships and responsibilities of reciprocity with other beings and place itself. The next section looks more specifically at how education influences care of place and the ethics of care and caring some of these women sought in their own pursuit of information that supports their care of and for place.

Education

“I think that one has to understand what education, mentoring and all those if things are interpreted as from a traditional viewpoint.” – Casey Camp-Horinek

“Education, it’s really a two-faced monster.” - Mary Maxine Kahaulelio

“So, education, I grew up in a rather big family...which means I have a lot of people in my life that shared experiences, lived experiences, perceived experiences with me, and I could grow...you’re a product of your environment.” -Hannah Smith

Education has been something that has multiple understandings and values. There is the formal education that is imposed by the dominate society that includes the K-12 education system, the extended education of university and college, and the education one acquires from family, community, and place. Here we focus on the former understandings related to K-12 and academic education, most discussion relating to education in universities and colleges. This

section looks less at teaching and more at mentoring and how the need for advising and guidance influences those women that did have some formal education that had influence on their care of place needs and goals.

The first discussions about education highlighted an important distinction between the older women and the younger women. Older women discussed the historical violence experienced in the education system and that of their collective families connecting the violence of boarding schools and assimilation policies (Child 2000) with their own realities. There were discussions on how the education they were learning as children in the mainstream systems were not teaching them things that were thought of as useful to their everyday lives;

“They’re not teaching, they weren’t teaching you stuff that relevant to you, community, telling you stuff that’s not true...Your culture, your family, your community, everything was taught that was useful. Then you go to school and they teach you stuff that’s ridiculous.” – Mary Maxine Kahaulelio

While all the women discussed the challenges related to learning from a system not of their own culture there were also challenges and opportunities that happened within the formal structures of the educational system. Issues in the next section will be discussed in some of the challenges faced in academia in relation to caring for place and then in positive ways academia has influenced how these women came to be empowered to care for place.

Challenges and Opportunities

While there were many challenges a large portion of discussions were related to finding mentors within academia that supported their interests, work, and other needs found within places of higher learning. I was interested in how mentoring plays into the academic experience and in what ways that supports care of place. It seems that some of the women that came into academic spaces already had an interest in the kind of work they wanted or needed to do and it

was challenging to find support that focused on their needs academically, and their needs were often unmet or met outside of the discipline and/or the academy.

“when I did have any sort of education, I had to seek it out on my own, find others in the academy who are Native and working on these topics. Then realizing that some of the people who were non-Native working on these topics were actually doing so in a harmful way and they refused to see it...I didn’t feel like I was actually emboldened or empowered enough to stand up to these people because they had the expertise and titles.” – Ashley McCray

I feel like I’m always looking for more mentors who can mentor me on the cultural and social side of science and basically how to be a good scientist for Native people because I don’t get that from my advisor.” -Diamond Tachera

One participant brought up the specific things she didn’t get from her experience within the academy. Diamond stated;

“Not sense of place care. Sense of worth, yeah. Self-worth, yeah. There’s a lot of things that personally, emotionally, mentally being in the academy has affected me negatively.” – Diamond Tachera

This comment highlights what other participants said about how the experiences in the academy made them feel. Diamond goes on to state “I feel there is just the academy is wrong. If the academy was different there would be so many local kids in earth science because that’s what they enjoy.”

Hannah Smith shared that there are a lot of “myths around getting a formal education that once you have a degree you can do these things better and I think my experience was good until it got bad,” suggesting that even with the formal degrees there are still many obstacles that prevent the intentional care of place that these women came to the academy to achieve. Not all struggled with their formal educations as much. Renee Pualani Louis said she was “groomed to be an intellect” and that she “got” the education system and knew how to “manipulate it instead of it manipulating her.” She thrived in the academic system and was intent on finding ways to make education more accessible for the next generations. Education is one example of the many ways in which these women utilized resources to access the empowerment they desire in their

pursuit for caring for people and place. Education was a means to learn more ways to protect and care for place as well as achieve the agency in the mainstream system to advocate for place in ways that would not be dismissed and ignored.

There were other ways in which the academic experience positively influenced some of the women's care of place ethics. Ashley stated that while the academy itself didn't intend to influence her experience positively, it was her negative experiences in academic spaces that pushed her to resist the "colonial space" and depend more on her Indigenous understandings of the world. Ashley goes on to say;

"I've tried to do the best I can to leverage the privileges and tools I've amassed through my colonial education and being in those institutions. Just being able to have a seat at the table...that has been beneficial for our communities in different ways..." sharing how "the formal education or the formal spaces that those formal mentorships that I gained...did give me the language and the tools to explain my feelings and my understandings of the world."

Ashley uses what she learned in academia as resistance mechanisms to push back against the mainstream system that she feels restricted and oppressed by. She used what she learned in the academy towards her own goals of environmental justice and care of place work she strives for.

Casey Camp-Horinek bring up positive points about formalized education and points out "I think that one has to understand what education, mentoring and all of those things are interpreted as, from a traditional viewpoint" suggesting that the relevance of what is taught and how it is integrated into the human landscape of place is going to have differing foundations and that we must be intentional with understanding so we are not imposing our own biases onto others. Casey also states, "I think science is catching up. I believe there's a possibility that they may get to the place and understanding quantum physics is actually a basic understanding of all that is and all that is related." There is hope for science to catch up with what Casey, as an elder, sees as the ultimate connection between the seen and unseen phenomena, science and modern

experiences. It is hope that drives the elders and inspires youth. Hope that the ethics of care will become the socially constructed norm for resource management practices and environmental protections that govern our systems currently.

Mentoring in school was positive, in that Ashley, Diamond, Hannah and even myself found examples of how not to be in some of the mentors available to us but also in the examples of those Native mentors we were able to locate and connect with that showed us how we wanted to be. They displayed actions of care that supported the dreams, aspirations and goals of their students. These positive mentors as Hannah explains;

“...went through the motions of grants, ... institutionalized learning, data sharing...and her programs were fun. I saw more knowledge sharing there (White Earth Tribal College) than I saw at UMD and I think that inspires people because people like to show up continuously and want to participate.”

The acts of sharing knowledge and inspiring engagement and participation are key elements that some of these women looked for as the standards they wanted for themselves and others. Diamond mentioned mentors creating and maintaining a “safe space” and how her mentor “was there to take care of us, not just in academia but in life.” These acts of caring are echoed throughout the interviews and clearly tell of the importance of caring for the women in how they learn and how they themselves care for their peers, each other and the influences that inspire them to care for place and the ways in which they embody and enact their own acts of caring for their place-scapes. These women seek out those mentors who display the ethics of care they themselves already hold as norms. If they are unable to identify someone within their department or cohort they look beyond the immediate spaces of their department and out to other programs for people who support their ways of knowing, doing, and being. Without these critically important people there is the risk of losing Native women in sciences, to other disciplines or they end up leaving academia entirely.

School is not the only place where mentors are identified. All the women spoke of mentors in the community and especially within their families. Some of the women described place as a mentor -- and how their deep care of place came from the relationships they have with place and the beings of place that taught them how they want to be, and how they need to be.

“there were a few other people around that area who I tapped into as mentors and as friends, support systems while keeping my national Network as well...our traditions are that we have been stewards of these lands, the Algonquin lands, as traders and as people who traveled a bunch for generations.” -Hannah Smith

While school wasn't the easiest place to learn and be taught how to care for place, it was a location where there are tools and language that contributed to the ways in which these women could learn and prepared themselves to care for place and utilize their own ontology to care for place and the beings of place. Schooling and education are another platform women were using to get the agency to have a seat at the table where decisions are made that directly impact the places these women were fighting to protect and care for.

Beyond family, community, and school, place itself has had influences on how these women have come to care for place. Place has its own agency (Bang and Marin 2015, Nash 2005) and through direct interactions and experiences with place the women interviewed have been shown how to be and how to care for each other from place. In the next section place mentoring is looked at through the responses of the women interviewed.

Place Mentoring

“You learn from the environment. You learn from what's around you.” - Mary Maxine Kahaulelio

Place itself is a strong factor in how these women have developed their care for, and of, place. Many of the lessons we learn about resources and relatives comes from the direct engagement with place. Place teaches us many things like patience, respect, relationships,

relatedness, and reciprocity to name a few. Many Indigenous Peoples are deeply dependent on place and the relationships of place so it makes sense that the women interviewed carry with them a strong responsibility and relationships with the place-scapes they love. Love is not too strong a word as the responsibilities and relationship these women talk about is deeply sacred.

“I really believe that our understanding and our decolonization that we’ve collectively come to, has made us realize that as Indigenous women, our relationships with the Earth as a life sustaining entity or spirit is very sacred and traditional.” – Ashley McCray

There is a deep relationship and recognition of the interdependency with place. A sense of purpose for and to place. A desire to leave place better than we found it. A purpose and responsibility to protect place from harms, “responsible to those that nurture us” and a desire to “protect” the “waters” and the ability to “eat of her gifts,” thus a recognition and respect for the foods, medicines and other resources humans and other living beings need to survive. This respect is culturally and personally tied to the responsibilities these women share to protect and care for place academically, culturally, and personally. There is a deep responsibility to defend and protect place from violence and a willingness to put themselves in places of potential harm to protect and care for place.

“So yeah I feel like I have to stand up and defend how other people want to treat the land.” - Diamond Tachera

The responsibility these women have with their places are deep and learned from an early age from both family and community and place itself. Each woman has experienced place in ways that taught care and responsibility in ways that carry forward in acts of care, protection, and other responsibilities for and to place. Place has taught us how to survive and how to thrive. Place has taught us to recognize the connection between us and our environment and respect the deep connectiveness between our bodies and mind and places we are part of.

“Land is my wealth. It’s my health.” – Mary Maxine Kahalelio

“For me as a Lakota woman, I’ve been told our first medicine is water. Our second is Earth. And our third is women because it takes all three of those for any life whatsoever. Having those groundings and those understandings makes me feel like it’s really my duty, my obligation to uplift Grandmother Earth and the issues that she’s enduring, because those are also the issues that I, as an Indigenous woman, am enduring or endure too.” - Ashley McCray

The relationships with place have been ongoing for generations and evolved with place creating generations of lessons learned by individuals and communities. The challenge becomes how can we listen and teach others to listen to what places are telling us.

“So, we have been stewards to that territory for years and years...And that relationship is now within our DNA and within the plants and the land, and that’s talked about in ceremony and that’s talked about in our daily lives.” – Hannah Smith

“So, the education has come in the form of being in those other places, listening to other people’s ability to translate, but also listening period...” – Casey Camp-Horinek

It is within the landscape that many answers are sought and found. Details of the past can provide information of the present and future. Place-scapes hold detailed information on our scientific phenomena, historic events, and predictors of possible futures.

“Our cartographic practice depends on our understanding of reality and our knowledge framework...our oral texts embed these names and they embed the scientific phenomenon... Of course our landscapes are full of stories that describe those scientific phenomena, that describe our historical events. They are absolute survey markers of our past, and they are absolutely helping us, in this day and age, now...” – Renee Pualani Louis

It is these teachings and direct interactions with place that shows us how to not only survive within a place but to possibly thrive with place. It is realizing that there must be a combination of knowledge that is needed.

“...with the understanding of Indigenous Knowledge is that having our teachings incorporated with their (Western) teachings that maybe other humans might be able to add those together and be able to see a way forward. You know there are very few choices that we have. It’s either we align ourselves with natural laws or cease to exist as a species.” – Casey Camp-Horinek

Another important factor in the care for place is the spirituality and metaphysical. Relationships with place are both and more. Our relationships with place create reciprocal relationships that provide understanding and multigenerational knowledge that gives meaning.

In Hawai'i having such a bright metaphysical side it's almost like our daily life was dependent on what the metaphysical stories, the chants, and the old things were saying and expecting of us. It was like they were pillars of how we live our life today... We need to be able to accommodate for that in our understanding of science. We need to be able to accommodate for that metaphysical side of things. Because a lot of times that metaphysical side can also include generational information, and so that means history, the concept of generational." - Renee Pualani-Louis

Place teaches us science within context of location, climate, biome, time, and other physical and metaphysical influences to best understand systems of place. This knowledge informs and directs these women in their desires to protect place. This protection manifests in academic pursuits, frontline activism, and ethics of care that they carry with them to whatever location on the Earth they find themselves. It is the ethic of care that guides the relationships they build and nurture with the places they go and the beings they meet and interact with. Ethics of care informs the lessons they pass on to their own family and communities and is foundational to the lands they call home. Care is one of the most basic lessons we are taught by our family and community, but it starts in place. Place mentors us to care for each other and the landscapes and waterscapes that care for us. It teaches us hard lessons of survival and gentle lessons of love and nurturing. These women acknowledge their mentors from family, community, school, peers, and place. We learn to care for place from many places, peoples, and beings. It is this system of care and care ethics that drives our choices to advocate for place through acts of activism, ceremonies, academic advocacy, and in daily acts of kindness and care for the world and its inhabitants.

In this final section the purpose of empowerment is the reason for the willingness to put themselves in harm's way to care for place. I share how the women see using the tools they chose to utilize in their pursuit of caring for places.

Empowerment and Care

"Corporations abuse people and the environment. Someone had to stand with scientific evidence to argue against intentional exposure by the state and leadership." – Winona LaDuke

The importance of advocating for place in ways that are meaningful and relevant is a major reason for these women to put themselves in spaces of heightened visibility and potential violence. It is the desire for agency to protect place that drives the women of this study to go to school and get degrees to access the places decisions are made that affect place and the systems and beings of place. When the academy isn't providing the tools or supporting women in meaningful and useful ways, they turn inward to their own ethics of care and advocacy and seek out extended family and community to rally together in place to create agency and protect place. School provides the tools and language some of these women needed to resist environmental degradation and push back on policies that do not protect place or the systems and beings of place in ways their own moral compass sees as acceptable and beneficial.

It is the responsibility and care for place that they have learned and experienced that drives them to put themselves in harm's way. It is a sense of obligation and responsibility that these women feel they need to protect and defend their homelands and place-scapes.

"So I feel like this sense of place that I have, it comes out of a place of protection and defense." - Diamond Tachera

It is almost like life and death that these women feel the importance of what they do to protect places they love and have relationships with. It is a critical component to their futures that drives them to fight. The future of their cultures, homelands, and their children that are drivers for their front-line advocacy because history has proven that the leadership of this country doesn't hold the same ethical value system that includes a care for place in ways that protects them as people and the places they hold dear, and often depend upon.

"We're adapting or we're dying. We're giving our next generation enough information so that they can adapt." Renee Louis

Conclusion

This study has looked at a handful of Native women from three very different places and who all are advocates for the care of place in places of potential violence and high visibility. This study showed how care of place develops from family, community, school, and place itself. These women have used culture as their moral compass to guide them in how they pursue caring for place and protect the environment. They study place as an individual grounded in their community and culture and study place from the western academic places that give them agency to advocate for place on a large scale and policy level. Some women use science and the tools acquired there to learn, teach, and protect places. And place itself has its own agency to teach critical lessons of survival, thriving, reciprocity, and relationships.

It comes back to us as humans to apply what we have learned from the examples the Earth has shown us of what happens when we are careless and what happens when we are careful. It all comes down to care and caring. If we care for place, place will care for us in return. Indigenous women will continue to fight to care for and protect the homelands they love and have relationships with in whatever ways that guides them and achieves their goals. We each need to really reflect on the ways we care for place. What is it about certain places that draws us to them and what are the ways places speak and guide us?

What this research shows is there is a deep care and responsibility these women have with place that comes from their culture, family, community and from their own love for places. These women were taught to care for their land and waterscapes. It is an engrained behavior that is naturalized in everyday actions. The relationships of reciprocity are reenacted in daily prayers, songs, dances, and other ceremonies between people and place all the time. There is a regular and constant exchange between people and place, and it is deeply dependent on the ways in

which one is taught and engrained with responsibilities to place that dictates how place relations will look and feel like. Much of the guidelines that dictate how we honor place or do not depends on how we are raised to respect place and how we are taught to care for place.

The next questions become how do we teach an entire culture that has a culture of being separate and above environment how to connect to and be part of environment? It is the responsibility of all of us to change the mainstream settler colonial structure how to be respectful, responsible and reciprocal to the places we belong and are part of. It is our responsibility to teach our youth to care for and even love their lands and waters they live among. This starts in the home, and if teaching care for place doesn't happen there it then must happen in the K-12 education centers. It needs to also happen by listening to what place is telling us and showing us. We must find ways to make caring for place through respect, reciprocity, responsibilities, and with relationships to place a priority before it is too late and we humans as a species go extinct like other species of the past. There is much to do and much to learn to create real change in the pursuit to be good relatives on a planet we are desperately dependent on. Teaching and mentoring are instrumental in passing along valuable knowledge for the survival and thriving of peoples and places we call home. Now we must learn to understand and implement what place is showing us.

Chapter 6: Place Mentor

Introduction

The relationships we have with the places we live form a significant backdrop of what we learn about the environment. We learn from our environment from the first moments of our creation. Whether it be within the womb of our mother, the first moments at birth seeing our family members and hearing their voices, or sitting quietly within the socially structured homeland, we are nurtured by and taught who we are and how to be. Place can be as familiar as our own mother and many humans are taught that the Earth is our mother. Place is saturated with information about relationships, responsibilities, and reciprocity. Place teaches us how to be good relatives in the larger circles and cycles of life. Our relationships to the places we live operate at unconscious and conscious levels, and impact significantly what and how we learn. It is through direct engagements and interactions and observations within place that we are mentored on the ways in which we must be to coexist with place in a healthy and thriving manner which then shows us how to be good human beings through acts of care and caring. Mentorship is a crucial aspect of how Indigenous Peoples and the landscapes and waterscapes they live in and are part of, learn to care for place and one another as well as being shown how to be in balanced relationships of reciprocity with place and other beings.

Indigenous knowledge keepers, scholars, and leaders have articulated philosophy and knowledge traditions that focus on how to have the best possible relationships with place. Indigenous traditions push us to engage all dimensions of place, from human institutions to ecological dynamics and flows, to cycles in nature, to moral relationships with animal and plant life. Indigenous studies have offered models of place-based education. In the literatures in Indigenous geography and Indigenous education, a preponderance of work has shown that place-

based education focuses on cultivating peoples' sense of care. Care can be expressed by people learning what it means to understand their relationships to, reciprocity with, and responsibility for the places where they live.

This literature establish critical knowledge of what Indigenous place-based education should impart. There is more work to be done on the unique role that places themselves play in the learning process. The position we take in this article is that places do form an important backdrop and context for learning; at the same time, places themselves act as mentors in our learning journeys over time in particular places. The mentorship aspect of place is present but underdeveloped in the Indigenous geographical and educational literature. We will work to provide more voice to mentorship, seeking to uplift its importance in how our relationships to place are connected to learning about the environment.

We will show how mentoring as a concept invokes trust-based learning that continues to provide us with guidance over time, guidance that deepens as trust grows. While place itself is not a human so to speak, we will show that Indigenous models of place-based learning suggest that key facets of human trust can be used to understand how we can treat our relationship with place. I will focus on just three tenets of Indigenous place-based experiential learning: relationships, reciprocity, and responsibility. We will show how each one reveals mentorship-based learning models that inform our knowledge of the environment – where knowledge of the environment is not just informational but speaks to knowing our moral obligations to the land. We will conclude by further showing that the role of mentorship in relationships, reciprocity, and responsibility fosters a deeper appreciation of Indigenous approaches to research. Using the 7Rs model of Indigenous research, we will conclude the article by demonstrating that Indigenous research importantly includes mentorship-based learning with place.

Indigenous scholars, knowledge keepers, and leaders have cited the importance of place in education (Deloria Jr and Wildcat 2001, Israel 2012, Tuck, McKenzie, and McCoy 2014, Bang and Marin 2015, Bang and Medin 2010). Indigenous education emphasizes settings where learners can independently investigate ecological communities and flows through curiosity and experience, and then having dialogue later with other people about what they experienced. Indigenous education emphasizes the importance of learning from places, especially the stories that places tell through their own recounting of history and experiences. People can learn from water, animals, and other beings and entities in the environment. The literature on Indigenous education and place is rich and multifaceted. Given the complexity and intimacy of Indigenous conceptions of place, there are further educational dynamics fostered by place-based relationships. This chapter investigates mentorship.

Typically, mentorship is thought of as the relationship between two or more people. Place figures very little into definitions of mentorship beyond literature that discusses meeting spaces most often connected to Western concepts of education, business/labor training, and other human-centric trainings. Literature in Indigenous Geography, while focused on place, can be reinterpreted as centering relationships, responsibilities, and reciprocity as key to how place is understood. Moving beyond a human-centric understanding of how one learns about oneself in relation to the worlds and other beings around oneself is critically dependent on how, where, when, and with whom one learns.

Mentoring is often recognized as sharing knowledges, educating, and preparing the next generations by passing on what is already known in preparation for what is to be, and what is possible. This means that mentoring is more than the interactions between humans but is also the learned experiences between animals, plants, seasonal patterns, and multiple other systems.

Through observations, experiences, and listening, all beings are learning and implementing what is learned from place. Place is an active participant with power and agency that exists with or without the human beings and is much older than humans on the Earth. We learn about place and learn and are taught about all the actors of place. Is place teaching us? If so, does place mentor? How, why, and in what ways does place mentoring manifest? How do ethics of care and compassion support place mentoring and the relationships, responsibilities, and reciprocity of places?

While mentoring may not be a focal concept, I suspect it is nonetheless present in literatures in Indigenous Geographies, Indigenous education, and Indigenous Studies. It is sufficiently present so that we can recover some aspects of its meaning. This article will recover these meanings of place mentorship as a concept in relation to place and the relationships with place using the 7R's work I have been doing and will shed light on the care of place, and places of caring that is overlooked by Western knowledge systems.

Looking beyond the colonial systems of knowledge, I use Indigenous methodologies as a framework to consider the ways mentoring and place are understood, coupled with the 7R's of Indigenous research practices: respect, relevance, reciprocity, responsibilities, relatedness, relationships, and redistribution, (Montgomery and Blanchard 2021) to understand how place and the beings of place teach us how to live and be in the world, making sense of what it means to be mentored by place. The study specifically focused on three ways place and mentorship are connected: 1) relationships 2) responsibilities and 3) reciprocity. The goals of this study are to understand and explain the many characteristics and contributions of place that supports mentoring humans and the more-than-human beings of place that exemplify place mentoring, and to facilitate the understandings of the relationships, responsibilities, and reciprocities of

place that teach, sustains, and guides those who recognize the power and wisdoms of and in places.

Mentoring

Mentoring has been recognized most often as the connections to workplace, education, and a number of other human to human acts toward achieving competency in something. Yet it is initially unclear how mentorship, mentoring, and mentee-mentor relationships would relate to Indigenous conceptions of place. An important facet of place relationship is the mentoring role place plays with us.

Loban (2014) specifically looks at the importance of mentoring Native scholars and the role of the university in facilitating successful mentoring for recruitment and retention of Native students. In this article, Loban digs deeper into mentoring through the lens of Indigenous research. Loban starts by using the Oxford Dictionary to define mentoring “as ‘an experienced and trusted advisor’ and an ‘experienced person...who trains and counsels new employees or students.’ At the simplest level, mentoring is described as involving two individuals, and a formal or informal process, with one, the mentor, providing instruction, with a view to assisting in the professional development of the other, the mentee, being taught how to perform an action and/or behavior.

Loban (2014, 11) goes further describing components of “good mentoring” in an academic space but similar values described, “relationship between mentor (more experienced) and mentee (less experienced) require level of connectedness that supported a meaningful and nurturing relationships intrinsic to inactive reciprocal relationships and involve a high level of human relationship of some significance.” Through applying the same ideas, with place being the mentor and humans being the mentee, this is relevant and fits quite smoothly into a different

way of looking at how we are in relationships and responsibilities of reciprocity with place learning as mentees. Learning from experiences with and of the land and water-scapes is common-place in American Indian education models (Arvizu and Saravia-Shore 2017, Bang and Medin 2010, Bender 2017, Bergstrom 2012, Brayboy et al. 2012, Dawson 2014, Michell and Centre 2008, Tuck, McKenzie, and McCoy 2014) as well as prolifically discussed in place-based education pedagogy (Deloria Jr 2001, Johnson 2012, McLeod and Vanelli 2020, Michell and Centre 2008, Tuck, McKenzie, and McCoy 2014).

If mentorship is understood as a relationship of reciprocity, then it can be mapped onto the reciprocal relationships described in Indigenous thought on place. Mentorship is a gift exchange relationship with educational and experiential components. It is not just the transfer of knowledge in the reciprocal or gift exchange. It is also the active trust relationship that forms, and the constant guidance and stewardship of the mentor. Describing relationships to place as mentorship relationships creates clarity in the wisdom of place. Place-based relatives, whether animal or plant life, or ecological flows or spiritual and geographic entities (mountains, rivers, etc.), have the capacity to become trusted guides and stewards of our learning. The more we are respectful and attentive to place and all the beings of place, the more we can develop trust-like relationships with them and recognize that places have distinct personalities. Deloria suggests the formula “power and place = personality” (Deloria Jr 2001) with power being the life force of all things. The trust-like relationships of reciprocity can be described as mentorship relations in that the land is the first teacher guiding humans how to be and “places produce and teach particular ways of thinking about and being in the world” (Bang et al. 2014, 44).

Relationships with/of/in place

“Indigenous knowledge practices are ecological encounters of profound ethical relationality that acknowledge the act of living in place as a sign of learning how to be in place... The human and the more than human are all living enactments or possible pathways of being and becoming, teachings offered, sounding through sonic resonance and reverberation. Place and becoming create a powerful symmetry of being. These teachings live within Anishinaabe creation stories; they offer us a pathway into how to be in place.” (Kelly 2020, 186)

The very first relationship experienced by humans is with our mother in the womb. We learn the sound of her voice, the rhythms of her heart and body, the warmth we are carried in, and the difference between light and dark. In the womb we are impacted by the foods, waters, and medicines our mother ingests from the places she engages with. The next relationships are with our immediate and extended family in the places we grow with and learn from. Relations are intimate, intimate in a way that is mutually shared. These “relationships with land are diverse, specific, and un-generalized” and “relationships to land are familial, intimate, intergenerational, and instructive,” arguing that we learn best from the land because “land teaches and can be considered as first teacher” (McCoy, Tuck, and McKenzie 2017, 8-9); the earth is our mother and the earth embodies the information we need for survival. The earth works hard to show us through experiences how best to be in place.

There must be a communication that goes on, be it verbal, acted out, or visualized in some way that conveys messages for understanding between humans, plants, animals, and the places they are part of. “The land and sea have ‘evolved’ an Indigenous language to communicate with and through human beings, a language that ‘grew in an area over thousands of

years of interactions between the elements and the human and plant and animal beings' (McCoy, Tuck, and McKenzie 2017, 12, Rasmussen and Akulukjuk 2009). Deloria argues that "we must return to and understand the land we occupy" (Deloria Jr. 2007, 32). Place teaches us how to communicate, and our languages are grounded in the places they are developed in.

The scales at which we come to know places continuously changes with us as we grow and age, and the love of/with place grows too. We learn with all our senses and with intuitions and dreams. Our subconscious works to understand what we experience and what humans are supposed to do and how to be with what we learn. The senses we as Indigenous youth are most encouraged to use are our eyes and ears. "Awareness of one's self is the beginning of learning" in American Indian metaphysics and "it is experience that shapes Indigenous education" after all most of what we know is "learned through living" as Indigenous life lessons are emergent from experiences in the world (Wildcat 2001a, 13). Learning is explicitly experiential, and mentoring is learning through experiences. "Places have practices" (Tuck and McKenzie 2014, 14).

For many Indigenous People it is with our eyes and ears we are instructed to use most as we learn. Observe and listen. According to Larsen and Johnson, experiential place-based learning required they "...listened to the beings of place for what they have to teach us about being in the world because we are enmeshed in relationships within our mutual relationship with place" (Larsen and Johnson 2017, 18), suggesting humans learn about ourselves and each other by observing the relationships between humans, animals, plants, weather, seasons, rocks, and waters and so on. Acts of reciprocal recognition fosters ethical relationality.

“Place, as I know it, is entangled with personal relationships, history, and cultural identity/identities that many of which you- at once influenced by geographic location, yet independent of it” (Vincent 2020, 150).

Place is not independent of our experiences. Place not only situates what we learn but the time/pace, scale/landscape regions, interrelatedness with the earth that informs us about our needs, responsibilities, and how we must engage to thrive within this complex structure of our environment and all the relations of place. We can no longer believe we are separate or above place but embrace the connections, the relatedness of our physical and spiritual to find the humility needed to accept our impact on place and vice versa. We are deeply dependent on the health and wellbeing of places.

“stewardship does not express human exceptionalism or control over nature...Instead it refers to acknowledgement of one’s place in a web of the interdependent relationships that create moral responsibilities, and it recognizes that there are methods and forms of expertise involving carrying out such responsibilities...”(Whyte and Cuomo 2016, 10)

We thus become part of place. Place saturates our cells, influences and manages our experiences and memories, and enhances our consciousness. Place shapes our personalities as unique human beings and their personalities become part of place personalities. Cultures are unique to the places that their personalities evolve in and with. Place teaches how to work together by watching the collaborations of ants as they work together as a unit, and yet independent. We learn about collaborations by understanding how plants and trees work together sharing and exchanging nutrients in their daily, weekly and seasonal cycles that happen not on the surface of the soil but underneath in the soil itself. Animals can teach us what plants are edible, which parts can be harvested when and where they are best to be collected. But we are

also taught that if we over-consume or overharvest, our relationships with these plant beings or animal beings will respond accordingly in ways that remind us that we are interdependent on the relationships of place and place beings, and have a deep responsibilities of reciprocity.

“Our bodies were not only in the High Arctic landscape, but they were landscapes just as the landscape was an extension of our bodies... We became appropriated beings in the landscape. On the other hand, we were also beings who could re-appropriate meaning and reconstitute our bodies in relation to the landscape.” (McLeod and Vanelli 2020, 240)

“These places have transformed, taught, and healed, connecting humans and nonhumans within the relationships that negotiate their mutual entanglement. These places are like relatives, friends, or companions; for some, these places are *kin*.” (Larsen and Johnson 2017, 79)

When relationships are made and maintained in a good way there is a balanced environment that includes humans. Larsen and Johnson (2017, 26- 27) describe these relationships as “reciprocal guardianship” and “place-based responsibilities” for coexistence.

Place exists without us, but we cannot exist independent of place. Most humans have a need and desire to belong somewhere and that somewhere is often within a home-scape whether we are born to a place or adopt one. We are place because place-scapes include us. We as humans adapt and conform to the relative’s place introduces us to. We watch and listen to the ways in which relationships of other being’s, plants, animals, elements, seasons, and other humans to name a few learning how we must be to participate in a place in balance ethically with morality, responsibility, and reciprocity. It is through relationships and how responsibilities are

managed and how reciprocity is enacted that determines how successful humans will be, or how we fail within any place.

Responsibilities

Obligations, duty, care, and role are all ways to describe and explain what responsibility means as related to how responsibilities are employed in many Indigenous communities in relation to and in relationship with place. As children we are taught about the ways in which the land cares for us by providing food, shelter, water, and all the necessities needed to not only survive in an environment, but to thrive. The big lesson we are to learn is responsibility. There are many roles and responsibilities we are obligated to with place, one of the most important is care.

“Care ethics refers to approaches to moral life and community that are grounded in virtues, practices, and knowledge is associated with appropriate caring and care taking of self and others...Ethics of care understand moral agents as deeply and inextricably embedded in networks of the ethically significant connections and conceive of caring as exercising responsibilities and virtues that maintain and positively influence relationships and general flourishing within those overlapping networks.” (Whyte and Cuomo 2016, 2)

Kelly (2020, 192) looks at her Anishinaabe place stories to teach her about her ethical relationality to the earth and all of creation. These stories speak to the “essential relationship between humans and *All Our Relations*.”

“I am enacting a living prayer through my practices and, in my ceremony of becoming, carrying out the reciprocity of responsibility implicit in the teaching of the land and my people. ... Listening to and acknowledging the teachings within the stories requires

reciprocal recognition and the honouring of my respectful responsibility within this act of knowing.”(Kelly 2020, 193)

Johnson and Larsen (2013) have looked at place through a geographic lens. Through their work they have collected some Indigenous perspectives that collectively express “a deeper sense of place” as related to Indigenous research and relationships of responsibility. Learning and teaching a sense of responsibility to and for place has an accountability that western Eurocentric sciences fails to recognize and utilize. The collections of stories focus on relationships between academic research, Indigenous Peoples, and their places. These authors also speak to the responsibilities to relationships between humans and the more-than-human beings of place.

In other works, Larsen and Johnson show responsibility to place as “reciprocal guardianship,” as a type of ethos of responsibility, as “inalienable responsibilities”, and “being in good relationships with human and non-humans...” grounded in place-based learning of relationships, responsibilities, and reciprocity. They go on to state, “An educational relationship with place is also a call to responsibility- to a reciprocal guardianship that honors and preserves our life supportive of being together in place” (Larsen and Johnson 2017, 116). Additionally, in other work that focuses on place and the construction of self, Kelly states;

“Our participation in place gives rise to a participatory consciousness, and this participation in the pedagogy of place and the participation through our story cosmologies allow us to participate in the spiritual ecology of a culture. Land and story unite within us and offer us a way to understand our selves and the responsibility of becoming a human being within the family of being.” (Kelly 2020, 194)

Responsibility to place has manifested in many ways, including obligations, accountability, care, and through the infinite relationships that are continually taking place on many scales simultaneously. Our responsibilities to the places that care for us are in constant evolution and growth, changing with the seasons and over time to stay relevant to the needs of place and the beings that inhabit place.

Reciprocity

Place gives and place receives. Place provides food, shelter, and many other things needed for all life to survive. Place teaches us how-to live in balance with each other as humans, and with the other-than-human beings that also coexists within a landscape, waterscape, and other place-scapes that all beings are a part of. Kimmerer (2013, 97) states “the Earth, that first among good mothers, gives us the gift we cannot provide ourselves...she gives what we need without being asked” (p. 103) and refers to it as “Circles of Care.” Kimmerer talks about how “cultures of gratitude,” the giving of thanks for what you receive, “must also be cultures of reciprocity,” and that “each person, human or no, is bound to every other in a reciprocal relationship” each having duty to the other (p. 155). She goes on to discuss all the relationships with land lessons she has learned and how these lessons are incorporated into her daily relationship of reciprocity of her home place and her education as an Indigenous scientist. She shows how building relationships of reciprocity and responsibility are foundational to a “sustainable relationship with ecosystems” as she shares how she defines how place shows her love and she shows her love to place in return.

“the story of our relationship to the earth is written more truthfully on the land than on

one page. It lasts there. The land remembers what we said and what we did (Kimmerer 2013, 341).”

So, what does place reciprocity look like? What are the responsibilities humans have to place in exchange for the life-giving gifts the Earth provides humans and other-than-human-beings?

Looking at Trasks’ perspective of reciprocity through the gendered Indigenous women lens says, “Reciprocity implies that there is an ebb and flow in relationships, a give and take. Reciprocity infers that there is a mutual sharing, something given for something taken” (Trask 2007, 293). In this work “reciprocity is the way of balance” and one part of that balance involves relationships as part of the responsibilities of mutual sharing with place, establishing that land and water provide life dependent gifts, thus supporting a gift economy. A gift economy contrasts the colonial market capitalism economy grounded in individualism and fiscal value of items.

Many Indigenous Peoples have depended on a collective gift economy that obligates certain responsibilities to them such as to provide guardianship to the places they have reciprocal relationships. These relationship and responsibilities are passed down through the generations in ceremonies, stories, and daily actions that reinforce the relationship and provide context to the daily patterns of place and all its inhabitants. Recognizing places as being created long before humans makes the land and other beings related physically through sharing of foods, medicines, and water with animals and plants. Being of place through birth to death and setting the life cycle of humans with the live cycles of all our relations creating reciprocal recognition of place having equitable agency with humans and all the beings of place.

“... reciprocal recognition is the core practice that fosters ethical relationality, honors the circle of life and the flourishing of our Indigeneity... Indigenous knowledge practices are ecological encounters of profound ethical relationality that acknowledge the *act of living in place* as a site of learning *how to be in a place* (Kelly 2020, 186-187).

Many Indigenous worldviews recognize place beings such as plants, animals, and other beings, as relatives. There is a deep responsibility to gift to place in whatever ways are respectful, reciprocal, and nurtures the relationships needed for all our relations to thrive. Respecting that to receive something there must be mutual benefits.

“we often hear traditional people say that they must bring a gift when they harvest wild plants, that they must ask permission when they cut trees, take birch bark, and reach agreement with any plant to be harvested for a ceremony.” (Deloria Jr 2006, 127-8)

“Specifically, Indigenous conceptions of care 1) emphasize the importance of awareness of one’s place in the web of related connections spanning many different parties, including humans, non-humans and entities, and collectives; 2) understand that moral connections as involving relationships of interdependence that motivate reciprocal responsibilities; 3) valorize certain skills and virtues; 4) seek to restore people and communities who were wounded from injustice by building relationships that can generate responsibilities pertinent to current environmental challenges, 5) conceive of political economy as involving the protection of the right to serve as responsible stewards of the lands, the environmental quality of which is vital for sustenance.” (Whyte and Cuomo 2016, 5-6)

“We witness the world and the world witnesses us. I am enacting a living prayer through my practices and, in my ceremony of becoming, carrying out the reciprocity of responsibility implicit in the teaching of the land and my people.... Listening to and acknowledging the teachings within the stories requires reciprocal recognition and the honoring of my respectful responsibility within this act of knowing.” (Kelly 2020, 193)

Place influences our lives and we have influence on place. There are symbiotic relationships between all the beings of place. For Indigenous Peoples and others who share deep love for place, ignoring or refusing to acknowledge place relationships, responsibilities, and reciprocity is difficult, if not impossible, going against foundational protocols for being in place. One of the reoccurring themes throughout the literature is the processes of place learning and teaching which I argue are the fundamentals of place mentoring.

Place mentoring

Place is the beginning point of reference we have to understand where we are, with whom we live and are related to, how we are to be in relations to all those around us, and where we return to for comfort and rejuvenation of the diverse needs we have throughout the phases of our lives. Place teaches humans how to be human beings through our actions. Every place has a personality and that character of place shapes our own identity and personality. Deloria goes on to state “Power and place equal personality” (Deloria Jr 2001). Place teaches humans how to be unique humans with personalities shaped by the places they are in relationship to and with.

“The prairie was my teacher, and she imprinted upon me from an early age the need for resourcefulness, resiliency, and respect- all lesson she taught through experiential learning on the landscape.” (Schlamb 2020, 167)

“Elegant teachings unify through deep listening practices as students regain their ability to hear the voices of the ancestors, peers, adversaries, and the living earth in order to shape and influence their own behaviors and begin to embody active hope with the eyes to see beyond our time.” (Leighton 2020, 202)

Place is so interwoven in the physical and spiritual understandings of many Indigenous worldviews it becomes indistinguishable from the mundane and commonplace within the sacred. In is normalized in one’s identity and positionality within place-scapes. Place teaches us so much whether we recognize, acknowledge, or believe it. Place never has to ask for credit but instead provides lessons that can be harsh with teachings of cause and effect from over extraction or consumption or coded with enlightenment and sacredness.

“Playing the role of the dynamic teacher, the prairie landscape provided both the environment and the opportunity in which to teach me some of the most critical life lessons I have to date... It remains my first and original landmark on my identity landscape, the starting place from which I began to learn who I was, and the place I return to when I need to be reminded of my direction.” (Schlamb 2020, 169)

“my most profound teacher has been the land; it is my sacred place of being in source of solace. It has taught me how to become a human being and the community of being and,

as a young person, it is where I turned to in troubling times; it is my place of heart and healing. This program pedagogy of place has its legacy; it has actively created a sensibility, my own sense of Indigeneity, and my way of knowing, being, and doing.”

(Kelly 2020, 189)

If mentoring is the teaching or training of more experienced beings to lesser experienced beings then place-based learning is truly place (the older and much more experienced) teaching humans and other beings (lesser experienced) how to be within a system of many other beings and cyclical patterns of specific places. This fits clearly within the definition of mentoring. Each place has its own lessons to teach and it is through deep relationships, reciprocity, and responsibilities beings find their place within the complex interconnected patterns and responsibilities for reciprocal relationships with and within place. As humans we are the younger and less experienced beings whom seem to have lost our place in this colonial capitalist consumer system imposed on places.

The Earth is telling us her story of places and because the lessons are not being adhered to we have been put on red alert by scientists in documents such as the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment recently released (2021) and in documents such as those done by or with Indigenous Peoples (Wildcat 2009, Boyle, Redsteer, and Eggers 2013, Cochran et al. 2013, Dittmer 2013a, Hardison 2013b, Wildcat 2013). We have tens of thousands of years of Indigenous Knowledges of deep place teachings we can apply to our lives to develop the relationships of reciprocal responsibilities with places. As mentees we have not learned to apply what we are being taught by the earth and we may have run out of time, at least for humans and some species.

“The pedagogy of place matters because the land offers instructions on how to be human and human beings respond reciprocally with gratitude through Indigenous Poiesis and Indigenous ceremony... Land and story unite within us and offer us a way to understand ourselves and the responsibility of becoming a human being within the family of beings.”

(Kelly 2020, 194)

The Earth is and has for a long time been telling us the stories of humans impacts with many places. The older, more experienced Earth has given all beings the blueprint of balance and taught all beings how best to be in the relationships of place, responsibilities of place, and in reciprocity with place for continuity. It is up to humans to apply what we already know.

Research Findings

Place mentorship consists of embodied experiences. Such experiences are enacted and perpetuated in many ways including education, behavioral morality, relatedness, relationships and processes, to mention a few examples. It is through looking at Indigenous geographies of place we can see clearly how relationships, responsibilities, and reciprocity are learned from and within landscapes, waterscapes, and other places with unique personalities, specialties, knowledges, energies, and beings, in and of place, we humans learn how to be and coexist respectfully in reciprocal relationships. Place is more than a location site for human interactions, but an active participant in the epistemologies, ontologies, and cosmologies, combined with the spiritual and metaphysical that inform, teach, and demand our moral behaviors in ways that are emphasized in relationships, responsibilities and reciprocity manifesting in place mentoring. Place is a mentor on how to be, as well as how not being in good relations can result in disasters for humans and more-than-human beings on multiple scales, across space, and over time.

How different our world would look and be if everyone came to find themselves deeply responsible and in relationships of care and reciprocity with the places they inhabit What are the ways people love place already and how can we all love the landscapes, waterscapes and place-scapes we are dependent on? There is still so much more to learn and do in relation to place care and responsibility. There is still much that place must teach us and that we must experience in the learning process. The reality is that place mentoring teaches humans about who they are to be and who they can become. It teaches us how to be in right relationships with animals, plants, and each other as well as all the beings, animate and inanimate, that are part of all land and waterscapes of our planet. When humans embody and employ the relationships, responsibilities, and reciprocities with the planet, policies are developed that care for place, sovereignty is strengthened, diversity is cherished and respected, and the planet thrives. Education must incorporate the lessons learned from place and youth must be taught from an early age how to have relationships of respect and reciprocity with place. The responsibilities that grow out of the love and care taught for place last generations.

“The places we inhabit, inhabit us. They are not merely the backdrop or the foreground of our life stories; but, rather, the places we live play a major role in the possibilities of events and the action in our lives.” (Markides and Markides 2020, 115)

Place as mentor summary

Place is our teacher and mentor. Being deeply responsible and related to place is what drives Native Peoples to care for and even love places and to be willing to fight and even die for place. Mother Earth will go on as will whatever relatives survive the social and environmental

violence of humans. Geography, and all disciplines need to consider the value and wealth of alternative ways of being and doing in, of, and with places that Indigenous geographies offers, with a healthy dose of “Indigenous realism” (Wildcat 2009) and a lot of love. This article has looked at a few of the ways in which place mentors and teaches us through relationships, responsibilities, and reciprocity. I hope that further work in this area will add to the rich ways that place can be understood and appreciated. Place has so much value beyond resource extractions. Place is a valuable teacher that mentors us in numerous ways how to be better if only we humans in all our hubris would only listen and embrace the lessons being shared with us. Place cares about us and for us in numerous ways. It is time to return the respect. We are guests, custodians, and relatives. We are place, and place is us.

Chapter 7: Conclusion

The three articles speak to one another through care of place and mentoring. Mentoring students and early career faculty in school and in career entry points is crucial to the success of Native American and other Indigenous Peoples. The article on Centering Native Voices is a deep dive into the challenges and opportunities for advancing diversity in sciences as well as advancing Native youth into careers in science, technology, engineering, and math careers. It was made clear how important safe spaces are for education and learning and more importantly how important quality mentoring is for Native students and early career faculty and staff. Education can do so much but without the experiences of Native mentors to guide and nurture the challenges of academic advancement is exasperated.

The second article on Indigenous women led environmental activism spoke to the rational Indigenous women I interviewed have for doing the frontline activism bringing up interesting reasons such as caring for place, cultural responsibilities, relationships, and reciprocity with

place. The women interviewed had a care of place that came from generational teaching such as relatives and community and from place itself. The women interviewed understood their connections and dependence on place and had cultural and personal relationships and responsibilities to places and felt obligated to advocate and defend places they care about and for. This obligation was taught through cultural norms, formal and informal educational places and activities, and through direct relationships with place.

These two articles are also connected to the theories of place conscious education (Gruenewald 2003) where place matters and there is significant information and knowledge learned from place and place teaches people through experiences and if humans can listen and observe they can be mentored by place. Place mentoring is the theory that suggests place educates us through actions and interactions, observations, and experiences. Place mentors us how to exist in a place in balance with the other beings of a place.

Together all three articles speak to the importance and influences of mentoring and care of place, the value and purpose of education. These chapters also speak to the critical importance of teaching care for place ethics to youth and to non-Native mainstream society. So, what does this research suggest for next steps? First, we must articulate the need to find ways to change education methods and methodologies to include place conscious education, mentors that reflect the culture and ethics of Native students and scholars, and the need to recognize the values of gendered knowledge and ethics of care in environmental education. There also needs to be more focus on the ways in which we learn from place and the ways place mentors humans.

Moving forward from this work there needs to be a focus in the K-12 education system for teaching place consciousness (Gruenewald 2003) and the 7 R's of Indigenous education and research methods; relationships, responsibilities, respect, relatedness, reciprocity, relevance, and

redistribution (Montgomery and Blanchard 2021) for teaching care of place ethics and practices. The hope is there will be a culture shift in place relationships, science, and education that includes Indigenous ways of knowing and being that implement care of place and mentoring. Care and accountability to places we call home and dwell within are critical to the preservation and advancement of our planet and socially constructed ways of being. The need to shift and influence the mainstream epistemology and ontology towards Indigenous thinking is part of the next steps to implementation of theories of care and the ideas of place mentoring.

Geography is ripe to be a leader in the shifting of place-centric thinking and development of methods such as the 7 R's and place mentoring ideas that can contribute to real change in social constructs of settler colonial relationships with place. Geography has made significant contributions to the ways in which place is defined especially in the areas of Indigenous Geography. Geography and other disciplines have much to learn by embracing Indigenous geography and current trends in diversity equity, inclusion and justice. As disciplines such as Geography realize their own histories and take responsibilities for their part of settler colonialism, imperialism, and patriarchy, the advancements can happen more readily. Geography as a discipline really needs to address its own complacency with Indigenous peoples and their knowledges and take a deep and intentional look at how settler colonialism impacts environmental justice and Indigenous Peoples. Decolonizing Geography is ambitious but needed, as it is complicit in its contributions to oppression of marginalized others with its colonial and settler colonial foundations and continued methods and methodologies.

There needs to be more work done on Indigenous gendered knowledges and how they fit into the larger discussions of Traditional Ecological Knowledge and place-based knowledge. Much of the earlier works focused on knowledge of men but only recently has Indigenous

women's knowledges been of focus of study. It's important to look more into Indigenous Feminist theories and thought especially in respect to place relationships and responsibilities. There is much work to do around ethics of care and care of place theories. The connection between care ethics and theories of care are important indicators of the ways in which we connect to places and how that care manifests during times of crisis. The three articles of this work provide a starting point from which to grow and there is much work to be done. Change happens one of two ways; evolution, slowly over time and revolution. Either way things must change.

I myself have changed in this process. I have learned where my own care ethics have come from. All the time I have spent running around in the mountains and swimming in the rivers of Northern California, the love I have for the beach, and true love affair I have with all the places that season my personality have all come from being a wild and free child and being introduced to places by my family, friends, and through exploring alone the world around me. I have lived on the land in ways few ever experience. I was cared for by the land and waters I grew up on and within. I harvested plants for food, medicine, and for love. As a kid I used to pretend I could talk to the animals, trees, and rocks. Who knows, maybe I still can. My love for places comes from direct engagements and real intimate relationships with different places during my life. Places held me together when I thought I was falling apart. They hid and protected me when I was in danger. Places showed me where there was food along my favorite trail to ride my horse on in the mountains and where the best mountain spring water was for my horse and I to drink on hot summer days. Most important Place taught me about growth and patience. My own life has seasons and other patterns of growth and learning. I understand how much I depend on the places I dearly love, and they depend on me to fight for their protection.

My care for place comes from love.

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