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PLACE-BASED ENVIRONMENTAL EDUCATION TOWARDS COLLECTIVE
ENVIRONMENTAL LITERACY

By

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A capstone project submitted in partial fulfillment of the requirements for the degree of
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CHAPTER ONE

Introduction

The term 'place' is more complex than a simple reference to a geographical location, it speaks towards the emotional connections a space may hold. When referencing a sense of place, we are alluding to feelings of belonging and identity, and it is when we have found this sense of place that we have found home. Being built with emotional attachments and place-meanings, an individual's sense of place is subjective and can change over time (Kudryavtsev, Stedman & Krasny, 2012). A sense of place can also impact how we feel about our local environment and how willing we are to make collective changes to protect this environment. In the context of this capstone project, I hope to explore a sense of place in relation to environmental education, community and collective action and answer the question: *How can community members build a sense of place through environmental education towards the goal of collective environmental literacy?*

Though environmental education has gone through several iterations in its history, today its goals, as formalized through intergovernmental conferences, include giving citizens the knowledge, skills, and attitudes needed to understand environmental issues and create solutions to these problems that balance the needs of all living and nonliving things (UNESCO, 1978). There are emerging conversations within the field that concern the most efficient methods of environmental education, the degree to which advocacy can influence education as well as the preferred learner outcomes and their measurement. Each of these issues pertain to this capstone but it is environmental literacy and the newly

coined term ‘collective environment literacy’ that are of greater interest to me as an educator focused on mitigating socio-environmental issues.

Being an amalgamated term, environmental literacy is used to refer to the skills, knowledge, and attitudes needed to solve environmental issues (Roth, 1992).

Environmental literacy, on an individual scale, has long been described and assessed whereas collective environmental literacy, which describes a literacy assumed by a community, is still in its infancy within the field and lacks a set definition (Ardoin et al., 2023). The basic idea behind its creation is that environmental issues cannot be solved by just one individual, nor are they the responsibility of one person alone; instead, solutions can be a product of group behaviors and environmental understandings. Through this work I hope to answer the question: *How can community members build a sense of place through environmental education towards the goal of collective environmental literacy?*

Education that hopes to build a sense of place must be both instructional and experiential, meaning you must learn about a space and explore this space (Kudryavtsev, Stedman & Krasny, 2012). In some ways this also entails redefining place meanings by adding in environmental components to physical locations that you already know, such as developing a deeper consideration for how nature and society interact in familiar locations like your neighborhood or your backyard. In other ways, this could mean gaining entirely new place meanings by experiencing natural physical locations that you have no knowledge of and are completely unfamiliar to you. Finally, as a sense of place is also tied to the people around you, your community, this education would ideally make you feel better connected to others.

To make strides towards an answer to my research question, I hope to create an online place-based environmental resource that is informed by the components of collective environmental literacy and can be utilized by all members of a community. Because of the COVID-19 pandemic, virtual environmental education was a popular way to reach audiences who were limited in their outside movement. During this time, educators found that they were able to reach even wider audiences because virtual education could reach individuals who could not normally participate in environmental education, because of proximity to programming, the cost of programming, and any other physical constraints (Merrit et al., 2022). It has been seen that a sense of place can be established through online environmental education, by emphasizing known and familiar locations (Hoke et al., 2020), as long as the virtual learning supplements experiences in nature rather than detracts from them (Quay et al., 2020).

Using this virtual resource, that is built upon the ideas of collective environmental literacy and the strategies outlined by virtual educators, users can cultivate an emotional sense of place and in turn develop a literacy that is primed for collective action that is specific to their locale. In this chapter I will reflect upon my own experiences in developing a sense of place, explore my history with environmental education, and finally situate my project within the greater context of environmental education.

Personal Sense of Place

During any self-introduction, one point that is both memorable to others as well as a personal source of pride is the number of places that I have called home. These places are defined by their rivers, their wetlands, and their proximity to mountains, oceans, and deserts. The environment is always what first comes to mind when I dream about these

locations. My memories are filled with such extremes as the Palouse Hills of Washington State, whose wheat and canola crops wave so singularly in the wind, to the sliver of tundra biome along the Rockies where marmots can be found, to the balds of the Appalachians that are connected through Rhododendron tunnels, and finally to the tallgrass prairie of Iowa where the remnant prairies host monarch butterflies and hundreds of wildflowers that cycle through arrays of color. One becomes inoculated to the fear of moving to a new place through the prospect of developing new place-meanings to regions that were previously unspecified and growing roots in a new locale that do not wither when one moves on. In my experience, a sense of place and emotional attachments to regions are not solely dependent on the duration of the immersion, rather it is in the context of the immersion. By this I mean experience and personal involvement with the land itself as well as the people who also call it home. What precipitated my various relocations, and directly revealed to me the local environment and its inhabitants, was my service work through AmeriCorps.

After graduating from college with a degree in environmental studies, I took several AmeriCorps positions that allowed me to connect with several environmental non-profits and conservation districts, including Green Iowa AmeriCorps, the E. B. Lyons Center of Dubuque, IA, and the Mississippi River Museum. My stewardship work within these organizations ranged from boots-on-the-ground conservation work to community-focused advocacy work. In one state I participated in daily plantings of native plants to combat stream bank erosion along fields and rangelands and in another I helped citizens think about their energy usage and how their home could be more energy efficient. Each project in which I directly interacted with nature or the local community

made me personally involved with my space, and eventually I regarded each location as home. Through this work I was able to put into practice the knowledge I had gained through my undergraduate studies, and I was able to see firsthand the vulnerability of our environment and how humans may affect this local environment in both positive and negative ways. As an employee with the organizations, I was also able to have a voice in the decision making and to engage in organization-wide discussions that concern future projects or environmental education events.

These service years represented a period of my life of great learning and even greater purpose during which time I learned from my surroundings as well as from the individuals I worked alongside. In each of these work-place settings, staff members became a community unto-themselves that created place-meanings based upon hope and a knowledge of the local environment's vulnerability. Specifically, within the conservation district that I worked for, when they viewed a parcel of land, they saw not only its current condition, but alongside the degradation they saw their plans for it and how it could eventually sustain the surrounding community. A fundamental part of each organization's mission was direct conservation and sustainability work, but these organizations also participated in environmental education.

Environmental Education Experience

The environmental education performed during my service years took many forms and involved various subsections of the community in which I served. Each was successful to a degree and served to connect the community with the environmental mission of each organization, but as an educator I saw gaps between the learner outcomes

and the goals of environmental education, namely the goals of environmental literacy, fostering place-based identity and creating an environmentally conscious community.

One form that environmental education took was volunteer stewardship work, where individuals could engage in conservation projects. Such events were performed with a range of citizens including families, college students who needed volunteer hours, and retirees. During these occasions the work itself was the focus and volunteers would participate in large stream cleanups or plantings. Those involved would learn about the processes of conservation and the environmental issues that would be remediated through their service, but during these events I wondered if there was a way to also address environmental attitudes of the participants and give the volunteers a voice in the decision making. Though they were participating in environmental stewardship, these events didn't allow for the volunteers to practice the inquiry skills needed to solve environmental issues nor were they able to exercise problem-solving, rather they were following the environmental organizations lead.

Another form that environmental education took was directed towards creating positive relationships between nature and the local community. Educators served as guides with the desired goal of creating opportunities to experience nature without direct purpose and without stress. During nature walks, or other similar experiences, individuals could take a break from expectations, feel rejuvenated and, as a side-effect, develop a deeper appreciation for natural areas. It was perhaps their passive nature that made these occasions the most popular in our region, the environmental education within these events was also passive but nonetheless compelling because of its indirectness. Though the inclusion of specific knowledge of environmental issues could spoil the experience, I

could not help but speculate about extensions to these events that could channel an individual's connections with nature towards actions and capitalize upon the growth in their sense of place.

Context for Environmental Education

The direction of my capstone is a product of the differing experiences between myself and those who participated in our environmental education. Considering my holistic experience at these organizations, in which I was able to bond with my region and use this bond to conceptualize and implement creative environmental solutions to the region's environmental issues, I believe that there is a way for community members to create more lasting relationships with their region and that this sense of place could be leveraged in such a way as to foster an environmental literacy that is hyper-localized. Considering the methods of environmental education used and the embedded philosophy of these organizations, the foundations for an environmental education that encapsulates collective environmental literacy and is bound by a sense of place are already established; they simply need to be reconceptualized. An environmental education that follows these ideals could pave the way for an environmentally literate community that can create environmentally conscious decisions directly on the local scale and can perhaps even impact the national and global environment.

Positionality

Because of the nature of my capstone project, which is focused on community engagement and environmental inclusion, it is important to reflect upon barriers and privileges that can exist within a community. A community is made better by the diversity it encompasses but because of hierarchical power dynamics that privilege

wealthy white males and females, a community's voice may only represent this group, ignoring the voices of people of color, indigenous families, immigrants, and individuals with little to no income. Similarly, environmentalism can be seen by some as a political tool that can exclude whole populations and ignore the socio-environmental issues that differentially impact these populations because of this hierarchical power dynamic.

Reflecting upon my own experiences, I acknowledge my own privilege as a white, middle-class female with a college education. In the environmental field, there are many individuals who look like me with the same experiences and skills. This homogeneity in environmental education makes the field lack the benefits of diverse voices and backgrounds and makes it ill equipped to address all the issues that impact a community and are important to every member of the community. Without this diversity, environmental action and agencies cannot even hope to represent the community or speak with any authority about it. Because I am a white, college-educated female, I was able to be more readily hired by environmental agencies and became someone who was able to have a say in environmental work, but this cannot continue. Environmental education needs to envision an environmentalism that redistributes this agency towards environmental good for all, not just a few. When a community can be brought together to better inform the environmental consciousness of the area, including everyone's knowledge and awareness of environmental issues that are important to them, then every individual has a modicum of agency that can coalesce towards collective action.

Summary

Throughout this chapter, I have described what has been my impetus for this

capstone project and my connections to the question: *How can community members build a sense of place through environmental education towards the goal of collective environmental literacy* A sense of place has been tied to my own environmental work and environmental literacy, but the environmental education I have performed in the past falls short of achieving the goal of collective environmental literacy and a community that is ready to make large-scale changes. I believe that a local community has a responsibility for their region and has the unique position of being able to create solutions to environmental issues that reflect the holistic community, which includes humans, plants, animals, and all non-living things. Throughout my capstone, I hope to create a resource that paves the way for this type of environmentally conscious community. In this chapter, I have also described my own positionality and indicated how my project acknowledges the ways in which voices within a community can be stifled.

In Chapter Two I will explore in greater detail the philosophies and pedagogical approaches to environmental education, the interdisciplinary concept of sense of place, the novel idea of collective environmental literacy, and finally reflect upon methods of place-building within environmental education. Chapter Three will focus on the creation of the website, its place-based content and the methods of community engagement it will employ. Finally, in Chapter Four I will reflect upon the experience of creating this capstone project and describe how this experience has impacted my understanding of the field of environmental education.

CHAPTER TWO

Literature Review

Introduction

A sense of place has been central to my knowledge of the environment, my attitudes towards environmental issues, and has motivated my personal environmental work. With this personal context, I wished to answer the question: *How can community members build a sense of place through environmental education towards the goal of collective environmental literacy* The answer to this question can be better understood with an understanding of the interdisciplinary concepts that comprise this question.

To begin, this chapter will briefly discuss environmental education's origins as a pedagogy, the opposing theories and learning outcomes that have defined the field and end with a discussion of environmental literacy to better contrast with the concept of collective environmental literacy that will be discussed deeper into the chapter. After establishing environmental education this chapter will discuss the themes within sense of place literature, its applications for environmental education and how this concept of place can be expanded to include personal and collective identity. Following this, the novel concept of collective environmental literacy will be explored as well as the connections that can be made between community, environmental education, literacy, and collective action, to name a few. Finally, addressing the heart of the research question will be a focus on specific strategies employed by environmental agencies and educators that can build a sense of place and can foster the skills and connections needed for collective environmental literacy. This final section is in no way a comprehensive summary of all

strategies that could be employed towards this end, but rather is a brief discussion of notable strategies that could be employed.

Environmental Education

The beginning of environmental education is probably best described as a convergence of practice brought on by urgency and pragmatism. The term is differentiated from both science education, which imparts knowledge through observation and interpretation, and outdoor education, which takes place mostly in nature, in that it incorporates the strengths of these two subjects towards a workable goal of improved environmental health (EPA, 2022; Monroe & Krasny, 2015; Wals et al., 2014). Environmental education is also distinct from the field of education for sustainable development that was introduced by the United Nations as a way of uniting sustainable development goals with environmental goals. Some critics believe that this later field is too anthropocentric to help citizens efficiently address environmental issues because it focuses on environmental services rather than environmental appreciation (Kopnina, 2011). Greater insight into environmental education's core can be gained by understanding the historical contexts surrounding its formal beginnings and through the written statements from international conferences that met expressly to define and redefine the fledgling field.

Environmentalism was certainly a subject of great global conversation during the 1960's and 1970's. In the US alone both decades saw the creation of many notable environmental policies including the National Environmental Policy Act, the Clean Air Act, the Clean Water Act, and even the Environmental Education Act of 1970, to add to this, these decades also include the first Earth Day in 1970 and the creation of the EPA.

Policy makers, responding to global environmental issues, partook in several UNESCO sponsored workshops including one that was conducted in the capital city of Belgrade in what was then Yugoslavia. The workshop produced a document that was entitled the Belgrade Charter, which would be published in the first edition of Connect, UNESCO's public newsletter. This charter included several goals and outcomes associated with contemporary environmental education at the time and included several guiding principles that UNESCO felt would set a framework for any subsequent work (UNESCO, 1975). These preliminary thoughts, as well as the international approach, used to glean these ideas set a precedent for a subsequent document that is still considered the definitive framework for environmental education, the Tbilisi Declaration of 1977.

In the Tbilisi Declaration there are stated learner objectives and goals that still guide contemporary environmental education, these include awareness of the environment, knowledge of environmental issues, attitudes or values that favor the environment, skills that will aid in solving environmental problems, and finally, opportunities for participation in the solving of environmental issues (UNESCO, 1978). It is important to note that the Tbilisi Declaration sets these objectives for both "social groups and individuals" rather than just individuals, but this will be brought up once more in a later section (UNESCO, 1978, p. 26-27). These documents created a solid framework for the field, but practitioners and researchers have spent decades in conversations about how these can be put into practice or to what degree they need to be updated to reflect our current environmental urgency.

Directions within Environmental Education

Writing before the creation of many noteworthy environmental education policies,

William Stapp in 1969 wrote a seminal article about the field of environmental education and its purpose for citizens, who he felt were being tasked with direct and indirect sway in environmental policies. He argued that these citizens were not ready for this responsibility as they lacked knowledge of the environment, awareness of how to solve environmental issues, and even lacked the motivation needed to act (Stapp, 1969). It is interesting to note that at the time it was thought that knowledge and environmental attitudes would naturally lead to environmental behaviors whereas contemporary researchers know that there is a myriad of factors that can hinder pro-environmental behaviors even when knowledge and attitudes are aligned (Kollmuss & Agyeman, 2002; Ardoin et al., 2023; Wals et al., 2014). There are many commonalities between Stapp's article and the two intergovernmental documents referenced in the earlier section; they each are apprehensive about environmental issues and hope that the education they prescribe will create a population that is apt to deal with these issues. Researchers and practitioners in the years that followed however spent a great amount of time debating amongst themselves the ways in which this education could be put into practice. There has also been a wealth of discussions about action and advocacy within environmental education; some believe that advocacy is inherent to environmental education while others argue that any advocacy should not be part of the process or the end product of education.

When discussing the pedagogy of environmental education, some scholars promote education 'for' the environment, which would entail discussing impending issues and the socio-environmental context in which they occur, while others believe in a curriculum 'about' the environment that would include factual knowledge and the

development of skills such as inquiry and appreciation. Such scholars that were outspoken for the latter form of education include Jickling, who believed that education ‘for’ the environment was indoctrination and would create activists over educated citizens (2003). He believed that educators, who also define themselves as environmentalists, will advocate for their own beliefs while they are educating others rather than balancing view points, and fail to educate at all (Jickling & Spork, 1998). In opposition, educators who use advocacy or promote certain pro-environmental behaviors, could argue that considering the environmental issues we have today, teaching students about these issues without giving possible solutions would make these issues seem insurmountable.

As this debate continues, some scholars feel that the field has failed the Tbilisi Declaration and created citizens that are unable to act because their education failed to teach either ‘for’ or ‘about’ the environment (Saylan & Blumstein, 2011). There is a need for an end to this debate to regain focus on environmental education and the needs of our environment. Modern theorists, viewing the field holistically and incorporating the view of both researchers and practitioners of environmental education, recognize that these two contrasting ideas they call ‘instrumental’, referring to factual environmental knowledge, or ‘emancipatory’, which speaks towards education for action, (Fraser et al., 2015, p. 779) are not binary and can and should be combined in practice (Gibson et al., 2022).

Transcending the theoretical, practitioners of environmental education understand that because of the purposes of the field, informed and democratic action must be an outcome of environmental education (Ardoin et al., 2020; Clark et al., 2020; Short, 2009). In a Delphi study that incorporated both researchers and practitioners in order to

mitigate any bias in thought, Clark et al. tried to summarize the many directions that characterize the field as well as the motivations of environmental educators (2020). With this data, the research team found one clear definition of the field that speaks to the full potential of environmental education as well as the many and varied ways that organizations can approach education, even if their end goal remains the same: to improve the health of our environment. They wrote that:

Environmental Education works to move people to action for the tangible benefit of the environment and humanity. To realize these benefits, people must connect experientially with the environment, learn needed skills and understand the complicated social and cultural connections between humanity and the natural environment. (p. 396)

This definition incorporates the ideas of action, the interdisciplinary characteristic of the field, and the methods of both teaching ‘for’ and ‘about’ the environment. Viewing environmental education holistically with a unified horizon of improved environmental health can perhaps improve the field and provide critical insight into what some believe to be the encapsulation of environmental education, that of an environmentally literate individual (McBride et al., 2013; Merritt et al., 2022; Roth, 1992)

Environmental Literacy

The theory of environmental literacy was first coined by Roth in 1969 in response to an article that described the prevalence of environmental illiterate citizens, in this article he queried what characteristics define an environmentally literate individual, a question that has been debated and theorized enough to the point where it has lost some of its meaning (Roth, 1992; Wheaton et al., 2018a). When first described, environmental

literacy is very similar to the Tbilisi Declaration in that it refers to the knowledge, skills and motivations needed to solve environmental issues (Roth, 1992). Though some could view literacy as a product of education there are some caveats and dimensions to the term that were added with subsequent research. Literacy, according to vocal scholars, is a process rather than an end goal (Roth, 1992; Wheaton et al., 2018a), it consists of a number of characteristics that define a literate individual (NEEF, 2015; Hollweg et al., 2011), and should be used to guide curriculum (Roth, 1992). Similarly to the tension concerning action's place in environmental education, some argue that action is a part of literacy where literacy can be measured through observable behaviors such as action (Roth, 1992), while others hint that literacy refers to dispositions for action rather than action in itself (Wheaton et al., 2018a).

Central to literacy is its measurement and its applications in environmental programs and in schools. Measurement and assessments of literacy, though few, have been created to determine the effectiveness of an education program towards improved literacy, but very often the scope of literacy is so wide that many assessments must instead gauge select characteristics of literacy (Hollweg et al., 2011). Some researchers criticize the act of assessment without a clear definition of literacy (Roth, 1992). Building upon this, some researchers think that assessments of traditional environmental knowledge could not fully acknowledge the many ways in which individuals interact with and understand their environment. Just as there is homogeneity with environmentalism and a lack of diversity within the field, assessments could privilege one pathway of understanding our environment over another and discount some individuals' experiences and perspectives (Wheaton et al., 2018b). Finally, though some researchers argue that

there is no binary relationship or a pass/fail mentality within assessments (Hollweg et al., 2011; NEEF, 2015), the act of assessment could infer a line between literacy and illiteracy or, at the very least, a spectrum of literacy that involves different levels of observable behavior (Roth, 1992).

Environmental literacy and assessments have also been a topic of conversation in schools. There are some states in various degrees of planning or implementing environmental literacy plans that would infuse literacy into standards, create professional development for teachers, and add a literacy component to student graduation (Bodor et al., 2019). This is certainly in keeping with Roth's belief that literacy should inform curriculum as well as his belief that schools should carry some responsibility in creating an environmentally literate society. When he made this statement, however, he by no means felt that schools are the only location where literacy can be grown (1992). Environmental literacy can be addressed at various levels including in communities organizations, religious organizations and in the home (NEEF, 2015).

The researchers that have hoped to polish the theory of environmental literacy have also had several criticisms for the field. Namely, they argue for a concise definition of the term prior to any measurement or assessments (Roth, 1992). In addition, they hope that literacy will be expanded to accommodate the nontraditional ways in which an individual can interact with their environment beyond traditional environmental programming (Wheaton et al., 2018b). Once the definition of literacy has been broadened, the question then becomes, how can literacy contend with two environmentally literate individuals who may reasonably disagree with each other (McBride et al., 2013). Finally, and of significance to this paper, there is the issue of

literacy emphasizing individual competency rather than the competency of a collective group (Ardoin et al., 2023).

In general, environmental education has a complex history that has been enriched by researchers and practitioners that engage with the field for different direct purposes. These include cultivating citizens that are able to solve environmental issues, growing environmental literacy and environmentally literate youth, and providing opportunities to take concrete action towards these issues that threaten our current relationship with our environment. Central to environmental education, regardless of how this education is performed, are the environmental issues themselves, which are present in our local environments as well as felt globally. These local environmental issues can be perceived as an entry into environmental consciousness and because of this educators and environmental groups can consider the lens of sense of place, which considers how individuals relate to their physical space, to augment environmental education.

Sense of Place

Relationships are what define an individual's sense of place; relationships between the individual, their community, and the land in which they are situated. Beneath this overarching concept are several terms that, when combined, define an individual's sense of place, these include place meanings, place attachment, place identity, and place dependence to name a few. These first two terms receive the most attention and are sometimes used in relation with one another. In general, place meanings represent the symbolic meanings an individual or a community has for their place (Kudryavtsev, Stedman & Krasny, 2012), while place attachment describes the generally positive emotions an individual can have for their place (Trentelman, 2009). To summarize the

two, place meanings can be seen as the foundation and the reasoning for place attachment, but both can comprise a person's sense of place (Brehm et al., 2011). Because sense of place can be used in many fields, these definitions and the relationships between them are contingent upon the researchers and practitioners that employ them and their field of study. Sense of place is an interdisciplinary concept that can be used by sociologists, psychologists, historians, environmental scientists, and even urban planners and architects, though there has been a greater emphasis on how sense of place relates to the environment and pro-environmental behavior (Erfani, 2022). Because of the great variety of fields that are studying this concept, the term has become more complex with each nuance discovered, even if there are some disagreements.

To begin, many would assume that because of their individual nature, place meanings and place attachments vary based upon the individual, but some argue that a community's similar sense of place and place identity can work to marginalize others who do not share this same identity (Ho, 2020). In this example, the individual who has been excluded develops negative place meanings based upon their experience. In another example taken from the field of sociology, exclusion from predominant place identities can lead to isolation, placelessness, and a lack of sense of place (Le Roux & Groenwald, 2021). This process of exclusion through place identity, and the idea of negative place meanings, has implications for environmental education, as any program that aims to encourage place attachment would have to acknowledge that place meanings vary. One theory that can be employed in education to accommodate this reality is critical pedagogy of place that addresses colonialism and feelings/memories of oppression (McInerney et al., 2011).

Another element of place relationships that has been explored across disciplines is the rate at which it develops. It is generally believed that both place attachment and meanings develop in a slow process based upon length of time spent in a place but does not alter once established (Raymond et al., 2017). To go further, some scholars argue that there are many processes that shape place attachment at varying rates and these meanings change throughout one's life (Cross, 2015; Chapin & Knapp, 2015), while others argue that some place meanings are instantaneously formed and altered as they become integrated with socially constructed meanings (Knaps et al., 2022; Raymond et al., 2017). Dimensions within a sense of place have developed over time with scholars but of greater interest to this project is the connections between an individual, their ecological place meanings, environmental education, and how place can impact pro-environmental behaviors.

Sense of Place and Environmental Education

Perhaps the most logical means of creating a sense of place through environmental education would be the creation of ecological place meanings, and to a degree some believe that simply viewing nature for the value it brings to a place can lead to place attachment (Brehm et al., 2011). This method has been cautioned against, with one researcher believing that an individual's relationship with space has several dimensions, with only one being the biophysical dimension that would relate to ecological place meanings. Beyond the biophysical, there are the psychological dimensions (such as a sense of belonging), sociocultural dimensions (which is tied to community and culture), and political-economical dimensions (Ardoin et al., 2012). With

this in mind, we can better analyze past efforts in the sense of place research as it relates to environmental education.

In an argument for how sense of place can be developed, Kudryavtsev, Stedman and Krasny argue that there are two overarching methods: “Experiential” and “Instructional”, with the first relating to direct experience and the second relating to media as well as written or oral communication with others (2012, p. 239). Within the first method, researchers point to significant life experiences such as a childhood spent in nature with mentors (Chawla, 1999; Tani, 2017) or the experiences in nature that you gain in the context of outdoor recreation (Larson et al., 2018). Several other empirical studies focus on how specific environmental education events can impact a sense of place. Some found that environmental education that included stewardship and recreation could increase place meanings and place attachment to types of ecosystems but could not foster place attachment to that specific region (Kudryavtsev, Krasny, & Stedman, 2012), another argued that the creation of sense of place was not a certainty in restoration and volunteer work unless the communities had decision-making leverage in the project itself (Kibler et al., 2018), finally other researchers advocate for experiential environmental education that is based upon a vision for a place as a method of creating place meanings (Russ et al., 2015). These studies have explored how sense of place can be cultivated, but there has also been a focus on how sense of place relates to pro-environmental behaviors.

As stated earlier, knowledge of environmental issues is not in itself an impetus for environmental behaviors (Kollmuss & Agyeman, 2002); some instead believe that sense of place can be directly correlated with behaviors. It has been suggested that place meanings based upon seeing nature as valuable can drive an individual towards

pro-environmental behavior, especially when these place meanings are threatened by environmental degradation (Kibler et al., 2018; Larson et al., 2018). One holistic view is that pro-environmental behaviors reinforce a sense of place and vice versa in an iterative loop because it makes you engaged with your space and improves the locus of your control, or what you can influence (Hintz et al., 2016). Some caveats to this research are the tendency to study areas with high natural abundance (Kudryavtsev, Stedman, & Krasny, 2012). These studies also do not acknowledge the variance of place meanings and the degrees of place identity within a community. Kibler et al. suggest that some communities can develop a sense of place for a region that has already been degraded, posing a challenge to those who wish to leverage sense of place towards restoration efforts (2018). In this way sense of place and place identity can hinder behaviors and environmental education must endeavor to alter a community's perception of their environment.

Sense of Place and Identity

It has already been mentioned how place identity can be a method of marginalization but primarily place identity has been seen as a method of unification within a community or a region. Place identity illustrates the relationship between an individual and their space with some describing it as the degree a place is integrated into your own personal identity (Kudryavtsev, Stedman, & Krasny, 2012). Place identity is augmented by personal involvement with place (Erfani, 2022) and can in turn be used to influence place as people change their physical location to align better with their sense of place (Peng et al., 2020). As stated earlier, place is also reliant on sociocultural and psychological characteristics such as community, culture, and a sense of belonging

(Ardoin et al., 2012). In this way, if the relationship between an individual and their community is positive, and the individual feels connected to this group, place identity can increase and reflect the collective identity. Similarly, this collective identity is shaped by the individuals within the group and also is synergistically a product of shared meanings and community narratives (Erfani, 2022). A community identity can also reflect more than the individuals that comprise a region such as Aldo Leopold's land ethic that envisioned a community made up of the land itself as well as those who rely upon it, including people, plants and animals (Hintz et al., 2016; Leopold, 2020).

Environmental education with consideration for community identities, regardless of the scale, is a nuanced and effective method that has gained traction as of late in the form of community environmental education (Aguilar, 2018; Zachariou & Symeou, 2008), and one cannot help but feel hopeful when considering collective identities being channeled towards environmental behaviors to form collective action (Erfani, 2022; Kibler et al., 2018; Larson et al., 2018). This is not to say that communities can be represented by solely one identity, and it should be noted how challenging environmental work can become when two place identities are channeled in opposing environmental directions such as an identity based on conservation versus an identity based on 'progress' and development (Chapin & Knapp, 2015).

Sense of place literature has benefited from its relevance to many distinct fields. Drawing from sociology, psychology, and community studies, sense of place can also be used in environmental education to interpret environmental behaviors (Hintz et al., 2016), environmental concern and attitudes (Brehm et al., 2011), and even collective action through community identity (Kibler et al., 2018). This last element of collective identity

is a lens through which one can consider the theme of collective environmental literacy, a new concept that builds upon the ideas of collective action and synergy.

Collective Environmental Literacy

In environmental education there is a tendency to view desired learning outcomes as related to an individual's environmental literacy, such as an increase in knowledge, skills and motivation towards pro-environmental behavior (Hollweg et al., 2011). Logically, one can challenge this preference for the individual scale when one views environmental issues as impactful to populations rather than singular individuals, thus requiring collective responsibility. Another component to consider is how socio-environmental issues can differentially impact some populations over others, meaning the justice-informed perspective of a holistic community or region could accommodate this inequality (Monroe & Krasny, 2015). Towards the theme of efficiency, individual action, such as consumption patterns or energy conservation, can only create meaningful changes when performed across a community, thus becoming a form of collective action (Gibson et al., 2022). A movement towards the collective/community scale has been anticipated or initiated on various levels (Ardoin et al., 2020; Ardoin et al., 2013; Clark et al., 2020; Gibson et al., 2022; Monroe & Krasny, 2015) and this shift has facilitated a variety of conversations and terminology meant to encapsulate the way in which collective environmental identities and collective knowledge may coalesce towards collective action, one such term is collective environmental literacy.

Collective environmental literacy has recently been theorized, not as a product, but rather as a stepping stone defined as “a dynamic, synergistic process that occurs as group members develop and leverage shared resources to undertake individual and

aggregate actions over time to address sustainability issues within the multi-scalar context of a socio-environmental system” (Ardoin et al., 2023, p.34). The authors that coined this term are candid about the fact that they have not yet conceived how this literacy could be measured or applied to environmental education; they even are open to changes in the definition as well as the name itself. Despite the fluid nature of this concept, in their article the authors include four elements of collective environmental literacy that can transform the field of environmental education and how we think of collective identity and action. These elements include scale, dynamic processes, shared resources and synergy.

Scale is a reference to the change from individual to collective, but it also incorporates different measurements of community, which can be defined as a geographic community or an abstract community that shares the same identity, if not the same location, such as a community of practice (Aguilar, 2018; Ardoin et al., 2023). Collective environmental literacy as a dynamic process is not unlike the original conception of environmental literacy of an individual (Roth, 1992), in that it emphasizes literacy as a process rather than the end result (Ardoin et al., 2023). Ardoin et al. also suggest that what adds to the dynamic nature of collective environmental literacy is the scale at which it occurs as it involves the interactions among the community and this literacy remains flexible enough to alter with changing issues. The author’s final two elements of collective literacy that have the most significance towards environmental education and collective action are shared knowledge, which demphasizes what knowledge any singular individual possesses but rather looks at socio-environmental understandings shared by the

group, and synergy, which draws power from the many diverse minds and experiences of group members (Ardoin et al., 2023).

The idea of collective environmental literacy or community-level environmental literacy, another term that others scholars have suggested, represents a new pathway in environmental action and education but it is limited by its novelty. Many researchers have also explored the themes of community environmental literacy, collective action, and communities of practice. To a degree this latest scholarship pulls from these ideas, but research expressly for community-level/collective environmental literacy is limited. The theorists behind these practices also suggest that research could become stymied as all communities are different and any empirical data from one community is not applicable to another (Gibson et al., 2022). This can also be seen in environmental behaviors and actions that result from collective environmental literacy, as the environmental goals of each community would vary as well depending upon the communities needs and desires, adding another limitation to any research (Ardoin et al., 2023; Gibson et al., 2022). One avenue of research that also deserves examination is the educator's role in collective environmental literacy; to what degree can an environmental educator help facilitate a group towards this form of dynamic and synergistic literacy. In addition, there is research needed to explain to what degree a sense of place can influence a community's likelihood of forming the bonds necessary to perform efficient collective action. The answers to these questions are elusive, but it is important to consider the connections between environmental education, collective environmental literacy, and sense of place.

Relationships and Observations

The relationship between environmental education (specifically community

environmental education) and collective environmental literacy is delicate and could become misconstrued if not clarified. To start, it is important to remember that collective environmental literacy is a process, as well as a product, that should inform environmental education, but community environmental education does not in itself guarantee the development of collective literacy (Ardoin et al., 2023). In addition, when a community is defined geographically a sense of place could be seen as a parallel goal of a collective literacy- informed education, where a sense of place reinforces collective literacy and vice-versa. In the end it is important to consider the theme of community within environmental education and how this has informed the concept of collective environmental literacy.

Community environmental education is a method of education with a deeper history than collective environmental literacy, but they share many similarities. In its most generalized form, community environmental education includes education programs typically based on collective action and local issues. With volunteering and collective action, community educators hope that these programs aid in empowering communities by addressing local concerns in the most localized method possible (Aguilar, 2018). In this way community environmental education is a method, and an educator could hope that the community takes the skills and knowledge gained, to empower them towards a state of collective environmental literacy. Research into this method of education, however, is subject to the same limitations as collective environmental literacy because of its emphasis on localization, as no two communities are the same (Aguilar, 2018; Ardoin et al., 2023).

Contributing to these two ideas, practitioners and researchers across the field have brought principles that can serve to guide those who wish to connect communities with environmental education. It has been noted that any education meant to involve the community must acknowledge the community itself as a stakeholder in the development of the curriculum (Monroe & Krasny, 2015), as well as reflect the local needs and interests of the area (Simmons, 2017). Reflecting what some see as a central purpose of environmental education, community environmental education must stimulate community engagement and include tangible action towards environmental issues (Saylan & Blumstein, 2011). The community referenced in these principles include citizens of all ages, but education is stronger when it features partnerships between citizens and established groups like government agencies, schools, workplaces, and environmental non-profits (Monroe & Krasny, 2015). Conceptually, community environmental education is certainly useful towards collective environmental literacy because of its shared principles, even if the concept doesn't address explicitly the collaborative skills needed by a community to reach collective environmental literacy. The two do share, however, a great emphasis on place and how sense of place is channeled towards action.

Even though sense of place, as a term, is not expressly connected with the themes of collective environmental literacy or community level environmental literacy, place meanings, place identity, and collective identity, which can comprise sense of place, are deeply embedded into these themes. Place meanings, as stated earlier, are deeply individual in that they are the symbolic meanings attributed to a space. In any given community there are a variety of place meanings, but collective environmental literacy

entails a process of blending these meanings together to create a collective and altruistic meaning of the environment (Gibson et al., 2022). This coalescence also can mitigate the common qualm of environmental literacy in that it can account for how two environmentally literate people may reasonably disagree (McBride et al., 2013). Another element of place meanings is the knowledge or understanding a person has of their space, their funds of knowledge. Within the framework of collective environmental literacy, the diversity of perspectives and funds of knowledge is critical as it brings about a novel understanding of any environmental issues and breaks away from homogenous opinions (Ardoin et al., 2023). Place identities, either on the individual or community level, can be strengthened through community environmental education when the education includes locally and culturally relevant interests (Simmons, 2017) and if this community is not defined by their geographic location, it is their common identity that has brought them together to facilitate collective action (Ardoin et al., 2023). When we consider how these two concepts are linked, the question remains how educators can foster a sense of place towards collective environmental literacy.

Place-Building in Environmental Education

Because of the great deal of consideration needed to answer this question, Ardoin et al. left the measurement and practice of collective environmental literacy for other researchers and practitioners to theorize (2023). The authors do put forward several steps that could lay the groundwork for a community to develop a collective literacy.

It was suggested that communities and partners must first gather and develop shared resources and, when amassed, gauge these resources for any gaps (Ardoin et al., 2023), regarding education programs, Gibson et al. argue that educators must focus on

building shared efficacy (2022). Widening this discussion to include concepts of community environmental education and education for sense of place some researchers believe that any program meaning to raise community identity shouldn't measure efficacy by the gaining of knowledge and attitudes, but by the degree the education empowers and lends agency to members of a community (Monroe & Krasny, 2015). Certainly, the sense of place strategies of experiential and instructional education that were mentioned earlier could be applied towards education for collective environmental literacy (Hintz et al., 2016), alongside an emphasis of the varied ways in which people feel their sense of place (Ardoin, 2012). Acknowledging these prescriptions one can analyze specific practices in environmental education to determine efficient strategies to build a sense of place towards collective environmental literacy. In this section, the ideas of community asset mapping, photovoice, community listening sessions, intergenerational learning and virtual learning will be explored with a focus on their connections to sense of place and collective environmental literacy. From these different strategies, one can begin to understand the best ways to leverage experience, instruction, and collaboration towards the twin goals of sense of place and collective environmental literacy.

Community Asset Mapping

One education strategy that certainly builds community identity and pools together the diverse resources and knowledge a community may contain, is the process of community asset mapping. Originating as an urban planning mechanism, asset mapping has expanded for uses in varied fields all the while keeping its original purpose to facilitate the consideration of social and natural assets of a region (Wali et al., 2017). In general, this process entails a group identifying a community's strengths and considering

the physical locations or resources of value within a region such as schools, government agencies, business, natural areas, community buildings and any other community-dependent object of value (Simmons, 2017). The purpose of such mapping is to graphically identify the interdependent relationships of a community (Wali et al., 2017), to create solidarity towards a shared goal, and to empower the community to capitalize on these shared goals and resources towards democratic action (Simmons, 2017).

One major strength of this method is the way in which data is collected. Many organizations that facilitate community asset mapping focus on the diverse voices within a community so the resulting product can represent the community at large and collect such data with personal interviews or surveys (Wali et al., 2017). The distinct ‘insider’ nature of community mapping sets the process apart from other community assessments that are completed by outside groups and are completed with or without help from community stakeholders (Simmons, 2017). This language of varied perspectives is in keeping with sense of place literature that suggest that place-meanings are individual and the identification of such places with value during the mapping surveys guides the participants to consider their place attachment and what they feel defines their region. Other characteristics of this mapping activity, namely the process itself of surveys and interviews and the full evaluation of a community’s interdependence, paves the way for collective environmental literacy by setting precedent for sharing knowledge and perspectives and strengthening partnerships to make collective action more efficient.

Visual Media and Photovoice

Media and instructional materials are notable means of environmental education

and can both be used in combination with an instructor or as standalone materials. It has been seen that the different modalities of instructional and collaborative media can serve different purposes with visual media being seen as more emotion driven and persuasive compared to text, which is better suited to education for specific knowledge (Merritt et al., 2022). Visual media can also serve as a reproduction or analysis of an individual's place meanings and can influence others (Kudryavtsev, Stedman & Krasny, 2012).

Photography has also been employed by educators and environmental organizations to cultivate place in participants as well as inspire critical reflection of place meanings and attachment. These photographs can be part of education materials or social media campaigns, to name a few, where the photographs act as instructional materials. One method of collaborative photography is the process of photovoice created by Wang and Burris, where participants engage in group listening sessions inspired by their chosen photographs (1997). Beginning as a health-orientated and transformative participatory action activity, photovoice has since been used in other fields, most notably in socio-environmental education (Derr & Simons, 2020). With the goals of reflecting upon community strengths and community issues and lending these discoveries to policy makers, the concept of photovoice has real applications towards sense of place and collective environmental literacy.

Before a participant even takes a photo, the process requires an individual to understand their place meanings, whether positive or negative, in order to encapsulate these meanings into a photograph; in some cases, the process of taking a photo can make an individual understand the barriers they feel to a sense of place and place attachment (Derr & Simons, 2020). Once the group has been assembled and the photographs have

been taken, the resulting session of analysis and collaboration is a means of sharing knowledge and context and thus could be considered a forum for collective environmental literacy. Finally, the focus on social transformation, inclusivity of voices typically unheard in public discourse, and the component of civic action (Wang & Burris, 1997) is deeply in line with the process and goals of collective environmental literacy, which include diversity of perspectives and collective action. Some have critiqued the overuse of photovoice in applications that stray from the original intention of community transformation and social change, but when this method is used with its original purpose intact, photovoice can be a profound method of collaboration and environmental education (Derr & Simons, 2020).

Community Listening Sessions

Strategies that employ collaboration have already been touched upon in the form of photovoice and community mapping, but in each of these cases conversation has been facilitated through a medium or been used to create a tangible product, in a community listening session the conversations that occur are the desired product and questions provide a loose structure that serves to elongate conversation rather than guide it towards some end. Collaborative learning is the framework for this process as well as other similar strategies such as conversation cafe's, visioning exercises (Ardoin et al., 2013; Simmons, 2017) and any other intentional community forum that prioritizes diverse voices.

Community listening sessions lend themselves very well to environmental justice, conservation, and socio-environmental issues as they embrace how interconnected social health and environmental health can become and the ways a community can approach

problem solving. Ardoin et al. explored the use of community listening sessions towards environmental issues in a recent study and it is from this study that the approach has gained more traction (2022). The authors describe a typical session as a large group of diverse community members being posed engaging open-ended questions that allow for conversation to flow without the need for the interviewer. Using the theory that learning is a social process, these sessions are differentiated from other focus groups or participatory research in that the data that is collected through the session does not represent the opinions that participants held before the event, but rather represents the synergistic beliefs and opinions of participants that emerge from the session itself. Building upon the shared nature of environmental issues, listening sessions also can prepare participants for collective action (Ardoin et al., 2022). Employing discussion and collaborative learning could be a valuable strategy to build a sense of place as participants speak from their daily experiences, which are deeply embedded in one's physical place and revolve around place meanings. One crucial element that must not be forgotten during listening sessions and should not be forgotten during education that employs this framework, is a focus upon diverse voices within a group rather than the voices who are privileged in other community forums (Ardoin et al., 2022). Collaborative learning in this context is typically performed with adult participants but collaborative learning can also occur between different age groups.

Intergenerational Learning

It has already been established that children can develop pro-environmental attitudes and behaviors through time spent outdoors and most often in the company of a mentor (Chawla, 1999), but this framework of intergenerational learning could reap

benefits at all ages. Researchers and practitioners have explored intergenerational learning that occurs in experiential-contexts where different age groups work together (Klein et al., 2021), but a large focus has been on instructional learning where children are encouraged to share knowledge with the adults in their family (Duvall & Zint, 2007). In both instances, the social aspect of learning is employed to have more diverse learner outcomes and to influence behaviors and environmental attitudes. In one study by Klein et al. two age groups within a community worked towards a conservation project; in this project both the work benefited from the energy of the younger group as well as the life experience of the older adults and the individuals themselves also saw the benefit of added confidence and could begin to make informed and equitable decisions that spoke to the perspectives of both generations (2021). This specific study and several others have tended to frame this intergenerational learning as a boon to the youth's environmental literacy as an individual (Klein et al., 2021), rather than collective literacy, but it also fosters collective environmental literacy. In addition, this focus on student learning, with adult learning being sidelined to a bonus, is in keeping with the overall trend within education to focus on youths rather than adults. Some researchers believe that intergenerational learning is a means of branching into adult learning, which they believe has been relegated because of the limited free-time adults have for education and the little funding available for adult-focused education (Duvall & Zint, 2007). With a deeper understanding of the social aspect of learning, perhaps intergenerational learning could become a novel means of both youth and adult learning, whether it occurs within a family or within the community at large.

Intergenerational learning doesn't just directly influence the environment within the context of an educational event or program, it can also indirectly impact the environment by instilling community identity, strengthening sense of place, and setting the stage for collective action and collective literacy. Its ability to cultivate identity and foster belonging within that community is noteworthy as it can create opportunities for community bonding and the sharing of knowledge (Klein et al., 2021; Zachariou & Symeou, 2008). It is this sharing of local knowledge that is so in keeping with the idea of collective environmental literacy, which advocates for deep funds of knowledge rather than making every member of the community an expert in their environment (Ardoin et al., 2023). Though this method has potential, it must be refocused to prioritize these qualities that build sense of place and collective environmental literacy. Though in its current applications intergenerational learning has been poorly correlated with behavior changes (Duvall & Zint, 2007), the indirect changes to the learners themselves as well as the community are noted. Finally, any pedagogy that is knowledgeable of how much family, culture and social norms impact pro-environmental attitudes and actions and seeks to remedy this by augmenting the behaviors of both the parent and children is worthy of further research (Kollmuss & Agyeman, 2002). Moving away from collaborative learning in its traditional sense, environmental educators have also been open to collaborative learning that occurs in virtual environments.

Virtual Learning

The COVID-19 pandemic had no shortage of impact on education, so it is not surprising that environmental education also was required to adapt. This virtual environmental education took the form of virtual field trips, online activities, and

interactive games and despite its main purpose to reach youths and adults who would normally partake in environmental education but were restrained during the pandemic, virtual learning also expanded the field of education to those who didn't normally have access to in-person programs because of the cost, location, and any other physical constraints (Merritt et al., 2022). It is because of this equitable aspect of virtual environmental education that educators have still held on to virtual programming despite the isolation of the pandemic subsiding. Virtual learning is not ideal for many educators (Quay et al., 2020), but there are some guiding principles that can make virtual learning efficient towards the acquiring of environmental knowledge and a developed sense of place.

Relevance is one central tenet of virtual education; connecting a student virtually to information that they will care about such as their own region and social-ecological issues that bridge the social and natural aspects of the environment (Hoke et al., 2020; Merritt et al., 2022). Regarding place, virtual programming can either inspire individuals to visit the unfamiliar site featured in the program later (Merritt et al., 2022), or the programming can be based upon environments that are already familiar such as backyards or local environments so as to strengthen established sense of place rather than build a sense of place for somewhere unfamiliar (Hoke et al., 2020). Especially during the pandemic, such local environments became a deeper focus as exploration was restricted (Quay et al., 2020). Virtual educators have also tried to prioritize collaborative learning online between the educators and the public as well as between participants. Some suggest that virtual learning can build a sense of place if the educators are enthusiastic about the places they present (Hoke et al., 2020), while others stress the

importance of role models within the context of education, in the form of experts, educators, and environmental organizations (Merritt et al., 2022). Social interactions between participants can drive virtual learning (Hoke et al., 2020; Merritt et al., 2022), even if conversations are done asynchronously. One other matter for consideration is the degree to which virtual learning could detract from the experiences in nature it is trying to supplement (Quay et al., 2020). Finally, it should be noted that now that education is not solely reliant on virtual environments, educators can now use their technological skills that they acquired during the pandemic to augment in-person learning, rather than replace it (Merritt et al., 2022). In general, virtual learning can build a sense of place, encourage students to deepen their understanding of familiar places, and could even become a tool for collective environmental literacy when the virtual environment allows for open and continuous communication.

Throughout this section, several education activities or approaches to pedagogy have been explored for their relation to and applications for sense of place and collective environmental literacy. Further research is required to validate the use of such practices towards these dual goals, but it is worth noting that sense of place and collective environmental literacy is not incongruent with current education practices and in some cases, educators can build these two capacities unintentionally even if their focus is on transformative, informative, or collaborative goals.

Summary

This chapter has reviewed the interdisciplinary research completed by environmental education researchers, educators, sociologists and psychologists. Environmental education has been shaped by these diverse voices since its inception as a

field that prioritized individual environmental literacy, then described as the knowledge, skills, behaviors and attitudes needed to combat environmental issues. These issues have not alleviated since the Tbilisi Declaration of 1977, and in many ways have been exacerbated and compounded as they become associated with social issues that differentially impact parts of a community. Responding to these contemporary issues, researchers in distinct fields are arguing for the lens of environmental education to be focused on place and community to better respond to issues of any scale, be it local, national or global. Environmental education is uniquely poised to build a sense of place and when guided by collective environmental literacy, this education can pave the way for collective action that is more efficient and more encompassing than typical education geared towards individual actions and an individual's development of knowledge, skills, and attitudes.

In the final section of this literature review, several strategies were outlined that have been employed in environmental education but also have principles that are not unlike those outlined by Ardoin et al, when they describe their novel idea of collective environmental literacy (2023). Building upon these strategies of collaboration and social learning, and the foundational principles of sense of place and environmental education, a virtual learning environment will be created to answer the question: *How can community members build a sense of place through environmental education towards the goal of collective environmental literacy* Chapter Three's focus is on the creation of this place-based website, including the design principles, the intended audience, and how the website will balance instruction, experience and collaboration to best build a sense of place and collective environmental literacy.

CHAPTER THREE

Project Description

Introduction

It is through a local lens that nature is first understood and environmental issues are first felt. This local perspective, the place meanings we contrive, and the overall place attachment we feel can be summarized as a sense of place, which can be acted upon or developed with place-based experiences and instruction. In an iterative loop, environmental educators can create place-based programming that builds place bonds and, in turn, a sense of place should influence environmental education events and environmental actions. Traditionally, environmental education seeks to improve an individual's environmental knowledge, skills and environmental attitudes, but there is a growing trend that adds a greater emphasis to collective knowledge, the skills of collaborative problem solving, and collective action. This movement is based on the reasoning that collective actions are more efficient than individual actions and environmental issues do not impact individuals alone, but rather communities as a whole (Monroe and Krasny, 2015). It is with these thoughts that sense of place and collective action merged to form the term collective environmental literacy, which describes a community synergistically solving environmental issues in ways that do not privilege or exclude any voice or perspective within that community (Ardoin et al., 2023).

In their article describing the term collective environmental literacy, Ardoin et al., advocate for communities to develop shared resources and gather local knowledge to better solve a community's socio-environmental issues (2023). This consideration for collective action and collective environmentalism is echoed by Clark et al., who describe

environmental education as a pedagogy that “works to move people to action for the tangible benefit of the environment and humanity” (2020, p. 396). Considering the relationships inherent in this research, I hope to answer the question: *How can community members build a sense of place through environmental education towards the goal of collective environmental literacy*. In order to determine the answer to this question, I have created an online community resource that places an emphasis on community collaboration, place identities, and an environmental-influenced sense of place.

This chapter begins with a breakdown of the website itself and references to the best practices that guide each individual feature within the site. Following this, the chapter will then describe, in part, the region in which it will be situated, the intended audience that will use the site as well as the importance of ensuring that the participants that engage on the website fully represent the community. I will then discuss what steps will be done to update the website and to encourage participation. Finally, I will describe how this product will be assessed to gauge its success in engaging community members, building both an individual and a community's sense of place, and how it lays the groundwork for collective environmental literacy.

Project Description and Rationale

As stated earlier, this website is intended to be a community resource that compiles local knowledge and perspectives to better inform environmental solutions. The goal of the website is that any community member who uses it will build their sense of place and gain the skills, partnerships, and collaborative experience necessary to open the door for collective environmental literacy. Towards this goal, the website is a place for multiple education methods including direct instructional education, experiential

education and collaborative learning, where learning occurs in the context of interactions and observations (Ardoin et al., 2013). Though part of the content has been created by myself and from my perspective, the bulk of the content will be supplied by users as they collaborate in open discussions about the region and engage in various activities. Beyond this content, however, there are several elements that were considered to make the website more accessible and followed best practices of web design.

Virtual learning environments gained traction during the COVID-19 pandemic as educators looked to other means of reaching their students, but it was found that virtual learning allowed for environmental educators to reach individuals typically unserved because of economic or geographic constraints (Merritt et al., 2022). Because of the virtue of accessibility in virtual environments, the website format works well for inclusive collaboration. Accessibility was also of consideration in the design of the website. As this website is tailored to suit varying ages and experience with technology it was important to create a site that is intuitive to use, easy to navigate, both desktop and mobile friendly, and can be easily altered based upon user's feedback (Leavitt et al. 2006). Another element of consideration in web design was the level of credibility and professionalism the website conveys. This meant being transparent about the purpose of the website, including my own credentials, citing sources used, and keeping the website updated frequently (Leavitt et al. 2006). Finally, as the site features input from participants, privacy will need to be continually ensured to allow for comfortable communication between users, but this concept will be explored in more detail later in the chapter.

The first content that was made available as the website was made public were two main sections that were split between instructional information and activities that encouraged experiential learning, could be done as a group, and emphasized localized nature and ecosystems native to Iowa, the region in which the website is based. This content was created based upon my own sense of place and, by its very nature, is based upon my own experience and perspectives on the natural environment but overtime it will be supplemented by user input. The main purpose of these sections was to make users gain an understanding about what makes their environment unique, to encourage them to see their environment as valuable, and to establish nature as a fundamental part of your place and sense of place. Within these two sections, there were four categories that I explored in greater detail, the tallgrass prairie, bodies of water, nature and society and backyard nature.

This first category explores the tallgrass prairie, an ecosystem that is native to the midwest but has been reduced over time to a fraction of its original size. This ecosystem was chosen because remnants of tallgrass prairie can be found all over the state of Iowa and it is important to protect these ecosystems before they go away. The "Bodies of Water" category was selected to highlight how experiences in water can influence a sense of place and they too are vulnerable. The final two categories explore perspective in that they make the viewer widen their view to see how nature and society interact and narrow their view to notice nature directly in or around their home. In each category you will find information that explores each topic, including an essay using scientific sources, a reference to how these categories relate to sense of place, a list of physical locations that encapsulate the topic, and finally additional sources that a user might find helpful. To

increase relevance to Iowan users that are not in the same geographic community, the information was generalized based on the state when necessary, and was clear about how to translate the information to a hyper localized perspective.

Moving on to the second main section of the website, this website included eighteen lessons/activities that were also split into these four categories as mentioned earlier. These lessons vary with age group and range from Pre K - 3rd grade, 6th Grade - 9th Grade, and finally 9th Grade - Adult, with some lessons generalized to all ages. It was important to supply lessons from this wide age group to accommodate more users and different types of groups, including families, friends, and any other type of group. Each lesson plan includes where the activity should take place (inside or outside), what age group it is most suited for, what season it should be done in (if applicable), a brief description of the activity and purpose, objectives, materials needed, any useful vocabulary, a brief warm up discussion or activity, the actual activity/activities, a explanation about how this activity promotes social learning, several open-ended questions to spark more conversations, a community extension section about how you and your group can utilize what you have learned and involve you community, and finally a description about how the topic relates to a sense of place. To ensure that each lesson is effective and engaging, each lesson has a brief survey that allows users to give input that will be used to better the lesson. These lessons overall encourage users to learn more about their local environment, have experiences in nature beyond the virtual website, and to consider how they might utilize these activities within their communities.

The first virtual collaborative activity the website features is a forum devoted to determining the community assets of the region and plotting these locations

geographically to fully understand the strengths of the community. Community asset mapping has been used as a tool by urban planners, but it can also serve to galvanize community engagement and environmental action by calling attention to the interdependent relationships within a community and uniting users towards a shared goal (Simmons, 2017; Wali et al., 2017). Users will complete a Google form with multiple choice and long answer questions based upon various types of community resources. This community asset map process is informed by Healthy City's Facilitation Guide, with several adaptations to transition the activity to a virtual environment. This guide is informative as it guides participants to see the differences between true community assets and places that the participants frequent in the community (Healthy City, 2012). This section also utilized some of the questions that are featured in Our United Villages' *Community Asset Mapping Workbook*, a resource that focuses on all forms of assets within a community including culture, politics, economics, and sources of knowledge (2012). Once thorough community input has been collected, these locations will be plotted geographically and made public to gather any input on omissions to the map as well as to illustrate possible partnerships that can be made within the community.

Another visual component of the website is devoted to the process of photovoice, where participants supply pictures and engage in conversations sparked by these images. Photovoice was created as a transformative and justice-informed participatory action tool that placed voices centerstage that were typically unheard in public discourse (Wang & Burris, 1997). During the activity, participants directly develop their sense of place by determining photos that represent their personal sense of place, their place meanings as well as any barriers to place attachment. Participants also expand their sense of place by

discussing and understanding the place meanings of others through their photographs. Following the photovoice process as outlined by Community Toolbox, the final component of this activity will be a form of action that uses the insight gained through discussion, such as an exhibit of the photographs throughout the website or creating an action plan based on any barriers to place attachment (n.d.). Once complete, these photographs could also be used to better inform the community asset map or to launch discussions in the last collaborative activity on the website, community listening sessions.

This last section of the website takes the form of a long discussion forum that is informed by the process of community listening sessions as outlined by Ardoin et al., (2022). Built upon the pedagogy of collaborative learning, and building upon the process of learning circles, focus groups, and participatory research, listening sessions aim to facilitate in-depth conversations between diverse community members through open-ended questions (Ardoin et al., 2022). This forum is open and available to all website's users and initially consists of several questions that concern sense of place, community identity, environmental issues in the region, barriers to place attachment, and barriers to environmental action. As the conversation deepens, more questions will be added and users are able to suggest their own questions. Because of the personal answers these questions may invoke, participants are liable to feel vulnerable when engaged in conversations and it is because of this that privacy and proper web etiquette will be maintained to protect the website's user base.

The final element of the website is a series of measures that will ensure privacy and respect in virtual conversations. Towards this end, and following the advice of web design scholarship, the website includes a list of forum etiquette rules that are posted in

the photovoice and the listening session forums. These rules enable conversations to remain civil, respectable, and productive but prevent any disparaging comments or hate speech (Leavitt et al. 2006; Preece & Shneiderman, 2009). As the goal of the website is to be a community resource that is accessible and welcoming towards all members of the community, it is vital to ensure that all voices can be a part of a conversation that is free of discrimination and disregard.

Setting and Audience

As the project is a website, learning primarily takes place online in the form of virtual lessons and online forums but because of the project's focus on place and community, this website was made to reflect the region in which it is situated, and an understanding of this specific region was necessary to implement this project.

Ecologically, the state of Iowa, which is the focus on this website, is not just corn fields but agriculture does dominate the region and is a source of many environmental issues. This website celebrates the biodiversity that can be found in the state, the many rivers and lakes that the state has, and the many ways in which society and nature interact but it also notes the ways in which Iowan's can negatively impact their environment.

Most people in the state live in urban or suburban areas but there is also a moderate percentage of the state that live in rural areas. In order to not privilege one area over another, the website offers information and activities that can be done in both of these settings. Not every individual in the state is directly associated with agriculture but it cannot be discounted that some individuals have a deep cultural connection to working landscapes that can impact their relationship with the environment and their environmental behaviors. This website does not advocate for one way to see nature but

instead asks users to think critically about their local environment and encourages users to gain a deeper appreciation for their natural environment. It should also be noted that the state has a number of environmental injustices, where environmental issues differentially impact parts of the state and parts of a community over another. This means that there are some socio-environmental issues that systematically impact communities of color, low income communities, indigenous communities, and communities with immigrants or refugees. Each individual that uses the website has their own unique perspective that is influenced by their experiences and because efficient conversations will only occur between different perspectives, it is important that every perspective and every sense of place is welcomed on the website.

Timeline

In the summer of 2023, the website was designed and the content was created following the best practices as outlined above. The site was made public in July of 2023 and now the focus will be encouraging participation, updating the website with any feedback the site receives and monitoring the community-focused activities to ensure respectful and efficient conversations.

Assessment

Traditional assessments of environmental education and environmental literacy have been largely individualized and have been used to gauge the improvement in an individual's environment knowledge, skills or attitudes. Contrary to this traditional mindset, the effectiveness of this website is based upon public engagement, empowerment, and personal development. One ongoing assessment is the degree to which the community engages with the website and how relevant the website's content is

to all users. As stated earlier, because this website is intended for community-wide use, it is vital that the website not be dominated by one perspective. Towards this end, there are many options for users to give input to the lessons and the community-focused activities. All input received will be used to make this website and its content more relevant to its users. In this way, it is the website's users that will be assessing the website, rather than the website assessing its users.

Summary

In creating this website, I hoped to answer the question: *How can community members build a sense of place through environmental education towards the goal of collective environmental literacy* Because of the limited research into education strategies that are specifically for collective environmental literacy, it will be invaluable to use the strategies of community asset mapping, photovoice, community listening sessions, as well as the best practices of intergenerational and virtual learning to better answer this question. The final product is a resource and virtual location where a community can express their sense of place, begin to understand the place identity of others, and finally collaborate to build collective environmental literacy. In this chapter I have outlined the intended audience for both the instructional and collaborative aspects of the website, described the state of Iowa where the website will be based, and have given an overview of the next steps the website will take as well as the ongoing means of assessing the website's success or failure. In Chapter Four, I will reflect upon the creation of the website, connect once more to the literature used to answer my research questions, talk about limitations to the project and possible further research.

CHAPTER FOUR

Conclusion

Introduction

In my life and in my many relocations, my sense of place has had moments of emergence and development that always are preceded by feelings of isolation and placelessness. Upon moving to a new region you are given a fresh start at the cost of feelings of familiarity. In my experience it has been nature that makes me feel welcomed in the beginning, taking the form of trails, creeksides, or public parks, over time my sense of place is developed further by community members who also take joy from nature. This process of understanding new places, coupled with my passion for conservation and sustainability, led me to my research question: *How can community members build a sense of place through environmental education towards the goal of collective environmental literacy.* To answer this question I created a virtual community resource that aimed to guide users to a deeper understanding of their place and their environment as well as provide opportunities for users to contemplate the perspectives and experiences of other people in their community. This virtual community would be primed for pro-environmental behaviors and collaborative and inclusive collective action and would also be a stronger and more unified voice ready to deal with socio-environmental issues.

In the course of this chapter, I will explore the major learnings I obtained through research, website design, and implementation. Following this, I will discuss several resources from my literature review that would have the most impact on this capstone. I will also briefly mention how this project benefits the field of environmental education,

what limitations there are to the website, how I will utilize my results and finally I will outline any directions for further research.

Major Learnings

During the capstone process, beyond extensive learnings about sense of place and collective environmental literacy, I have had several breakthroughs of understanding that have guided this capstone project and will continue to guide me as a learner and an educator. The first is a recognition of many ways in which people relate to their space and how they form place meanings. If someone was tasked to define their sense of place, a question that would undoubtedly give someone pause, they would consider how their space makes them feel and what specific elements of their space give a place meaning and value (Kudryavtsev, Stedman & Krasny, 2012). The answer to this question would be personal, emotional and wholly unique because it is formulated through experiences and perspectives that cannot be fully replicated. As this capstone has made me reflect upon my own method of developing a sense of place, which I discussed briefly at the beginning of this chapter, I have also come to know that it would be a folly to assume that this process would resonate with every reader or every user on the website. Considering this, one question that was always in my mind as I was creating content for the website was how I could best design a virtual space or an activity that did not isolate or privilege any perspective or method of place-building. These questions lead me to my second major understanding, that one cannot rely solely on their own perspective.

It would have been disingenuous to fully free myself from my own experiences and perspectives as I wrote the essays, lessons, and forum entries that would eventually form the website. This website is meant to be a celebration of place and community

relationships but I know my own experiences that shaped this initial content is not ubiquitous. Because of this, I view the website of today as a starting place for the website that is to come, a website that has a user base that engages in the community-focused activities on the website, participates in the lessons available, and provides feedback on how they relate to their space and to what degree the content can be improved to better reflect different perspectives. This website is wholly reliant on users just as individuals rely upon their community. By designing the website in this way and relying upon input from users rather than solely my own perspective, I am in keeping with the basic tenets of collective environmental literacy, namely the importance of shared knowledge and synergy, where the collective is more than the sum of its parts (Androin et al., 2023).

Relating to the article Ardoin et al. penned in 2023 that first mentions the term ‘collective environmental literacy’, one final learning from this capstone is that the field of environmental education is not stagnant nor is it reticent for change. I was surprised during my research by how recent many of my articles were, as is best highlighted by the Ardoin et al. article that was less than a year old when I began this project in January of 2023. There are many issues and debates within the field of environmental education but it is encouraging to know that researchers around the globe are responding to these issues and conceptualizing new directions within the field. The following section will illustrate this concept further and also explore on a deeper level several sources that were important in the capstone.

Revisiting the Literature Review

In Chapter Two, though I referenced content from a variety of researchers and educators to make connections between sense of place, environmental education,

collective environmental literacy, there were two documents that would have the strongest influence on the capstone. The first represents the foundations of environmental education and the second represents a new direction within the field that encapsulates these foundational concepts.

As stated in Chapter Two, the Tbilisi Declaration of 1977 was formulated during a UNESCO-organized intergovernmental conference and it is a defining document in the history of environmental education. In this document, the goals, objectives and defining principles of environmental education were laid out and meant to guide education at local, national, and global levels and for every age group (UNESCO, 1978). What was most significant to this capstone was the stated objectives of the field, which include improved environmental awareness and knowledge, the development of pro-environmental attitudes and environmental problem solving skills, and finally opportunities for participation in solving these environmental issues. When formulating the lessons and educational content of the website, these objectives were always kept in mind and each lesson is directed towards several of these objectives rather than focusing on simply improved environmental knowledge. Despite its age, and despite the inability to update this document, the Tbilisi Declaration was written with such forethought that I now regard it as required reading before creating any environmental education content. One special note that directly relates to this capstone is that each objective is targeted towards “social groups and individuals”, this phrase is prescient of the next document that was most influential on this capstone (UNESCO, 1978, p. 26-27).

It would not be hyperbolic to say that this capstone would be completely changed if it had not been influenced by Ardoin et al.’s article that outlines the term ‘collective

environmental literacy'. The authors define this term as: "a dynamic, synergistic process that occurs as group members develop and leverage shared resources to undertake individual and aggregate actions over time to address sustainability issues within the multi-scalar context of a socio-environmental system" (Ardoin et al., 2023, p.34). Moving away from theory and towards practice and having now created a website that seeks to emulate this process and this type of literacy, I now have an even deeper appreciation for this work as well as a more complex understanding of the concepts behind it. At every stage of the design process I considered this definition and kept the image of a community with high collective environmental literacy as a horizon line to strive towards.

One subtle element of this research paper that was also influential was its inference that environmentalism and environmental education of today is not accessible or welcoming to everyone. There are barriers to environmentalism that prevent large scale environmental behaviors and improved environmental health but these barriers can be mitigated through shared knowledge and a focus on inclusivity. These barriers include a tendency to privilege one perspective of nature over another, the lack of diversity within environmental organizations, and the tendency to view ideal nature as pristine and untouched. When creating this website, I tried to be cognizant of these barriers and recognized that the website needed to be transparent with its goals and reflect its user base as much as possible. Though this website has just been made public, the concept behind it, which has been guided by these two documents alongside countless others, could have significant implications and benefits to the field of environmental education and environmentalism.

Implications and Benefits to the Field

As stated earlier, the website as it is today is a starting place for the website it could become. To achieve this goal there are several elements that went into consideration while it was being designed and will continue to guide its management as time goes on. These elements include respectful dialogues and privacy. On several pages of the website there are web etiquette rules that prohibit hate speech, derogatory remarks, and off-topic soliciting. As these rules might be broken on occasion, the website has a stated policy that these types comments or forum posts will be removed and the user will be unable to make further comments in the public forums. This kind of policy is necessary as members of this virtual community might feel vulnerable and this website is intended to be a safe space. This also relates to privacy as all websites must consider their users' privacy by not requiring a great deal of personal information and keeping this information private and not open to every online user. These two policy implications for the website are common to most virtual environments but this project also has several implications to consider beyond these. Some of these implications relate to collective action and environmental experiences but this project and the ideas behind it could provoke changes to the field of environmental education.

Every lesson on the website has an opportunity for collective action or engaging with your physical community, whether it be the main focus of the lesson or a small addition, as is the case with lessons made for younger audiences. In some cases I suggest specific pro-environmental actions but in general these lessons point towards the environmental issues themselves and encourage users to devise equitable solutions to these issues that are unique to their region and with the help of their peers or other

community members. I feel that this focus on collective action is a benefit to the field because it is in keeping with the Tbilisi Declaration's objective of participation and could bring about concrete environmental improvements on a local level (UNESCO, 1978). Rather than avoid advocacy, this approach to environmental education embraces advocacy but gives learners free-reign to direct their action, is dependent on group involvement, and emphasizes environmental solutions that do not privilege one group of people over another. This could lead to policy changes or new pro-environmental behaviors within a neighborhood or a community but it also could be hindered by ordinances or policies at the state or local level. This could be as simple as yard ordinances, recycling systems in a city or township, or how open city councils or community organizations are to changes in environmental policies.

Another element of this capstone that carries its own implications to the field of environmental education is a diversity of perspectives. Unique relationships with a place, environmental experiences and perspectives are celebrated in the website as every experience contributes to the shared knowledge of the site and can lead users to environmental solutions that incorporate this knowledge. This diversity of perspectives as well as the unique ways in which people acquire a sense of place is paramount to collective environmental literacy. Unfortunately this diversity is not always present in environmental agencies, environmental non-profits, or reflected in environmental initiatives. This can make the environment less accessible for all community members or lead to environmental initiatives that are less engaging or could negatively impact parts of a community. In general this capstone and the ideas of a collective environmental

literacy and sense of place could possibly impact the field of environmental education but there are also some significant limitations that must be addressed.

Limitations

During this capstone I encountered limitations in the ideas behind my project as well as the method and design of the website itself. At the forefront, there is limited research into the subject of collective environmental literacy and the authors that coined the term do not outline how it could be implemented or measured (Ardoin et al., 2023). In Chapter Two, I spent some time illustrating how the concept of collective environmental literacy has a rich precedent in the form of community environmental education and communities of practice but using these two concepts to infer practices of collective environmental literacy could make an educator stray from the basic tenets of collective environmental literacy itself. Though I say this is a limitation, it was rather a challenge that made me more cognizant of how this form of literacy differs from these two foundational concepts.

Moving beyond this limited research, one limitation that is at the heart of any community-based environmental education research or practice is that no two communities are the same because they are composed of different individuals and their physical place has unique characteristics (Aguilar, 2018). There is also the possibility that different individuals and different communities will develop a sense of place based upon behaviors, beliefs, or values that are not pro-environmental and could, in fact, be obstacles to improved environmental health (Chapin & Knapp, 2015). Disagreements are not something to be avoided and there is no right way to understand your environment and your region but if an individual is cemented in their own opinion and not willing to

hear different perspectives and reach a middle ground than there is an inherent limitation to how effective any method of cultivating collective environmental literacy can be.

In regard to the website itself, there are also several limitations that I considered during the design and implementation of the website. To begin, access to the internet or to internet-enabled devices is not universal, nor is it affordable for every individual. Though many communities have public libraries or locations with free public wifi, these options have their own tradeoffs and bring limitations to users. Though I hope to reach a wide audience with my website, I will ultimately not be able to reach every individual because it is a virtual environment. One current limitation, that I hope to remedy with advertising the website and fostering connections with local partners, is its limited user base. This website is based upon participation but it is up to me to encourage this participation and sustain usership. Another limitation that gets to the heart of why I created the website, is that there is extensive environmental degradation in the region in which the website is based and these environmental issues may discourage individuals from appreciating their environment or even spending time outside in nature. How can any individual hope to incorporate the environment into their sense of place if they cannot experience it. This last limitation is out of the locus of my control but with collective environmental action that is done by communities with a high collective environmental literacy, perhaps lasting changes to our environment can be generated and sustained. There are several limitations to this capstone that stem from both the foundational ideas that inspired it as well as from the implementation of a virtual learning environment but this capstone represents a first step in a journey rather than a destination. The next directions for the project will be further explained in the following section.

Moving forward and Future Research

This capstone's website makes the direct connection between sense of place, environmental education and collective environmental literacy but this method of virtual learning environments is a nontraditional approach for all of these subjects. Moving forward there is a need for further research into methods of collective environmental literacy and its connection to sense of place, as is echoed in other collective or community-level literacy research (Ardoin et al., 2023; Gibson et al., 2022). This could entail research using more traditional methods of environmental education such as field events, community-based projects, problem-based learning. As an educator I am eager to learn more about this subject so I will await further research into collective environmental literacy. Within the context of the website, however, there are several future directions that can be explored over time that will build upon the website's current content and expand its usership. Moving forward with any of this future research is dependent upon usership so my chief aim at this time is to advertise the website. Once the usership has been expanded I will focus on the virtual community and how to improve the website to better serve them.

As stated earlier, the goal of the website is to promote users to develop their sense of place and engage in community-focused dialogues. In the process, this website creates a virtual community and reflects many physical communities. Moving forward I hope to have a user base that is large enough to have groups within the virtual community based upon their physical community, such as groups based upon cities, townships or counties. Having groups within the user base will deepen the connection of users as they will be able to have more in-depth conversations about the natural and social assets of their

unique community, their sense of place, and what environmental issues their specific community is faced with. Perhaps these place-specific groups could even leverage their virtual connections and engage in face-to-face interactions. As more people engage with the website I will also update the content and the web design according to user input. This includes updating the community asset map with the survey results, adding more lessons according to the interests and place meanings of users and being more explicit about the different ways in which people relate to their environment and their space. Beyond this, I will update the website to better mitigate barriers to environmental education and fostering place meanings. Finally, I will utilize the results from the community asset survey and advertise the website in these locations that are seen as community assets, this will promote the website and hopefully garner new users. Moving forward, there is a great amount of work to be done, both in the context of the website and in environmental education scholarship but even in uncharted territory we can make headway one step at a time.

Conclusion

This capstone has led me to mature as a researcher, an educator, a community member, and as an individual. In the capstone process, I have found the importance of a developed sense of place, the benefit of a diversity of perspectives, and how influential recent scholarship can be. After revisiting my literature review, I find that there is a stark difference between my understanding of the texts at the beginning of the project and now that I almost reached the end. This capstone project and the concepts that have guided it hold new possibilities in environmental education because of its focus on inclusivity and collective action but it is not without its limitations. Moving forward using the results

from the website and new scholarship into the theme of sense of place and collective environmental literacy, it is my hope that I can get even closer to an answer to my initial research question: *How can community members build a sense of place through environmental education towards the goal of collective environmental literacy.*

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