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Environmental Educators’ Perceptions of Inaugural Louisiana State Department of Education Environmental Education Standards and Accompanying Environmental Education Endorsement Plan: A Multiple Case Study Approach

Abigail Greer
Louisiana State University and Agricultural and Mechanical College

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ENVIRONMENTAL EDUCATORS’ PERCEPTIONS OF INAUGURAL LOUISIANA STATE DEPARTMENT OF EDUCATION ENVIRONMENTAL EDUCATION STANDARDS AND ACCOMPANYING ENVIRONMENTAL EDUCATION ENDORSEMENT PLAN: A MULTIPLE CASE STUDY APPROACH

A Thesis

Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Master of Science

in

The Department of Agricultural and Extension Education and Evaluation

by

Abigail Ann Greer
B.S., Clemson University, 2020
December 2022
DEDICATION

I would like to dedicate this thesis to my late mentors, Latongia Pepper and Greg Cornwell. To Latongia for passionately exemplifying the gold standard of nonformal education to me from such a young age, and to Greg for fostering my knowledge of natural resources through his mentorship in my early career. I am forever inspired by and thankful for you both.
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# TABLE OF CONTENTS

DEDICATION ................................................................................................................ii

ACKNOWLEDGEMENTS ..............................................................................................iii

ABSTRACT ..................................................................................................................vi

CHAPTER I. INTRODUCTION .......................................................................................1

CHAPTER II. REVIEW OF LITERATURE ....................................................................15

CHAPTER III. METHODOLOGY ..................................................................................54

CHAPTER IV. FINDINGS .............................................................................................72

CHAPTER V. CONCLUSIONS, DISCUSSION, AND RECOMMENDATIONS ..............94

APPENDIX A. IRB APPROVAL ..................................................................................123

APPENDIX B. CONSENT FOR PARTICIPATION .........................................................125

APPENDIX C. INTERVIEW PROTOCOL ...................................................................127

APPENDIX D. HISTORY OF ENVIRONMENTAL EDUCATION OFFICE OF LOUISIANA .................................................................130

APPENDIX E. KEY PRINCIPLES AND CONCEPTS IN ENVIRONMENTAL EDUCATION ..................................................................................135

APPENDIX F. LOUISIANA ENVIRONMENTAL EDUCATION ADVANCEMENT PLAN APPLICATION .................................................................................141

REFERENCES .............................................................................................................146

VITA .............................................................................................................................170
ABSTRACT

Increasing environmental literacy through environmental education is an integral approach to fighting many of the environmental challenges facing Louisiana. The State Department of Education in Louisiana has released two initiatives to increase environmental literacy in the state while incorporating nonformal environmental education into formalized k-12 education. The first initiative is a set of Key Principles and Concepts (KPCs) in environmental education, which is aimed at providing standards to nonformal environmental educators in Louisiana. The second initiative, the Louisiana Environmental Education Advancement Plan (LEEAP), accompanies the KPCs and provides an opportunity for nonformal environmental education organizations to achieve endorsement through partnership with the Louisiana State Department of Education based on the degree to which the KPCs are met by the organization.

This multiple case study investigation centered on the perceptions of nonformal environmental educators across Louisiana when presented with the two Department of Education initiatives. Nine educators were represented in this study, each of whom participated in one of three focus groups with their peers. Participants were asked about perceived needs, opportunities, and challenges arising from the introduction of the KPCs and LEEAP. Focus group transcripts were analyzed using rigorous qualitative data analysis, resulting in six emergent themes: 1) strong sense of servitude, 2) changes in recruitment and retention, 3) desire for connectivity, 4) unknowing optimism, 5) overwhelmed and outvoiced, and 6) comfort with pillars of formal education. These findings indicate that environmental education is systemically undervalued in Louisiana. Because of this, organizations are experiencing challenges in recruitment and retention, difficulties with reaching enough of their communities, and meeting resistance when trying to find space for their programming in k-12 curriculum schedules. Given these challenges,
I recommend the incentivization of partnerships between formal education institutions and their employees and nonformal environmental education organizations. Furthermore, I encourage the reformation of a professional association for environmental educators to facilitate collaboration. Finally, I recommend the involvement of nonformal environmental educators in the development of additional resources and initiatives, and the continued monitoring of adoption and implementation of current initiatives to evaluate success and address needs as they arise.
CHAPTER I. INTRODUCTION

Background of the Problem

Louisiana has historically faced unique environmental and natural resource management challenges. Threats such as coastal land loss (Penland et al. 1990; Roy et al. 2020), wetland salinization, draining and consequent flooding (Boesch et al. 1994; Dahl 2000; Maret & Blakeman 1970), encroachment of invasive species (Oswalt 2010; Sasser et al. 2018), poaching of endangered species (Harrell & Bidwell, 2014), as well as heavy reliance on both commercial fisheries operations (Guiry et al., 2021; Louisiana Seafood, n.d.) and waterfowl hunting revenue (Gan, 1993) have all impacted Louisiana in numerous ways.

These threats to Louisiana's ecosystem have directly impacted Louisiana's economy, as well as coastal preservation and recreational opportunities in the state. To combat these environmental issues, there is an increased need for effective environmental education, which allows learners to become environmentally literate and ultimately act as stewards of the natural world. One solution to tackling environmental educational challenges has been the introduction of environmental education within all levels of public education. Providing students with environmental education concepts throughout their education helps to create an understanding of the human role in the environment. Beginning in 2022, Louisiana developed a new approach to environmental education. These changes included the release of an inaugural set of state environmental education standards, the release of a state environmental literacy plan, and the implementation of an endorsement system for nonformal environmental education institutions throughout the state. It is imperative to understand the nonformal educational landscape in the face of these changes, which have occurred across both the formal and nonformal education sectors.
Environmental Education (EE) has been defined as, "a process that helps individuals, communities, and organizations learn more about the environment, and develop skills and understanding about how to address global challenges" (North American Association for Environmental Education [NAAEE], n.d.a). Environmental education encompasses a multitude of topics ranging from entomology to climate change and serves as a pipeline to help address issues in environmental education at the state and national levels.

**Environmental Issues in Louisiana**

Coastal land loss in Louisiana has threatened the state's coastal and wetland ecosystems for decades. However, awareness of this issue went largely unaddressed within the educational curriculum until 2009 when a study identified Louisiana’s coastal and environmental curriculum across grade school to be ranked most adequate out of the Gulf states, with Texas not being considered within this study (Clary & Brzuszek, 2009). This study identified that Louisiana environmental education curriculum was adequate but recommended further development and integration of environmental curriculum for all grade levels. Primarily, knowledge and awareness of coastal issues has been inconsistently passed from generation to generation depending on the personal salience of the issue, as well as through media coverage of changing coastal characteristics and natural and manmade disasters (Burley et al., 2007). Coastal and wetland loss awareness was hypothesized to be primarily a focus of individuals who live and work within a close proximity to the coast (Burley et al., 2007) despite these issues directly impacting areas across the entire state.

Already, coastal residents in Louisiana have adapted to the increase in flooding, decrease in land mass, and threats to livelihoods. However, for some areas, a total loss of these communities may be inevitable with some sinking at rates close to half an inch per year.
(Grambling & Hagelman, 2005; Penland & Ramsey, 1990). For example, Louisiana is home to the United States’ first climate refugees (Van Houten, 2016), with the Isle de Jean Charles, an American Indian settlement south of La Place, largely evacuated in the early 2000’s due to the effects of coastal loss (Burley, 2010). Losing land to sea rise and erosion is a threat to human infrastructure, wildlife, fisheries operations, plant communities, and inland communities all throughout Louisiana. Saline systems exist along the coast as an important buffer between brackish systems and the freshwater systems slightly more inland, but the encroachment of saltwater into these wetland buffer zones has harmed and even eliminated freshwater systems and specialist species (Salinas et al., 1986). This encroachment, in turn, has led to a domino effect for species relying on coastal specialists, creating a much larger impact outside the immediate area of degradation. Destabilization of Louisiana's coastline and coastal marshes remains a pressing environmental issue with even the most optimistic outlooks foreseeing grim consequences without the proper intervention (Chmura et al., 1992).

Flooding in Louisiana is not isolated to extreme weather events such as hurricanes. Instead, flooding has become a regularly occurring issue for many parishes both coastal and inland, causing massive amounts of damage to infrastructure, loss of human life, and erosion of sediment (Li, 2020; Upton, 2017). The presence of impervious surfaces such as parking lots and new construction, specifically in Louisiana, has proven to increase the number of environmental problems urban areas experience (Johnson, 2004). Additionally, the loss of wetlands, both through manmade and natural forces, has contributed to flooding severity in recent years by robbing the Louisiana landscape of its natural defenses (Tibbetts, 2006). Beyond the infrastructure damage and loss of human life due to flooding, the consequent change in hydrology has damaged ecosystems by causing an influx of saltwater (Shaffer et al., 2016) or
inundating ecosystems that lack the vegetation to survive prolonged saturation of soils (Cooper et al., 2019).

Due to the unique nature of Louisiana's hydrology and climate, the state and surrounding areas are particularly hospitable to invasive species introduced through heavy shipping activity along the Mississippi River. Further, the frequent landscape disturbances caused by flooding and hurricanes give way for invasives to colonize (Tulane/Xavier Center for Bioenvironmental Research, n.d.) with some of the more notable invasives including nutria (*Myocastor coypus*) and Chinese tallow (*Triadica sebifera*). Nutria, while originally introduced to solve a deficit in the fur demand from the overhunted native muskrat (*Ondrata zibethica*), have now become powerful forces of destruction in wetland ecosystems (Bernard, 2002). Chinese Tallow was introduced to the Gulf Coast in the 1900s to assess its viability as an agricultural crop (Bruce et al., 1997). Since then, the invasive woody species has moved into and taken over native habitats. Introductions such as these were a product of poor management decisions and a public lacking environmental literacy (Holm et al., 2011).

**Brief History of Environmental Education in United States**

Environmental education can be traced back to early philosophers’ musings on human connections to the natural world (Madigan, 2008). At the time, people had not yet begun to use the term environmental education but were instead advocating for the study of nature and the natural world (Jack, 1978). This type of philosophical study was seen in the writings of Ralph Waldo Emerson and Henry David Thoreau, both 19th century authors well-known for their musings on mans’ interactions with nature and the tendency to find problems to more complex solutions whilst spending time outdoors (Walden Woods Project, 2015). These early voices
focused on social issues through the lens of nature. Soon, a boom in ecological challenges affecting daily life would demand a shift to environmental problem solving (Banks, 1950).

The rise of environmental education began following observations of environmental challenges, degradation, and changes in resources following the second world war (García-Barrios & Taylor, 1992). The United States lagged behind European EE, largely due to greater levels of European population densities, urbanization, and the environmental impacts of World War II and recovery (Kline, 2002). The International Union for Conservation of Nature emerged shortly after in 1948, flanked in time by many influential environmental figures such as Aldo Leopold, Rachel Carson, and Gifford Pinchot. These voices spoke out about responsible natural resource management, pollution, sustainability, and early red flags emerging in the environment such as extinction. This influx of commentary on the environment did not have an immediate effect, but instead preceded some of the lowest points of the United States’ relationship with the environment. As stated by Kline (2022):

As victors in the world conflict, Americans thought they deserved improved living standards and material comforts. Conservationists struggled as the nation focused on these expectations rather than on environmental concerns. The public at large did not begin to comprehend the environmental damage caused by two hundred years of uncontrolled industrial expansion until the mid-1960s. At that point, historian Roderick Nash explains, Americans focused their attention on environmental issues, but with different priorities, as the proper-use concepts of the past were being replaced with a more altruistic view of nature. (p. 79)

In the 1960’s and 1970’s, environmental challenges became hard to ignore. Bodies of water catching fire, deadly air pollution, and large-scale oil spills became more common
(Kirkpatrick, 2019) and as America witnessed these disasters, the overall environmental consciousness grew (Morrissett & Wiley, 1971). With that, a rise in EE legislation occurred throughout the 1970’s (Rocchio & Lee, 1973). Curriculum development however, trailed behind (Hungerford et al., 1980). Despite conflicting political views of presidential administrations throughout the 80s, 90s, and 2000s, environmental education remained integrated into formal education in a variety of capacities (Carter et al., 2010).

More recently, the United States began facing new environmental challenges that called upon government, educators, advocates, and citizens to reevaluate their role in environmental management (Sola, 2014) at a time in which many were further removed from nature than ever before (Louv, 2008). Nonformal environmental education has increased since the turn of the 21st Century but has faced the same ever-growing ecological challenges as formal education (Breslyn et al., 2016), which increased the demand for effective environmental education (Varela-Candamio et al., 2018).

**Brief History of Environmental Education in Louisiana**

Environmental education in Louisiana largely trailed behind the greater movement seen in the United States throughout the 20th Century. The history of the environmental education movement in Louisiana has been condensed into a brief history written by classroom teacher Claudia Fowler, founding member of the Louisiana Environmental Education Association (Appendix D). The earliest coordinated effort to address the issue of environmental education in Louisiana occurred in 1990. That year, a group of science teachers tasked with teaching environmental education in formal classroom settings banded together to create the Louisiana Environmental Educators’ Association (LEEA) (Fowler, n.d.). This association aimed to provide a network of environmental educators that would allow for collaboration, exchange of resources,
and perhaps most importantly a unified voice. In 1993, LEEA advocated for the creation of the Louisiana Environmental Education Commission (LEEC) to members of the Louisiana state legislature. Following the passage of the act that created LEEC in 1993, the commission assessed the current environmental education landscape in Louisiana through a survey in partnership with Louisiana State University (Fowler, n.d.). From the responses of 3,169 participants ranging from high school teachers to middle school students, this survey indicated a dire need for environmental education measures in the state to be improved. Notably, formal educators in this survey recognized the need for collaboration with agencies and organizations that facilitate nonformal environmental education. With the findings of this survey, the original legislation was amended to remove the sunset date for LEEC. This established LEEC in a more permanent way, allowing it to address the issues identified in the study.

In 1995, the Louisiana Environmental Education Commission helped to draft legislation that created the Office of Environmental Education within the Louisiana Governor’s Office. Within the legislation that allowed for the creation of this office, was verbiage that incorporated environmental educators from LEEA into the LEEC board of representatives (Fowler, n.d.). The commission, after, “studying similar programs in other states”, (Fowler, n.d.) requested legislation to be drafted that allowed for funding for the Office of Environmental Education to be derived from sales of a prestige license plate. While this funding program was similar to those in other states used to fund environmental education (Snyder, 2016), Louisiana was unique in that it had an environmental education specific license plate, which allowed proceeds to go entirely to the office or department that hosted LEEC (Fowler, n.d.). In addition to establishing a prestige license plate, Governor Mike Foster provided seed money in 1997 to help establish the Office of Environmental Education (Fowler, n.d.). Following the hiring of Gwen Emick as the first
program coordinator, the commission launched a media campaign in 1998, used to raise awareness for the commission as well as the prestige license plates. Fowler noted that the campaign was extremely successful in creating media awareness of the commission and the availability of license plates for purchase (n.d.).

During the establishing years of LEEC, LEEA increased in membership. The first annual LEEA symposium was held in 1996. For several years, LEEA and LEEC worked towards their respective goals of connecting environmental educators and their resources and improving environmental education through state-level action. LEEC was soon transferred via the passage of Senate Bill 365 which created another temporary home for the commission within the Louisiana Department of Wildlife and Fisheries (S.B. 365, 2008 Leg., Reg. Sess. (La. 2008)).

Most recently, LEEC was incorporated into the Louisiana State Department of Education (LDOE) in 2019 with the passage of House Bill 501 (H.B. 501, 2019 Reg. Sess. [La. 2019]) while The Louisiana Environmental Educators Association became inactive in 2015 (Louisiana Environmental Education Association, 2015).

Following the disbandment of LEEA, LEEC began efforts to create an Environmental Literacy Plan (ELP) specific to Louisiana in July of 2020 (Louisiana Environmental Education Commission, July 2020. p. 1). State-specific ELP’s are encouraged by NAAEE to help further environmental literacy through the integration of EE into k-12 curriculum (Bodor, 2020). As of the February 2022 LEEC meeting, the state ELP was still in progress (LEE, February 2022. p. 1).

As LEEA began to disband, LDOE embarked on an initial attempt to catalog the environmental education providers in the state via a survey completed in cooperation with EcoRise, a non-profit environmental education organization out of Austin, Texas. The work of
EcoRise centers around environmental education improvements using a variety of strategies such as professional development, program mapping, free and for-purchase curriculum, and city partnerships (EcoRise, 2022). An online dashboard, hereafter EcoRise dashboard, was the product of this collaboration between LDOE and EcoRise consultants. The EcoRise dashboard depicted the findings from a statewide survey aimed at nonformal environmental education programs. Findings cataloged and categorized programs across the state, as well as several in the neighboring states of Texas and Mississippi by several criteria: age group served, rural community access, regional location, area served, sector, program themes, and program location (“LDOE EcoRise Dashboard”, n.d.). Those seeking nonformal environmental education programming could toggle the criteria to identify the program(s) that best fit their needs.

The EcoRise dashboard noted 45 organizations as providers of nonformal environmental education spread across nine regions of Louisiana with an additional three providers identified in Mississippi and Texas. The information featured in the EcoRise dashboard was collected via survey and the educational providers self-identified which descriptors best fit each criterion. The dashboard noted no environmental education providers in three of the nine regions of Louisiana. The EcoRise dashboard, while well-intentioned, failed to represent the environmental education offerings accurately and thoroughly in the state. Per LEEC’s July 22nd, 2020, meeting minutes, Gina LaMotte, an EcoRise representative, identified several gaps in the data reflected on the dashboard (LEEC, July 2020. p. 2). Thus, LDOE began to pursue further efforts to become involved with the environmental education offerings in the state.

The first initiative from LDOE aimed at enhancing environmental education in Louisiana was the Key Principles and Concepts (KPCs) in Environmental Education, released in mid-2022. The five principles each covered an overarching statement summarizing an environmental
education concept and were accompanied by a clarifying statement. The principles were broad in nature and did not contain information specific to Louisiana, but instead focused on concepts applicable to all landscapes and populations. The KPCs, as posted on LDOE’s website in October of 2022, lacked information about how to apply them. However, through personal communication with LDOE representatives and attending LEEC meetings, it is understood that the KPCs were intended to inform nonformal environmental educators on standard concepts about which formal educators are seeking programming. The KPCs resembled standards that would be used in other subject areas but are optional to adopt. LDOE has conducted a series of professional development workshops to introduce these KPCs to nonformal environmental educators (S. Necaise, personal communication, September 22, 2022).

To accompany the KPCs, LDOE developed the Louisiana Environmental Education Advancement Plan (LEEAP). This plan worked in tandem with the KPCs by allowing environmental education organization to apply for a partnership with LDOE in which they are evaluated on their implementation of the KPCs. This evaluation can lead to an endorsement from the state department of education that declares the organization as a provider of “high quality” programming. Upon beginning this investigation, the LEEAP application was released to environmental educators in the state. However, the plan has since been paused due to staffing changes within LDOE (S. Necaise, personal communication, September 22, 2022). The first cohort of applicants was not yet chosen at the time the program was halted. Notably, an element of the LEEAP was potential funding from LDOE for the environmental education organizations seeking endorsement.
Effective Environmental Education

Academic subjects each require their own best-practice strategies to effectively engage and educate students, and environmental education is no different. Hands-on education, and more specifically hands-on science education has been widely researched and described as an essential component of quality educational experiences. As Flick (1993) explained, effective hands-on science education, "...involves instructional interventions that engages and maintains student interest." (p. 1). Further, Flick (1993) asserted that hands-on approaches are especially appropriate when demonstrating complex processes. This was especially applicable to environmental education as it consisted of understanding processes and evaluating changing outcomes, such as growth, reproduction, population dynamics, plant communities, immigration, emigration, and assessing human impacts on the environment. A study regarding the effects of hands-on environmental science education in a preschool setting found interactions with natural environments, materials, and processes encouraged children to ask questions, make observations, and problem-solve (Inan & Inan, 2015). Combining hands-on educational approaches with environmental concepts is a start, but the demanding nature of our ever-changing environment called for up-to-date environmental education across educational sectors.

Demand for Effective Environmental Education

Environmental education, unlike math or language, has encouraged learners to become practitioners regardless of their career goals (Merenlender et al., 2016). One may be able to avoid utilizing specific knowledge or skills in their daily lives but avoiding an impact on the environment is near impossible. Environmental choices are everywhere, from choosing what car to purchase, to bringing reusable bags to the grocery store – even in how one votes. Voting has been identified as one of the more impactful actions citizens can take to practice environmental
stewardship, but the combination of understanding environmental processes and legislation was often a barrier to exercising the right to vote despite many citizens understanding environmental issues to be pressing (Sciarini et al., 2007). Calls for better environmental education have been at the forefront of efforts to inform environmental issues voting (Beierle, 1999). Without an informed citizen base, environmental issues will continue to be contentious and misunderstood.

In a 2019 study of California coastal educators, findings indicated that the integration of formal and nonformal environmental education was imperative to achieving the nebulous goal of creating environmental stewardship within learners (Purcell, 2019). These findings helped solidify the unique challenge environmental education poses to educators, specifically, that not only does the subject matter need to be transmitted to learners, but that it must be applied in order to be effectively learned. Therefore, the role of environmental educators is inherently two-fold due to the nature of the content that is taught. Purcell (2019) noted the role of nonformal coastal educators and the centers in which they work as that of change agents affecting professional development, knowledge formation, and effective content delivery.

There are many critiques to the modern environmental education structure. Some notable points have included the overemphasis of humans and their needs in the environmental equation as opposed to a total-ecosystem approach (Taylor, 2017), the tendency of environmental education to promote awareness instead of more needed environmental responsibility (Omoogun et al., 2016), and the exclusion of demographic groups such as women, the LGBTQIA+ community, and urban youth through traditional education methods (Bellino & Adams, 2017; Gough & Gough, 2003; Gough & Whitehouse, 2018). Furthermore, the standards movement, characterized by the push to regulate education across states via the distribution of
standards for almost all subjects, has proven difficult for the discipline of environmental
education to adapt to (Andres, 2005).

Most recently, following the COVID-19 pandemic, calls for environmental education
have underscored the intertwined nature of humans with their surroundings. A study by Casas et
al. (2021) explored this concept further, categorizing certain environmental topics such as
climate change and pandemic prevention as risk communication. With this framing, it is clear the
need for effective and up-to-date environmental education applies to the global community. As
Louisiana moves towards implementing environmental education into public education
standards, it is important to be attentive to the needs of facilitators of environmental education in
the state, the effects these changes have on programs, and the outcomes of standardizing
environmental education. This study aimed to focus on the effects of these changes on those who
facilitate nonformal environmental education. The goals of this study were to understand the
perceptions and needs of nonformal environmental educators in Louisiana as they encounter
changes in state education standards, a nonformal program endorsement system, and the release
of a state environmental literacy plan.

Limitations and Assumptions

Limitations

The responses to this study are not representative to all Louisiana environmental education
professionals and can only be generalized to the individuals who elected to participate in the
study.
Assumptions

It was assumed the professionals in the study were knowledgeable about these aspects of environmental education and were able to report accurately on the needs of educators and the challenges and opportunities related to environmental education within the state.

Definitions

**Environmental Education (EE):** “…a process that allows individuals to explore environmental issues, engage in problem solving, and take action to improve the environment.” (Environmental Protection Agency, 2022a)

**Natural Resources:** Anything naturally occurring within the biosphere, including fish and wildlife. Can be consumed or used, may be renewable.

**Environmental Justice:** “…the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.” (United States Environmental Protection Agency, 2022b).

**Interpreter:** “A person who employs a mission-based communication process that forges emotional and intellectual connections between the interests of the audience and meanings inherent in the resource.” (National Association for Interpreters, n.d.).

**Environmental Literacy:** “[An environmentally literate person] makes informed decisions concerning the environment; is willing to act on these decisions to improve the well-being of other individuals, societies, and the global environment; and participates in civic life.”, (Maryland Association for Environmental & Outdoor Education, n.d.).
CHAPTER II. REVIEW OF LITERATURE

Brief Summary of the Need for Environment Education Nationally and in Louisiana

In the years leading up to 1989, Washington was a leading apple producer for the United States (United States Department of Agriculture, 1990). In 1989, Washington apple farmers and consumers fell victim to a lack of agricultural literacy that caused a widespread loss of crop and revenue. Alar, also known as daminozide, was a chemical widely used from the late 1960’s to 1989 to slow the ripening of fruit so that it can last long enough after harvest to make it to market (Egan, 1991). Despite its usage for many years prior to 1989, Alar became the target of public scrutiny following a non-rigorous and possibly corrupted report released by the Environmental Protection Agency in February of 1989 (American Council on Science and Health Staff, 1999; Bidinotto, 1990). Following the release of this report, Alar was functionally banned from use in commercial fruit production and products made from fruits that were exposed to Alar during their lifespans were removed from shelves. Public trust in apples fell dramatically, and producers were left to consider how to continue production while catering to the public’s new fear of Alar. Regrettably, the study published by the EPA was fraught with errors in its design and consequent interpretation of its findings, but the damage was done. States drew up legislation to ban Alar and similar substances, leaving the fate of producers in the hands of misinformed and uninformed consumers exercising their right to vote (Isern, 1997).

This is one of many examples of allowing public fear and lack of literacy to be exploited for privatized gains. The most obvious but perhaps most complex solution to preventing this problem is increasing literacy to facilitate informed decision-making. Increasing environmental literacy is the best investment in the fight against worldwide environmental challenges but keeping resources up to date in the face of ever-changing landscapes requires continuous
reassessment. Ultimately, the goal of environmental education is overall ecological literacy (Orr, 1992).

**History of Environmental Education in the United States**

**Pre-colonial Environmental Thinking**

Traditionally, environmental education has evolved out of environmental concerns. Colonization in the Canary Islands and consequently Europe (pre-1500s) preceded that of colonization in North America (post-1600s) with consequent environmental impacts. Environmental manipulation and technology harnessing natural resources such as aqueducts were characteristic of early European interactions with the environment (Deming, 2020). Apart from the population centers in Europe, much of the natural environment was exploited for resources such as timber and minerals that would then be traded throughout the globe (McNeely et al., 1995) throughout the 1500s and 1600s. The full repercussions of this indiscriminate harvesting of raw materials would not surface until hundreds of years later.

Outside of traditional natural resources, animals were also a popular point of exploitation, with the origin of zoos and exotic animal husbandry traced back to European Colonialism, and even further to encompass practices in ancient Rome, China, and Egypt (McNeely et al., 1995). These times were characterized by a New-American focus on controlling and dominating nature which heavily contrasted the approach of Native Americans in North America, who were generally living more sustainably and spiritually though their relationship with natural resources (Decker et al., 2001). Upon arriving in North America, Europeans began to upend the relationship Native Americans had with their surroundings by introducing overconsumption, exploitation, and rapid population expansion throughout the 1700’s (Decker et al., 2001).
Environmental education largely did not exist in these plentiful times but would soon emerge as public concerns arose in the wake of irresponsible natural resource usage in North America.

Before the term environmental education, people advocated for more harmonious relationships with the natural world (McCrea, 2006) and called for closer observation of natural phenomenon (Athman & Monroe, 2001). Louis Agassiz, a geologist and biologist of the 19th century, was an early advocate of studying the natural world from an early age (Agassiz, 2021). Environmental philosophers of the 18th and 19th century such as Comenius, Pestalozzi, Froebel, and Jean-Jacques Rousseau emerged as early voices in the EE conversation (Stapp, 1978). Rousseau, in particular, is remembered for his positive perception of nature as a part of the human experience, writing about how moving further from nature to civil society was to move further from a pure state (Delaney, n.d.).

**Environmental Awareness from 1800s to the mid-1900s**

Moving into the 1800’s, environmental concerns began to gain traction via legislation and public figures raising awareness:

The impact of human development and activity on North American wildlife during the 19th century did not go unnoticed. Concerns about the plight of wildlife were expressed through political avenues (laws) and legal avenues (litigation). Those concerns heightened after the American Civil War and became social and political movements during the late 1800s and early 1900s. (Decker et al., 2001, pp. 6-7)

It was during this century that America would see its lowest ever Bison populations due to overharvesting (National Park Service, 2022). The rise of industrialism following the Civil War (Library of Congress, n.d.) effectively crushed many advances in awareness with practices
such as deforestation, the increased use of fossil fuels, and the improper disposal of industrial waste (Cumbler, 1995). While this elevated concern did little to slow environmental degradation and overuse as the rise of industrialization and commercial agriculture paced alongside, this continued concern encouraged many key voices to emerge.

While the term environmental education had not yet emerged, the 1920s featured a changing educational focus that included more emphasis on the study of the natural environment, especially for younger children (Peeples, 1927). The early 20th century presented the United States with evidence of their impact on the environment when the years-long Dust Bowl disrupted agricultural, economic, and ecological activity (Peel, 1979). Peel cited the Dust Bowl to be, “…largely of man’s own making.”, (pp. 100). Midway through the Dust Bowl, the National Education Association (NEA), a professional organization of educators established midway through the 1800s, took an interest in adding conservation and environmental concepts into curriculum (Peeples, 1927). The NEA developed conservation curriculum aimed at responsible rural natural resource management (Bathurst, 1943; McCrea, 2006).

Early mentions of environmental education can be seen in the writings of Aldo Leopold, John Muir, and Gifford Pinchot, all of whom were founders of natural resource philosophies and practices in the United States in the early 1900s (Callicott, 1994). All three established varying environmental perspectives during their time in the United States and advocated for increased availability of environmental education (Carter & Simmons, 2010). Most notably perhaps, is the sentiment expressed in Aldo Leopold's pivotal publication, *A Sand County Almanac*. Within this reflective book, Leopold expressed not only the need for environmental education to help create better stewardship, but the need for a strong environmental conscience, stating, "No important change in ethics was ever accomplished without an internal change in our intellectual emphasis,
loyalties, affections, and convictions." (Leopold, 1949, pp. 209—210). In contrast to the management-forward messages of Pinchot and Leopold, lyrical poet Sara Teasdale published a piece titled *There Will Come Soft Rains* in 1920 that both condemned World War I while also putting into perspective humankind’s limited power over natural forces such as pandemics and the changing of the seasons (Teasdale, 1920). This influential poem later inspired acclaimed science fiction author Ray Bradbury to write a short story of the same name in 1950.

The poeticism of Muir and Leopold were quickly followed by more urgent literature such as that of Rachel Carson, a biologist and conservationist. Her most well-known work, *Silent Spring*, thrust environmental issues into the forefront, with sentiments such as:

> We urgently need an end to these false assurances, to the sugar coating of unpalatable facts. It is the public that is being asked to assume the risks that the insect controllers calculate. The public must decide whether it wishes to continue on the present road, and it can do so only when in full possession of the facts. (Carson, 1962, p. 29)

This more accessible call to action to enlighten the public regarding the facts surrounding environmental issues came just before another wave of environmental tragedies in the 1960s: the 1969 Cuyahoga River catching fire (Opheim, 1993), the Santa Barbera Oil Spill (University of Michigan History Department, n.d.), multiple smog events killing hundreds of people (University of Michigan History Department, n.d.), and a coal mine explosion in Farmington, West Virginia that killed more than 75 people in 1968 (Kovarik, n.d.). One notable piece of literature arose in the late 1960s when ecologist Garrett Hardin published his pointed article titled *Tragedy of the Commons* (Hardin, 1968). This article called on citizens to become better stewards of their environment during a time in which communal resources were being abused but notably, this article lacked a solution to the problems it raised (Hardin, 1968, p. 1243). Following
the publication of *Tragedy of the Commons*, the National Environmental Policy Act (NEPA) was passed in 1970 (42 U.S.C. § 4321-4347). While this act was not explicitly aimed at increasing environmental education for the greater public, it was passed in part to increase knowledge about ecological systems and how to better make informed environmental decisions, noting, “…each person has a responsibility to contribute to the preservation and enhancement of the environment.” (42 U.S.C. § 4321-4347, p 2).

**The Environmental Decade: 1970’s**

As the 1960s ended, the United States saw its first annual Earth Day celebration as well as an official environmental education effort at the federal level with the passage of the Environmental Education Act (1970). Earth Day marked, “…a major increase in public awareness of and concern about environmental problems.”, (Freeman, 2002, p. 125), but this awareness was still largely focused on human health because of environmental decisions rather than environmental concern for the sake of the environment itself (Freeman, 2002). Similarly, this victory was seen as short-lived by some due to surrounding historical circumstances. Schoenfeld (1975) cited former President Richard Nixon’s involvement in the Cambodian Incursion as a significant distraction from the three large environmental victories had that year. The creation of the Environmental Protection Agency (EPA), passage of the Environmental Education Act, and creation of Earth Day coincided with the US invading foreign lands, the Watergate Scandal, and Nixon’s unprecedented resignation (Miller Center, n.d.). Despite the distractions, the act sent funding to states to help implement EE into curriculum, established an Office of Environmental Education, and set precedent for other countries to follow (Carter & Simmons, 2010). The EPA, while largely devoted to managing and mediating environmental
matters, focused on an environmental education mission to support teacher education, administers, small grants for educators, and published classroom materials (U.S. EPA, n.d.d).

During this same decade, the North American Association for Environmental Education (NAAEE) was established, initially going by the name National Association for Environmental Education (Disinger, 2001). NAAEE was one of many organizations formed throughout this decade that would contribute valuable curriculum resources and nonformal enrichment regarding EE for both adults and children. These non-governmental organizations supplied EE outside of federal actions, which would become important in the 1980s with the beginning of the Reagan administration (Carter & Simmons, 2010). NAAEE began hosting annual conferences in 1972, bringing together educators and researchers to exchange advancements in EE (NAAEE, n.d.a). NAAEE has played an invaluable role in distributing EE materials, assisting states and nonprofit organizations with their own EE efforts, and has continued to host yearly conferences and research symposiums to facilitate sharing of recent EE advancements.

International EE efforts were also on the rise throughout the 1970s, with several notable meetings occurring quite closely together. The 1972 United Nations’ Conference on the Human Environment was held in Stockholm, Sweden and produced a recommendation calling for, “environmental education as a means to address environmental issues worldwide.”, (McCrea, 2006, p.5). In 1975, the Belgrade Charter, developed during the International Workshop on Environmental Education in Belgrade, Yugoslavia addressed this recommendation (United Nations International Workshop on Environmental Education, 1975). The Belgrade Charter, while primitive, was notable due to its attention to the division of labor between formal and nonformal education sectors (McCrea, p. 4). In Tbilisi, Georgia, another development in EE occurred with the inaugural meeting of the Intergovernmental Conference on Environmental
Education (ICEE) in 1977 (Hoffmann, 1978). This meeting established more thorough goals, objectives, and guiding principles for effective EE:

1. to foster clear awareness of, and concern about, economic, social, political, and ecological interdependence in urban and rural areas;
2. to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment, and skills needed to protect and improve the environment;
3. to create new patterns of behavior of individuals, groups, and society, towards the environment. (UNESCO, 1977)

The publication of this declaration created international pressure to increase EE efforts to keep pace with the UN’s call to mitigate environmental challenges. Another formal list of EE objectives was published just a few years before the ICEE meeting by an American professor at the University of Michigan by the name of William “Bill” Stapp. Stapp, also known as the founder of environmental education, identified the propensity to understand and act appropriately in any role within society to solve environmental challenges as a key pillar of environmental education (Stapp et al., 1970). Stapp published a list of four objectives detailing the successful marks of environmental education which build upon each other: 1) understanding man's role as part of the greater environmental system, 2) understanding the environment at large and how it is intertwined in society, 3) understanding environmental problems and how to act on them in a way that resolves them in varying societal roles such as voter, professional, citizen, and 4) establishing a general concern for the health of the environment that, in turn, motivates changed behavior (Stapp et al., 1970). Soon after this initial list, Stapp then contributed to the National Leadership Conference on Environmental Education, held in Washington, D.C. in March of 1978 (Stapp, 1978). The resulting report synthesized several of the aforementioned goals and
recommendations as well as created plans for legislation and consequent implementation (Stapp, 1978).

A notable nonformal EE advancement was made when in the mid-1970s, Project Learning Tree (PLT) was created through the collaborative efforts of the American Forest Institute and the Western Regional Environmental Education Council (Sustainable Forestry Initiative, 2019). This initiative created supplementary curriculum guides and hands-on EE activities in its early years but would later go on to align with federal EE standards such as the National Curriculum Standards for Science in 1998 and more recently the Next Generation Science Standards in 2017 (Sustainable Forestry Initiative, 2019). Following in the footsteps of PLT, in 1983 the Western Association of Fish and Wildlife Agencies in partnership with the Western Regional Environmental Education Council created educational resources to support teacher training and environmental education implementation. (McCrea, 2006; Soler, 2019).

**Environmental Education in the 1980s**

Following the surge of environmental challenges and awareness in response, EE in the United States was briefly set back during the Reagan administration when the EPA lost funding and personnel responsible for making informed environmental decisions (Fredrickson et al., 2018). This was followed by the elimination of the Office of Environmental Education in 1981 (McCrea, 2006). Also during this time, environmental issues facing the US continued to expand and grow in complexity. Expansion of industry, deregulation of production, and the environmental impact of a growing population characterized the ecological challenges of the 1980s. In sharp contrast to the developments of the 1970s, the 1980s were a time in which United States governing bodies focused on economic concerns, removing regulations, and reducing some of the reach that had previously been granted to the EPA (Kraft, 2000). As the
Reagan administration drew to a close, the environmental movement strengthened outside the bounds of governance and legislature with sizeable non-governmental organizations such as the Sierra Club and the Wilderness Society growing in membership (Kraft, 2000).

*Environmental Education in the 1990s*

The Bush presidency revisited EE policy with the passage of the National Environmental Education Act (1990), which aimed to increase the role of the EPA in EE through adding an Office of Environmental Education (now under the Environmental Education Division). This act, while a step forward, was host to regulations that limited the ability of the EPA to participate in any environmental education efforts that were deemed partisan (Congressional Research Service, 2008). In 1994, NAAEE began a push to create standards for environmental education as well as certification standards for environmental educators (McCrea, 2006; Simmons et al., 1995). The 1990s also saw the publication of Project WET (known as both Water Education Today, as well as, Water Education for Teachers), which was developed through a partnership of the Western Association of Fish and Wildlife Agencies and the Western Regional Environmental Education Council. This training program aimed to address water resources through curriculum and interactive instruction (Project WET Foundation, n.d.). Project WET was similar to PLT and Project WILD but received many supplements developed by individual states and regions to address unique needs (Carpenter, 1997; Grossman, 1997; Seavey & Fitzgerald, 2003). Additionally, the National Association for Interpretation established an EE section in 1993, identifying the role of nonformal educators within the mission of EE (McCrea, 2006). Environmental education during this decade saw solidification of the framework, but still lacked federal funding and implementation to give it the reach necessary to combat the growing environmental challenges of the late 20th century (Holsman, 2001).
Environmental justice is an important topic that saw substantial development alongside EE throughout the 1980s and 1990s with minority environmental advocates finding stronger footholds throughout the early to mid-1990s (EPA, n.d.b). Environmental justice was defined by the United States Environmental Protection Agency (2022b) as, “…the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.” The demand for environmental justice rose alongside with the civil rights movement throughout the 1960s and 1970s (Taylor, 2000) and continued to see increased traction as the demand for social justice evolved throughout the 21st Century (Bullard, 2020). The environmental justice movement transitioned from an informal campaign with varying levels of organization to formal recognition in the 1990s with the involvement of the EPA (Bullard, 2020). While the early 1990s were filled with grassroots organizations, informative reports on environmental justice, and other nongovernmental advancements in the movement, the Clinton administration oversaw legislature for more niche environmental education concerns, such as environmental threats that specifically affected minority communities (Exec. Order No. 12,898, 1994). The EPA under the George H. W. Bush and Clinton administrations expanded not only its environmental justice efforts, but also its capacity to reach environmental educators (McCrea, 2006). Several environmental justice efforts during this decade were born out of Louisiana given its concentration of petrochemical plants near urban areas (National Black Environmental Justice Network, n.d.). Additionally, environmental literacy emerged as a key to defending minority communities, such as those in rural Louisiana, from poor or predatory environmental decision making by the state, as well as private entities (Cole & Foster, 2001, p. 162).
Environmental Education in the 21st Century

The early 2000s were not eventful in terms of federal advancements in environmental education legislation. The passage of the No Child Left Behind Act of 2001 ushered in major changes in education but did nothing to bulk up environmental education or science education within the United States, opting instead to provide benchmarks and progress quotas for public school (No Child Left Behind Act, 2001). This act was seen as controversial by many and would eventually be replaced in 2015 by the Every Student Succeeds Act (ESSA) which gave more decision-making power to states when considering standards and benchmarks for progress (Every Student Succeeds Act, 2015). Within ESSA, EE programs were explicitly mentioned as being eligible for federal funding (NAAEE, n.d.b).

Federal legislation of the 2010s to 2020s did not see major advances in environmental education framework, but several notable pieces of legislation were introduced during this time. The No Child Left Inside Act of 2008 (NCLI), although not enacted into law, sought funding for EE (No Child Left Inside Act, 2008) and was developed to build on the National Environmental Education Act of 1990. The NCLI Act was proposed to, “…enhance the teacher professional development opportunities provided by the Environmental Education and Training Program and creates a new grant program focused on expanding the capacity of environmental education at the state and national level”, (No Child Left Inside Act, 2008, p. 9). In the wake of the failure to pass the NCLI Act, many states still decided to adopt a key part of the legislation: environmental literacy plans (ELP). In a 2019 nationwide survey, the North American Association for Environmental Education evaluated the extent to which environmental literacy plans have drafted, completed, adopted, and implemented. Twenty states reported currently implementing their ELPs, thirteen states completed but not yet adopted ELPs, and another thirteen states were...
still in the ELP drafting stage (Bodor, 2020). Notably, Louisiana was identified as planning to release its ELP in summer of 2022. The Environmental Education and Training Program (NEETP) under the direction of the EPA was originally established in 1995 when a grant was given to NAAEE to facilitate EE training. NEETP was facilitated through cooperative agreements with various authorities on EE and was developed to provide training and support to both formal and non-formal environmental educators and education professionals in general (EPA, n.d.c). While the NCLI Act was not implemented, the EPA continued to grant awards to facilitate EE professional development to NAAEE, which then developed the current program called “ee360+” (EPA, n.d.c).

The Climate Change Education Act (CCEA), originally called the Global Warming Education Act, was introduced in 2007 but stalled in the House of Representatives (Global Warming Education Act, 2007). The CCEA was a potential step forward for EE as it included recommendations for k-12 formal EE as well as an acknowledgement of nonformal education, funding and grants for community-level EE programs, and a focus on environmental justice (Climate Change Education Act, 2021). Also introduced in 2021, the Environmental Justice For All Act included provisions for developing outdoor education, a notable subset of EE (Environmental Justice For All Act, 2021).

The introduction of the NCLI Act and the CCEA are partially credited to the environmental education movement that arose from the publication of Richard Louv’s Last Child in the Woods: Saving Our Children From Nature-Deficit Disorder (Koch, 2006). Louv urged readers to reintroduce nature into the lives of children to instill meaningful childhood development while alleviating mental and physical ailments (Louv, 2006). Last Child in the Woods was critical in re-igniting the force behind the EE movement in the 21st century, but some
argue that the movement did not go in the right direction or found new solutions to the problem to be a façade on previously failed efforts (Schalit, 2006). Creating an environmental conscience within people can be seen as a way to encourage environmental action, but current environmental education had failed to address what is needed to create this urgency, as written by *The Failure of Environmental Education (And How We Can Fix It)*, by Charles Saylan (2011). Saylan (2011) asserted that while environmental education is present at levels we have never seen before, it has failed to keep up with the rate at which humans are degrading the world around them. Ultimately, he emphasized a need to imbue environmental education with values in a way that produces motivated stewards of the environment as opposed to latent citizens that have been overly inundated with facts and data points. Saylan also pointed out that this need spans both the public and private school settings (Nijhuis, 2011).

Nonformal EE experienced a boom in the 21st century. The North American Association for Environment Education has had a continuing role in the development of guidelines and best-practice recommendations for environmental educators, both formal (NAAEE, 2019) and nonformal (NAAEE, 2009). Many non-governmental organizations have developed EE curriculum and resources with remarkable success. A notable example is the Better Environmental Education, Teaching, Learning, & Expertise Sharing Project, better known as the BEETLES Project, founded through the Lawrence Hall of Science at University of California, Berkeley (BEETLES Project, 2022a). BEETLES materials aligned with the Next Generation Science Standards and offered individual collaborations with other non-formal science institutions (BEETLES Project, 2022b). In addition, governmental organizations at the state and local levels, such as Soil and Water Conservation Districts (Chatham County, n.d.) and state
wildlife management agencies (Louisiana Department of Wildlife and Fisheries, n.d.b), have provided outreach and nonformal EE as part of their work.

With the rise of distance education in response to the COVID-19 pandemic, EE saw more robust digital content development (Quay et al., 2020). Formats such as podcasts (Strickland et al., 2021) and virtual field trips (Das, 2021) were utilized en masse to reach the population during unprecedented circumstances. A notable rise in the popularity of Citizen Science, defined by the Oxford English Dictionary (Haklay, 2014) as, “Scientific work undertaken by members of the general public, often in collaboration with or under the direction of professional scientists and scientific institutions”, in the 2010s onward has also contributed to lowering the barrier to entry for environmental education (Kobori et al., 2016). Citizen science was and continues to be heavily utilized to connect citizens with nature while also teaching them the importance of scientific data collection and compilation in a socially distanced and accessible format (Kishimoto & Kobori, 2021). Extension and educational outreach providers saw increased opportunity to provide curriculum content to children who were forced to learn from home or who moved to home school as a result of the COVID-19 pandemic (Hood, 2021). No matter the format, the importance of environmental education cannot be understated.

History of National Formal Environmental Education Efforts

While early environmental education can be traced back to philosophers (McCrea, 2006), EE entered the American conscious in tandem with several ecological disasters such as the Dust Bowl and over consumption of North American wildlife (Chawla, 1992). Formal EE was not routinely available to the general public, and most official pathways to EE existing mainly at the university level (McCrea, 2006) until a greater push for environmental causes occurred throughout the 1970’s. EE began integrating into primary and secondary public school
curriculum with the passage of environmentally conscious legislature such as the Environmental Education Act (1970). Unfortunately, writing environmental concepts into curriculum did not meet needs immediately, as teacher training and professional development efforts lagged behind curriculum adoption (Sullivan & Schlesinger, 1972).

While efforts to implement formal EE were being made, nonformal EE was occurring in many areas of the United States. National Parks for example, led the development of nonformal programming and continue to be a source of EE to this day. Despite the establishment of the first national park, Yellowstone in 1872, (Cramton, 1932), managing the parks with consideration to education, recreation, and conservation came later with the establishment of the National Park Service (NPS) by President Woodrow Wilson in 1916 (Library of Congress, n.d.). Education has remained a central goal of the NPS, with educational resources found in almost every NPS-managed area (Powell et al., 2020).

Environmental education has seen a resurgence in recent years as a result of new environmental challenges such as climate change, sea-level rise, global pandemics, and extinctions. This is reflected in more recent legislation such as the Every Student Succeeds Act (2015), the Climate Change Education Act (2021), as well as through amendments to past legislation such as proposed budget increases for the now decades old National Environmental Education Act of 1990 (1990). The No Child Left Inside Act (2008) spurred large-scale cooperation between the North American Association for Environmental Education, individual states, and environmental education programs. State NAAEE affiliates work with NAAEE to formulate environmental literacy plans, ensure programs meet established guidelines for excellence (NAAEE, 2019), and have the necessary support when facilitating professional development and drafting curriculum. The Louisiana Environmental Education Commission is
not listed as an NAAEE affiliate (NAAEE, n.d.c). While cooperation with NAAEE was not required by any federal legislature, state environmental education programs could obtain funding and support from the previously mentioned ee360 initiative, which was previously organized by the EPA.

**Formal Environmental Education in Louisiana**

To create environmentally literate citizens, a need exists to inform students by exposing them to environmental curriculum and providing educational hands-on experiences earlier in their educational careers (Jackson, 2013). Efforts in Louisiana to incorporate environmental science into the general education curriculum are present, however, they have not been offered consistently throughout the state. Louisiana Department of Education has required environmental science standards but has not mandated curriculum to meet those standards. However, some schools within the state have offered environmental science-based coursework beyond the scope of the state science standards at the secondary level, including Advanced Placement Environmental Science, Environmental Studies in Agriscience, and Honors Environmental Science, as well as more targeted courses such as Forestry and Sustainability (Louisiana Believes, 2020).

Environmental science concepts are interdisciplinary, so it is important to take inventory of the courses that disseminate environmental science to educate students on other specialized topics. For students in kindergarten through 8th grade, classes are often less specialized, leaning more on the environmental science standards embedded in the general science standards for the state. At the middle school and high school level, students may opt to take agriscience courses depending on the offerings within their school which have frequently contained environmental and natural resource concepts due to the natural interconnectedness of the two fields. A recently
published curriculum, The Louisiana Agritechnology Curriculum Guide, which was designed to meet the requirements for the Louisiana Agritechnology credential, included an entire unit on natural resource conservation issues (Richardson-Gilley, 2020).

Nationally, the Next Generation Science Standards (NGSS), lacked widespread adoption across the US in public education institutions (Achieve, 2011; Pruitt, 2014). These standards included deeper engagement with material that is in current science standards, but also implemented updated content areas such as addressing man-made environmental challenges, climate change, and alternative energy (Next Generation Science Standards, 2013, Middle School Human Impacts Substandard). While progressive, adoption of the NGSS has been voluntary on a state-by-state basis and standards could be tailored as a state sees fit. Louisiana adopted many parts of the NGSS, most notably those which included mentions of climate change and sea level rise (Louisiana Department of Education, 2017). However, the standards the Louisiana Department of Education allowed standards to be met without explicit mention of more contentious topics. This can be seen in carefully worded core ideas, such as, “Changes in the atmosphere due to human activity have increased carbon dioxide concentrations and thus affect climate”, (Louisiana Department of Education, 2017, Louisiana Student Standards: Science p. 11). Louisiana is a local-control state, meaning schools may choose to accept or reject curriculum pieces on a parish-by-parish basis (Pondiscio, 2017). Districts can instead choose the curriculum they prefer to meet the state standards, allowing freedom to omit the NGSS additions. Despite the option for progressive curriculum incorporating environmental science principles, disseminating the material in a way that creates environmentally responsible students is much easier said than done.
The Louisiana Department of Education (LDOE) came into the responsibility of pursuing environmental education efforts upon absorbing the office of environmental education and the Louisiana Environmental Education Commission housed within it. Upon this merge of responsibilities, LDOE embarked on several efforts to further environmental education in the state. There were four notable LDOE environmental education initiatives at the time of this investigation: (1) Louisiana Coastal Fellowship Program, (2) Key Principles and Concepts in Environmental Education, (3) Louisiana Environmental Education Advancement Plan, and (4) State Environmental Literacy Plan.

The Louisiana Coastal Fellowship Program is, “structured to engage participating educators, known as fellows, in rich professional learning as a cohort of like-minded educators who are committed to championing environmental literacy for the students of our state” (LDOE, n.d.). At the time of publication, the first cohort of educators has recently completed the pilot session of the program. Though LDOE’s website does not yet elaborate about the results of this program, initial findings were discussed at the September 2022 meeting of LEEC (S. Necaise, personal communication, September 22, 2022). The conclusion of the first year of the Louisiana Coastal Fellowship Program will likely inform future LDOE efforts to engage in professional development opportunities in environmental education.

To confront the topic of environmental responsibility, a set of key principles and concepts in environmental education (KPCs) was developed by the Louisiana Department of Education. These standards were developed not as a supplement to the existing environmental science standards but instead, a standalone part of the overall educational standards for k-12 public education in Louisiana. This new material, released to the public in summer of 2022, was developed to promote environmental literacy through standardizing environmental education so
that it may better fit into the curriculum, standards, and schedules of k-12 educators. Principles emphasized the human role in the environment, with statements such as, “Humans can identify, assess, develop solutions, communicate about, and implement and evaluate solutions designed to prevent, reduce, or mitigate the impacts of human activities on natural systems,” (Louisiana Department of Education, 2022). These standards established key concepts in environmental education for grades kindergarten through twelfth. As these principles are quite new, there has yet to be any curriculum developed explicitly to achieve them, or assessment techniques developed to evaluate success at the time of this investigation. KPCs have been released both to the LDOE website and to a mailing list of nonformal environmental educators. From this correspondence, nonformal environmental educators were informed of roundtables and professional development opportunities available to inform them about the utility of the KPCs in their organizations, as well as how to use them. These key principles and concepts, while not mandatory to adopt, were intended to help nonformal environmental education organizations mold their program offerings in a way that makes them easier for formal k-12 educators to integrate into core standards and curriculum during the school year. The version of the KPCs used in this investigation can be found in Appendix E.

To build on the KPCs, the Louisiana Environmental Education Advancement Plan was developed by LDOE. The goal of LEEAP, per the application from LDOE, is to:

…strengthen the working relationship between the formal K-12 education system and non-formal EE providers, so that: 1) K-12 schools get more help providing EE to their students while also meeting subject standards, and 2) non-formal providers develop more partnerships with schools in their service area.
The KPCs were developed first, followed by the release of an application for the first cohort of LEEAP in April 2022. The KPCs were intended to inform LEEAP participants of the most important concepts their programming should cover. LEEAP was created to provide nonformal environmental education organizations chosen to participate with an endorsement from LDOE championing the organization as one that provides high quality programming compliant with standards-based instruction. Additionally, LEEAP had a secondary goal of fostering partnerships between formal k-12 educators and nonformal environmental educators in Louisiana through grants. It is imperative to note that due to LDOE and LEEC staff and operating budget changes resulting from the passage of Louisiana House Bill 397 in June 2022, the LEEAP initiative has been paused. The LDOE website has removed information about this initiative until the department is able to staff a position to oversee the launch and execution of the program (S. Necaise, personal communication, September 22, 2022). The version of the LEEAP application used in this investigation can be found in Appendix F.

Originally created by NAAEE, environmental literacy plans are state-specific plans that outline courses of action that a state and its educators can take to increase environmental awareness, interest, and ultimately literacy. While LEEC had previously drafted an environmental literacy plan (ELP) for Louisiana in 2016, it failed to be signed by the governor and was effectively tabled until 2022 when efforts to create a new ELP began (B. Gautreau, personal communication, September 26, 2022). This effort is reflected in the February 2022 LEEC meeting minutes (LEEC, p. 1). Once completed and if adopted by the state governor, a Louisiana ELP will help inform the efforts of environmental educators to increase statewide environmental awareness and literacy. There is no publicly available version of the original environmental literacy plan developed by LEEC in 2016.
Post-Secondary Environmental Education in Louisiana

Beyond high school, Louisiana universities have offered career pathways for people entering natural resource disciplines. Among the top five public colleges or universities in Louisiana with the highest enrollment (Louisiana State University, University of Louisiana at Lafayette, Southern University, Delgado Community College, and Louisiana Technical University), only Delgado Community College has lacked environmental science or natural resource majors (LSU 2021; ULL 2021; SUBR 2020; DCC 2021; LAT 2016). Louisiana State University has offered eight concentrations within the School of Renewable Natural Resources ranging from Conservation Biology to Forest Enterprise (LSU, 2021), but also has other natural resource-related majors such as those within the College of the Coast & Environment, the College of Science, the College of Engineering, College of Humanities and Social Science, and in the College of Agriculture, showing just how far reaching the need for natural resource experts extends. University of Louisiana at Lafayette, while experiencing a smaller enrollment, has included many natural resource concentrations, several of which were not found at Louisiana State University, such as Resource Biology & Biodiversity, Environmental Protection, and Digital Geography (University of Louisiana at Lafayette, 2021). Following the same pattern, Southern University has experienced a slightly lower enrollment but has allowed students to pursue a major in Urban Forestry, contrasting and complimenting other offerings across the state (Southern University, 2021). Louisiana Technical University had a unique concentration within their forestry major, in which students have been able to focus on forest management with attention to wildlife management goals (Louisiana Technical University, 2021).
Nonformal Environmental Education Efforts in Louisiana

When comparing the contributions of formal and nonformal environmental education, a 2010 article concluded that each source of education has its place, but the combination of the two resulted in a complimentary effect (Stocklmayer, et al., 2010). Louisiana is a candidate for marrying the two educational approaches as it has a wealth of nonformal environmental education sources in addition to the formal course offerings at the secondary level. Furthermore, Louisiana has a wide variety of environmental education resources and experiences which are available to the public. Resources such as Bluebonnet Swamp Nature Center and the Audubon Louisiana Nature Center offer enrichment via field trips and hands-on experiences for public and private educational institutions (Audubon Louisiana Nature Center, n.d.; Bluebonnet Swamp Nature Center, n.d.). Both institutions offer summer programming for youth, public events for all age ranges, off-site outreach events, and virtual education resources. Louisiana also hosts an active chapter of the Master Naturalist program, with several regional divisions that host various nonformal environmental education opportunities (B. Kauffman, personal communication, April 22, 2022).

While Louisiana does not have a national park, the state is host to the Kisatchie National Forest and Jean Lafitte National Historical Park. The Kisatchie National Forest consists of five districts that span just under 640,000 acres. Across the five districts, there are a variety of ecosystems such as prairie and dense longleaf pine forests (Burns, 1994). This large forest could provide a wealth of environmental education opportunities but has not hosted many official educational experiences (Burns, 1994). Jean Lafitte National Historical Park combines education about the rich history in the region with wetlands-forward environmental education programming (National Park Service, n.d.). In addition, Louisiana has 22 state parks spread
throughout (Louisiana State Parks, 2021) and these parks are host to many environmental education events such as Be Nice to Bees, Bird Walks with a Ranger, and Flora and Fauna Nature Hike reported as part of the early 2022 calendar (Louisiana State Parks, 2022). Louisiana State Parks have also employed both permanent and traveling interpreters to aid in education efforts throughout the state. Louisiana is also home to the Atchafalaya National Heritage Area, based on the Atchafalaya River basin, which is North America’s largest remaining freshwater swamp. The Atchafalaya National Heritage area spans 14 parishes in the state, and offers environmental education programming, curriculum, and field trips (Atchafalaya National Heritage Area, 2022).

In compliment to the offerings of state parks and nature centers, Louisiana Department of Wildlife and Fisheries (LDWF) has offered nonformal environmental education in several formats (Louisiana Department of Wildlife and Fisheries, n.d.). LDWF offers professional development similar to Project WET, called the Wetland Education Teacher Workshop (also known as WETshop) that focuses on Louisiana-specific coastal and wetland EE enrichment. Many critical issues such as coastal loss, invasive species, the impact of commercial fisheries, native species conservation, and the relationship of the oil industry to the coastal environment have been addressed within this workshop. In addition to this workshop, LDWF offered a grant in partnership with the Louisiana Sea Grant to facilitate the Native Fish in the Classroom project. This project allows students to learn about the native American paddlefish, *Polyodon spathula*, by using aquaculture in the classroom to raise eggs into juvenile paddlefish to be released into a Louisiana river near the participating school (Louisiana Department of Wildlife and Fisheries, n.d.). LDWF has also administered the Aquatic Volunteer Instructor Program
(VIP), in which educators learn to facilitate fisheries-related programming funded by the Sport Fish Restoration Act, also known as the Dingell-Johnson Act (1950).

Louisiana is home to one of 34 universities that facilitates the work of the National Sea Grant College program in partnership with the National Oceanic and Atmospheric Administration, established in 1966 by congress to further research, education, outreach, and conservation of coastal resources (National Oceanic and Atmospheric Administration, 2018). The Seat Grant program in Louisiana has offered a variety of educational resources and opportunities throughout the state. Educators from the National Sea Grant Program host educational experiences on the campus of Louisiana State University, but have also facilitated teacher professional development, outreach projects, and other nonformal programs across the state (Sea Grant Louisiana, n.d.).

Similarly, the Louisiana State Department of Environmental Quality (LDEQ) offers unique, statewide education and outreach programs. Most notably, LDEQ facilitated the annual Louisiana Envirothon. This environmental problem-solving competition for middle and high school students allowed participants to combine environmental science principles and natural resource management techniques to prescribe solutions to proposed environmental challenges that change each year the competition is held (Louisiana Department of Environmental Quality, n.d.).

In addition to state agency natural resource programs, programs such as the Louisiana FFA Organization and Louisiana 4-H, which are intertwined within school course offerings, are popular in Louisiana, with FFA having almost 12,000 members as of 2018 and 4-H having clubs and groups in every parish in the state (Louisiana FFA, n.d.; LSU AgCenter, n.d.). These organizations, while not entirely focused on natural resource and environmental education, both
have competitions, projects, and activities that involve natural resource issues such as FFA’s forestry competition or 4-H’s Wildlife Habitat Education Program (WHEP). Many 4-H program offerings are consistent across multiple states, but Louisiana 4-H has had a unique program designed to educate youth about the state’s abundance of wetlands. The Louisiana 4-H Youth Wetlands Education and Outreach Program has combined online instruction, classroom lesson plans, and hands-on field trips to educate youth about the ongoing fight against wetland loss (LSU AgCenter, 2021). Similarly, Coastal Roots, a program funded and facilitated by Louisiana State University, was developed to provide 2nd through 12th grade students with a hands-on experience in growing and planting native plants to restore coastal ecosystems (LSU Coastal Roots, 2021).

Other programs in the state have included those offered by organizations such as the Baton Rouge Zoo, the Audubon Zoo, and the Shreveport Aquarium. Some local nature parks have also hosted summer camp programs and nature education opportunities, like those put on by Water B. Jacobs Memorial Nature Park in Caddo Parish (Parish of Caddo, n.d.). It is important to note that there has been no central repository of these organizations, facilitators, agencies, or institutions and that this is by no means a comprehensive list or examination of the nonformal environmental education offerings in Louisiana. Instead, this section is intended to demonstrate the wealth and diversity of environmental education resources in the state. In the past, Louisiana had a formal organization of environmental educators called the Louisiana Environmental Educators Association (LEEA), but this organization has been inactive since 2015 (Louisiana Environmental Educators Association, 2015).
Defining Environmental Education Careers

Environmental education careers are highly diverse in the audiences they serve, the settings they occur in, and the goals of the programs. EE careers can begin with participants as young as toddlers, as evidenced by the recent rise in popularity of nature-based preschool programs (Larimore, 2016). Many programs find themselves catering to grade-school groups most of the year, with exceptions for public events that include incidental adult education. Additionally, programs have been offered in-person as well as virtually across the state. The level of rigor and formality to nonformal environmental education programs also varies widely by setting. The multitude of career paths in EE can be described by age group reached, setting the education takes place, and the goals of that education, but none can be easily defined.

Interpreters, often found in museums, nature centers, botanical gardens, and science centers, have been a unique source of environmental education. As per the National Association for Interpretation (NAI), interpreters are unique in their mission to create an emotional connection to the content area they are teaching about using mission-based tactics to reach their intended audience (n.d.). This means that interpreters are educating by means of creating emotional resonance in their audience. This delivery is likely to include key information, but often does not aim to educate through traditional teaching techniques (presentations, lectures), activities, or lesson plans. NAI emphasized the role of interpreters to impart values on those they are interacting with. While there are many kinds of interpreters, this study will focus on those who are employed by nature centers, state parks, and environmental science centers.

Environmental educators, also known by some institutions as instructors can be found in a variety of settings but err on the more structured side of nonformal EE. Science centers, nature centers, and other similar facilities that have indoor and outdoor instructional spaces tend to
create positions for educators and instructors. Job listings from the North American Association for Environmental Education job board which have included the key words “educator” or “instructor” have been used to find a summary of the duties of such positions. The following results occurred from searches by key word in February of 2022. Frequently listed duties included but have not been limited to facilitating indoor and outdoor environmental instruction, developing environmental education programs, leading summer camp activities, teaching field trip outings, and leading outreach education programs. These duties have employed skills such as program development, hands-on instruction, classroom instruction, and field instruction in addition to having a background in natural resources. While certain jobs may focus on specific programs an institution offers, many positions require proficiency in several methods of delivering EE. Bluebonnet Swamp Nature Center and Audubon Nature Center both offer nature summer camps, outreach programs, and public programming in both indoor and outdoor settings, and thus hire nonformal environmental educators that are admissible to this study (Audubon Nature Institute, 2022; BREC, n.d.). Furthermore, Louisiana 4-H Youth Development employs specialists in natural resource programming such as summer camps, outreach events, public exhibits, afterschool clubs, and workshops (LSU AgCenter, 2022).

Certain agencies and programs involved in natural resource management and conservation employ environmental educators. These educators tend to further the goals of the agency or program they are hired under. Examples of these positions include education and outreach positions for federal agencies such as the United States Fish and Wildlife Service and the National Forest Service, as well as state agencies such as the Department of Natural Resources and the Louisiana Department of Wildlife and Fisheries (LDWF, n.d.). Programs such as the Barataria-Terrebonne National Estuary Program (BTNEP) and the Atchafalaya National
Heritage Area host environmental education events related specifically to the ecosystems they are situated within (Atchafalaya National Heritage Area, 2022; BTNEP, n.d.). These programs and the educators who facilitate them provide a closer look at certain niches within the diverse landscape of Louisiana.

Given the wide array of resources that have been made available within the state, it is imperative to equip nonformal environmental educators to address the needs of communities in regard to environmental education. As evidenced by a large body of supporting work, an environmentally informed citizen base is a useful tool in the fight against environmental challenges. Therefore, it is important to gather input from nonformal environmental educators in Louisiana regarding content areas that need further attention, topics requiring interdisciplinary education, and content that is adequately covered throughout the state.

**Past Research in Environmental Education**

One of the central goals of environmental education is increased environmental literacy. Assessing the effectiveness of EE in its many different modes of delivery is important when increasing the environmental literacy resulting as an outcome. The dearth of evaluation in EE program effectiveness has led to a lack of program revision and improvement in the face of new environmental challenges (Carleton-Hug & Hug, 2010). In a review of EE evaluation practices, Carleton-Hug and Hug observed, “…current program design did not recommend or even mention participation in stewardship activities and focused instead on environmental/ecological knowledge and issue inquiry skills” (2010).

The lasting impacts of EE have been imperative to study because long-lasting behavior and value changes are necessary to change the course of environmental degradation of all kinds. A study at the University of Ulm illustrated the impact of even small amounts of engagement
with hands-on EE when students who had experienced EE in a hands-on manner previously retained more factually accurate knowledge and positive perceptions of EE in a post-treatment assessment than students who did not (Drissner et al., 2013). Importantly, this study showed that exposure to EE can deepen and clarify previous environmental knowledge. In a 2015 study, this idea was built upon when the impact of EE on various developmental stages of children was assessed in both the short and long term (Liefländer, 2015). This study advised that as students become older, EE curriculum should focus on more complex processes, including the interconnectedness of natural systems, and should shift from attitude development to decision-making ability development (Liefländer, 2015). A well-informed decision-making ability has been identified as a key component of environmental literacy.

Informing the public about environmental challenges, especially those that are location-based, is important to combatting misinformation and denial about environmental change (Jones et al., 2017). However, challenges arise when trying to disburse applicable, place-based environmental education. Creating understanding of environmental issues through the use of procedural EE knowledge instead of declarative EE knowledge is more useful when it comes to applying concepts to an individual’s own life and actions (Duvall & Zint, 2007). K-12 education, while effective in shaping youth, is not the only venue through which EE can be facilitated. Intergenerational EE learning is important as illustrated throughout the history of the environmental education movement in the United States and should be considered a core outcome of effective EE (Duvall & Zint, 2007). Duvall and Zint (2007) recommended capitalizing on youth’s connection to and influence on older generations to facilitate diffusion of EE through capillary action. By harnessing the power of children to influence their caretakers,
relatives, and families, environmental education facilitators can create intergenerational learning opportunities (Stephens et al., 2021).

The demand for EE evaluation research has been high so that programs may better target these gaps in knowledge and meet the population where it is in the face of a constantly changing and increasingly complex environmental landscape (Carleton-Hug & Hug, 2010). Much of the research surrounding environmental education has agreed that regardless of the subset of environmental topic being addressed, base level knowledge is often quite low (Carleton-Hug & Hug, 2010). The role of humans and their reliance on processes that degrade the environment, must be emphasized to bridge ecological knowledge gaps (Berkowitz et al., 2005). As issues continue to evolve and specialize, EE must be able to adapt in not only its delivery, but its approach, content, and urgency. Louisiana exemplifies the need for place-based environmental education approaches as the host of environmental challenges the state faces are incredibly unique (Ritter et al., 2019). Data from a Louisiana-based study that involved EE facilitated through virtual reality found that exposure to erosion and renewable resource lessons led to interest in furthering students’ knowledge on the topics (Ritter et al., 2019). Place-based environmental education has been proposed as a means to improve community resilience in the face of natural disasters such as flooding, hurricanes, landslides, and most importantly climate-change related incidents (Hata et al., 2021).

Environmental education is a field that has heavily favored hands-on instruction. The COVID-19 pandemic caused the entire education sector to adapt rapidly to a shift to online learning. The importance of an EE experience tailored to environmental challenges specific to the individuals doing the learning became more apparent with the influx of general, shared virtual materials (Assaf & Gan, 2021). An important observation made by Assaf and Gan (2021)
was that nature and the environment had the tendency to be separate concepts in distance EE, with nature seen as soothing and the environment seen as more chaotic given the pandemic. Within the recommendations of their study, Assaf and Gan (2021) urged that merging the appreciation for nature with concern for the environment was of great importance. The overall approach to EE also underwent restructuring due to a change in how the general public sought out and received information in the face of the pandemic (Casas et al., 2021). This shift from passively receiving information to actively seeking information, while initially challenging for those trying to disburse the information, may prove to be beneficial in creating active and engaged learners for the future (Casas et al., 2021).

Two notable and similar studies have been conducted regarding nonformal environmental educators and state standard alignment in California and New Jersey. Andres (2005) studied the self-assessments of nonformal environmental education programs to better understand the extent to which programs aligned with state standards. This study revealed extremely variable degrees of adherence to state standards as self-reported by eight centers facilitating environmental education. Furthermore, Andres (2005) attempted to analyze the effects of the standards movement on attendance of field trip programs but found results to be inconclusive. This study is noteworthy because it concerned a state that was an early adopter of statewide environmental education standards in addition to existing environmental science standards (Andres, 2005). Given some results from this study were inconclusive, it is important to consider potential improvement for future research. Andres (2005) successfully surveyed eight institutions that offered environmental education programming across six counties, out of 21 total counties in the state of New Jersey. The surveys used were quantitative in nature and allowed for people other than educators, such as directors, secretaries, or naturalists, to complete them (Andres, 2005).
In a thesis study on nonformal coastal environmental education centers, Purcell (2019) surveyed educational strategies and goals of five organizations within Orange County, California. This study was conducted using interviews and open coding analysis (Purcell, 2019). Notable findings included the sentiment that integration with the formal education sector is perceived as a means to elevate environmental education efforts overall, with the caveat that collaboration calls for coordination and a push for implementing both formal and nonformal programs into standardized environmental education (Purcell, 2019). Purcell (2019) also noted that nonformal coastal education centers were valuable sources for catalyzing change and developing training related to environmental education which included cross-disciplinary cooperation and increased funding or partnerships with a funding agency (Purcell, 2019). These findings hint at a positive relationship to be had between nonformal environmental education centers and formal education organizers, such as state departments of education.

Research Design

Conceptual Framework: Concerns-Based Adoption Model

The concerns-based adoption model (CBAM) is a conceptual framework that focuses on the human element of the process of accepting and implementing changes. The CBAM is flexible enough that it can focus on any one stakeholder group experiencing change (Hord, 1987) but is especially relevant to professional development contexts (Loucks-Horsley, 1996). This model was first developed in 1987 at the University of Texas - Austin in the Research & Development Center for Teacher Education (Hord et al., 2014). The CBAM model has been widely used in educational contexts and is accompanied by a wide body of research applying the constructs in educational settings such as universities, individual classrooms, and state and federal agencies (Hall & Hord, 1987; Matar, 2015; Stempel, 2014; Thomas, 2014). In recent
years, the CBAM has been applied to analyze changes related to the COVID-19 pandemic and the resulting shift to online learning modalities (Maseko et al., 2021; Nair & Rajappan, 2021).

Model Overview

The CBAM consists of three diagnostic dimensions: 1) an innovative configurations map, 2) the stages of concern process, and 3) the levels of use interview tool (American Institutes for Research, 2015). Each of the three dimensions can be broken down into smaller models. It is important to note that each dimension can be used on its own, but the CBAM integrates all three to collect data supporting the implementation process of a new idea. The innovative configurations map is in essence, an outline of the various ways an innovation can be implemented. Within the CBAM model, the innovative configurations map, “...specifies behaviors and expectations related to implementing a curriculum, intervention, or evidence-based practice and categorizes these behaviors on a spectrum from ideal to less than ideal”, (Kistler & Wilkerson, 2018, para. 2). This aids the CBAM model by creating an overarching guide to an investigation predicated on preliminary interviews and observations from stakeholders (Kistler & Wilkerson, 2018). Some investigations use an innovative configurations map as a standalone tool to guide an inquiry in which the map may be revisited and revised throughout (Kistler & Wilkerson, 2018). To create an innovative configurations map, a group must be assembled to first discuss various components of the inquiry. After determining the focal components, each component should be filled with smaller dimensions that aim to address that component. A spectrum is then created that illustrates the range of positive and negative outcomes that could possibly result from implementing that dimension (Kistler & Wilkerson, 2018).
The stages of concern process construct aims to keep the focus of an inquiry on the feelings and perceptions of those doing the work in an implementing-change scenario. The concerns within this component are that of those doing the implementation. There are seven recognized stages of concern within this component: (0) unconcerned, (1) informational, (2) personal, (3) management, (4) consequence, (5) collaboration, and (6) refocusing (American Institutes for Research, 2010a). Although there are many stages, it is generally accepted that the earlier stages of concern are more intrinsic while the later stages become more group oriented (American Institutes for Research, 2010a). Unconcerned individuals are not interested or able to concern themselves with the adoption of an innovation at the time of observation. Those in the informational concern stage are willing and open to receiving more information about an innovation. Personal concern is characterized by an individual examining how an innovation would affect them on an individual level if it were adopted. The management stage of concern looks at how an individual would manage the perceived changes identified in the personal stage. Following this, the consequence stage of concern examines perceived consequences of adoption with regards to how the innovation would affect others (students, coworkers, subordinates). The collaboration stage examines participants as they begin focusing on how to exchange information about adopting and utilizing the innovation with others, and the refocusing stage then sees facilitators stepping back to assess necessary changes, improvements, and successes of adopting the innovation (American Institutes for Research, 2010a). Assessing which stage innovation adopters are in can be achieved via questionnaire, interview, or written reflection (American Institutes for Research, 2010a). Findings from this assessment should be used to create targeted support for challenges experienced by those adopting the innovation at hand.
Very similar to the stages of concern within the CBAM, the levels of use demonstrate a continuum of usage of an innovation experienced by the implementers. There are eight levels of use that aim to categorize attitudes related to using an innovation and quantify the level of use that adopter is currently experiencing (American Institutes for Research, 2010b). The levels are as follows: nonuse, orientation, preparation, mechanical use, routine use, refinement, integration, and renewal. These levels are slightly more self-explanatory than the levels of concern and are well described by statements of use in Table 1. The American Institutes for Research (2010b) advises that before conducting focused interviews to ascertain levels of use, facilitators should create and distribute an innovation configurations map. Using the levels of use data and the stages of concern data in tandem can better illustrate the effectiveness of implementation of an innovation (American Institutes for Research, 2010b).
Table 1. CBAM Levels of Use Described by Statement

<table>
<thead>
<tr>
<th>Level</th>
<th>Typical Statement</th>
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<tbody>
<tr>
<td>Nonuse</td>
<td>“I’ve heard about it but, honestly, I have too many other things to do right now.”</td>
</tr>
<tr>
<td>Orientation</td>
<td>“I’m looking at materials pertaining to the innovation and considering using it sometime in the future.”</td>
</tr>
<tr>
<td>Preparation</td>
<td>“I’ve attended the workshop and I’ve set aside time every week for studying the materials.”</td>
</tr>
<tr>
<td>Mechanical Use</td>
<td>“Most of my time is spent organizing materials and keeping things going as smoothly as possible every day.”</td>
</tr>
<tr>
<td>Routine Use</td>
<td>“This year it has worked out beautifully. I’m sure there will be a few changes next year, but basically, I will use it the same way I did this year.”</td>
</tr>
<tr>
<td>Refinement</td>
<td>“I recently developed a more detailed assessment instrument to gain more specific information from students to see where I need to change my use of the innovation.”</td>
</tr>
<tr>
<td>Integration</td>
<td>“Not everyone has all the skills needed to use the program so that it has the greatest impact on student learning. I’ve been working with another teacher for 2 years, and recently a third teacher began working with us.”</td>
</tr>
<tr>
<td>Renewal</td>
<td>“I am still interested in the program and using it with modifications. Frankly, I’m reading, talking, and even doing a little research to see whether some other approach might be better for the students.”</td>
</tr>
</tbody>
</table>

*Note.* From “Levels of Use │ Concerns-Based Adoption Model” by American Institutes for Research, 2010 December 8. Copyright © 2022 American Institutes for Research®.

**Concerns-Based Adoption Model in Educational Contexts**

The CBAM has been widely used in educational contexts to evaluate the effectiveness of new innovations (Anderson, 1997). Because educational innovations are constantly being developed and adopted, CBAM makes sense as a conceptual framework to assess success because several parts are re-visitable throughout the implementation process. CBAM has been particularly popular to help guide assessments of state and federal education standards, such as Common Core (Jean, 2019). Since the model places adopter concerns at the center of all three dimensions of assessment, it is effective at targeting and addressing needs as they arise. The
CBAM stages of concern assessment was applied in an investigation of the Common Core State Standards and the concerns surrounding adoption of them when teachers were examined based on age, gender, and years of teaching (Boatright, 2014). The assessment gleaned that across all participant characteristics, the most common stage of concern regarding the Common Core State Standards was unconcerned/unaware (Boatright, 2014). This indicated that teachers needed more awareness of the standards because this was preventing them from moving to higher stages of concern (Boatright, 2014). Boatright (2014) concluded that to help teachers move to more extrinsically focused stages of concern, the problem of awareness and intrinsic motivations must be addressed first. The choice to focus on the stages of concern dimension of the CBAM is a popular one as the stages of concern is a useful tool to direct efforts where they are most needed.

Predating Boatright’s (2014) analysis, an investigation of teacher concerns regarding implementation of environmental education curriculum in Australian schools was conducted using solely the stages of concern dimension of the CBAM (Malone, 1992). Significant findings from this study indicated that schools that were previously attempting environmental education in unofficial or independent capacities had teachers in more extrinsic stages of concern than those that were introduced to the new standards at the time of the study (Malone, 1992). This study served to inform changemakers but also provided evidence for the effectiveness of professional development and ongoing support for teachers implementing novel curricula (Malone, 1992). More recently, Egaña (2001) conducted a multi-year assessment of the teachers tasked with leading environmental education field trips using interviews, self-reflections, and observations to analyze their stages of concern. Findings from this assessment indicated that the program was overall successful, but more specifically it was quite easy to assess success thanks to the program’s demonstrable goals that were communicated with the participants,
demonstrating the importance of participant leadership. (Egaña, 2001). Most recently, a study on
the impact of mentorship in the implementation of watershed education initiatives revealed a
mutualistic relationship between mentors and teachers (Ernst & Erickson, 2018). Teachers
indicated through focus group interviews that the mentors helped them apply environmental
concepts taught during professional development sessions while also providing valuable
feedback on what specific practices mentors employed that helped them the most during
implementation (Ernst & Erickson, 2018).

Given the success of utilizing the levels of concern dimension of the CBAM in
environmental education research, the model serves as the conceptual basis for this investigation.
The inaugural environmental education curriculum and accompanying state endorsement plan
will both affect nonformal environmental educators in Louisiana. An initial survey and
consequent monitoring of the changes in perceptions and needs of nonformal environmental
educators in Louisiana is important to ensuring successful implementation of both the EE
standards and the state endorsement program for nonformal environmental education
organizations.
CHAPTER III. METHODOLOGY

Overview

This investigation examined the perceptions and stages of concern regarding changes in environmental education standards experienced by Louisiana environmental education professionals through rigorous, tenable, and ethical methods. Employing an interpretivist theoretical perspective, I used an instrumental case study design to glean emergent themes.

Purpose of the Study

The purpose of this study was to determine the perceptions of nonformal environmental educators in Louisiana (defined as interpreters, state and federal agency educators, and nonprofit instructors and educators) regarding knowledge of state environmental education standards, implementation of said standards in their respective institutions, their perceived needs in the pursuit of program endorsement, and their perception of the organization of nonformal environmental educators in the state. In determining the perceptions of nonformal environmental educators in Louisiana, this study explored the relationship between formal environmental education state standards and nonformal environmental education professionals. As such, the information can be used in future endeavors to foster agreement across sources of environmental education, encourage environmental literacy, and create complimentary resources to create a united front in the face of the environmental challenges of Louisiana.

Research Questions

1. How do nonformal environmental education professionals in Louisiana describe their perceptions of the nonformal environmental education landscape?
a. Do nonformal educators perceive a need to create a new environmental education professional organization in Louisiana?

2. How do nonformal environmental education professionals in Louisiana describe their knowledge of and relationship with Louisiana state environmental education standards?

3. What needs do nonformal environmental education professionals identify regarding the process of achieving state endorsement of their respective program?

Epistemology and Theoretical Perspective

Given the qualitative nature of this investigation, it is important to discuss the philosophical and theoretical perspectives used throughout. The significance of this investigation and the findings within cannot be properly conveyed without describing the various perspectives influencing data interpretation, namely epistemological, theoretical, and philosophical viewpoints. Epistemological perspective informs and influences theoretical perspective, methodology, and methods (Crotty, 1998). Recognizing variations in epistemological perspectives and how they result in varying interpretations of data is integral to validating not only the findings of this study, but the interpretations and applications of the findings in future research.

The data collected and interpreted in this investigation was a constructionist epistemological position as described by Crotty (1998). Constructionism falls between objectivism and subjectivism on a continuum, with objectivism favoring more absolute perspective and subjectivism favoring fewer absolute conclusions and more dependent conclusions (Crotty, 1998). By approaching this investigation with a constructionist perspective, I was able to view data and findings as results of lived experiences and interpretations of the world as seen by the participants. Crotty (1998) asserted that constructionism was a perspective
that entailed creating meaning through social contexts, personal experiences, and individual perceptions of reality. Because this study aimed to investigate multiple perspectives on the structural changes in environmental education, a constructionist perspective was fitting because it allowed for varying perceptions of reality based on lived experiences of each participant. The goal of this investigation was to garner a diverse yet representative range of participants from the nonformal environmental education community in Louisiana, making it essential to allow for multiple constructed realities based on experience.

The interpretivist theoretical perspective was also used to inform and guide this investigation. Interpretivism is neither overly objective nor subjective, but instead falls in the middle. It has been characterized by a view of individuals that assumes they are to interpret the world around them based on their unique social, cultural, and historical interactions and experiences (Crotty, 1998). Environmental education, as an interdisciplinary subject area, benefits from being viewed from this perspective because of the many considerations that go into place-based, experiential education. Participants in this study have likely all considered cultural, historical, and social factors in how they facilitate environmental education, making it a fitting perspective for this investigation.

**Reflexivity Statement**

To abide by the standards high-quality qualitative research (Tracy, 2010), it was important to disclose any biases and inclinations I have as a researcher. I am a lifelong advocate for environmental education, and I hold the role of environmental education in the fight against ecological disasters in high regard. I have previously been employed as a nonformal environmental educator in the state of South Carolina, which has a different structure in place to align nonformal educational offerings with state standards. I am deeply interested in better
understanding the environmental education landscape in Louisiana so that I may not only compare it with my knowledge of other states, but also so I may contribute to the ultimate goal of creating environmental literacy within the population to combat environmental degradation. I value the role of rigorous, credible, and relevant qualitative social science research and have authored two publications utilizing interviews to conduct case study analysis. These factors may have influenced my analysis and interpretation of the data to favor nonformal environmental educators. To control for and reduce this influence, I have chosen to abide by Tracy’s (2010) eight criterion for excellent qualitative research throughout this investigation.

**Institutional Review Board**

This investigation was conducted in full compliance with the standards (procedural, relational, ethical, and situational) upheld by the university’s Institutional Review Board (IRB). The purpose of the IRB is to ensure that scientific research endeavors, in this case those conducted by Louisiana State University (LSU) faculty, staff, and students, are prioritizing the health, emotional and physical safety, and privacy of the subjects they involve. Additionally, this study was conducted using the remote meeting software, Zoom, in part to ensure compliance with the COVID-19 protocols not only of LSU, but of the various institutions study participants were affiliated with.

Written and verbal consent were obtained from study participants prior to data collection. Furthermore, participants were informed that this consent did not bind them to participation. All data, including focus group audio recordings, the resulting transcripts, notes taken during the focus groups, and notes taken during the participant screening process were kept confidential. Additionally, all raw or identifiable data regarding this study will be destroyed five years after completion of this project in accordance with LSU IRB (IRBAG-22-0066).
**Instrumental Case Study Research Design**

This investigation was grounded in an instrumental case study approach as popularized by Stake (1995). This approach was chosen as it was an appropriate technique to examine a specific issue, in this case the issue of environmental education changes at the state-level in Louisiana as it pertains to nonformal environmental educators. Stake’s (1995) case study approach, unlike others, concerns strictly qualitative data (Yazan, 2015). This was suitable for the focus group format of data collection. Further, Stake’s (1995) approach recommended for researchers to designate two or three research questions to structure observation, interviews, and the process of analyzing data (Stake, 1995) effectively. Therefore, the focus group interviews conducted within this study were guided by three overarching inquiries.

**Research Design**

**Background of the Study**

The environmental education landscape in Louisiana began to undergo sweeping changes in May 2022 with the release of the key principles and concepts in environmental education by the Louisiana Department of Education (LDOE) (Louisiana Department of Education, May 2022). With the release of these key principles and concepts in environmental education, the Louisiana State Department of Education concurrently released the application for the Louisiana Environmental Education Advancement Project (LEEAP) (Michelle Lewis, personal communication, April 29, 2022). This project allowed nonprofits and agencies that facilitate nonformal environmental education to apply to LDOE, and “…work to meet LDOE criteria for a “high-quality” endorsement in the LDOE’s directory of environmental education providers…”, (LDOE, April 2022). This endorsement, while offering opportunity, may also create challenges for organizations attempting to meet the EE standards or for those that fail to achieve
endorsement. The LEEAP application notes that only a select number of applicants will be chosen for this program, and the benefits from completing the program include promotion across school systems statewide, professional development opportunities, and technical support from LDOE. These new circumstances call for empirical data on the perceptions of nonformal environmental educators representing nonprofits and agencies from across the state, which is why this population was chosen for the study.

**Population and Sample**

The population of this study included nonformal environmental educators working with agencies or nonprofits, all of whom meet the purposive sampling criteria and work within the state of Louisiana. Criteria included working in the state of Louisiana at the time of the study, working within the field of environmental education, and working in an nonformal setting outside of the public school system of Louisiana. There was not a statewide organization of environmental educators in Louisiana that was active. The webpage for the Louisiana Environmental Educators Association was last updated in 2015 (Louisiana Environmental Educators Association, 2015) and the corresponding Facebook page has been deactivated as of May 2022. This created a challenge in reaching potential participants and served as a limitation for the study as it cannot represent all institutions offering environmental education programs, nor can it represent all parishes in the state.

Participants were selected using snowball purposeful sampling (Patton, 1990). Purposeful sampling, also known as judgment sampling, was defined by Bernard (2000) as when, “...you decide the purpose you want informants to serve, and you go out and find some” (p. 176). The snowball method of purposeful sampling has been useful in cases of reaching unknown or difficult to reach populations (Patton, 2015). This population has been deemed difficult to reach
due to the disbandment of the Louisiana Environmental Educators Association (LEEA), which used to have a mailing list and strong membership across the state. This mailing list, while still available through contacting the last known board members of LEEA, is no longer up to date, nor does it accurately reflect the organizations with which educators currently work as it is from 2015. The snowball sampling technique nominates initial participants and then asked them to reach out to their network to identify more individuals meeting the sampling criteria. The snowball purposeful sampling technique was utilized with criterion-based (Patton, 2007) purposive sampling to select initial participants.

To make initial contact with the target population, I contacted the Louisiana Department of Wildlife and Fisheries (LDWF) because of the robust education section on their website. Once I connected with an educator representing LDWF, I attended a workshop the department’s education division was conducting to try and meet more environmental educators. This proved successful and from this workshop I was able to meet several environmental educators representing different organizations and nonprofits. This accounted for about half of my recruitment efforts. The other bulk of my recruitment occurred purposefully, when I was introduced to the Chair of the Louisiana Environmental Education Commission, Brian Gautreau, at a volunteer event. From this, I scheduled a meeting with Mr. Gautreau to talk about the history of the Louisiana Environmental Education Commission, the history of the Louisiana Environmental Educators Association, and to connect with educators that he knows through his work as chair of LEEC. Upon contacting these educators, I asked each if they recommended that I contact any additional educators they may know, placing emphasis on the need to reach all regions of Louisiana and assemble a group featuring different genders, as well as people of different races and ethnicities. Final participants and focus groups are described in Table 2.
Table 2. Participants’ Personal and Professional Attributes

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Gender Identity</th>
<th>Age Group</th>
<th>Ethnicity</th>
<th>Highest Level of Education attained</th>
<th>Type of Environmental Education Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taylor</td>
<td>Female</td>
<td>41-50</td>
<td>African American</td>
<td>Master’s</td>
<td>Government - State</td>
</tr>
<tr>
<td>Devin</td>
<td>Female</td>
<td>31-40</td>
<td>Caucasian</td>
<td>Master’s</td>
<td>Government - Federal</td>
</tr>
<tr>
<td>Jordan</td>
<td>Male</td>
<td>31-40</td>
<td>Caucasian</td>
<td>Bachelor’s</td>
<td>Government - State</td>
</tr>
<tr>
<td>Skylar</td>
<td>Female</td>
<td>20-30</td>
<td>Caucasian</td>
<td>Master’s</td>
<td>Non - profit</td>
</tr>
<tr>
<td>Avery</td>
<td>Female</td>
<td>31-40</td>
<td>Caucasian</td>
<td>Bachelor’s</td>
<td>Private, not – for – profit</td>
</tr>
<tr>
<td>Tracy</td>
<td>Female</td>
<td>41-50</td>
<td>Caucasian</td>
<td>Bachelor’s</td>
<td>Government - Parish</td>
</tr>
<tr>
<td>Carter</td>
<td>Female</td>
<td>20-30</td>
<td>Caucasian</td>
<td>Bachelor’s</td>
<td>Government - State</td>
</tr>
<tr>
<td>Emerson</td>
<td>Female</td>
<td>41-50</td>
<td>Caucasian</td>
<td>Master’s</td>
<td>Government - Parish</td>
</tr>
<tr>
<td>Alex</td>
<td>Female</td>
<td>31-40</td>
<td>Caucasian</td>
<td>Bachelor’s</td>
<td>Government - State</td>
</tr>
</tbody>
</table>

**Description of EE group**

The focus groups consisted of both men and women, although the ratio of educators in the United States is majority female, with 64% of secondary school teachers identifying as female in 2018 (Irwin et al., 2021). Focus group participants were majority Caucasian females which reflects the population dynamics of educators within the state of Louisiana (United States Department of Education National Teacher and Principal Survey, 2018).
Participants represented organizations that were funded through a variety of sources. Some represented federal agencies in Louisiana, while some were funded by private foundations. Across the three focus groups, participants represented organizations and agencies from the parish to the federal level, as well as those that are funded privately or publicly or through a combination of funds. Participants were chosen in part due to their location. I chose at least one environmental educator to represent the northwest, northeast, southwest, southeast, and central regions of Louisiana. Despite the inclusion of many educators representing state and federal agencies, all of whom work in close proximity to Louisiana’s capitol, Baton Rouge, each focus group contained representatives of at least two regions.

Data Collection

Data collection took place throughout the summer of 2022. Educators in each focus group were contacted through electronic mail correspondence to request they complete a poll to determine availability. Because of the variable nature of summer schedules for educators, focus group interviews were conducted through Zoom video conferencing software to accommodate participants’ schedules. Once availability was established, a focus group was scheduled via Zoom. This meeting was recorded and transcribed. Participants were able to request to see the transcript pre-analysis to redact any information they wish to remove from the study, available upon request. Focus groups were transcribed using Descript, an audio transcription software package. The resulting transcripts were checked by the researcher to ensure accuracy. This process occurred for each of the three focus groups. Full interview protocol can be found in Appendix C.

Before each interview, I reviewed the key environmental principles and concepts (Appendix E) as well as the LEEAP application (Appendix F) with participants individually. To
conduct this review, I created an adaptive script to ensure I delivered the same information and
did not overstate any part of the EE changes to any one participant. Many participants entered
this study with prior knowledge of one or both documents. Participants were not made aware of
the identities of other participants in their assigned focus group until the meeting was conducted.
During the interview, notes describing any interruption, atmospheric characteristics, previous
relationships between participants, and the general emotions of the participants were captured.

Data Analysis

All focus group interviews were recorded on a secondary audio-only recording device.
The resulting audio files were uploaded to Descript, a transcription software. Raw data was
analyzed using three first-cycle coding methods and one second-cycle coding method as
described by Saldaña (2016).

First Cycle Coding Round 1: Structural Coding

Structural coding is helpful in research applications that examine multiple participants
(Saldaña, 2016). It is most suitable for, “…interview transcripts than other data such as
researcher-generated field notes, but open-ended survey responses are also appropriate with this
method” (Saldaña, 2016, p. 98). Given the semi-structured interview protocol and the multiple-
participant interviews, structural coding was employed to consolidate and make accessible data
of particular importance for analysis. Structural coding ties a line of inquiry to the specific piece
of data that corresponds with that question. An example of this data was participant’s length of
tenure within the environmental education profession and demographic data.

To utilize this approach, I examined each interview transcript to identify the exact
wording of the questions I used to direct discussion. Then, for each line of questioning, I
extracted codes that addressed the inquiry. This presented an occasional challenge when
participants failed to answer the question or began to speak off topic from the initial question, however these segments of data were not discarded but were instead reserved for other first round coding methods. Throughout structural coding process, 1,440 unique codes emerged. Examples of structural codes included “biologist supervisor”, “30-40% face-to-face facilitation”, and “it has an impact on how we work with other groups within our region”.

**First Cycle Coding Round 2: In Vivo Coding**

I chose to employ In Vivo coding as a first cycle approach to analyzing this data. In vivo coding was chosen because it allows verbatim sentiment from transcripts to emerge through the coding process, with Saldaña (2016) heralding this method as, “[prioritizing] and [honoring] the participant’s voice”, (p. 106). Furthermore, the field of environmental education and education at large can be host to many acronyms, jargon, and specific terminology that the survey would benefit from including as accurately as possible. Using In Vivo coding, 2,039 codes emerged. Codes that repeatedly emerged, such as “I don’t know” or “vital” were included in this count as their repetition indicated magnitude of certain sentiments. Examples of In Vivo codes include: “often at capacity” “outweigh your passionate interest” “people tend to stay” “better bridge between” “good job of introducing” and “means nothing to me”.

**First Cycle Coding Round 3: Emotion Coding**

The final first cycle coding method chosen for this investigation was emotion coding. Emotion coding was chosen because participants were surveyed about personal experiences and judgements (Saldaña, 2016). Emotion coding was particularly useful when capturing the variations in intensity of a singular emotion experienced by one or multiple participants. To ensure no relevant codes were missed, verbal and nonverbal indicators of emotions were used in this analysis. Throughout the focus group interviews, the researcher made note of physical
indicators of emotions and nonverbal cues. Examples of nonverbal indicators of emotions within this study include shrugging, face rubbing, and eyebrow furrowing. Transcripts were analyzed for spoken emotional cues, such as “it’s so frustrating” or “I feel handcuffed by them.” Audio recordings of the interviews were examined for emotional indicators such as inflection, prolonged pauses, and enthusiastic tone. This coding process yielded 367 unique codes.

**Second Cycle Coding: Axial Coding**

Following first cycle coding, I used axial coding as a second cycle coding approach to distill the 3,846 first cycle codes into conceptually similar categories. Saldaña (2016) describes axial coding as a process that “…describes a category’s properties and dimensions and explores how the categories and subcategories relate to each other” (pp. 235-236). Axial coding acts as the transitional step between first cycle coding methods and final theoretical coding. After reviewing list containing all open codes across the three interview transcripts, I began to create “bins” for recurring and similar codes. During this process, I made note of “dominant” and “less important” (Strauss & Corbin, 1998, p. 109) codes while still including them in the sorting and splitting process. As a result of this process, I developed 14 axial code categories. Examples of these categories included: “current relationship with education standards” “recruitment and retention” and “sense of servitude”.

**Thematic Analysis**

Following first and second-cycle coding, I employed thematic analysis to first interpret axial codes into emergent themes and then organize them into a chronological narrative progression based on my research questions. To facilitate this process, I met with a mentor who was an expert in qualitative analysis to negotiate the axial codes into a well-ordered depiction of
the data. As a result, six themes emerged. Themes emerging from research questions two and three were interpreted using the concerns-based adoption model (Hord, 1987).

**Building Qualitative Quality**

Tracy (2010) established eight criteria for excellent qualitative research, which I will be using to ensure this investigation is valid and well executed. The following eight “Big-Tent” indicators for qualitative excellence are as follows: (1) Worthy topic, (2) Rich rigor, (3) Sincerity, (4) Credibility, (5) Resonance, (6) Significant contribution, (7) Ethical, and (8) Meaningful coherence (Tracy 2010). Each criterion as well as the measures taken to adhere and implement it are listed in Table 3. By adhering to Tracy’s (2010) standards, this study was able to achieve its research objectives while creating validity, rigor, and reliability.

**Table 3. Methods Used to Meet Tracy’s (2010) Criterion for Excellent Qualitative Research**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Methods used to achieve criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worthy Topic</td>
<td>The topic of environmental education is relevant, timely, interesting, and significant</td>
</tr>
<tr>
<td>Rich Rigor</td>
<td>Investigation employed Concerns-Based Adoption Model as conceptual framework, interviewed nine participants, and collected and analyzed data using appropriate methods: data collection was conducted via Zoom, data analysis was conducted using Saldaña’s (2016) first and second cycle coding methods</td>
</tr>
<tr>
<td>Sincerity</td>
<td>Sincerity was achieved through self-reflexivity statement disclosing biases and inclinations of the researcher. Challenges and methods were documented transparently</td>
</tr>
<tr>
<td>Credibility</td>
<td>Credibility was established by using rich description, concrete details, ensuring multivocality, and explanations of tacit knowledge when necessary</td>
</tr>
</tbody>
</table>

(table cont’d.)
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Methods used to achieve criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resonance</td>
<td>Research reaches a variety of audiences and moves them using transferable findings, naturalistic generalizations, and evocative representation</td>
</tr>
<tr>
<td>Significant Contribution</td>
<td>Results from this study contributed to current environmental knowledge base in practical, conceptual, and heuristic ways</td>
</tr>
<tr>
<td>Ethical</td>
<td>Human, situational, relational, and exiting ethics were emphasized throughout this study</td>
</tr>
<tr>
<td>Meaningful Coherence</td>
<td>This investigation achieved what it intended to achieve, used appropriate procedures to achieve its outcomes, and makes meaningful connections between current literature, the research questions at hand, and findings resulting from them</td>
</tr>
</tbody>
</table>

**Worthy Topic**

To fulfill the criterion of a worthy topic, nonformal environmental education in Louisiana was chosen due to the actively changing role of the Louisiana State Department of Education (LDOE) and the urgency of the environmental challenges facing the state. Between the pressing ecological changes occurring in Louisiana and the newly released Key Environmental Principles and Concepts and Louisiana Environmental Education Advancement Plan, this study topic satisfies Tracy’s (2010) criteria being relevant, timely, significant, and interesting. Louisiana is experiencing a litany of environmental changes, many of them occurring in direct conflict with human interests as they have been established in the state. Environmental education remains a vital tool to inform and equip the population with the knowledge and critical thinking skills to make informed decisions relating to the environment. The involvement of LDOE in nonformal
environmental education efforts throughout the state is novel and should be closely monitored to better inform the partnership between LDOE and nonformal environmental education providers.

**Rich Rigor**

To meet the criterion of rich rigor, which is characterized by Tracy (2010) as data having requisite variety, face validity, careful collection procedures, and rich complexity of abundance. The Concerns-Based Adoption Model (Hord, 1987) was the conceptual framework that served to guide this investigation, thus fulfilling the need for a complex yet flexible framework. Furthermore, multiple sources of data were employed in analysis, such as interviewer observations, audio files, and interview transcripts. This variety gave the data a “rich complexity of abundance” (Tracy, 2010, p. 841). Finally, the quantity and quality of data collected within this investigation was appropriate for the breadth and depth of analysis which it was intended for (Patton, 2002).

**Sincerity**

To achieve sincerity within this investigation, self-reflexivity, honestly, vulnerability, and transparency were utilized throughout the research process. The effects of bias and personally held views on the validity of research was acknowledged through a reflexivity statement prior to collecting data, as well as throughout the data collection and data analysis portion of the investigation through oversight by members of the research team. To correct for any errors in interpretation of data, the conceptual framework and the multiple case study design (Stake, 1995) were utilized throughout the investigation.
**Credibility**

This investigation utilized, “thick description, triangulation or crystallization, and multivocality and partiality”, (Tracy, 2010) to establish credibility. To create thick description, axial codes and the resulting emergent themes were discussed with a research team to determine what to show rather than tell in the findings and discussion. Triangulation was achieved by collecting multiple types of data, such as audio recordings and field notes. This investigation was overseen by a team of researchers, thus ensuring multivocality in data reporting. Multiple supporting quotes from each of the three focus groups for each emergent theme were utilized to corroborate the findings and achieve credibility. These practices allow findings to be considered as credible and valid.

**Resonance**

Per Tracy (2010), resonance is an important criterion for excellent qualitative research because it allows the research to reach and have meaning to the intended audiences. Resonance was achieved by describing participants, procedures, and findings in a way that allows readers to empathize and reflect on their own practices and the practices of their institutions. The findings generated by this investigation have been presented in an intentional and thoughtful manner intended to have a meaningful impact on the environmental education landscape of Louisiana as well as other individuals who encounter this research.

**Significant Contribution**

Although the body of research surrounding environmental education in the United States is expanding, environmental education research specific to Louisiana is lacking. This is especially true regarding nonformal environmental education research within the state. This
investigation addresses general and specific questions relating to the nonformal environmental educator community in Louisiana. Particularly, this study investigated the inaugural attempt by the Louisiana State Department of Education to create guidelines for nonformal environmental educators. The timeliness of this investigation makes a significant contribution to the existing knowledge regarding Louisiana’s environmental education landscape. This study also adds to the body of knowledge regarding the standardization of nonformal environmental education offerings across several states in the United States.

**Ethics**

To meet Tracy’s (2010) recommended ethical criteria, procedural, relational, and existing ethical considerations were met and maintained throughout the investigation. Procedural ethics were largely ensured by complying with Louisiana State University’s Institutional Review Board (IRB) trainings, requirements, and recommendations. Data was managed in a responsible and confidential way on password protected devices. Any data collected during this investigation will be destroyed five years after completion of the study, as per IRB standards. Relational ethics were upheld through maintaining self-awareness throughout the participant recruitment and briefing process, the interview process, and the post-interview survey process. Participants were often reminded that their participation was voluntary, as was any information shared with the research team. Furthermore, participants were made aware of their ability to redact any raw data they provided throughout the data collection process.

**Meaningful Coherence**

This investigation was structured using Stake’s (1995) multiple case study design. This design allowed an investigation of the perceptions of nonformal environmental educators in the
state of Louisiana following the release of the Key Environmental Principles and Concepts and the Louisiana Environmental Education Advancement Plan. This study achieved the stated purpose by addressing all three main research questions and one sub-question. The findings resulting from this study, in accordance with Tracy (2010) address a dearth of knowledge regarding the nonformal environmental education landscape in Louisiana.
CHAPTER IV. FINDINGS

Through Stake’s (1994) multiple case study approach, five emergent themes and one sub-theme were derived from the data. The themes were then split into groups based on which research questions(s) they most closely correspond with. The first research question investigated the perceptions of the environmental education landscape of Louisiana from the perspective of nonformal environmental educators in the state. Emergent themes addressing this question include: (1) strong sense of servitude and (2) changes in recruitment and retention. A sub-question of the first research question aimed to gauge interest in and the need for a professional association for environmental educators in Louisiana. One theme, desire for connectivity, emerged and addressed this line of inquiry.

Research questions two and three investigated perceptions of nonformal environmental educators in Louisiana regarding the release and implementation of two guiding documents from the Louisiana State Department of Education: Key Environmental Principles and Concepts and the Louisiana Environmental Education Endorsement Plan (LEEAP). From data generated by these questions, three emergent themes were derived: (1) unknowing optimism, (2) overwhelmed and outvoiced, (3) comfort with pillars of formal education.

**Research Question #1:** How do nonformal environmental education professionals in Louisiana describe their perceptions of the nonformal environmental education landscape?

**Theme 1 – Strong Sense of Servitude**

Across all focus groups in this investigation, participants conveyed a strong sense of servitude. This sense of servitude was multifaceted, often being expressed in multiple ways such as concern for one’s immediate community, concern for the state of Louisiana at large, and
concern for individual citizens. The apparent sense of servitude was universal across participants regardless of the length of their career in environmental education, their primary audience sought, or the type of institution they work for. For example, Taylor was concerned for marginalized people who do not have the means to educate themselves about the environment, stating, “…they want to be able to stand up for themselves”, and therefore, “…offering this training to the public for them is necessary.” Taylor’s concerns largely stemmed from a desire to provide the knowledge and tools necessary to engage in everyday environmental conversations and decisions that impact lives, expressing, “[Everyday people] need that information to be able, almost to live.” The understanding that knowledge of environmental challenges equates to social and economic power was not isolated to Taylor. During a separate focus group, another participant, Devin, expressed similar feelings, stating that their organization was, “…putting the action and the control back into the hands of the audience and the people that we’re engaging.” Devin also touched on feeling compelled to be there as an audience themselves, stating that working with the public is a “two-way conversation…serving them.” These sentiments convey a sense of community-level servitude, but participants also spoke extensively about, “the big picture.”

Participants spoke earnestly about the need for large-scale environmental education in Louisiana. Encouraging audiences to, “look outside their community”, and “be engaged citizens” was a common thread throughout the three focus groups. Educators participating in this investigation were aware of their role in the preservation of Louisiana on a statewide level, with Devin saying, “[I] consider my goal to work with the entire state.” Alex, a participant in the same focus group added to this, stating, “Ultimately our goal is improving Louisiana, making sure Louisiana is around for the future.” Another participant, Skyler, outlined their role as an
environmental educator as someone who informs questions such as, “What do [children in Louisiana] want to do [one day]? Where are [children in Louisiana] staying…when they become an adult?” when asked about the place of nonformal environmental educators in fostering environmental literacy. When asked the same question about environmental literacy, Avery described environmental education as a transferrable skill:

Louisiana and the people who live here are in an incredibly and particularly vulnerable place when it comes to our environment…We have coastal loss, we have hurricanes, we have flooding, we have heat…It’s so important for people who live here to understand that…to understand why it’s happening and to have the tools and the knowledge…Whether they stay in Louisiana or go elsewhere…[They need to] be able to make decisions about their life, have input in their communities in a way that… comes back to this sort of base knowledge and understanding of all these various concepts.

Throughout all focus groups, participants emoted urgency when speaking about the need to inform their immediate communities as well as those across the state. When posed with a question about the importance of environmental literacy in Louisiana, Taylor drew global connections, “…you have to believe we have a changing climate…This is happening really quick…It just seems like things have escalated in a way I did not expect…It is necessary to inform people to make decisions, not just [allow] living in fear.” Linking small- and large-scale servitude together, participant Emerson expressed urgency surrounding how to connect “local issues” with “global issues.” Similarly, participant Carter described a need for cognitively connecting multiple scales of impact through their educational services, stating, “In terms of scales, local and global, and also short term and long term, there’s… a disconnect between having kids connect all those scales together to see the complexities and the bigger picture when
it comes to environmental impact.” Altogether, participants readily recognized their roles as public servants in their communities, but also recognized the possible scope of their impact on those whom they serve.

**Theme 2 – Changes in Recruitment and Retention**

Further characterizing the current landscape of nonformal environmental education in Louisiana, participants spoke freely and critically about recruitment and retention in the profession. More specifically, participants spoke about two overarching sentiments: (1) the perceived increase in formal educators leaving the field to enter nonformal environmental education and (2) the need for upward mobility and adequate financial compensation to retain young professionals. Participants employed personal anecdotes, comparisons to other states, and generalizations to describe these changes in recruitment and retention. It is important to note that a range of career lengths were represented across all participants, with Taylor reporting their tenure in the nonformal environmental education field lasting, “20 years” and spanning several organizations, while others such as participant Carter, reported recently completing, “five years” in the profession—all of which have been spent in Louisiana. Several participants cited employment in nonformal environmental education in other states, most notably participant Devin listed nine states they had prior employment in before coming to Louisiana. These varied career lengths and multi-state backgrounds lent themselves to rich comparisons throughout the focus groups.

The perceived migration of formal educators to the nonformal environmental education field is not unfounded, as many participants, such as Taylor and Skylar respectively, cited a desire to teach but, “… did not want to be in the classroom” or, “didn’t want to teach in a school.” One participant, Devin, cited themselves as an example, “…I’ve also been a classroom
teacher as well. So, I’ve done the formal and nonformal side.” Devin also shared their perception of the migration, mentioning they have met, “…[several] formal education teachers looking to leave.” Devin explained perceived motivations for this exodus:

I know [Alex] and I’s organizations have recently employed teachers that have left the field. These are experienced teachers with 10, 20 years of experience in the classroom and they love teaching. They [want to] continue to teach. They just feel that they can’t teach on their own terms in their classroom. So, they look for other opportunities and [formal educators are] leaving the formal education field for the nonformal.

When asked a follow-up question about how these formal educators may perceive the inaugural environmental education standards released by LDOE, Devin added, “[The standards are] very valuable because [former formal educators] almost think of the standards first, where I think of the phenomena first… [former formal educators] can be a foil [to the skills of nonformal environmental educators].”

Conversely, participants raised concerns about recruitment and retention of early career professionals. Participant Carter spoke from personal experience:

My experience is that my first organization was a nongovernment agency… and the pay and benefits were slightly above minimum wage. And at the time, it was fine. I… didn’t have very many living expenses, but… rent starts going up and…you start weighing. I was lucky that my current position opened up around the time I was starting to realize, “Oh, I need actual healthcare and a better living wage.”

Carter summarized that often, “…eventually your needs to live your life are [going to] outweigh your passionate interest until [the organization] sees turnover.” This sentiment was a
throughline across focus groups, with several participants in hiring positions expressing challenges with hiring related to compensation. Participant Emerson explained, “I have very little leeway when it comes to hiring as far as what I can offer people.” This was echoed by Avery, who added

…We’ve done what we can within our organization to improve that…Being able to bring people into the field and…keep them means you have to pay a livable wage and have opportunity for growth…and be able to develop people within the field… [lack of opportunity for growth] makes it challenging to hold on to anybody for too long.

Building on this sentiment, participant Taylor said, “…and then you [want to] pay the young people peanuts? Although they should not be expecting a million dollars…you [have to] offer something that is livable.” Devin volunteered a perspective that blended concern for upward movement with the demand for professional development placed on educators saying, “I think you run into challenges of movement upward in an organization…[hiring managers] [are going to] want to see ways…you have furthered your education, whether it’s formally or you’ve done training and courses.”

To contrast, participant Jordan explained their view of why people are choosing not to enter the environmental education field in Louisiana specifically, stating:

Louisiana’s not really known for being real science-heavy or real supportive of science… I imagine…it’s very difficult to recruit and retain people because they are [going to] go places like Austin, they’re [going to] go places out east. They’re [going to] go places out west and in the Northeast where there’s a heavier value placed on science and the natural environment.
The sentiment expressed by Jordan was not standalone, with many others adding similar accounts of the attitude towards environmental education in Louisiana. Participant Avery presented a blunt observation, “I think Louisiana is severely behind on a lot of things…as a state, we are seeing some of the worst effects of…the impact on our environment…we are seriously lacking in action to do something about it.” Alex offered a critical take when asked about differences in environmental education across states, saying:

I don’t [want to] knock on Louisiana [because] we’re Sportsman’s Paradise, but… [the environment is] not the priority here…Those resources are expendable to people here, and they don’t have an appreciation for it. So, they don’t look at [natural resources] as a priority to pass it on to future generations.

Participant Devin agreed, adding that, “I think the other states just prioritized [environmental education] and…found money for it.” Lack of financial resources and lack of mid to late career opportunities were both cited as hinderances to recruitment and retention. Participant Emerson summarized this, saying, “…entry and mid-level [positions in environmental education] are [going to] have a lot more turnover. Once you get to… middle [and] upper management…we’re… [going to] stay put because there’s not a whole lot of other places to go.” Participants were able to identify multiple causes of the near-universal problem of low pay for nonformal environmental educators across the state such as low inherent valuation of the environment, lack of financial support from state entities, and even COVID-19 pandemic recovery.
**Sub-Research Question #1:** What level of interest do informal environmental educators have in creating a new formal organization of environmental educators in Louisiana?

**Theme 3 – Desire for Connectivity**

While admittedly a smaller part of this investigation, the sub-research question, “What level of interest do nonformal environmental educators have in creating a new organization of environmental educators in Louisiana?”, yielded a wealth of dialogue between participants. Participants cited the following reasons for their desire for collaboration: (a) increasing efficient use of resources, (b) engaging with the formal education sector, (c) employing up-to-date science in lessons, and (d) being aware of correspondence from LDOE and entities. All participants universally agreed there is a strong desire and need for the re-establishment of a professional association of environmental educators in Louisiana, with all nine enthusiastically voicing interest and support for such an organization.

Across all three focus groups, participants brought up a lack of resources, both human and monetary. When asked about their level of interest in a professional organization for environmental educators in Louisiana, Alex replied:

> I am very interested… We all ultimately have the same goal…ultimately our goal is Louisiana improving Louisiana…I think it’s very important for us to all work together and share our resources so that we’re not doing the same thing at the same time.

Two participants in one focus group even mentioned facilitating programs at the same school within the same week earlier in the month, corroborating the need to minimize overlap by communicating, with Devin lamenting:
…that could have meant that I could have gone over to Cameron Parish or somewhere else and been working there. So, that just illustrates how, if we could have a more coordinated way of knowing both thematically where people are working and also regionally where people are working…it would be beneficial.

Participant Jordan, within the same focus group, agreed. They cited a lack of resources as a driver for better collaboration and communication, “If we can have a better network to help people…do as much as they can with what little they have…that’s really what needs to exist.” Across focus groups, this was a recurring sentiment. Participant Avery, when asked about the need for a professional organization, shared, “…we all have limited resources-- the schools and the nonprofit side. So, I think anything that can help ensure efficiency and effectiveness that we’re… not being redundant across the state…is great.” Avery added to the reasons for collaboration, elaborating, “…[collaboration] could also help to inform potential shifts in focus for different organizations.” While all participants voiced unanimous support for the reformation of a professional organization like LEEA, the question of, “How?” was often added to statements of need. During their focus group, Avery posed this question to their fellow participants, “…we have such limited resources to begin with. How do we really maximize it for all of us?”

Participants in each of the three focus groups voiced a desire for collaboration with formal educators in addition to collaboration with their peers in the nonformal environmental education field. When asked about their involvement in LEEA, participant Emerson explained:

[Attending LEEA symposiums] was a good bridge between informal and formal educators… [It was beneficial to] be able to talk about what [formal educators] are looking for, what [nonformal environmental educators] can provide, and kind of fine tune our offerings as well.
Participants Devin and Alex both volunteered accounts of how having formal educators on staff in their organization has proven to be helpful, with Devin sharing, “…having [formal educators] in our organization makes my organization stronger…it’s great that you have somebody that thinks that way.” Alex added, “…I look at the…science side of it and what we’re trying to get the students to do… and the teacher is able to look at it from the reality of teaching standpoint… So they’re able to offer that.” Jordan, within the same focus group, recounted their desire to hire a formal environmental educator to help develop, “…usable educational resources that teachers actually want to and can use.” Avery, when asked about their familiarity with creating lesson plans from education standards, said, “…we are always very eager and grateful for input and thoughts from teachers and school staff directly, since of course they are more the experts [on the standards] than we are.” Participants recognized the two-way flow of information between formal and nonformal educators to be an important part of the quest for effective environmental education.

Several participants recognized teachers’ desires to utilize environmental education offerings, with Alex stating, “[Teachers] want to use us. They want the ability to be able to keep things local…offer something new and refreshing and something that the kids can actually relate [classroom material] to.” Tracy expressed a desire to know examples of how best to help classroom teachers, saying “I love the idea of examples on… what do teachers want and need? That would be way easier for us to provide that.” Participant Emerson, in the same focus group, responded to this, “I would agree with that statement entirely. Just a better bridge between informal and formal education so we can kind of help each other, figure out what’s needed…” Participants expressed awareness of their utility to classroom teachers, but often also explained that they needed direction in order to help, such as participant Tracy saying, “It would be helpful
too, if teachers would tell us what they would like to do. We get that occasionally…But if we had more specifics… [our organization] can do it.” Participant Emerson agreed, saying, “If a class is studying something in particular, we’re always happy to accommodate…And then [classroom teachers] can tie it into…whatever standards…they’re doing in class.” Interestingly, many calls for this type of collaboration occurred outside of the interview questions inquiring about collaboration, but instead occurred when participants were asked about their perceptions of the Key Environmental Principles and Concepts and the Louisiana Environmental Education Advancement Plan.

Less significant but still notable reasons mentioned when answering questions about a professional organization included staying up to date on statewide developments and utilizing current research and best teaching practices. Given the evolving nature of environmental science, participants highlighted a need to keep up. Devin shared, “We try and show teachers the thing that we would like them to share in hopes that…it gets more current science and research into the classroom.” Devin continued, when asked about the scope of their organization’s community impact:

…when we’re best is when we’re in the communities, serving them and sharing the resources developed by research knowledge… We have a direct pipeline to current science that’s coming out… getting together at the symposium when it used to exist…was a very useful tool because it allowed us to exchange this information.

Participant Tracy mirrored this sentiment, mentioning the beneficial exchange of teaching best practices at the former LEEA symposiums, “…sharing ideas for lesson plans…I started this program at my school…and it’s worked really well and here, take it…back to your site.” Tracy continued, “I always felt that the sessions were really high quality…We always got good
information out of it beyond networking.” Participants also mentioned LEEA symposiums often included information about education standards. When asked about the benefits of an annual professional meeting, Tracy stated, “I do remember there being some sessions about new standards…[and] information about how we connect with formal educators.” Participant Carter highlighted the utility of this, adding:

I think there’s a lot of benefits to the association…If you’re not on the right newsletter list…you’re missing out on information right now, versus being able to have an association where you come together and you discuss all of these things and you learn from each other and connect.

Participant Devin exemplified this disconnect, saying, “I only know when the [LEEC] meetings are because I have to beg someone else to send me the invite.” The lack of an official channel of communication for standards and changes to formalized environmental education efforts were frequent concerns of participants. Awareness of changes tended to be raised by word of mouth or personal association, such as, “My boss is on the commission…so that’s how I was introduced to it”, “We did recently hire a new employee who was in on the committee… and she showed [the Key Environmental Principles and Concepts] to me”, “I have a coworker who is…working with LEEAP”, and even, “I first heard about the [Louisiana Environmental Education Advancement Plan] from you, Abigail.” These accounts corroborate the desire to have a central hub to receive word of changes and discuss with peers.

**Research Questions #2 and #3:** How do nonformal environmental education professionals in Louisiana describe their knowledge of and relationship with Louisiana state environmental education standards? What needs do nonformal environmental education professionals identify regarding the process of achieving state endorsement of their respective program?
Theme 4 – Unknowing Optimism

Congruent with concerns about communication of new developments in formal environmental education, many participants expressed a lack of awareness of the Louisiana Department of Education’s efforts to collaborate with the field of nonformal environmental education. While some participants expressed frustrations with LDOE as a result of this, many conveyed vague optimism in their lack of awareness of both the KPCs and LEEAP. Openness to and desire for greater collaboration between LDOE and nonformal environmental educators was a common sentiment amongst the participants, as was optimism in the face of changes even despite not knowing details. Participants also voiced needs alongside criticism.

When participants were asked about their awareness of the KPC’s, many responded that they were aware on a surface level, with Tracy responding, “I can say…I’m aware of [the KPCs] … as far as using [the KPCs], I think it feels complicated.” Participant Carter echoed a similar sentiment, “I was aware of [the KPCs] …but beyond that, I didn’t really investigate or know much about it.” Participant Jordan said that they were, “…somewhat familiar with [the KPCs].” Participant Skylar responded similarly, “We’ve been introduced to [the KPCs] …this is something we’ve just not dove deep into.” Those who responded with moderate awareness did not critique the KPCs, but rather often expressed unknowing optimism about their usefulness, such as participant Avery saying:

Off the top of my head, I can’t remember where I saw [the KPCs] first…I think having standards that are more specific and more aligned with the content that we’re doing will make it much easier for us to… advertise… to potential audiences what exactly we’ll be focusing on as well as making sure that our programming overall… all our offerings are
comprehensive when it comes to the standards across all of these [KPCs] and these grade levels.

Furthermore, Avery described excitement despite lacking specifics about the KPCs, saying, “I’m excited to see this particular branch…be recognized as an individual area of expertise and…put on the same level of other [types of sciences] that already have standards.” Devin, when asked about concerns regarding implementing KPCs, said, “I wait to see what [the KPCs] mean in practice, not in…the development and theory stage.” Skylar, when asked the same question, explained, “Taking a few minutes to look through [the KPCs], it seems like it’s…gonna be easier to move forward and try and make some of the programs…aligned to what the schools are wanting to teach.” Participants were not quick to discount efforts to formalize their nonformal environmental education efforts. Participant Avery summarizes this attitude, saying, “We haven’t really [begun implementing the KPCs] yet. So, I think there may be other thoughts, weaknesses…improvements that we may come across as we…start.” Skylar agreed, adding, “We haven’t really started diving into this and trying to connect it to programming…once you jump in you do start to see any places you could need more help.” Participant Jordan even spoke optimistically about the content of the standards, “I was actually surprised at how fairly general the standards are and how not necessarily restrictive they are to what the specific method of teaching is in the classroom.”

While many participants hesitated to criticize the KPCs prior to true implementation efforts, some offered initial perceptions indicating dissatisfaction and confusion with the content. “My concern with them is they all start with humans. It’s very anthropocentric”, shared Devin. “I had the same thought as [Devin], it’s all staring off with humans and it’s very based off of how [the environment] affects us and not necessarily the other way around”, agreed Alex. In a
separate focus group, participant Carter contributed a similar thought, adding, “I think [the KPCs] are a good idea, but…most of [the KPCs] seem very anthropocentric.”

Critiques of the content of the KPCs were less common than critiques of the communication structure which attempted to raise awareness of them. Participant Devin, when asked about perceived challenges in implementing the KPCs and the LEEAP initiative, said, “The [Louisiana State Department of Education] hasn’t really rolled out how these are going to be used.” This feeling was echoed by Alex, “Hopefully there’s more opportunities for guidance on how to use [the KPCs and the LEEAP].” Participant Tracy raised concerns with the KPC implementation process, saying, “We have a hard time…narrowing in on what we could do [with the KPCs].” When asked about general comfort with using standards, Tracy continued, “I know that everything we [teach] here ties in…but I think that… [formal standards] are…such big picture and kind of vague.” When asked for needs they foresaw in the implementation process, Tracy reiterated, “I just need this narrowed down.” This need for specificity was echoed by Carter, who noted, “A lot of the principles seem to…overlap, so it’d be nice if [LDOE] would get a little bit more specific…or even provide examples.”

Participants’ feelings on the LEEAP were much less detailed than that of those regarding the KPCs. Perceptions still erred on the side of optimism, but instead of criticism, participants expressed confusion or indifference about the plan. Participant Emerson explained their indifference, stating, “Field trips and working with teachers is a rather small part of what we offer…so as far as this [LEEAP] endorsement, I think it could be helpful.” Participant Carter, when asked about their initial perceptions of the endorsement plan, said:
[Word of the LEEAP] kind of went in one ear and out the other… I do see the benefit if you’re working mainly with school groups…but with my position, I work with both school groups and non-school youth groups

In a separate focus group, participant Skylar expressed vague optimism about how the KPCs could affect their work with formal educators, saying, “I hope that [the KPCs] would end up being beneficial for [formal educators]. On the flip side for us, it gives us an area to aim for.” Following this, participant Avery contributed, “I’ll have to see how [the KPC’s and the LEEAP] goes and the effectiveness of [the LEEAP] in accomplishing [efficiency and effectiveness].” Tracy relayed their initial perceptions of the LEEAP, stating, “I didn’t really know anything much about it… I think it would be helpful for us.” These sentiments, as well as the body language and conversational tones accompanying them, were mild and slightly positive in nature. It is important to note that participants were asked to refrain from disclosing whether their organization intended to apply for the LEEAP to preserve anonymity.

**Theme 5 – Overwhelmed and Outvoiced**

Although not overly negative about LDOE’s efforts in the environmental education sphere, participants expressed feelings of being overwhelmed by certain proposed changes. Furthermore, many participants felt outvoiced by other sources when it came to distributing accurate environmental education concepts.

When asked about the importance of environmental literacy in Louisiana, one participant, Taylor, expressed frustration with competing sources of information:

I feel like there should be a bigger effort to put issues in people’s faces, to make them care. And I don’t know how that happens. I don’t know if it needs to be on TV, I don’t
know how you get that out to the masses first…so at least they’re hearing about it other than these news clips of…politicians…because see, that’s what they’re following now…They’re not looking at what organizations are out there doing the work, what those organizations and people in those organizations are saying… It’s just so many people that are so uninformed that are making decisions and putting information out there that people are listening to, I don’t really know how to combat that.

Participants in a separate focus group expressed similar feelings about a dearth of correct and relevant information being provided to the public, with Carter saying, “…[people] know all the short-term information, when it comes to human interest, not necessarily the long-term environmental consequences.” In the same group, Tracy continued this line of thought:

I think it would be important to talk more about how industries pollute the environment here in Louisiana and what it means for our people and our long-term health. Of course, the ecology in our natural environment too. But…I doubt…that would happen on a state level because that’s very political, I suppose.

Carter also raised the call for teaching critical thinking in the face of misinformation, explaining the utility of, “…being able to see all the different viewpoints and weigh the cost and benefits of…considering one viewpoint more important over the other.” Other participants voiced concerns that an uninformed citizen base was also harmful, with Devin and Jordan agreeing there is a lack of awareness around Louisiana-specific environmental concepts. Devin, when asked about how best to improve the field of environmental education in Louisiana, spoke about the need for education about life in Louisiana, saying, “We’re also a state that is so environmentally engineered and people do not understand that, do not understand the flood control structures that are around them and how that impacts [their lives].” Jordan continued:
The politicians at every level, much less the K-12 folks, are so completely ignorant of the—not ignorant in a bad way—but not understanding of the comprehensive way that our water systems work in Louisiana…It’s probably one of the most engineered water management natural environments in the world. We don’t really think about it.

The concern communicated by the participants regarding disinformation and ignorance wasn’t contained to these two challenges. Participants spoke about feeling overwhelmed trying to keep pace with the changing demands of the environmental education field, even outside of disinformation. When asked about the collaborative capacity of the environmental education field in Louisiana, participant Devin expressed the following concerns, “There are still people that I wish I were working with… [there are] communities that I cannot…figure out how I should be better serving them.” Notably, earlier in the interview when asked about their organization’s scale of impact, Devin noted, “I consider my goal to work with the entire state.”

Data collection for this investigation occurred during the summer of 2022, a time in which the COVID-19 pandemic was less at the forefront of the collective conscious than it was in 2020 or 2021. Regardless, educators spoke about feeling overwhelmed by the transition to virtual programming and the consequent transition back to in-person programs. Participant Avery described their organization as, “…all hands on deck” during COVID-19 surges due to, “severe staff reduction.” Even in the wake of COVID-19, participants expressed feeling thinly spread with Tracy sharing, “We’re so busy, we’re…often at capacity”, when asked about anticipated changes if their organization were to attain a LEEAP endorsement. Carter, within the same focus group, posed a question about the merit of hiring to try and meet LDOE’s changes, asking, “…it would be very intense to be involved in [LEEAP]…It’s [kind of] like, do you need
to hire an additional person just to handle LEEAP?” Responses indicated a systemic
overwhelmed feeling in the face of these sweeping changes from LDOE.

Theme 6 – Comfort with the Pillars of Formal Education

Although the KPCs and LEEAP initiatives are LDOE’s early efforts of adding
standardized elements to nonformal environmental education offerings in Louisiana, many
participants expressed confidence and comfort with key parts of formal education such as:
curriculum development, standards, and the role of school administration. The majority of
participants, when asked about their familiarity using current standards to inform lesson
planning, responded that they felt quite comfortable with the practice. Others expressed
knowledge of the ways in which they could best interact with formal education to facilitate
environmental education programming. Many also mentioned a desire to provide more seamless
integration into formalized education efforts.

In focus group one, when participants were asked about their confidence in using
standards to build lessons, participants responded: “I feel pretty comfortable…navigating the
standards”, “I feel comfortable and confident using them”, and “I don’t really know how to apply
[standards]. It is something I [want to] learn.” This final participant, Jordan, went on to add, “If I
can better understand the standards and how to apply those or how teachers do, then I can better
understand how to create something that might be usable.” When asked the same prompt,
participants in focus group two responded: “This is [going to] be my first time [using
standards]”, and “Thinking with a 10-point scale, I would…put myself probably somewhere in
that…six to eight range in terms of comfort [using standards].” Participant Skylar elaborated in
their answer:
When I started here, we started doing a lot of standards-based lessons just because we kind of found out that in our area that worked really well. And it worked, we were able to reach more students because we were able to take [the students] into the classroom. But I graduated…science not education, so it was definitely a learning curve…I would probably say between a seven and an eight [in terms of comfort with standards], but we have had a very supportive science coordinator…that [has] kind of helped us…make the transition to bring the science and the standards together. So, without that support, it would’ve been much harder.

In focus group three, when asked about comfort using standards, participants responded: “I’ve used [standards] in the past when…developing lessons that are supposed to be implemented in the classroom”, and “We tried to go through and revamp [lessons] we had…as we got a few staff members involved we were…looking through these and saying, ‘Oh, well, this program would hit this standard’.” One participant, Carter, raised concerns with relying on standards in nonformal settings, explaining:

I see one of the strengths is that you are making sure you’re complimenting the…classroom education, so you’re bolstering it. But…one of the flaws or drawbacks is that it’s limiting what nonformal environmental education can touch…If it’s not tied to one of the principles or standards, then you’re cutting that out of what a kid could potentially learn when you’re providing programming.

Participant Emerson agreed, adding, “A lot of what we do is just providing the experience for the visiting groups. So, less lesson planning and more…being active and doing and learning by being there.” Emerson continued, “We haven’t found at our site that we get a lot of requests from teachers to really tie into standards.” Within that same group, participant Tracy expressed
concerns about how to use standards to communicate with formal educators, sharing, “How do we show teachers which [lesson] they should choose?” Regardless of these hesitations, the consensus across groups was general comfort with implementing standards into nonformal environmental education offerings, both in theory and in practice.

Within this investigation, participants expressed awareness of how to best get environmental education programming in front of students by working within the administrative structures of schools. Participant Alex volunteered their experience, sharing, “[fellow environmental educators] suggest we reach out to the PE teachers and the [agricultural education] teachers because they…have a lot of freedom in what they can teach. So, that is kind of how we’ve tried to go around getting science into the classroom.” Alex continued, “We shouldn’t have to go through [physical education] to teach science.” Others shared similar loopholes, with Devin contributing, “I [want to] figure out how to use [KPCs] as a tool to justify more to administrators than to teachers. Teachers would…like to take their kids out, it’s the administrators or the school district…that has these barriers.” Later, when asked about their perceptions of the LEEAP initiative, Devin continued this line of thought with, “I appreciate that LDOE is trying to take a leadership role in this. I think they could be a valuable partner in trying to get more kids out in the field if they can apply pressure to administrators.” Other participants also voiced appreciation for the role of school partnerships in facilitating environmental programming. Participant Avery explained, “Our organization does partner quite closely with a handful of schools.” They continued, when asked about their scale of impact in the community, “We do have a program for free [environmental education] programming for all title one classrooms K-12 throughout Louisiana.” Participant Devin also praised direct partnerships with individual schools. When Devin was asked about what the environmental educators of Louisiana
are excelling at, they replied, “I think that it all boils down to…where [schools] are actively looking to do partnerships.” Devin tied in administrative support, saying, “I think…the administrator has to see the value [of the partnership].” The understanding of how to break into school programming was well-represented throughout the various focus groups.
CHAPTER V. CONCLUSIONS, DISCUSSION, AND RECOMMENDATIONS

Purpose of Study

The purpose of this study was to determine the perceptions of nonformal environmental educators in Louisiana (defined as interpreters, state and federal agency educators, and nonprofit instructors and educators) regarding knowledge of state environmental education standards, implementation of said standards in their respective institutions, their perceived needs in the pursuit of program endorsement, and their perception of the organization of nonformal environmental educators within the state.

Research Questions

Three research questions and one sub-question guided this investigation:

1. How do nonformal environmental education professionals in Louisiana describe their perceptions of the nonformal environmental education landscape?
   a. Do nonformal educators perceive a need to create a new environmental education professional organization in Louisiana?

2. How do nonformal environmental education professionals in Louisiana describe their knowledge of and relationship with Louisiana state environmental education standards?

3. What needs do nonformal environmental education professionals identify regarding the process of achieving state endorsement of their respective program?
Summary of Findings

This qualitative investigation utilized Stake’s (1994) multiple case study design to accurately capture the lived experiences of nonformal environmental educators in Louisiana following the release of inaugural environmental education standards and the accompanying endorsement plan by the Louisiana State Department of Education. This case study research was bound in both place and time with all participants in Louisiana and all interviews being conducted after the release of the aforementioned documents, but prior to their implementation in the Fall 2022 school year. This study was comprised of nine participants, each who were actively employed in the field of nonformal environmental education in Louisiana during the time of data collection.

Following purposive snowball sampling, I selected participants that represented multiple types of providers of environmental education in the state. I obtained written and voluntary consent from participants prior to conducting three, three-person focus groups using a semi-structured interview format. These focus groups were conducted via Zoom video conferencing software, which allows users to generate an audio recording. Using Descript transcription software, each focus group audio recording was transcribed and checked for errors via manual review. Throughout each focus group interview, I recorded observations regarding body language, tone, inflection, and other emotional indicators. During audio transcription, I took note of any perceivable emotions conveyed by sound alone.

I employed three first-cycle coding approaches to analyze transcripts. I chose In Vivo, structural, and emotions coding approaches because they best fit the phenomena I aimed to document in this investigation. Following first cycle coding, I chose to utilize axial coding as a second-cycle coding method to distill initial codes into categories. After reducing the initial
codes into categories, I used thematic analysis and negotiation with a qualitative research expert to name and connect six emergent themes into a cohesive narrative flow.

The first two emergent themes, *strong sense of servitude* and *changes in recruitment and retention*, became evident when participants expressed their perceptions and needs in the current environmental education landscape of Louisiana. These themes help to address the first research question of this investigation: How do nonformal environmental education professionals in Louisiana describe their perceptions of the nonformal environmental education landscape? The strong sense of servitude conveyed by participants was accompanied by feelings of urgency to help citizens of Louisiana be informed about pressing environmental issues. Not only did educators feel a compulsion to help those in their immediate communities, but they consistently recognized the power that well-informed, environmentally literate citizens have. This empowerment was ultimately touted by participants as a tactic to protect oneself from environmental disasters, a tool in informed decision making, and a low-cost way to increase social mobility.

The second emergent theme, *changes in recruitment and retention*, added to the urgency expressed by participants. Through the interview process, participants voiced concerns for the retention of young environmental educators due to low pay and lack of upward mobility within the profession. Participants identified a low value placed on environmental education in Louisiana as a catalyst for these two factors negatively impacting retention of young educators. Interestingly, participants identified an increase in formal educators entering the nonformal environmental education field. Participants perceived restrictions in formal education as the driver for this migration.
Despite not being the primary focus of this investigation, the sub-question inquiring about interest in a professional organization for Louisiana environmental educators yielded valuable dialogue and revealed a desire for connectivity. Notably, the desire expressed by participants extended past the bounds of a professional organization. Participants voiced intense desire to better collaborate in the formal education sphere. Participants cited many reasons for why they desired improved connectivity and collaboration, including the need to pool resources, need for efficiency, and need to reduce redundancy.

The final three emergent themes related to the research questions regarding perceptions of the Louisiana Environmental Education Advancement Plan (LEEAP) and the Key Environmental Principles and Concepts (KPCs), both of which were released by the Louisiana State Department of Education. The themes, unknowing optimism, overwhelmed and outvoiced, and comfort with pillars of formal education described participants’ relationships with LDOE’s efforts. Participants expressed surface-level knowledge of the KPCs. However, despite not knowing details on implementation and utilization, environmental educators within this investigation communicated optimistically about the impacts of the KPCs. There was even less apparent overall knowledge about LEEAP, but the same undercurrent optimism was evident amongst participants. Despite being less knowledgeable about LDOE’s efforts to enter the environmental education sphere, participants expressed comfort and confidence with important pillars of the formal education system. Participants spoke with assurance when asked about their ability to use standards to inform lesson plan progression. Similarly, participants shared ways in which they have learned to navigate roadblocks in the formal education system. The theme overwhelmed and outvoiced emerged during lines of questioning about LEEAP and the perception of current environmental literacy in Louisiana. Participants described the current
environmental education offerings in Louisiana in great contrast with the environmental challenges the state faces. Furthermore, educators expressed feeling overwhelmed and overpowered by other sources of information—or disinformation. An organized description of each theme with accompanying quotes from participants can be found in Table 4.

Table 4. Summary of Emergent Themes and Example Quotes

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<tr>
<th>Theme</th>
<th>Description</th>
<th>Example Quote</th>
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<tr>
<td>Theme #1 Strong Sense of Servitude</td>
<td>A strong sense of servitude was expressed by participants when they considered their role in disbursing vital environmental education that they perceived to aid in self-preservation and social mobility in their communities as well as across the state.</td>
<td>“[My organization is] putting the action and control back into the hands of the audience and the people that we’re engaging.”</td>
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<td>Theme #2 Changes in Recruitment and Retention</td>
<td>Environmental educators observed evidence of formal educators leaving their field to pursue careers in nonformal environmental education; participants attributed the challenge of retaining young environmental educators to the lack of perceived value of environmental education in Louisiana.</td>
<td>“Being able to bring people into the field and…keep them means you have to pay a livable wage and have opportunity for growth…and be able to develop people within the field… [lack of opportunity for growth] makes it challenging to hold on to anybody for too long.”</td>
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<td>Theme #3 Desire for Connectivity</td>
<td>Participants communicated an understanding of the different kinds of partnerships (nonformal educators to nonformal educators, nonformal educators to formal educators, nonformal educators to school administration) that are fruitful and help reduce overlap, increase reach, and ultimately push environmental education into the forefront.</td>
<td>“[Attending LEEA symposiums] was a good bridge between informal and formal educators… [It was beneficial to] be able to talk about what [formal educators] are looking for, what [nonformal environmental educators] can provide, and kind of fine tune our offerings as well.”</td>
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<td>Theme #4 Unknowing Optimism</td>
<td>Despite low levels of use and concern regarding both the KPCs and LEEAP, participants expressed optimism towards LDOE initiatives and collaboration with the formal education sphere at large.</td>
<td>“Taking a few minutes to look through [the KPCs], it seems like it’s…[going to] be easier to move forward and try and make some of the programs…aligned to what the schools are wanting to teach.”</td>
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<td>Theme #5 Overwhelmed and Outvoiced</td>
<td>Participants expressed concerns that environmental education messaging is competing with misinformation and disinformation. Additionally, Participants felt overwhelmed by the demand for environmental education.</td>
<td>“They’re not looking at what organizations are out there doing the work, what those organizations and people in those organizations are saying… It’s just so many people that are so uninformed that are making decisions and putting information out there that people are listening to, I don’t really know how to combat that.”</td>
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<td>Theme #6 Comfort with Pillars of Formal Education</td>
<td>Unanimously, participants were confident in their ability to utilize standards to develop curriculum and programming. Additionally, participants expressed understanding of common plights of formal educators that prevent them from utilizing environmental education organizations.</td>
<td>“We started doing a lot of standards-based lessons just because we… found out that …worked really well…We were able to reach more students... It was definitely a learning curve… but we have had a very supportive science coordinator…that [has] kind of helped us…make the transition.”</td>
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**Conclusions**

The six emergent themes resulting from this qualitative investigation yielded eight distinct conclusions. It is important to note that these conclusions were based in empirical research but should not be generalized outside of the scope and bounds of this investigation. The study limitations, parameters, challenges, and assumptions must be considered to properly utilize the conclusions.

**Changes in Recruitment and Retention**

Based on this research study, participants believe that environmental education is undervalued in Louisiana. As a result, the field is underequipped to confront challenges in recruitment and retention. The undervaluation of environmental education in Louisiana stems from several sources. Louisiana’s many industries rely on an extractive relationship with the natural environment to prosper, leading to an inherently anthropocentric view across those who profit from and are employed within these industries. Forestry, fisheries, and petrochemical operations lean on the natural abundance of certain resources in the state, so much so that the
resources and ecosystem processes that provide raw materials are taken for granted. Perhaps this has led to a systemic devaluation of the environment by industry and the governance installed to help oversee these industries (Goldberg et al., 2020). As a result, the environmental education efforts in the state have been hindered because it is simply not seen as a priority to give back or conserve the natural environment in Louisiana by those making large-scale decisions. This conclusion is in line with investigations of the various values, typologies, and beliefs held by those in natural resource stakeholder challenges (Reed et al., 2009). Furthermore, this conclusion is supported by the novel *Strangers in Their Own Land* by Arlie Russell Hochschild. Hochschild investigated the relationship of anti-environmental protection voting behavior with Louisiana’s generational reliance on exploitative industries (2016).

**Overwhelmed and Outvoiced**

Along with being undervalued, the voices in environmental education in Louisiana have been competing with politicization of environmental challenges, an uninformed public, and disinformation. Participants in this investigation described these two challenges in detail and explained the effects both had on them as individual educators and as members of the profession at large. Fear of speaking out against environmentally damaging practices, such as the allowance of excessive greenhouse emissions from petrochemical operations, hinders the effectiveness of environmental education messaging. The intertwined nature of extractive industries and Louisiana’s economy also inhibited science-forward speech and educational programming that may cast these industries in a bad light (Leber, 2020). An investigation into environmental racism conducted in 2021 by the Louisiana Department of Environmental Quality found the social and economic benefits resulting from the petrochemical industry to outweigh environmental damages resulting from these practices (Castellón, 2021). Further, environmental
educators were contending with government officials with agendas that do not include bolstering environmental education. An example of this was the first attempt by LEEC to establish an environmental literacy plan (ELP) in line with NAAEE guidance and in anticipation of the passage of the No Child Left Inside Act (2008). The ELP was completed by LEEC but was not signed by former governor, Bobby Jindal. This was in accordance with many other education-related budget cuts and appropriations that occurred during Jindal’s term as governor (Russell, 2016). Changes in governance may influence the emphasis placed on environmental education, but it remains important to address how the public’s attitudes surrounding the natural environment are shaped by local media, economic endeavors, and state government priorities.

**Unknowing Optimism**

Employing my chosen theoretical framework, the concerns-based adoption model, I also drew two conclusions based on findings relating to the Key Environmental Principles and Concepts and the Louisiana Environmental Education Advancement Plan. Using the CBAM *Levels of Use* dimension, I conclude that environmental education professionals in this investigation currently occupy the *orientation* level of use in reference to the Key Environmental Principles and Concepts. Use of the KPCs could easily transition into the *preparation* stage with strategic attention from LDOE. Participants expressed awareness of the KPCs, some even applauding LDOE professional development workshops about the new initiatives. However, use of the KPCs did not extend past orientation despite decent levels of awareness. This is congruent with concerns raised by participants about the KPCs, specifically that they are not actionable. Understanding of the KPCs is adequate and present, but adopters are challenged when making an action plan to implement the KPCs in practice. Given that an analogous study has not been
conducted, these findings are valuable to informing future research on adoption of environmental education innovations.

The level of use differed when examining the Louisiana Environmental Education Advancement Plan. Participants in this investigation firmly occupied the nonuse level of use when speaking about their relationship to LEEAP. Participants identified feeling overwhelmed when assessing how to utilize LEEAP. LEEAP, unlike the KPCs, requires participants to apply to participate in the program. Perhaps this initial investment of time has deterred participants from pursuing LEEAP endorsement. To bring LEEAP into the orientation and preparation stage, LDOE could employ efforts like those used to introduce the KPCs. Namely, professional development that target levels of use may be fruitful. Participants noted satisfaction with multiple introductions to the KPCs, and the higher levels of use of the KPCs provide evidence for the success of this approach. The differing degrees of use between these two initiatives, despite being released simultaneously, can likely be attributed to the respective complexities of each. LEEAP is an ongoing partnership requiring re-examination and two-way communication between environmental educators and LDOE. Participants also did not perceive effects of a large scale, negative or positive, because of a hypothetical LDOE endorsement through the LEEAP initiative. Given the unique nature of the KPCs and LEEAP, these findings and resulting conclusions may help to better inform future efforts to evaluate and improve environmental education offerings in Louisiana.

Desire for Connectivity

Aside from LDOE’s environmental education initiatives, there were two additional conclusions regarding the role of formal education in promoting environmental education in Louisiana. First, I conclude that professionals in nonformal environmental education in
Louisiana saw value in cyclically supportive partnerships with varying levels of organization in the formal education sphere. This conclusion was based in emergent theme, ‘desire for connectivity’. Findings related to a desire for partnerships between nonformal environmental educators and formal educators and their school districts supports past research, such as that conducted by Peffer and Bodzin (2010), which found benefits between collaboration between nonformal EE educators and formal pre-service science teachers. Furthermore, Wilmoth (2018) found that existing school partnerships with environmental education organizations incentivized continuing use of their programming despite barriers. Wilmoth (2018) also cited barriers such as cost of field trips and alignment with curriculum requirements when asked about their use of EE programming. This was in alignment with the perceived barriers nonformal environmental educators in this investigation highlighted. Therefore, we can conclude that encouraging such partnerships will likely bolster environmental education efforts in Louisiana. Participants expressed a need for more information flow between formal and nonformal spheres to bolster both efforts. Eloquently put by participant Jordan, “A rising tide lifts all ships”.

The second conclusion focused on the need for increasing environmental literacy in Louisiana. I concluded that environmental education professionals desire the reformation of the Louisiana Environmental Educators Association but lack the concerted leadership necessary to begin this process. Participants in this investigation expressed unanimous support for the reformation of LEEA, but there was not a single mention of an action item to accomplish this. This is not surprising given the overwhelmed feeling participants expressed, especially in reference to the urgency they felt to serve their communities, but it does speak to a need for help from outside of the environmental education community to accomplish this. Furthermore, this conclusion is in line with findings outside of the environmental education community. Natural
resource management organizations, professional biological societies, and even the American Psychological Association have recently reported changes in engagement in their respective organizations (Hoyer, et al., 2015; Humphries et al., 2016; Robiner et al., 2015). It is important to take this need for organization into consideration while also trying to avoid pushing environmental educators in Louisiana to self-support. By utilizing intervention to reassemble a professional association for environmental educators in Louisiana, an added outcome may be reducing burnout. In a 2001 study on educator burnout, participants indicated burnout was worsened by poor professional relationships and lack of support (Moodley, 2001). By pursuing actions to reassemble an association, the resulting members may feel improved professional relationships and increased feelings of professional support.

Comfort with Pillars of Formal Education

There was sufficient understanding, both in breadth and depth, of standards throughout the nonformal environmental education community in Louisiana. These conclusions were based on participants’ anecdotal accounts of fruitful working relationships with individual schools, parishes, and school boards as well as their personal accounts of success employing standards to inform lesson plan development and progression. This was supported by research from the National Park Service, which found that the use of standards in interpretation, another example of nonformal education, led to improved quality of instruction (Bacher et al., 2007). Similar findings have been documented by a study on garden-based learning, with garden educators explaining their ability to use state standards to guide lesson design (Cramer & Ball, 2019). The body of research surrounding standardization of environmental education, while not abundant, does not indicate a dearth of understanding standards, which these findings corroborate.
Sense of Servitude

My final conclusion related to urgency within the Louisiana environmental education community and beyond. Primarily, environmental education professionals understand the severity of environmental issues in Louisiana in a way that directly translates to urgent concerns for the social, economic, and cultural viability of communities across the state. This conclusion, while difficult to glean specific courses of action from, was notable because it describes participants’ passions and motivations while contextualizing their perceptions of developments in the EE field. The urgency environmental educators feel to inform and equip those whom they serve is admirable but raises demands for how best to prepare educators to accomplish this mission. A recent study investigating educators’ experiences with educating students living in areas experiencing ecological distress found that educators were most challenged by professional expectations and a lack of guidance on effective measures (Verlie et al., 2020). Within that investigation, participants explained that they found empowering students to navigate ecological disasters, such as climate change impacts, to be a prominent and effective course of action (Verlie et al., 2020). The findings of this investigation support the findings of Verlie et al. (2020) in that they indicate the same urgency to empower but echo the same confusion regarding guidance.

Discussion and Implications

Discussion of the Standardization Movement on Environmental Education

While the United States education standards movement can be traced back before Reagan’s 1983 National Commission on Excellence in Education (NCEE) (DeBoer, 2006), the standardization of environmental education was a more recent phenomenon. The United States
federal government, following the NCEE’s findings, embarked on standardizing education across the 50 states (Miyamoto, 2008). Individual states have most of the responsibility and say in their respective educational structures (U. S. Department of Education, 2021). The role of the federal government, as recognized by the U.S. Department of Education (2021), was to maximize the effectiveness of the overall educational system in the country through efforts to disseminate best practices, provide support, and improve student outcomes. To improve student outcomes, the federal government implemented annual state testing and standardization of common subjects (Miyamoto, 2008). These efforts began after the findings of NCEE were released in 1983 and have continued to present day. This should not be confused with efforts to utilize standards in education in general, which predated investigations of the effectiveness of the United States education system. Reception of federal education standards and standardized testing has been mixed.

Reception of federal education standards and implementation of federal education standards remain two divergent topics. Labaree (2000) examined three main reasons for the resistance against the standards movement: (1) desire for local control, (2) expanding education opportunity without consideration to the needs that arise when serving more students, and (3) concern about the substance of education as opposed to the format. The desire for local control relates back to the traditional hands-off federal role in state and local education offerings. Furthermore, concerns about increasing the quality of educational offerings while expanding opportunities are reasonable. These three reasons are not the only reasons for resistance, but they capture the diversity in public opposition. Perhaps more important to consider though, is educator perception of standardization.
As the main facilitators of education standards, teachers and educators are vital to the success of any such movements. In more recent literature, Cheng (2012) described educator perceptions of the Common Core State Standards (CCSS), which were released in 2011 and widely adopted across the United States. Cheng found teachers to hold “limited optimism” and “modest expectations” when asked about the CCSS (2012). Furthermore, teachers expressed concerns with how simple and reduced the standards appeared to be (Cheng, 2012). A similar investigation of the Next Generation Science Standards (NGSS) revealed teacher concerns about the feasibility of implementing the standards (Harris, 2018). Participants also voiced concern about how long the standards may take to put into practice, citing anticipation of significant delays (Harris, 2018). On the contrary, Harris (2018) found that participants appreciated the more flexible nature of the NGSS when compared to their predecessors. Between Cheng’s 2012 assessment of the CCSS and Harris’ assessment of the NGSS, there was a common thread of educators feeling overwhelmed by the standards, not because of the content of the standards, but rather because of their relationship to state standardized testing.

Concerns about assessments accompanying educational standards were a common thread with many iterations of standardization. Even early attempts at standardized testing received pushback, with a survey of elementary school teachers revealing that teachers did not understand the utility of the yearly tests (Salmon-Cox, 1981). Similarly, a survey of school administrators found that personnel did not view themselves as the people who were intended to use state testing information (Sproull & Zubrow, 1981). Neill and Medina (1989) completed a thorough investigation of the effects of standardized testing and found that southern states administer standardized state tests more frequently than schools in other regions of the U.S. Further, Neill and Medina (1989) concluded through this investigation that many standardized tests have
characteristics that create bias against minorities and low-income students, such as the word choice used, example scenarios, acceptable answers based on cultural norms, and presumed common knowledge. Kohn (2000) related the downsides of standardized testing to the already challenging job of being an educator in the United States, concluding that the push for standardized testing led to an exodus of teachers from the profession.

In more recent investigations, researchers focused on the effects of the COVID-19 pandemic on standardized testing. Many changes occurred to the normal requirements for state testing amid the pandemic, leading to questions about the real need for the testing. Some schools reduced the utility of standardized tests to helping determine a re-opening timeline for in-person classes (Hodges, 2022), while others saw the COVID-19 pandemic as an opportunity to conduct education without the demands of standardized testing, instead asking what metrics may yield more accurate and relevant measures of student outcomes (Starr, 2021). Bennett (2022) concluded that the COVID-19 pandemic created greater transparency in public education. With this transparency, Bennett (2022) asserted that a key weakness of standardized testing is its inability to capture reliable measurements of educational progress in such a diverse populace. Due to social distancing, many standardized tests traditionally used in college admissions were waived. Some institutions have made the submission of test scores optional, even in the semesters following the decline of the COVID-19 pandemic. Given how recent this development is, there will be a delay in research on the effects of waiving these admission requirements, but it will be important to monitor developments on this front.

Given the similarities between agricultural education and environmental education, examining the standardization of agricultural education in the United States can reveal important information that may forecast outcomes for the standardization of environmental education. A
survey of Wisconsin agricultural educators revealed an almost even split between participants who wanted to incorporate standardization into their subject area, and those who did not (Becker, 2014). A similar investigation into agricultural educators’ perceptions of the CCSS revealed that participants held similar concerns about the speed at which they felt expected to adapt to and implement new educational initiatives (Stair et al., 2016). While standardization of agricultural education has been occurring on a state-by-state basis, some states have pursued alternative ways of evaluating student outcomes. A 32-state survey conducted in 2020 found that thirteen of the included states currently utilize agricultural education standards (Jones et al., 2020). Participants who indicated they taught using their state agricultural education standards shared that the standards largely focused on agricultural literacy (Jones et al., 2020). An important facet to the standardization of agricultural education is the push to incorporate STEM principles into the subject matter. This push creates greater overlap with federal STEM standards which may negate the need for the development of separate agricultural education standards. Eck et al. found that pre-service agricultural educators strongly intended to integrate STEM principles into their lesson planning (2021). The standards movement and its impact on agricultural education in the United States is an evolving topic and will continue to inform the progression of the greater movement over time.

While the standards movement has yet to fully take hold in the environmental education sphere, the United States has shown no indication of trending away from this approach in national education. Continued monitoring of the implementation of standards, endorsements, state-adopted curriculum and other similar formalizing efforts will be imperative to the continual improvement of environmental education in the United States. This investigation fits into the larger discussion of the standards movement in education because it may inform future research
endeavors. Core academic subjects, such as math and literature, are predominantly standardized in the United States. Conversely, subjects such as agriculture and environmental education call to be closely studied as they begin the standardization process. They stand apart from related arts subjects that have undergone the implementation of standards, such as physical education or musical arts (Lund & Tannehill, 2015) due to the heavy crossover of STEM concepts. Therefore, it is important to consider the findings that emerged from this study to inform the direction of additional lines of inquiry. Specifically, the overall understanding of how to implement standards and curriculum in lesson plan development may speak to how Louisiana environmental education professionals have different needs than that of educators in other subject areas and geographic regions.

**Discussion of Desire for Collaboration**

Collaboration between formal and nonformal educators has been studied in many contexts and these partnerships have proven useful. Peticolas (2003) concluded that to help environmental education take a strong hold as part of formalized education, partnerships between formal and nonformal educators must be created, they stated, “Developing collaboration can improve the integration between field programs and the classroom curriculum and increase the commitment and support from classroom teachers that environmental education programs depend upon” (p. 196). Similar conclusions were made in Purcell’s (2019) investigation of environmental education providers in California. Purcell asserted, “The emphasis on formal schooling standards…may signal integration with formal schooling rather than catering to [formal educators]” (p. 61). The results from this investigation confirm the utility of reciprocal cross-disciplinary partnerships. Participants touted the benefits of partnerships, citing leverage to get their content into classrooms, as a major asset.
It is important to take note of the nuance of Purcell’s (2019) findings, as well as the findings of this investigation. There was a distinction between bending to accommodate formal education expectations, whether through employing standards or pre-written curriculum, and blending the missions of both stakeholders to increase cohesion and synergy. Current LDOE offerings lean more towards catering to needs of formal educators, which is not surprising as the organization is focused on formal, public, k-12 education. By releasing the Key Environmental Principles and Concepts and the Louisiana Environmental Education Advancement Plan, LDOE is attempting to formalize nonformal environmental education offerings so that they may be easier to integrate into classroom education. Although there has already been a great deal of development on these two initiatives, both the findings from this investigation and additional literature suggest alternative approaches may be more fruitful. Wals and Leij (1997) explored approaches to bolstering environmental education on a national scale, citing national standards as an unviable solution because the subject matter explored in EE lends itself to four-dimensional learning—something that is hard to capture in formal standards. While educators within this study expressed a willingness to try and utilize LDOE’s offerings, examining what LDOE can offer in return in the formal sector that would provide support to nonformal environmental educators could prove to be invaluable.

The need for support in implementing environmental education into formal classroom learning is not isolated to nonformal environmental educators. Instead, Soler (2019) found similar needs in the formal science education sector. Most notably, educators cited the lack of opportunities to tie environmental education into the required subject areas in which they taught (Soler, 2019). This was in part due to stringent curriculum and schedule formal educators must adhere to (Soler, 2019). The notion that restrictive curriculum prevents formal educators from
fitting environmental education programming into their school year is supported by the findings of this investigation.

Within this investigation, participants also voiced a desire to reform an association for environmental educators in Louisiana. Some participants cited this association as means to better connect with formal educators, while others explained that a network in the field of environmental education pooled resources and promoted the sharing of useful materials. It is important to note that professional associations are not easy to establish or maintain and rely heavily on volunteerism (Chiariello, 2008). However, the utility of professional associations cannot be understated. Based on a needs assessment of environmental educators on a national level, Fleming (2009) concluded that there is a need for professional associations to foster the professional development through networking and the exchange of best practices.

The findings from this investigation fall in line with the larger trend of challenges in maintaining professional organizations across many disciplines (Hoyer, et al., 2015; Humphries et al., 2016; Robiner et al., 2015). While there is not a universal solution to challenges with creating and continuing professional organizations, future research may inform best practices and types of support that prove to be most effective in sustaining these important networks. Having not only a network of peers but also a concerted voice behind a group of professionals may simplify the process of addressing the needs of environmental educators in the state by improving communication overall.

**Discussion of Competing Voices in Environmental Education**

Cited amongst many participants as a growing challenge, misinformation and ignorance continues to present as a counterforce to promoting environmental literacy. Educators, formal
and nonformal alike, must be aware of the growing tide of environmental education misinformation. Media campaigns and prewritten curriculum, two documented sources of environmental misinformation (Donohoe, 2006) were of notable concern to participants in this investigation. Participant concerns about the effects of environmental misinformation are not unfounded, as environmental information has a direct link to environmental behavior (Southwell et al., 2018). Various approaches have been employed to combat environmental misinformation, such as sarcastic social media content (Anderson et al., 2018), comedic television programming (Brewer & McKnight, 2015), and the newly termed technique of “inoculation” (Lewandowsky & van der Linden, 2021). The investigations regarding the effectiveness of techniques that can be used to counteract harmful misinformation are steadily populating. Perhaps more efficient is establishing initial viewpoints grounded in current science in lieu of correcting misinformation to begin with. Recent Twitter discourse has given a name to this idea, which is now known in academic circles as “Brandolini’s law” (Brandolini, 2013). Considering the most effective use of human capital, k-12 education is a promising contender in the fight against misinformation by starting early.

Given the frequency of natural disasters in Louisiana, the state is a strong candidate for the implementation of “crisis education” (Kidman & Chang, 2020). Participants voiced concerns about the verified growing rate of natural disaster occurrences (Bardsley, 2016), citing their respective, and often personal, missions to provide mobility through environmental education. While the body of research addressing the newly coined “crisis education” is still being established, the findings of this investigation indicate a potential opportunity to utilize this strategy in Louisiana. Bardsley (2016) promoted proper natural disaster related education to boost population resilience in the face of future challenges. Curriculum that can respond to
natural disasters and increase interest in the causes of said disasters is a similarly new field of study, but documentation of case studies on the use of such curriculum has proven fruitful (Blanchard-Boehm & Cook, 2009; Taylor & Moeed, 2013).

Although it may be out of the control of environmental educators to actively confront conflicting voices that muddle the intended core messaging of profession, the field of environmental education can combat misinformation through salient teachings at the community and state level. Recognizing that profit-focused private companies have influence on how Louisiana residents view their environmental impact is a step in the right direction. Acknowledging forces creating barriers for the disbursement of effective environmental education contributes to raising the collective value of environmental education as a discipline and a knowledgebase.

**Discussion of Levels of Use of LDOE Initiatives**

Based on the *Levels of Use* and *Stages of Concern* (Hord, 1987) of the Key Environmental Principles and Concepts and the Louisiana Environmental Education Advancement Plan, the adoption of both initiatives is hesitant and sporadic. The Concerns-Based Adoption Model has been used in other environmental education contexts to evaluate understanding, implementation, and outcomes of state-backed environmental education programs (Lieberman & Hoody, 2001). Large scale efforts to formalize environmental education, such as the NAAEE Guidelines for environmental education, have made strategic and intentional choices in how initiatives are introduced. One choice, as highlighted by Marcinkowski (2009), was that of making optional the adoption of the guidelines. The KPCs and LEEAP are currently promoted as optional, additional environmental education initiatives by LDOE, which agrees with NAAEE’s guideline introduction strategy. There are, however, critical differences in the
introductions of NAAEE’s guidelines and LDOE’s KPCs. Marcinkowski (2009) cites the many voices that contributed to the formation of NAAEE’s guidelines for excellence as a determining factor in the adoption of this initiative. By involving many different stakeholders in the development of the guidelines for excellence, NAAEE was able to simultaneously raise awareness of the guidelines themselves during development and early implementation (Marcinkowski, 2009). The lack of awareness and implementation of LDOE’s environmental education initiatives could be attributed to a more closed development process than that employed by NAAEE.

It is important to consider the communication channels used to disperse innovations as this can largely determine adoption rate (Reed & LaPorte, 2010). Given that the former association for environmental educators in Louisiana is no longer active, that channel is not a viable way to disburse LDOE initiatives. However, it is imperative that LDOE raises enough awareness of these initiatives so that they may harness the power of early adopter and environmental educators within this investigation demonstrated the necessary, “core moral values” (Marshall, 2004, p. 75) to position them as such. Furthermore, participants exhibited the necessary flexibility and persistence that may allow them to adopt and influence others with the use of LDOE initiatives (Marshall, 2004). Urgent concerns about serving their communities prime environmental educators as candidates for furthering the adoption of LDOE’s environmental education projects. It is just as imperative to thoroughly raise awareness of both the KPCs and LEEAP as it will be to reassess Stages of Concern and Levels of Use (Hord, 1987) throughout the introduction and implementation process. Lack of targeted communication and introduction strategies likely contributed to low awareness of LDOE efforts within the environmental education community.
Recent changes in LDOE staff have paused the rollout of LEEAP (S. Necaise, personal communication, September 22, 2022). This pause allows for increased efforts to raise awareness of the KPCs and LEEAP. Furthermore, this pause grants LDOE the opportunity to better understand the most opportune time to release the LEEAP applications in consideration to the time budgets of nonformal environmental educators. While the body of literature surrounding the time budgets of nonformal educators is lacking, a 1999 study of agricultural educators found time budgets to be a significant determinant of ability to address curriculum changes (Mundt & Connors, 1999). The similarity between demands placed on agricultural educators and environmental educators could help to inform an effective and timely introduction of LDOE initiatives in the future.

**Recommendations**

The nature of this investigation is qualitative. With that, there are no numerical values that can be assigned to findings, emergent themes, or conclusions to indicate severity of need, urgency, or importance. However, the diversity and depth of codes for certain themes as well as the proliferation of opinions across all focus groups can indicate the priority of needs. With that, I would like to encourage that recommendations for practice are addressed first. A reliable channel of communication among environmental educators as well as one between formal education institutions and nonformal environmental education organizations must be restored to streamline future initiatives. Despite original intentions to investigate the need for a professional association as a sub-research question, the depth, richness, and unanimity of codes leading to the emergent theme, *desire for connectivity*, posture recommendations resulting from this finding as most pressing.
**Recommendations for Practice**

Based on this research, several recommendations for practice can be made. Based on evidence of an overwhelming desire for increased connectivity and collaboration, I recommend that the task of re-organizing the former Louisiana Environmental Education Association be delegated to one individual, or if necessary, a team. This process must include a thorough, in-person effort to inventory and connect with all providers of environmental education in Louisiana. Past efforts to inventory providers through virtually distributed surveys failed to capture the entirety of the state, hence it is necessary to conduct an in-person systematic review. To build on this, I would further like to recommend that this effort be completed expeditiously so that it may precede the second launch of the Louisiana Environmental Education Advancement Plan (LEEAP). Participants in this study, while somewhat knowledgeable and comfortable with the Key Environmental Principles and Concepts (KPCs) authored by the Louisiana State Department of Education, did not convey awareness or understanding of LEEAP. This lack of understanding and awareness must be addressed for both the KPCs and LEEAP to become truly actionable. Additionally, I recommend that more representation is given to members of this new association by filling vacancies in the Louisiana Environmental Education Commission with association members and if necessary, creating new seats for them. Finally, I urge the Louisiana Environmental Education Commission to consider installing a seat to be filled by a member or representative of one of Louisiana’s indigenous tribes. This will impart valuable indigenous knowledge, ensure minority representation, and help to inform the promotion of stewardship of the environment through inclusion.

Louisiana must see a transformation in how it is valued by all stakeholders. I deem this necessary for two reasons: 1) the urgent need for proper application of environmental education
concepts cannot be escaped regardless of location, class, background, profession, or valuation of the natural world and 2) the longevity of impactful environmental education careers and the start of new environmental education careers is at stake.

To cement nonformal environmental education into the public standardized education experience, I recommend that cyclical support is needed to push environmental education into the formal education sphere. Participants in this investigation agreed that collaboration between teachers, school administrators, and school districts is integral to the incorporation of environmental education into current curriculum constraints. The current one-off partnering of environmental education organizations with individual schools or school districts, while effective, is underutilized and not established in a formal capacity, lending it no longevity. Participants recognized their reliance on formal educators to find time and a logical space for environmental education programs during the school year. Instead of this imbalance, I would like to recommend that both formal and nonformal educators seek out partnerships with each other based on proximity and shared interest. Furthermore, I recommend the incentivization of these partnerships by financial means. Should LDOE have the funding, I recommend the introduction of small grants that can be applied for by partnered environmental education organizations and individual schools or school districts.

Finally, I would like to recommend that future courses of action that involve LDOE entering the environmental education sphere be more comprehensive and reciprocal. Future releases of standards, curriculum, endorsement plans, trainings, and professional development opportunities, need to be communicated thoroughly with the environmental education community to foster cooperation. It is imperative, based on the findings of this investigation, that LDOE changes the way in which it connects with nonformal environmental educators in the
state. The current mode of communication leaves is not inclusive of all areas of the state, which leads to indifference and alienation of valuable educators. Using formal channels such as the Louisiana Environmental Education Commission, LDOE must meet environmental educators where they are. Improved communication about and awareness of LDOE initiatives will certainly increase utilization, while also allowing environmental educators to feel like they have more of a say in the partnership.

**Recommendations for Research**

Regarding future research, this study makes several recommendations that, if pursued, may yield findings to bridge gaps in current literature on the standardization of environmental education, the utility of formal to nonformal education partnerships, and the needs of environmental educators in Louisiana. Primarily, I recommend further utilization of this qualitative, multiple case study investigative approach to continue to inventory the needs of nonformal environmental educators in Louisiana. Participants in this study were vocal about their needs and I believe continuing to give others in the profession a platform to communicate ideas and needs to stakeholders will prove to be helpful. Specifically, I recommend further examination of nonprofit organizations that facilitate environmental education and organizations that provide environmental education programming in the northern and western regions of Louisiana. These populations, while more difficult to reach, do exist and may have distinct needs. The need for greater understanding of environmental educators’ needs is independent of the timeline of LDOE’s initiatives.

Conversely, following the anticipated implementation of the Key Environmental Principles and Concepts and the Louisiana Environmental Education Advancement Plan, I recommend that there is a concerted effort to continue to evaluate the *Level of Use* (Hord, 1987)
of each. Furthermore, there should be qualitative and quantitative investigations of the outcomes of these two initiatives. I recommend that exit surveys and teacher satisfaction surveys be utilized to assess the implementation and effectiveness of the KPCs. For LEEAP evaluation, I recommend a similar assessment of student and teacher outcomes, but I want to also recommend investigations into how LEEAP endorsement recipients feel the endorsement process has affected them. This will yield valuable feedback for further iterations of LEEAP, as well as add to the body of literature surrounding formalized efforts in environmental education at the state level.

From a development standpoint, additional research may be needed should LDOE wish to create companion curriculum to the KPCs. While the KPCs do not have pre-written curriculum at this time, it is important to ensure that any development on this front is backed by current research, is locally and globally relevant, and caters to nonformal environmental educators across all sectors. Curriculum should also be developed with reciprocal collaboration between nonformal and formal educators in mind. As environmental challenges continue to evolve, curriculum must reflect these changes to best serve those that it informs.

**Recommendations for Policy**

With the passage of House Bill 397, now Act 15, during the Louisiana 2022 Regular Legislative Session, the Louisiana Environmental Education Commission (LEEC) saw an almost exponential decrease in budget (Louisiana Act 15, 2022). This effectively cut funding for the Louisiana State Department of Education position that oversaw the progression of the Louisiana Environmental Education Advancement Plan. As a result, the plan is paused until this change in staff is addressed. I recommend that legislation that addresses and rectifies this budget decrease is drafted expeditiously. To prevent LEEC from falling victim to unfunded mandates, LDOE and
Louisiana legislators must work together to produce creative solutions to environmental education funding needs.
APPENDIX A. IRB APPROVAL

TO: Abigail Greer  
LSUAG | Dept | Agricultural and Extension  
education and Evaluation

FROM: Michael Keenan  
Chair, Institutional Review Board

DATE: 23-Jun-2022

RE: IRRAC-22-0066

TITLE: A multiple-case study examining the perceptions of inaugural state environmental education standards in Louisiana

SUBMISSION TYPE: Initial Application

Review Type: Exempt

Risk Factor: Minimal

Review Date: 23-Jun-2022

Status: Approved

Approval Date: 23-Jun-2022

Approval Expiration Date: 22-Jun-2025

Re-review frequency: (three years unless otherwise stated)

Number of subjects approved: 12

LSU Proposal Number:

By: Michael Keenan, Chair

Continuing approval is CONDITIONAL on:

1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU’s Assurance of Compliance with OHS regulations for the protection of human subjects*

2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.

3. Obtaining renewed approval (or submittal of a termination report), prior to the approval expiration date, upon request by the IRB office (irrespective of when the project actually begins); notification of project termination.

4. Retention of documentation of informed consent and study records for at least 3 years after the study ends.
5. Continuing attention to the physical and psychological well-being and informed consent of the individual participants, including notification of new information that might affect consent.

6. A prompt report to the IRB of any adverse event affecting a participant potentially arising from the study.


8. SPECIAL NOTE: When emailing more than one recipient, make sure you use bcc. Approvals will automatically be closed by the IRB on the expiration date unless the PI requests a continuation.

* All investigators and support staff have access to copies of the Belmont Report, LSU’s Assurance with DHHS, DHHS (45 CFR 46) and FDA regulations governing use of human subjects, and other relevant documents.

Mike Keenan  O 225-578-1708
209 Knapp Hall  O 225-578-1708
Baton Rouge, LA 70803  F 225-578-4443
APPENDIX B. CONSENT FOR PARTICIPATION

PROJECT TITLE: Environmental Educators’ Perceptions of Inaugural Louisiana State Department of Education Environmental Education Standards and Accompanying Environmental Education Endorsement Plan: A Multiple Case Study Approach

INVESTIGATORS:
Abigail Greer, Graduate Student, Dr. Kristin Stair, Professor, Department of Agricultural and Extension Education and Evaluation (AEEE), Louisiana State University, Dr. Richie Roberts, Professor, Department of Agricultural and Extension Education and Evaluation (AEEE), Louisiana State University, and Dr. Michael Kaller, Professor, School of Renewable and Natural Resources, Louisiana State University

PURPOSE:
This qualitative study seeks to understand Louisiana nonformal environmental educators’ perceptions of challenges, opportunities, and needs that may arise following the release of two new pieces of environmental education material from the Louisiana State Department of Education: 1) The key principles and concepts of environmental education document and 2) The Louisiana Environmental Education Advancement Program. This study aims to use Louisiana’s changing environmental education landscape as a case study of the larger standards movement in public education.

PROCEDURES
The study will consist of three focus group interviews of 3-4 participants each. The estimated duration of an interview is between 1.5 to 2 hours. Participants have been selected through purposive sampling and will be briefed on the environmental education standards and the environmental education organization endorsement plan produced by the Louisiana State Department of Education. The interview will be audio recorded and transcribed. Additional supplementary data such as curriculum participants may have developed will be collected via email. The interview transcript will be analyzed for themes using several qualitative coding approaches.

RISKS OF PARTICIPATION:
No known risks are associated with this project, which are greater than those ordinarily encountered in daily life.

BENEFITS OF PARTICIPATION:
Results from this study could promote a greater understanding of the perceived challenges, opportunities, and needs that may arise from the shifting environmental education landscape in Louisiana. Therefore, the information you provide could inform future efforts to improve environmental education such as professional development opportunities, curriculum development, and educator summits.

CONFIDENTIALITY:
The records of this study will be kept private. Any written results, including your views and/or direct statements, will be concealed with pseudo-names. Research records, including survey questionnaires, interview transcripts, supplementary materials, and audio files, will be stored on
a password-protected computer in a locked office and only researchers and individuals responsible for research will have access to the records. The data will be identifiable until the completion of the data analysis phase of the project, which is projected to be completed no later than September 2022.

CONTACTS:
Should you desire to discuss your participation in this study and/or request information about its results, you may contact any of the researchers at the following addresses and telephone numbers: Abigail Greer, 225 J.C. Miller Hall, Dept. of Agricultural and Extension Education and Evaluation (AEEE), Louisiana State University, Baton Rouge, LA 70803, (864) 770-5072, agre185@lsu.edu, Dr. Kristin Stair, 135 J.C. Miller Hall, Dept. of AEEE, Louisiana State University, Baton Rouge, LA 70803, (225) 578-6194, kstair@lsu.edu, Dr. Richie Roberts, 130 J.C. Miller Hall, Dept. of AEEE, Louisiana State University, Baton Rouge, LA 70803, (225) 578-7892, roberts3@lsu.edu, or Dr. Michael Kaller, 105 Renewable Natural Resources Building, South Tower at Highland Rd. Baton Rouge, LA 70803, (225) 578-0012, mkalle1@lsu.edu. If you have questions about your rights as a research volunteer, you may contact Michael Keenan of LSU AgCenter at 209 Knapp Hall, Baton Rouge, LA 70803, (225) 578-1708 or mkeenan@agcenter.lsu.edu.

If you chose to participate in this study, please initial by the statement below and then sign and date the consent to participate below. This study has been approved by AgCenter IRB. For questions related to this study, or your rights as a participant, please contact Michael Keenan of LSU AgCenter at 209 Knapp Hall, Baton Rouge, LA 70803, (225) 578-1708 or mkeenan@agcenter.lsu.edu.

Thank you, your time is very much appreciated!

_____ This study has been discussed with me and all my questions have been answered. I may direct additional questions regarding study specific to the investigators.

I agree to participate in aforementioned study.
Name (printed): _____________________________
Signature ____________________
Date: _________________________________
APPENDIX C. INTERVIEW PROTOCOL

Demographics of Subject
Age:
Ethnicity:
Region of Louisiana in which participant is employed:

Thank you for participating in this study. There are no right or wrong answers, and you can choose to not answer or stop the interview at any time. During this interview, I will be asking you a series of questions about your perceptions of the challenges, opportunities, and needs associated with the release of the inaugural Louisiana State Department of Education environmental education standards (also known as key principles and concepts) and the accompanying environmental education organization endorsement plan (LEEAP). Your responses to these questions will be kept confidential throughout the research process. All of your responses will be assigned a pseudonym that will be connected with your responses throughout the duration and, subsequent potential publication, of this project, therefore optimally protecting confidentiality.

It should also be noted that only audio recordings will be used using a separate audio recording device and stored on a password-protected computer. Once recordings are transcribed, all original audio will be deleted. I anticipate that the interview will last for 60 to 90 minutes.

For the purposes of this study, the following two documents will be referenced:
- Louisiana Department of Education’s Key Environmental Principles and Concepts (accessed August 2021), called “standards” interchangeably
- Louisiana Department of Education’s Louisiana Environmental Education Advancement Project (LEEAP, accessed May 2022), called “endorsement plan” interchangeably

Major Guiding Questions:

1. Could you tell me about yourself and your introduction to the field of environmental education?

   Sub-questions (If necessary)
   - What is your educational background?
   - How many years have you worked in this field?
   - Without naming your employer, what is your current job title and how long have you been in this specific position?

2. Could you describe your perceptions of the new LDOE environmental education standards?

   Sub-questions (If necessary)
   - What are some strengths of these standards?
• What are some weaknesses or areas for improvement of these standards?
• What is your level of understanding of these standards?
• What is your level of comfort with meeting these standards either as an individual educator or as your organization?
• What needs do you perceive yourself or your organization having in implementing these standards?
• Are you aware of environmental education standards in other states?

3. **Could you describe your perceptions of the new LDOE environmental education program endorsement plan? Please do not disclose whether your organization has applied for LDOE endorsement at this time as this is potentially identifying information that could compromise confidentiality.**

Sub-questions (If necessary)

• What are some changes, if any, you anticipate upon implementation of this endorsement plan?
• What is your level of understanding of the endorsement process?
• How will this endorsement plan affect your organization? How might it affect you as an individual educator?
• Are you aware of similar endorsement plans in other states?

4. **What does effective environmental education mean to you?**

Sub-questions (If necessary)

• What modes of instruction do you find most effective?
• How might environmental education be updated to reflect current needs and challenges?
• What do you do as an educator to facilitate effective environmental education at the individual, group, and organization level?

5. **How would you describe the role of nonformal environmental education in forming environmentally literate citizens?**

Sub-questions (If necessary)

• What do you believe qualifies as nonformal environmental education?
• What is the importance of environmental literacy?
• What role does your organization play in your immediate community and in Louisiana as a whole in the pursuit of environmental literacy?

6. **What level of interest do you have in a professional organization for Louisiana environmental educators?**

Sub-questions (If necessary)
• Is this something that may be useful to your organization?
• To what extent were you aware of/involved with the former professional organization for environmental educators in Louisiana (LEEA)?
• What other professional development opportunities are you seeking?
• How do you perceive the recruitment and retention of environmental educators in Louisiana?

7. Could you tell me about your level of awareness of the Louisiana Environmental Education Council?

Sub-questions (If necessary)

• Describe your feelings, level of understanding, and perceptions about the role of Louisiana state legislature.
• Do you believe changes at the legislative level affect you as an individual educator?
• Do you believe changes at the legislative level affect your organization?

8. What changes would you like to see in the environmental education landscape of Louisiana?

Sub-questions (If necessary)

• What are areas that may need more focus?
• What areas do you feel Louisiana’s environmental education resources cover well?
• How collaborative do you feel the field of environmental education is in Louisiana?
HOW LOUISIANA STARTED AN OFFICE OF ENVIRONMENTAL EDUCATION

In 1990 a group of educators, who happened to be mostly science teachers concerned with teaching environmental education in the classroom formed the Louisiana Environmental Educators' Association to provide a way for educators to network, provide support and to share resources. This organization, LEEA, played a major role in establishing the Office of Environmental Education. In 1993, a state legislator introduced a bill in the Louisiana Legislature, unbeknownst to LEEA, similar to the Wisconsin legislation, which created their Office of Environmental Education. Knowing that the fiscal impact of this legislation would kill any chance of its passage, the LEEA group requested that the legislator withdraw his bill and simply introduce one that would create the Environmental Education Commission. This bill passed because it carried no fiscal impact on the state budget. After this bill passed, they worked with the Governor to appoint a variety of representatives to the commission:

A state agency representative from the:
- Department of Education;
- Environmental Quality;
- Natural Resources;
- House Natural Resources Committee;
- Senate Natural Resources Committee;
- Board of Regents.

Non-agency representatives:
- Two members representing environmental advocacy organizations;
- Two members representing the industrial community;
- One member representing the small business community;
- One member representing local governments;
- One member of the Board of Elementary and Secondary Education; and
- One member who represents a professional environmental scientist.

The problem with this legislation is that it had a sunset date attached. Therefore, the Commission had to ask the Governor to extend its life through an executive order until the next regular session when they could introduce new legislation. This could not take place until the regular session of 1995 because Louisiana has a fiscal only session every other year where only fiscal matters could be introduced.

The Commission then decided that it needed an evaluation of environmental education in Louisiana so during 1994, they contracted with a marketing professor at Louisiana State University to conduct a survey on environmental education in Louisiana. This survey targeted teachers/educators in primary and secondary schools; business/industry representatives; and students in primary and secondary schools as well as university level students. Through this statewide assessment, the Commission learned:
• That less than one-half of the schools statewide had a formal environmental education program.
• That over 40% of the high school students surveyed had taken no environmental education courses.
• That students not exposed to a formal environmental education program were found to be significantly less knowledgeable regarding environmental issues.
• That teachers surveyed recognized the need to coordinate environmental education with other agencies and organizations.
• That businesses surveyed agreed that mechanisms need to be put in place to facilitate more and better coordination between schools and organizations, which could provide support.
• That approximately only 10% of all schools have any funding for environmental education programs.
• That both teachers and students have an incorrect perception of risk for over half of the 38 issues examined in a recent statewide survey.
• That teachers lacked adequate knowledge on 78% of the 38 issues while students lacked knowledge on all 38 of the environmental issues.

This survey assisted the Commission in drafting the legislation, which actually created the Office of Environmental Education within the Governor’s Office. One of the important changes made through this legislation was to add educators to the Commission. LEAA was interested in having a representative from their organization from each of the congressional districts across the state. This helped to make the Commission unique, actually having teachers on board whom would help formulate policy and practices needed to provide environmental education in Louisiana.

The next concern of the Commission was how to fund the office. After studying similar programs in other states, they decided to ask for legislative authorization to create a prestige license plate to help fund the program. This was included in the 1995 legislation. Once the plate was designed and printed, sales were slow and the commission was concerned with trying to open the office as soon as possible. At this time, a new Governor had taken office and his assistance was sought in receiving a small amount of funding to open the office. Thus the Governor agreed to provide seed money to open the Office of Environmental Education in the 1997-98 fiscal year. Once this was worked out, the Commission started searching for a Coordinator for the Office. Ads were placed in newspapers and through word of mouth applications began pouring in. The Commission was mandated through its legislation to recommend three individuals to the Governor for his selection and appointment of a Coordinator. The Commission went through many, many interviews and finally came up with two acceptable candidates. Then things started to fall apart. These recommendations were passed on to the Governor’s Office and staff in the Governor’s Office interviewed the applicants. However, even though time was important to the Commission, it was not to those staff members who interviewed the applicants. Many months went by with the Commission becoming very frustrated and they were beginning to think their goals would not materialize. When they finally received permission to offer the position to the number one candidate, she had changed her mind and decided not to change jobs. The offer then
was extended to the number two candidate, who also declined. This left the Commission back at square one with no individual for a coordinator. However, the Commission still had a budget and with time going by fast and the close of the fiscal year approaching way to fast, they decided to contract with a media company to at least promote the sale of the prestige license plate. It was at this point in time that I began talking to several commission members about the Coordinator’s position. I had worked with many of the commission members on the annual conference they began sponsoring in 1996. After several more months, in April 1998, we finally were able to open the doors to the Governor’s Office of Environmental Education.

The first thing we did when I was hired on was to conduct the media campaign. I was on board to help negotiate the contract and assist the commission members in working with the media company. We recruited Louisiana celebrities to appear in our public service announcement and cut a 30-second and a 10-second television PSA. Once the PSA, and the poster and push cards were complete, we toured the state stopping at zoos and nature centers announcing the opening of the office along with the purpose of the office and how the money from the license plate would be utilized. It was a very successful road trip. We received a tremendous amount of media attention.

In its legislation, the Office of Environmental Education is mandated to assist the commission:

1. To review the status of environmental education in the state every two years;
2. To design a plan for environmental education and review the plan every two years at the direction of and with the assistance of the commission;
3. To provide assistance to the commission in the administration and evaluation of the state environmental education grants program;
4. To promote and aid in the establishment and assessment of elementary and secondary school environmental education programs through cooperation with the Department of Education and the Board of Elementary and Secondary Education;
5. To promote and aid in the development of pre-service and in-service environmental education programs for environmental educators, formal and non-formal, through cooperation with the Board of Regents and the state’s colleges and universities;
6. To cooperate with state and federal agencies and the private sector in developing, promoting, conducting, and evaluating programs of environmental education;
7. To function as an environmental education clearinghouse by
   a) Reviewing and recommending environmental education materials.
   b) Establishing an electronic capacity to disseminate databases of environmental education information, formal and non-formal, and to network with interstate and federal programs.
   c) Cooperating with state and federal agencies and organizations in the development and distribution of an environmental education newsletter.
   d) To promote the development of cooperative environmental education initiatives with the private sector.
c) To initiate, develop, implement, assess, and market non-formal environmental education programs; facilitate, encourage and support multi-school district cooperative efforts to determine the need for, develop, and assess environmental education curricula; promote state government and private sector policy that is consistent with the environmental strategic plan established; and coordinate non-formal environmental education with elementary, secondary, and postsecondary environmental education programs.

8. To initiate research in environmental education.
9. To coordinate environmental education conferences to assist in the dissemination, development, and achievement of the state’s environmental education goals.

The office is also mandated to establish a grant program and to work with the Department of Education to develop a curriculum framework for establishing environmental education programs in all public and private elementary and secondary schools. The Office has just completed its second year of its grant program. Over the past two years, we have funded $15,000 in teachers’ grants. Our grant application calls for the body of the proposal to be anonymous. The reviews do not know whose proposal they are reviewing until the scores are computed and the awards made.

The Office of Environmental Education is a co-sponsor of the annual environmental education conference, which held its fifth symposia this year.

A toll-free number was established so that citizens and educators could easily contact the office. We also have a web page, which can be found under the Governor’s Office website. We are currently involved in expanding the web site plus creating a directory of resources for educators in Louisiana.

Louisiana still has many tasks yet to accomplish in the Office of Environmental Education, but we do feel we are on our way to meeting our mission of making environmental educational resources available to help Louisiana citizens make informed decisions and take responsible actions for protecting, managing and enhancing our state’s unique environment.
OUTLINE

1. HOW IT STARTED – 1990 – LEEA
2. LEGISLATION INTRODUCED – 1993
3. SURVEY – 1994
4. LEGISLATION INTRODUCED – 1995
5. FUNDING – 1997-98
6. MEDIA CAMPAIGN – 1998
7. MANDATES OF LEGISLATION
8. GRANT PROGRAM – 2ND YEAR
9. SYMPOSIUM – 5TH YEAR
10. TOLL FREE NUMBER
11. WEB PAGE

12. ONGOING PROMOTION OF PLATE – CAR DEALERS, AUTO PARTS STORES, CREDIT UNIONS, BANKS, AUTOMOBILE DEALERS ASSOCIATION, BANKER'S ASSOCIATION, TIRE DEALERS, OIL CHANGE SPECIALTY STORES, ENVIRONMENTAL COMPANIES, CHEMICAL COMPANIES, ETC.
APPENDIX E. KEY PRINCIPLES AND CONCEPTS IN ENVIRONMENTAL EDUCATION

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<th>Principle 1</th>
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<td>Humans depend on healthy, balanced natural systems for their well-being and long-term survival.</td>
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<td>Clarification Statement</td>
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<td>Human dependence refers to the needs of individuals, communities, societies, and civilizations, additionally, it relates to the viability and functioning of complex infrastructures that support human-social systems.</td>
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<td>Humans need food, clean air and water, from healthy natural systems to live, grow and survive.</td>
<td>Ecosystem services and processes that occur in healthy natural systems (e.g., pollination, decomposition, photosynthesis, oxygen production, water filtration, flood and erosion control, climate regulation) are essential to human life, communities, societies, economies, and cultures.</td>
<td>Human lives, communities, societies, activities, and jobs (e.g., agriculture, industry, manufacturing) depend on matter and energy (e.g., wood, clean air and water, soil, oil, wind).</td>
<td>Human lives, communities, societies, activities, and jobs (e.g., agriculture, forestry, fishing, recreation, and industry) are affected by the carrying capacity of Earth's natural systems and depend on and benefit from the biodiversity of those systems.</td>
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<td>Everything humans do, such as building and moving from place to place, depends on natural resources obtained from healthy, balanced natural systems.</td>
<td>Healthy natural systems produce a wide array of ecosystem goods (e.g., food, air, water, energy, soil, fish, lumber) essential to supporting human life and activities and sustaining and enhancing human social systems.</td>
<td>The availability of ecosystem goods and services for human survival can be increased, decreased, or unaffected by factors including human practices (e.g., management of waste and toxic materials, land use and habitat restoration), rates of resource consumption, size of human populations, and the potential renewability of those resources.</td>
<td>The availability and reliability of ecosystem goods and services that natural systems provide humans are directly affected by human practices involved in the operation of human communities (e.g., environmental policies and regulations, infrastructure systems developed for coastal management, flood control, energy production, transportation), growth of human populations and resulting in increased rates of resource consumption.</td>
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<td>Natural systems' health influences the amount of food, clean air and water and other resources (ecosystem goods) available to meet human needs.</td>
<td>The quantity and quality of ecosystem goods and services available for humans depend on the health, viability, and functioning of natural systems.</td>
<td>The quality, quantity, and reliability of ecosystem goods and services humans obtain from Earth's land, ocean, atmosphere, and biosphere are directly affected by and depend on the health of those natural systems.</td>
<td>The biodiversity, viability, and healthy functioning of natural systems influence the quality, quantity, and reliability of the ecosystem goods and services that support and sustain all human lives, communities, societies, and activities.</td>
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**Principle II**

Human activities influence the functioning and health of natural systems and can be a determining factor in their continued existence.

**Clarification Statement**

The complex structures, compositions, and functions of natural systems are affected by human actions. The effects can be short or long-term and may positively or negatively influence the continuity of natural systems and the human social systems they support.

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<td>- Human activities cause changes to natural systems (habitats) where plants and animals, including humans, get what they need to live, grow, and survive.&lt;br&gt;- Human activities that change natural systems influence the number and kinds of living things that can survive in an area, and if changes are significant, some species may not be able to live there.</td>
<td>- Human activities can significantly affect natural systems by polluting air and water, decreasing available water sources, and removing native vegetation.&lt;br&gt;- Changes to natural systems due to human activity can affect how organisms interact with the environment and their chances for survival.&lt;br&gt;- Growing human communities can result in habitat destruction, changes in the numbers and kinds of organisms living in an area, and the overall health of ecosystems.</td>
<td>- Human practices and social systems (e.g., laws, economics, and policies) are used to extract, transport, and consume resources, directly and indirectly influencing its natural systems' geographic distribution, composition, biological diversity, and viability.&lt;br&gt;- Human-caused changes to natural systems can be significant and occur at rates resulting in some species disappearing from an area (e.g., dying, moving away, or going extinct).&lt;br&gt;- Significant changes can result in short- or long-term impacts on natural systems' health, viability, and functioning.&lt;br&gt;- Human population growth, consumption of ecosystem goods and services, and human communities' operation, directly and indirectly, affect natural systems' health, viability, and biological diversity.</td>
<td>- Human social systems (e.g., laws, economics, and policies) and practices (e.g., methods used to extract, transport, and consume resources) can alter natural systems, thereby influencing the carrying capacities of ecosystems and their geographic distribution, composition, biological diversity, health, viability, and functioning.&lt;br&gt;- Changes caused by human social systems and related infrastructures can, directly and indirectly, have positive or negative effects on the health, viability, and functioning of natural systems, and in some cases, can be significant enough to influence their continued existence.&lt;br&gt;- Human population growth and associated anthropogenic changes (e.g., habitat destruction, pollution, climate change, invasive species) result from extracting, harnessing, transporting, and consuming natural resources and can lead to the disruption of natural systems, thereby influencing the functioning and geographic distribution, composition, biological diversity, and viability of ecosystems and threatening the survival of some species.</td>
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August 2021
### Principle III

Human activities can influence the natural cycles and processes that provide the energy and matter that human social systems and natural systems depend on.

### Clarification Statement

Human actions affect the movement of energy and matter between natural systems and human social systems by changing both cycles and processes through consumption and altering natural patterns of transfer and flow. The characteristics, quantities, and types of matter determine if it is beneficial, detrimental, or has no effect on humans.

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<td>As appropriate, build foundational grade-level knowledge in social studies and science standards.</td>
<td>Humans depend on and benefit from the repeated cycling of matter between living and nonliving parts of ecosystems.</td>
<td>Humans depend on and benefit from cycles of matter and energy (e.g., water, life cycles) and processes (e.g., erosion, decomposition, soil formation) that occur in Earth’s systems (biosphere, hydrosphere, atmosphere, and geosphere).</td>
<td>Humans depend on and benefit from natural systems cycles and processes that occur in natural systems.</td>
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<td>Human activities and practices (e.g., mining, manufacturing, land management, energy production, and use) alter the cycles and processes that occur in natural systems.</td>
<td>Human activities and practices alter cycles and processes in natural systems, disrupting physical and biological components of ecosystems, and causing shifts in populations of organisms.</td>
<td>Human-caused changes to natural systems cycles and processes can affect the health, viability, and functioning of those systems and the organisms that depend on them.</td>
<td>Human activities, including the methods used to extract, harvest, transport, and consume natural resources, alter the cycles and processes that operate within natural systems, directly and indirectly influencing the quality, quantity, and reliability of ecosystem goods and services available to support human lives, communities, and societies.</td>
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<td>Human-caused changes to natural systems cycles and processes can affect the health, viability, and functioning of those systems and the organisms that depend on them.</td>
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<td>Human activities can alter Earth’s major cycles and processes, influencing the geographic distribution, composition, biological diversity, health, viability, and functioning of natural systems.</td>
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<td>Human-caused changes to cycles and processes in natural systems can diminish supplies of fresh water and clean air. They may also result in global-scale changes such as desertification, climate change, and decreased availability of fertile soil.</td>
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### Principle IV

Human decision-making about natural systems is influenced by many interacting factors and considerations, including ecological, economic, and intrinsic values.

#### Clarification Statement

Human decisions and actions can be based on: individual, community, and societal short- and long-term needs (e.g., food, water, shelter, health, safety); a wide variety of concerns and considerations (e.g., economic, political, and governmental functions); beliefs and points of view; and available scientific information.

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<td>• Humans think about natural systems in many different ways based on their individual and community needs.</td>
<td>• Humans in different communities across Louisiana experience and value natural systems in different ways based on their community history, culture, and other perspectives.</td>
<td>• Humans in different parts of the nation think about and value natural systems and resources in different ways based on their state's economies, jobs, history of resource use, cultural characteristics, and other perspectives.</td>
<td>• Global challenges can impact natural systems and resources and local communities identifying and describing social, economic, and political conditions. Therefore, when evaluating alternative engineering design solutions, solving problems related to natural and human social systems interactions should account for the full spectrum of these factors.</td>
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<td>• Humans’ choices and decisions about their needs and using resources can result in activities that influence natural systems.</td>
<td>• Decisions humans make and their actions can be based on their individual and community needs related to their dependence on the natural systems and resources that support their short- and long-term needs (e.g., food, water, shelter, health, jobs, recreation), and local environmental concerns (e.g., coastal erosion, clean air and water, loss of local habitat, and weather changes).</td>
<td>• There are many different things to consider when human needs and consumption involve making decisions about activities that can affect natural systems, including how to reduce the impacts on natural systems and the living things that depend on them.</td>
<td>• The spectrum of decision-making about natural systems and resources and how those factors can influence future decisions should consider sustaining biodiversity and natural system functions. This process should include humanity’s dependence on the living world for the resources and other benefits provided by biodiversity.</td>
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<td>• Before making decisions, it is vital to know as much as possible about how human activity might affect natural systems as well as the humans and communities nearby.</td>
<td>• When deciding how to resolve issues related to natural and human social systems interactions, the criteria for success should consider potential effects on natural systems and human communities.</td>
<td>• Systematic processes should be utilized when researching and evaluating possible solutions when deciding how to resolve issues related to natural and human social systems interactions. These criteria for success should consider the potential impacts on natural systems and human communities.</td>
<td>• Criteria for design decisions about how to resolve issues related to natural and human social systems interactions should take into account potential impacts on natural systems, be quantified to the extent possible, and stated in such a way that one could tell if a given design minimizes those impacts, and consider the legal, economic and political processes that might influence the solution.</td>
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<td>• Decisions related to actions that affect natural systems should consider how much they could influence local natural systems and the plants and animals that live there.</td>
<td>• Decisions about actions that affect natural systems should be based on how they affect the individuals and communities that depend on them.</td>
<td>• Decisions involving trade-offs among social, economic, political, and</td>
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August 2021
### Principle V

Humans can identify, assess, develop solutions, communicate about, and implement and evaluate solutions designed to prevent, reduce, or mitigate the impacts of human activities on natural systems.

**Clarification Statement**

Depending on the types of interactions and impacts, there are many different approaches for preventing, reducing, or mitigating impacts and restoring the healthy functioning and viability of natural systems and their ability to support human lives and social systems.

Comprehension of Principles I-IV is fundamental to proficiency with Principle V.

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<td>• Environmental problems can be observed and identified near schools, homes, and other parts of the community.</td>
<td>• Observing and describing the interactions between natural systems and human social systems is needed to identify environmental problems.</td>
<td>• Solving environmental problems and decreasing their impact requires the identification and description of relevant local natural and human social systems and interactions between the systems.</td>
<td>• Diminishing and mitigating environmental problems requires that individuals, communities, states, and other levels of government identify and describe natural and human social systems and recognize the range of interactions and interdependencies that exist between the systems.</td>
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<td>• Human activities can cause environmental issues.</td>
<td>• Environmental problems are often the result of interactions between natural systems and human social systems.</td>
<td>• Interactions between natural systems and human social systems involve cause and effect relationships that can influence their capacity to support the human communities that depend on them.</td>
<td>• Cause and effect relationships involved in the interactions between natural and human social systems must be identified and analyzed to determine how they may affect the viability and healthy functioning of natural systems and their capacity to support and sustain human lives, communities, societies, and activities.</td>
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<td>• Individuals and community members should be aware of local environmental issues.</td>
<td>• Many community members (e.g., students, parents, teachers, city officials) should be aware of local environmental issues and how to decrease the effects of human actions on natural systems.</td>
<td>• A variety of factors (e.g., effectiveness, cost, community perspectives) must be considered when choosing possible approaches for decreasing the impacts of interactions between natural and human social systems.</td>
<td>• When designing, evaluating, and selecting among alternative solutions for preventing, reducing, or mitigating environmental problems, consideration should be given to individual and community perspectives, economics, laws, political</td>
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August 2021
| alternative among various solutions is most effective in solving an environmental problem requires observations about the effectiveness of each potential solution. | contexts, and available scientific knowledge.  
- Communicating with and involving diverse stakeholders, particularly those directly affected by a specific problem, is critical for successfully implementing actions intended to diminish or mitigate environmental issues.  
- When implementing a solution that seeks to prevent, reduce, or mitigate environmental impacts, it is essential to evaluate the effectiveness and practicality of the solutions and determine if there are ways to increase the benefits of the potential solutions. |
APPENDIX F. LOUISIANA ENVIRONMENTAL EDUCATION ADVANCEMENT PLAN APPLICATION

Application for Participation

for

Louisiana Environmental Education Advancement Project

Due Date/Time: June 30, 2022, by 11:59 p.m.
State of Louisiana
Department of Education
Overview
Louisiana Environmental Education Advancement Project seeks to expand statewide environmental literacy opportunities by supporting non-formal organizations to emphasize place-based learning opportunities that deliver instruction in state content standards and Louisiana’s Environmental Education Key Principles and Concepts while meeting local student learning needs.

Open date
April 2022
Closing date
Jun 30, 2022
Decisions Announced
Jul 29, 2022

Project Duration
12 months
Funding
TBD

What is the Louisiana Environmental Education Advancement Project?
The Louisiana Environmental Education Advancement Project (LEEEP) is a project of the Louisiana Department of Education. LEEP was initiated to strengthen the working relationship between the formal K-12 education system and non-formal EE providers, so that: 1) K-12 schools get more help providing EE to their students while also meeting subject standards, and 2) non-formal providers develop more partnerships with schools in their service area. The first phase was to develop the Louisiana Key EE Principles and Concepts (KPCs) and the Louisiana EE Program Quality Indicators.

The next stage of LEEP will provide a pilot cohort of up to six non-formal EE providers with anticipated funding of $15,000 (combined funding from external partners as well as LDOE grant funds, awaiting confirmation of the amount) and professional development and technical support, to help cohort members work to meet LDOE criteria for a “high-quality” endorsement in the LDOE’s directory of environmental education providers. This endorsement indicates to K-12 schools across the state that a non-formal provider offers: 1) programing and instructional materials that demonstrate a thorough integration of standards-based environmental education programs and materials and 2) has developed strategies for working with school systems, schools, teachers, and students to increase the number of local school systems working with these providers. LEEP will provide professional development and technical support that will serve as a model for ongoing work focused on increasing opportunities for students and teachers to participate in outdoor and other environmental learning experiences.
Who Can Apply?
Applicants must be non-profit organizations and agencies that provide environmental education programs and instructional materials to Louisiana’s K-12 schools and school districts. Applicants must be physically located in Louisiana.

What are the priorities of this program?

- Educational
  - Environmental education capacity building
  - Environmental literacy advancement
  - Resource alignment to support core academics
  - Equitable environmental learning opportunities for all children
  - Service, leadership, and career development for all children

- Environmental
  - Community engagement
  - Community and state overall health and well-being
  - Protecting and conserving Louisiana resources
  - Launching a new era of local and state environmental partnerships

How will participating organizations engage in this program?

Cohort members will:

2. Participate in a series of intensive professional development sessions shaped to meet their needs as identified during the self-assessment.
3. Receive technical support from the LEAP Team to guide and help them attain a “high quality” endorsement in LDOE’s Environmental Education Partner Guide.
4. Work with the LEAP Team to identify and recruit teachers, school staff, and community members in the non-formal providers’ service areas to participate in the professional development while building critical relationships.
5. Help LEAP Team plan and participate in a symposium for Louisiana’s non-formal environmental education community. During the symposium, they will share their lessons learned, invite more organizations to join the effort the following year, and show K-12 educators what they have to offer.

How will your organization benefit from this program?

Selected participants will receive professional development that aims to help them expand and enhance their offerings to schools in their local communities. Participating organizations will receive assistance from the Louisiana Department of Education in attaining a “high quality” endorsement in the LDOE Environmental Education Partner Guide, which will be promoted across all school systems statewide.
**Cohort Selection Priorities:**
Priority will be given to selecting organizations that are motivated to work with the LDOE and other non-formal organizations to:
- integrate the KPCs into their programming and instructional materials, and
- better connect to Louisiana’s state academic standards, and
- establish working relationships with more school districts, schools, and teachers, thereby increasing the opportunities for students to participate in outdoor and environmental learning experiences

**Additional Documentation to Include**
- Evidence of ongoing organizational commitment to undertaking this work (evidence can include strategic plans, board resolutions, etc.)
- A statement that commits the organization to consistently attend and participate in the Cohort Professional Development Sessions
- Annual budget(s) that indicates the organization’s commitment to education and demonstrates the capacity to support this work
- Description of the organization’s current educational offerings including estimates of the numbers of school systems, teachers, students, and communities the program engages with
- Data that indicates schools and district outreach efforts
- Examples of data that indicate programmatic impact on students and/or teachers

### What is the timeline of cohort dates and professional development courses?

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<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
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<tbody>
<tr>
<td>July 29</td>
<td>Announce selected Cohort members</td>
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<tr>
<td>August 18</td>
<td>Cohort Professional Development Session 1</td>
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<td></td>
<td>- Self-Assessment</td>
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<td>This is a mandatory meeting.</td>
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<td>September-October</td>
<td>Cohort Professional Development Session 2</td>
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<td>- Topics based on needs identified by the EE Indicators of Quality Self-Assessment</td>
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<td>- Other topics to be determined in consultation with participating organizations</td>
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<td>November-December</td>
<td>Cohort Professional Development Session 3</td>
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<td>- Principal topics TBD in consultation with participating organizations</td>
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<td></td>
<td>- Strategies for strengthening formal and non-formal partnerships</td>
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<td></td>
<td>- Leveraging place-based opportunities to partner with local school systems</td>
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<td></td>
<td>- Educator panel including local teachers, school/district leaders, LDOE, LECC</td>
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<tr>
<td>January-March 2023</td>
<td>Cohort Professional Development Session 4</td>
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<td>- Principal topics TBD in consultation with participating organizations</td>
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<td></td>
<td>- Progress reviews with cohort members and working session with LDOE, LECC and Technical Support Team consultants to provide targeted support</td>
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<tr>
<td>Month</td>
<td>Event Details</td>
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</table>
| April | Cohort Professional Development Session 5  
- Principal topics TBD in consultation with participating organizations  
- Progress reviews with cohort members and working session with LDOE, LEEC, and Technical Support Team consultants to provide targeted support |
| May   | Virtual meeting for symposium planning |
| June  | Cohort Professional Development Session 6  
- Principal topics TBD in consultation with participating organizations  
- Progress reviews with cohort members and working session with LDOE, LEEC, and Technical Support Team consultants to provide targeted support  
- Revisit self-assessments and celebrate progress  
- Virtual meeting for symposium planning  
- Symposium Planning Progress Plan check-in (virtual meetings)  
- Virtual meetings for Cohort Interviews and Reflection |
| July  | Symposium |
| August| Environmental Education Provider Directory updated and published |

**For Questions or Additional Information**

Please reach out to [environmentaleducation@la.gov](mailto:environmentaleducation@la.gov) if you have any questions, comments, or concerns.
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https://www2.ed.gov/about/overview/fed/role.html


VITA

Abigail Ann Greer was born in Greenville, South Carolina in 1998. While in high school, Abigail worked at a local science center to foster her enjoyment of environmental education. Before attending Louisiana State University, she attended Clemson University, where she earned a Bachelor of Science in Wildlife and Fisheries Biology. Following the completion of her Master of Science in Agricultural and Extension Education with a minor in wildlife in December 2022, Abigail will pursue a career in nonformal environmental education and evaluation.