The Role of Informal Environmental Education in the Changing Political Climate of 2017 in the USA: A Focus on Climate Change

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Abstract

    The campaign leading up to the 2016 United States (U.S.) presidential election and subsequent transition of federal political power in the Executive Branch from the Democratic Party to the Republican Party has received worldwide attention. The most notable feature of the 2016 election was the nature of the discussion and debate of key political issues, one of which was climate change. With the transition to a new presidential administration there has been a notable shift in the political discourse surrounding climate change and the future role that the U.S. will have in mitigation efforts. The increasing connection between climate change and what is perceived as the economic well being of the U.S. has resulted in climate change becoming a political wedge issue at the center of public debate, rather than a scientific issue. This paper sought to investigate the role of informal environmental education in the changing political climate of the U.S. The strong link between climate change and politics has had a substantial impact on the ability of the formal education system to bring the subject into the classroom. Informal environmental education has the potential to have a significant impact on the ways in which the U.S. deals with climate change. Environmental education, especially the topic of climate change, is an inherently political and controversial issue. Moving forward it will become increasingly necessary to widen our definition of education and truly embrace the ideas behind life long learning. Through the creation of thoughtful bridges between formal and informal education, by recognizing the strengths and limits of each field, it will be possible to create more holistic and meaningful learning experiences throughout a person's lifetime.

Introduction

The campaign leading up to the 2016 United States (U.S.) presidential election and subsequent transition of federal political power in the Executive Branch from the Democratic Party to the Republican Party has received worldwide attention. Many reasons exist for this increased interest, including a record number of candidates vying for the Republican nomination and the first female candidate to win the nomination of a major political party. The most notable feature of the 2016 election was the nature of the discussion and debate of key political issues such as immigration, women's rights, education, and climate change. In the coming years, decisions that are made surrounding any one of these issues will have a significant impact on the future direction of our country. However, the political decisions made about environmental policy will not only have significant implications for the U.S., but for the entire planet. With the transition to a new presidential administration there has been a notable shift in the political discourse surrounding climate change and the future role that the U.S. will have in mitigation efforts.

During the Obama administration (November 2015), world leaders came together to discuss climate change and the steps that needed to be taken in order to decrease human carbon emissions, which resulted in the Paris Agreement, whose "central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius" (United Nations Framework Convention on Climate Change, 2014). The Paris Agreement marks an important milestone in history in that the countries that signed accounted for 97% of the world's greenhouse gas emissions compared to the 14% accounted for in the Kyoto Protocol (signed 1997). In the Paris Agreement, the U.S. pledged to reduce

greenhouse gas emissions with a "target of a 26 percent reduction in emissions below 2005 levels by 2025" (Ki-moon & Stavins, 2017).

Throughout the U.S. presidential campaign, and continuing into the beginnings of the newly elected administration, President Donald Trump has expressed his desire to change the narrative of the U.S. environmental policy. One of his proposals was to withdraw the U.S. from the agreement. While the possibility of the U.S. exiting the Paris Agreement is significant in itself, the new administration has also come under fire for the appointment of Scott Pruitt as the Administrator of the Environmental Protection Agency and the subsequent changes to both the climate change content available on the websites of the EPA and the White House (Hiltzik, 2017). The shift in the national narrative that occurred due to the transition of power between administrations with drastically different views on the environment and the role the government in protecting it has begun to have and will continue to have significant impacts on the public discussions of many key issues in our country, including education and climate change.

In the midst of the current political and public debates concerning climate change, a critical intersection that must be examined is that of climate science, education, and our national political narrative. The ways in which students learn about climate change and the political debate that has developed around it will shape the future of our country for generations to come. Education needs to play a central role to prepare students to navigate the debate and become informed, active citizens, thereby creating a more ecologically aware population. Nevertheless, the discussion that typically surrounds education is centered on the formal K–12 systems. By limiting our focus to this relatively small amount of time a child spends in compulsory education puts an extreme amount of pressure on the formal school systems and discounts the limitless learning opportunities that a person will experience outside of the classroom not only as a child

but throughout their adult life. In order to address societal issues such as climate change, it is necessary to leverage as many educational recourses as possible and promote a learning culture that continues throughout a person's life.

Understanding the interaction between political ideology and opinions on topics that have become highly politicized and controversial is important to understanding not only how these issues are being taught in schools, but if they are taught. In a majority of states in the U.S., the approval and/or adoption of education standards are the responsibility of the state legislature. The current political climate of a governing body and "feedback from constituencies which is often based on the political climate" are two of the most influential factors in the decision to adopt education standards (Pruitt, 2014, p. 153). Standards that are developed to include topics that may cause conflict would be more likely to be rejected and replaced with standards that better represent the current political climate. Similarly, even when standards for controversial topics are in place, teachers who choose to cover this material in their classrooms may face pressure from parents, the administration, or other community stakeholders to present the information from a specific perspective or not present the information at all (Wise, 2010).

Informal environmental education has an important role to play as the political narrative in the U.S. changes during the transition to and in the new presidential administration. It affords the unique opportunity of being able to reach people of all ages and allow participants to engage in learning opportunities without the stress of evaluation and in a less structured environment that provides more flexibility and learner choice (Bell, Lewenstein, & Feder, 2009; Eshach, 2007). The field of environmental education can play a critical role in educating the public about climate change because of its inherent political context due to the fact that it is driven by the value that is placed on the environment (Chapman, 2011). By addressing climate change and

other environmental problems within the political context in which they exists allows the student to not only learn the science content knowledge behind the problems, it also prepares them to be able to more effectively seek out and identify credible sources for information and critically participate in the democratic process.

Literature Review

Public Perception of Climate Change and Environmental Concern

The environmental movement in the U.S. can be traced back to the 1960s. A consensus opinion among those involved in the environmental movement began with the publication of the seminal book, *Silent Spring*, by Rachel Carson in 1962 (Stevenson, 2007). In the book Carson discusses the severe environmental consequences caused by the use of chemical pesticides such as DDT and other harmful practices. Since this moment in history, the level of concern for the environment in both the political and public spheres have shifted in focus and fluctuated in intensity. Simultaneously, political party affiliation and political ideology has become an increasing influential factor in the determination of a person's perception of climate change and the current crisis our environment is facing (Dunlap & Van Liere, 1978; Buttel & Flinn, 1978; McCright & Dunlap, 2011; McCright, Xiao, & Dunlap, 2014).

With the emergence of the environmental movement, Dunlap and Van Liere (1978) noted that a significant paradigm shift occurred throughout the U.S. during the 1960s and early 1970s. The emergence of the environmental movement and resulting awareness within the general public began to directly challenge the dominant social paradigm, which had dominated our society's worldview, that nature was seen as a tool at the disposal of the human race. Surprisingly widely accepted, the "New Environmental Paradigm" that had begun to form during the early 1970s, combined ideas such as "balance of nature," "limits to growth," and "the need to

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reject the anthropocentric notion that nature exists solely for human use" (Dunlap & Van Liere, p. 10, 1978).

As the environmentalists were encouraging this new worldview and the public at large was beginning to accept these new ideas moving forward, Buttel and Flinn (1978) examined the relationship between political party identification and support for environmental protection. The study found no significant relationship between party affiliation and concern for the environment. The nonpartisan nature of environmental protection that was seen throughout the 1960s and early 1970s has been linked to multiple factors: (1) the environmental degradation was viewed as a large enough problem that the public believed that government involvement was required to provide the necessary resources, (2) the air and water quality were impacting people of all political affiliations, and (3) no direct threat to the U.S. economy or 'way of life' was identified by politicians or the general public when protective measures were put in place (Buttel & Flinn, 1978; McCright, Xiao, & Dunlap, 2014; McCright & Dunlap, 2011). It is these last two areas that have experienced the most change resulting in the current public and political conflict and debate surrounding environmental policy and protection.

Concern for environmental issues began breaking down along party lines as Hamilton (2011) found that Democrats who felt that they had a better understanding of climate change also perceived higher threat levels from it, while the opposite was true amongst Republicans. McCright and Dunlap (2011) and McCright, Xiao, and Dunlap (2014), found that political party affiliation and political ideology had a significant relationship with beliefs about and perceived threats from climate change. McCright and Dunlap (2011) conclude "the culture wars have thus taken on a new dimension, with serious implications for long-term societal resilience" (p. 180). McCright, Xiao, and Dunlap (2014) further examined the relationship between educational level

and amount of concern about climate change and environmental protection. While increased education led to an increase in concern in those who identified themselves as Democrats, the opposite was true for those who identified as Republicans. The presence of this relationship is a remarkable shift from the studies completed in the early 1970s and the authors argue that as the divide between political parties over this issue continues to increase, substantial impacts on policy will result in the coming years.

This divergence between the two major political parties in the U.S.[1] (Democratic and the Republican) political parties with regards to environmental policy in the U.S. can be traced to the mid-1990s. With the election of Bill Clinton to his first term as President of the United States, there was a small window of time in which Democrats controlled both the executive and legislative branches of the government. During this time, global warming was accepted as a problem that warranted government attention. However, in 1994, Republicans gained control of Congress and quickly began to push back against environmental policy and climate science. This period has been referred to as the "Republican Revolution" (McCright & Dunlap, 2011). During this time, political groups began to turn the issue of climate change from a scientific subject to a political wedge issue (Hamilton, 2011; McCright & Dunlap, 2011). This push was driven by media campaigns and the promotion of 'scientific research' that was presented directly to politicians and the public without going through the peer-review process. This campaign and the resulting shift in the influence of education on a person's level of environmental and climate change awareness demonstrate the "efficacy of media campaigns that provide scientific-sounding arguments… [to] reach educated but ideologically receptive audiences" (p. 239-40, Hamilton, 2011).

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[1] There are other political parties that exist in the U.S. (e.g, Green and Libertarian), however, due to low membership numbers they have not been considered in this paper.

The results of these most recent studies are cause for concern as they provide evidence contrary to the commonly held belief that increased education and increased understanding of environmental science and awareness of climate change will lead to increased pro-environmental attitudes and behaviors, and is something that should be kept in mind from the education perspective (McCright & Dunlap, 2011). Another important element of public perception of climate change is the continuous flow of new scientific information that is available to the public. Due to the fact that climate change is a global process that will continue to have a variety of impacts on different parts of the world for the foreseeable future, the research and information that is being put out by the scientific community will continue to change with it. While this is a normal and accepted reality within the scientific community, the shifts within the scientific community have the ability to instill doubt and mistrust in populations that do not fully understand the nature of science. McCright and Dunlap (2011) argue that the continuous flow of new information and new understandings of climate change will continue to increase the political divide because of the way in which a person filters and interprets new information is heavily influenced by political orientation and long held beliefs and values.

Influence of Politics on the Formal Education System

Historically, schools were designed to create factory workers and replicate current social conditions, rather than foster critical thinking and social inquirers (Stevenson, 2007). Within today's democratic society education plays a critical role. As a student progresses through school they are expected to not only acquire the necessary content knowledge and skills to become a productive member of society, they are also expected to gain the knowledge and skills that will allow them to participate in the democratic process effectively. However, these goals of education have led to a large amount of tension in the politics of education. As our society

continues to change and advance technologically, it becomes more and more necessary for our educational system to prepare our young people to meet increasingly complex challenging environments. However, the relationship between the education system and political systems make this critical shift a difficult, if not an impossible, task (Spring, 1993).

Spring (1993) describes the educational system of the U.S. and the politics within as a web of connecting intersections between governmental bodies, political parties, special interest groups, and experts. Within this complex web, decisions are multilayered as they are influenced by legislation and policies at the federal, state, and local levels. When examining the differences in political ideologies between the two major parties that exist in the U.S. a critical area of divergence that impacts education is the view on the size of the role that federal government should have when compared to state and local governments. The divide surrounding the role of the federal government and the growing political divide have a strong influence on whether or not environmental education is incorporated into school curriculum and also influence the specific content that is included and the manner in which content is presented to the students (McGinnis & Simmons, 1999; Elmore, 1997; Chapman, 2011).

While political ideology has a significant amount of influence on the curriculum and content that is presented in schools, the political debate and tension surrounding many important topics (often referred to as science, technology, and society (STS) issues or socio-scientific issues (SSI), including climate change) that will have large societal implications in the future puts large amounts of pressure on teachers and school administrators. In a study conducted by McGinnis and Simmons (1999), teachers reported that the controversial topics which they chose to include and/or exclude from their classrooms were heavily influenced by the political ideologies and values of the school administration and surrounding community. Therefore, while

a teacher may have felt that a certain topic was important for students to understand, they would often exclude it from the classroom curriculum due to community pressure. Elmore (1997) explains that the content that teachers present to their students is the result of the external political pressures placed on them by administrators and government officials.

In recent years, one of the largest political and financial incentives that have been driving schools is student performance on standardized tests. Standardized tests have not only become the most influential gauge of student performance, but also an evaluation of the competence of teachers and the school systems in which they operate (Elmore, 1997). Poor performance on these tests can result in significant changes in resources available to a school or school system and the ability for a school system to operate without significant intervention from government officials (Elmore, 1997; Spring 1993). In addition, standardized testing has historically focused on math, English, and language arts, and therefore teachers are incentivized to focus on these subjects while there is little time left to focus on science so that enough time is spent on content that will be tested (Bell et al, 2009).

Another significant tension within the public educational system is in the idea that education should remain neutral in its approach to all topics in order to present students with the necessary information to independently form their own ideas, opinions, and political views. Spring (1993) refers to the idea of neutral knowledge as flawed on multiple levels. First, a neutral, independent third party does not produce educational materials, such as textbooks. The textbook industry is a multimillion-dollar industry that is profit-driven and shaped by political forces (Spring, 1993). When a textbook is created it must be 'marketable' to a specific target audience or state to which a company wishes to sell the book. Second, the idea of 'neutral knowledge' places teachers and school administrators in an exceedingly complex and unrealistic

situation. The idea that knowledge can be taught in a completely neutral and unbiased manner suggests that teachers have the ability to separate themselves from their own ideas, values, and beliefs; this is not possible. Sadler et al. (2006) argues that while it is inevitable for teachers to express their own values while teaching, the teacher must make a decision whether their values are expressed explicitly, or to hide them – expressing them implicitly.

In April 2013, the publication of the Next Generation Science Standards (NGSS) became an important step toward ensuring that our students are better prepared to understand and address the issue of climate change as they develop into the future leaders of our society. The NGSS are the first set of national science standards to explicitly include the topic of climate change (Hestness, McDonald, Breslyn, McGinnis, & Mouza, 2014). The NGSS are also unique in that while past national science standards and benchmarks were created and published to act as a guide for individual states as they developed their own standards, the NGSS were developed with the intention of being adopted in their entirety (Pruitt, 2014). Since its publication, 17 states and the District of Columbia have adopted the standards and begun the process of implementing them in their schools systems (Workosky, 2016). Pruitt (2014), who served as the coordinator of the development of the standards, explains that recent research conducted on science education was one of the driving forces in how the standards were constructed:

> *"In embracing science education research, the NGSS represent performance expectations (PEs) that require all students have a deep understanding of smaller disciplinary core ideas (DCIs), are able to show evidence of that knowledge through scientific and engineering practices, and connect crosscutting concepts across disciplines." (p. 145)*

While the NGSS have been developed to bridge the gap between education research and education practice, the research community has critically examined the inclusion of topics such as climate change, which includes discussion of sustainability. Feinstein and Kirchgasler (2014) examined how the NGSS define and frame the discussion of sustainability and discuss the implications on students' understanding of such a complex and dynamic topic.

An examination of education standards and practices in their historical context reveals that the way in which science education has framed the relationship between humankind and nature is a reflection of "the anxieties and priorities of the times" (Feinstein & Kirchgasler, 2014, p. 122). The NGSS are following the same pattern. Currently, the most visible discussion and debates surrounding climate change and sustainability have occurred in the context of politics, science, and technology. This has resulted in the emergence of 3 major themes: universalism, scientism, and technocentrism. The focus on these themes, which are also reflective of current trends in the natural sciences, fails to present the social and ethical complexities that are critical in the discussion of sustainability (Feinstein & Kirchgasler, 2014).

Informal Environmental Education

Informal education, as described by Bell et al. (2009), is "characterized as learner-motivated, guided by learner interests, voluntary, personal, ongoing, contextually relevant, collaborative, nonlinear, and open-ended." In order to be successful, many of the current environmental education takes place in informal settings. Many organizations operate with the goal of fostering personal connections between participants and the environment to encourage pro-environment behaviors and attitudes.

Environmental education has changed as our relationship to the environment has evolved. When the U.S. was an agrarian society, people would naturally develop a knowledge base about

the natural world through participation in activities such as "farming, gardening, and brewing alcohol" (Bell et al., 2009). Today, members of our urbanized society have a much different relationship and understanding of the natural world. As this relationship has changed, so has the nature of environmental education. Rather than occurring naturally through everyday tasks and experiences, environmental education, in a majority of the country, requires the creation and development of a personal connection to the natural world so that participants will be more inclined to development pro-environmental behaviors and attitudes (Stevenson, 2007).

Environmental education has had a similar evolution as our political ideology to environmental concerns. In the late 1960s and early 1970s, environmental education was widespread in schools for the same reason that it was supported by politicians from both sides of the aisle. The content included in the environmental education curriculum did not "challenge the socio-economic or political fabric" (Heimlich, 1993; Stevenson, 2007). When the shift began to occur in politics it was reflected in our schools. As with the formal education system, the field of environmental education is heavily impacted by politics and the political divides that exist in the U.S.

The increasingly partisan nature of environmental protection and environmental policy and the political discourse has had a significant impact on the field of environmental education and increased the level of scrutiny being used to evaluate these programs. Although the field has worked to create rigorous standards and improve methodologies, the field will continue to be controversial and to have its political critics (Holsman, 2001).

While politics and the overall political climate impact the field of environmental education from the outside, changes in the political and public spheres have also sparked debate and discussion as to what the overall goals should be and how best to reach those goals within

the field. One of the dominant arguments is that environmental education needs to reach beyond a focus on short-term environmental problems and the 'immediate environment' (i.e., park or beach cleanups) (Tilbury, 1995). Rather, there has been a push to create environmental education with the ultimate goal of sustainable development (i.e., global warming) (Jickling & Walks, 2008; Tilbury, 1995). Environmental education for sustainable development differs from the current manifestation of environmental education in that it actively engages with both the politics and policies behind education and environmental protection, rather than trying to reach the 'goal' of neutral knowledge as is expected in the formal education realm.

Scholars argue that it is necessary for environmental education to been seen, addressed, and evaluated in its political context to create an environmental education for sustainable development. Holsman (2001) explains that attempting to understand and critique environmental education while removing it from its political context puts the field at a disadvantage. Similarly, Tilbury (1995) argues that achieving and maintaining sustainable development will require the "development of politically literate individuals." This vision of environmental education requires that students are not only aware of environmental issues, but also possess the ability to engage in the political discourse surrounding environmental protection and policy. The environment has developed into such a political wedge issue over the last few decades that environmental education is inherently political and students should learn all the necessary knowledge and skills to be able to separate and understand the scientific and political arguments and foster not only scientific understanding but also a "commitment to activism" (Stevenson, 2007; Hodson, 2003).

Bridging Informal and Formal Education

In response to the publication of the NGSS, the need for educators to be able to effectively provide climate change education significantly increased in the states that have

chosen to adopt the standards. After an analysis of the standards and current literature, Hestness et al (2014) argue that a lack of confidence about teaching climate change was a critical factor for teachers. In order to address the concerns that teachers expressed, a model for professional development was provided. This model focused on the collaboration between educations from both formal and informal institutions, as well as scientists, and education researchers. The collaboration allowed the educators to practice and receive feedback from colleagues before bringing the lesson to the classroom. In order to help educators present lessons that were more engaging for their students, the professional development model also focused on addressing climate change "through the lens of regional observations, with the goal of supporting learners in constructing explanations about climate change relevant to their own lives and communities." (Hestness et al, 2014, p. 325).

Within the U.S., the vast majority of the debate that surrounds education is about the formal education system that spans primary and secondary grades. However, the average person in the U.S. only spends "between 14% and 18% of their waking time in school," therefore limiting the debate and discussion regarding education to the formal education system is neglecting over 80% of the potential learning time that a person has throughout their lifetime (Riedinger & McGinnis, 2017). With all of the challenges and barriers that the formal education system must navigate it is clear that "schools cannot act alone," especially in regards to science instruction (Bell et al., 2009). One way to create and foster more meaningful and holistic science learning opportunities and alleviate some of the pressure that is being placed on the formal education system is to bridge the gap between formal and informal education sectors is by creating communities of practice (U.S. Department of Education, 2016).

The relationship between these different learning environments is currently "unclear and contested" which acts as a significant challenge in creating holistic learning communities (Bell et al., 2009). By establishing clear connection between informal and formal education settings, students could actively engage with their community while still in the formal educational system and would become life-long learners, becoming more aware of learning opportunities long after they leave the formal education system. By challenging the learning paradigm, blurring the sharp distinctions between formal and informal learning and the settings in which an educational experience takes place, learning is positively impacted (Eshach (2007.) By combining informal and formal education, educators can take advantage of the benefits that each provides and present a more holistic picture of the complexities of real-world problems (Dorie & Tal, 2000). While informal environments are driven by learner interest and create more personal learning experiences, the formal environment can "create a frame for the transfer of knowledge" which helps ensure the learner acquires the knowledge and skill sets that are deemed valuable by society (Holsman, 2001; Bell et al. 2009). Informal education also has the benefit of being able to reach people of all ages and appeal to a range of intelligences (ex. interpersonal, spatial, musical, and intrapersonal) and learning styles. Constructing bridges between the formal and informal education allows for those no longer in the formal system to better recognize and engage in learning opportunities when they present themselves (Eshach, 2007). While the development of communities of practice is beneficial for STEM education as a whole, there are particularly significant benefits specifically for the field of environmental education.

Dorie and Tal (2000) described a model for a mixed formal and informal STS curriculum in which student's engaged with relevant societal issues in school, their community, and local industry. By using an STS topic in a curriculum that integrated learning outside of the school

setting and school hours and engaging with community members, students were able to gain a more sophisticated view of the environmental problem they were engaging in, asked more questions, and internalized the issue being addressed (Dorie & Tal, 2000). Along similar lines, Payne (2006) calls for an environmental education curriculum in schools that is more reflective of their informal counterpart, in that students should actively engage in the reflexive process and examine their behaviors and attitudes and the impact that they have on the problem that is being addressed. McGinnis et al. (2012) highlights that it is not only the student that can benefit from the integration of the formal and informal science education sectors; there can also be important benefits for the preparation of pre-service teachers as well. The teacher candidates engagement in informal learning and teaching experience can also help boost their own interest and engagement with science content and inquiry (McGinnis et al, 2012). By boosting the confidence and knowledge of pre-service teachers surrounding complex issues such as climate change will increase the effectiveness when engaging their own students in the same topic.

Now, more than ever, there is a need for developing effective STEM and environmental education. As Hodson (2003) explains, "for the first time in history, we are educating students for life in a world about which we know very little…" (p. 648). Our society is facing an environmental crisis on a global scale, which can be difficult for people to understand. We are currently at a critical crossroad where our traditional economic and societal values are in direct conflict with the future ecological health. For our society to be able to work toward a solution successfully, we must expand our definition of education and build larger and more comprehensive educational communities to foster a more holistic approach and truly embrace the idea of life-long learning.

Implications and Conclusions

Climate change is quickly becoming a defining issue of our generation. However, the 2016 presidential election highlighted the increasing political divide that has formed around the issue. Since the beginning of the environmental movement in the 1960s, the increasing connection between climate change and what is perceived as the economic well being of the U.S. has resulted in climate change becoming a political wedge issue at the center of public debate, rather than a scientific issue (Hamilton, 2011; McCright & Dunlap, 2011). The strong link between climate change and politics has had a substantial impact on the ability of the formal education system to bring the subject into the classroom, with increasing pressure on teachers to present 'neutral knowledge' and separate content from the political debates that occur outside of the school (Spring, 1993). While the inclusion of climate change in the NGSS is an important step in teaching climate change to students, the standards have only been adopted by 17 states across the U.S. (Workosky, 2016). Similarly, the adoption of standards that include climate change content are only targeting students who are currently in grades K–12. At the rate in which the effects of climate change are beginning to occur, the U.S. needs to begin actively working toward solutions.

Informal environmental education is a field that has the potential to have a significant impact on the ways in which the U.S. deals with climate change. Environmental education, especially the topic of climate change, is an inherently political and controversial issue, due to the association between corporate and community environmental practices and economic growth. The variety of environments and contexts in which informal environmental education occurs, allows the field to reach people of all ages and from different parts of the country. The increased flexibility in informal learning environments is beneficial in that experiences are initiated by learners, are learner centered, non-threatening, and conducive to the formation of

personal connections. These experiences create more lasting and meaningful memories from the experience (Bell, Lewenstein, & Feder, 2009). Heimlich (1993) argues that if we accept the "assumption that learning is a natural activity," then the goal of informal education is to "enhance the human nature of inquiry" (p. 4). He goes on to explain:

"The success of [an informal] environmental program resides with the true responsiveness of the program to the needs and wants of the learners, not the perceived wants and needs of the learners by the institution or by the individual educator." (p.5)

The MADE CLEAR Learning Sciences Team at the University of Maryland has taken many of these ideas into account in the development of lesson plans to engage pre-service teachers with the topic of sea level rise (see appendix). Throughout the three sessions participants not only learn the scientific concepts that are involved in sea level rise, they also engage in place based reflexive practice. One of the most important features is the final session of the curriculum. During this lesson participants use what they have learned and observed to help them transition to a global perspective. By transitioning to a global perspective participants are introduced to topics such as climate justice and economic implications, both of which have strong ties to the current political climate.

It will become increasingly necessary to widen our definition of education. Developing 'life-long learners' is often discussed as one of the goals of our educational system, but there is limited discussion in making meaningful and lasting connections between the formal education system and the field of informal education, especially for those who are no longer in school. With the rate at which our environment will be changing in the coming years and the continued development of the political divide concerning environmental policy, informal environmental education is at a critical intersection, to both help create a climate-literate and politically literate

population. Forsyth (2009) explains the necessity of being able to see "the evolution of environmental facts and knowledge" as a piece of the debate and discussion that is taking place, rather than a starting point for environmental debate (p.1). The development of political literacy through the topic of climate change has the ability to begin to heal the political divide that has been created in our society.

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