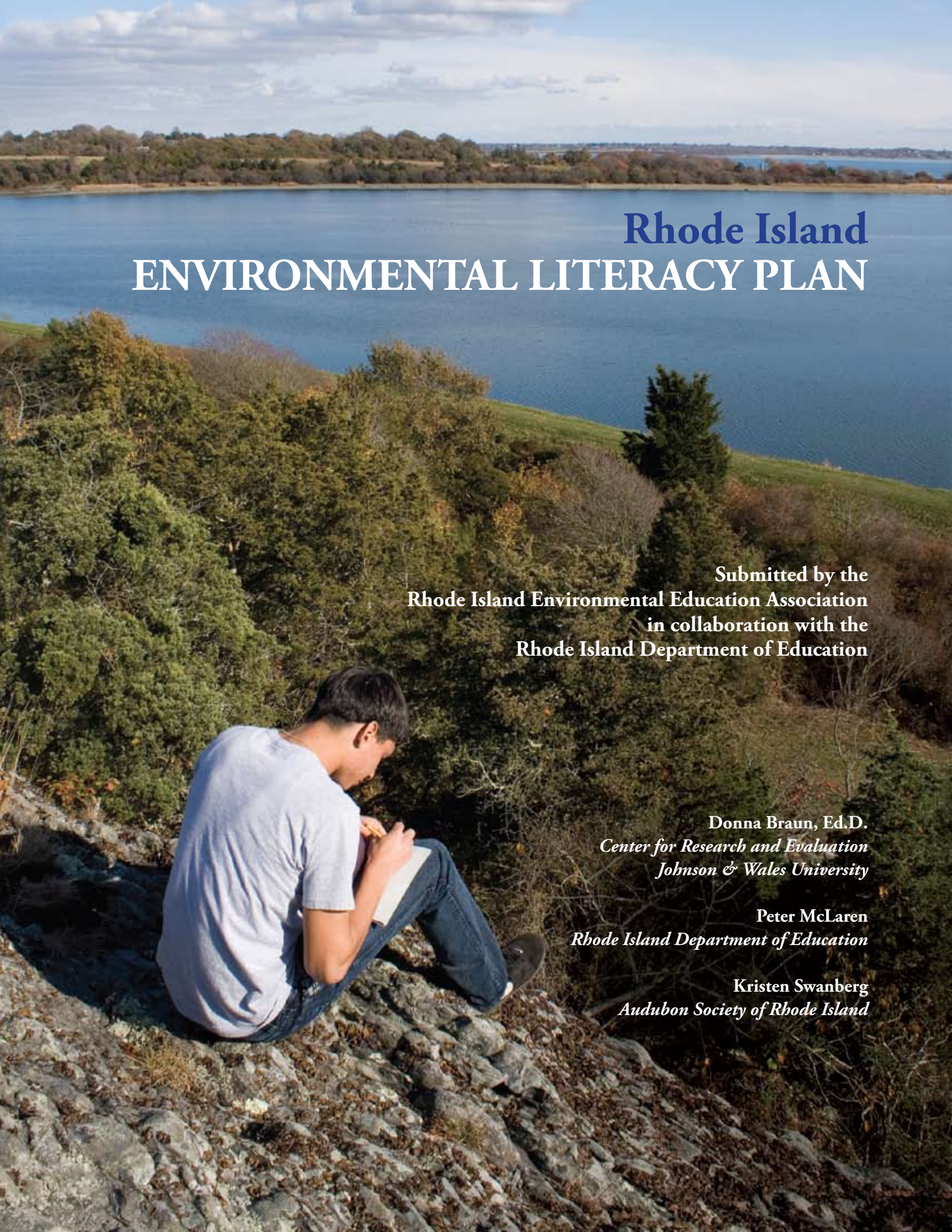

Rhode Island
ENVIRONMENTAL LITERACY PLAN

Submitted by the
Rhode Island Environmental Education Association
in collaboration with the
Rhode Island Department of Education

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An immense amount of time, energy, people and collaboration produced the Rhode Island Environmental Literacy Plan (ELP). The driving force for the work came from the ELP Committee that the Rhode Island Environmental Education Association (RIEEA) developed to spearhead the efforts to create the ELP. RIEEA would like to extend heartfelt gratitude to the members of the ELP Committee for their tremendous dedication: Reada Evans of Rose Island Lighthouse Foundation, Shareen Knowlton of Roger Williams Park Zoo, Peter McLaren of the Rhode Island Department of Education, Lauren Parmelee of the Girl Scouts of Rhode Island, Bridget Prescott of Save the Bay, and Kristen Swanberg of the Audubon Society of Rhode Island.

For extending the support and advocacy needed to keep this effort moving at a quick pace, we would like to thank the Rhode Island Department of Education (RIDE), the Rhode Island Foundation (RIF), the Rhode Island Department of Environmental Management (DEM), and all the member organizations of RIEEA. Specifically, we want to thank Commissioner Deborah Gist of RIDE, Jennifer Pereira of the RIF, and Director Janet Coit of the DEM.

The vision and recommendations in the ELP are strong and comprehensive due to the involvement of hundreds of both formal and informal educators who answered surveys and attended focus groups. Your largely anonymous contributions shaped this work, and for that we are incredibly grateful.

We would also like to thank the following for their significant contribution and support to the ELP creation: Jenny Astrella of Narragansett Bay National Estuarine Research Reserve (NBNERR), Paul Beaudette of the Environmental Council of Rhode Island (ECRI), Kim Botelho of Norman Bird Sanctuary, Dan Brown of Wheeler School, Dan Bisaccio of Brown University, David Cedrone of the R.I. Economic Development Council (RIEDC), Paul Dolan of DEM, Shannon Donovan of Scituate High School, Tim Duffy of the R.I. Association for School Committees, Patrick Duhon of Providence Public Schools/Providence After School Alliance, Tom Flanagan of Barrington, Greg Gerritt of ECRI, Denise Jenkins of the RIF, Carrie Hawthorne of Roger Williams Park Zoo, Janet Durfee Hidalgo (formerly) of Governor Carcieri's office, John Lebriola of Chariho Middle School, Robert O'Brien of Smithfield School Department, Kate Nigh of RIDE, Sue Pfeil (formerly) of Pawtucket School Department, Joy Poland of Building Bridges 2010, MaryAnn Scholl of University of Rhode Island (URI), Rian Smith of School of Leadership, Afghanistan (SOLA), and Kristin Van Wagner of NBNERR.

Throughout the development of the ELP, we noted many times that the work in this plan is only as strong as our connections to and collaboration with each other. There is amazing work occurring in hundreds of schools and outdoor programs throughout Rhode Island to build environmental literacy. Just as conservation biologists work to build corridors to connect wildlife habitats, we hope this ELP will have the same effect to expand the collaboration and opportunity Rhode Island youth need to be healthy, informed, and active citizens.

Cover image by Kim Botelho

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INTRODUCTION

"This work is vital to support the growth of green jobs—and for the growth of the economy as a whole.... But our commitment has to be about even more than career pathways. It also has to prepare all students with the knowledge they need to be green citizens[1]."

U.S. SECRETARY OF EDUCATION, ARNE DUNCAN

The Development of Rhode Island's Environmental Literacy Plan

In the Fall of 2008, the Rhode Island Environmental Education Association (RIEEA) began to reach out to broad variety of educational stakeholders, including members of the Rhode Island General Assembly; professional educational associations; the Rhode Island State Departments of Education (RIDE), Environmental Management (DEM), and HEALTH; higher education institutions; K-12 educators; community organizations; and outdoor, environmental education centers and organizations. RIEEA convened a kick-off presentation at which Gary Heath, former Assistant Superintendent, Maryland Department of Education and Director of Educational Policy for the No Child Left Inside Coalition, presented information about the No Child Left Inside legislation. Since that time, RIEEA has coordinated the efforts to keep these stakeholders informed and engaged in contributing feedback to the Environmental Literacy Plan (ELP).

In the spring 2009, RIEEA received a grant from the Rhode Island Foundation to hire a consultant to work with RIEEA and RIDE to write the ELP. Letters of support were also received at this time for the development of a Rhode Island ELP from both RIDE and DEM.

Over the summer of 2009, the number of educators and stakeholders involved in the planning continued to grow. A great deal of time was spent identifying other initiatives and efforts in the state that could connect and strengthen the ELP. A few strong connections emerged: the Rhode Island Technology Enhanced Science Project (RITES), a National Science Foundation-funded Mathematics-Science Partnership, the Great Outdoors Pursuit from the R.I. DEM, the Initiative for a Healthy Weight from the R.I. HEALTH, and the 21st Century skills and the R.I. Department of Education's Strategic Plan 2010-2015.

Throughout the fall of 2009, RIEEA compiled the results of research on national and state academic achievement, as well as on the academic, health and career outcomes that are associated with the inclusion of environmental education in K-12 curricula. From this, a "Case for Support" document was developed (Appendix A) and has been used to promote the concept of an ELP at different public and legislative events.

A gap analysis was also completed to determine the degree to which R.I. already has components

[1] U.S. Secretary of Education, Arne Duncan, speaking at the Sustainability Summit, September 21, 2010.

[2] NAAEE *Guidelines for Learning* were developed to set a standard for high-quality environmental education across the county, based on what an environmentally literate person should know and be able to do. They draw on the best thinking in the field to outline the core ingredients for environmental education (NAAEE, 2004, pg.1). These standards are aligned to national standards in arts, civics and government, economics, English language arts, geography, history, mathematics, science, and social studies.

of the ELP in place. This included an analysis of the Rhode Island Science, Civics, and Engineering and Technology Standards. This analysis was then cross-walked to national environmental literacy standards (see Appendix B) developed by the North American Environmental Education Association (NAAEE)[2], as well as an analysis of the R.I. graduation and assessment requirements. Additionally, a survey was made available to all Rhode Island teachers to determine the level of environmental literacy being taught in K-12 schools and the professional development needs in environmental education across the state (see Appendix C).

An Environmental Literacy Plan steering committee (see Appendix D) was convened in the fall of 2009 to review the work to date and provide input into the vision and action steps for the creation of the ELP. The steering committee later provided detailed feedback on the first draft of the ELP.

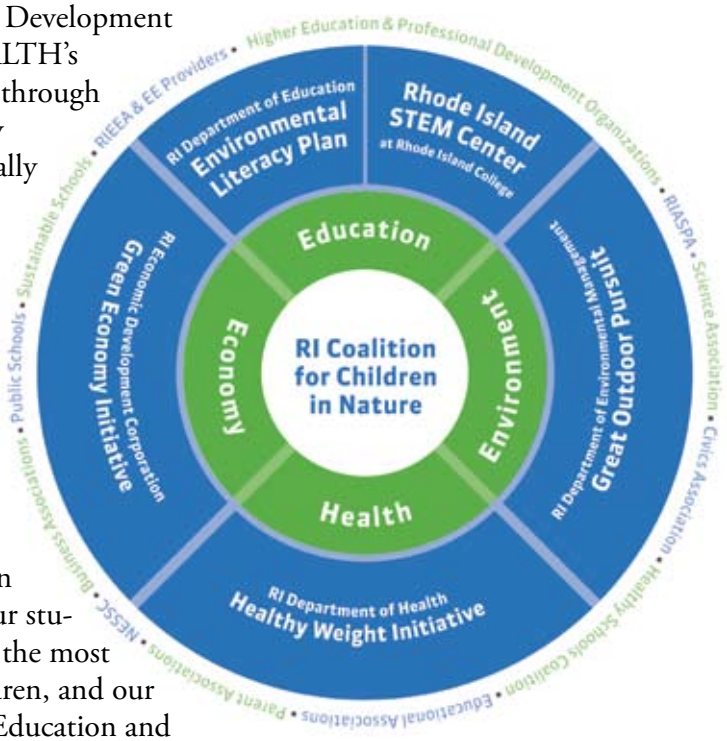
Significant effort was taken to connect the ELP development work in R.I. with initiatives across the region and the country. RIEEA board members worked closely with national organizations including the No Child Left Inside Coalition and NAAEE. Throughout the process, Rhode Island gained recognition as a national leader in ELP development, especially in regards to developing the ELP through an inclusive and collaborative process. As such, RIEEA received recognition as the 2009 NAAEE Affiliate of the Year.

RIEEA and RIDE worked with the New England Environmental Education Alliance to coordinate ELP development efforts with the five other New England states. Four of these states (RI, VT, NH & ME) share a statewide assessment systems, the New England Common Assessment Program (NECAP), and membership in the New England Secondary Schools Consortium. ELP teams from all six New England states, including both environmental educators and department of education employees, met in the fall of 2009 for a full day ELP planning session facilitated by Linda Rhodes, Advocacy Committee Chair, and Brian Day, Former Executive Director of North American Association of Environmental Education.

Children in Nature Coalition

Rhode Island's governmental agencies, non-profit organizations and businesses have begun the work of providing opportunities for environmentally literate citizens to be developed, engaged, and employed in Rhode Island. However, many of these efforts are not connected in ways that could leverage the further development of environmentally literate citizens. Therefore, in the

fall of 2010, RIEEA developed a proposed Executive Order to establish a Children in Nature Coalition to provide the forum and means to establish the communication needed to create collaboration to enhance the efforts of state agencies and the work of businesses and nonprofits. For example, Rhode Island's Department of Education's Environmental Literacy Plan, the Department of Environmental Management's Great Outdoor Pursuit, The S.T.E.M. Center at Rhode Island College, the Rhode Island Economic Development Corporation's Green Economy Initiative, and HEALTH's Healthy Weight Initiative all represent efforts that, through communication and collaboration, could be greatly enhanced to further reach the goal of environmentally literate citizens.



The proposed Executive Order to establish this initiative has been shared with Rhode Island Agencies and the Governor's office. If established, the new Children in Nature Initiative could provide a means to build and sustain support for the short- and long-term action recommendations that make up the ELP.

As Secretary Duncan recently stated, "Right now, in the second decade of the 21st century, preparing our students to be good environmental citizens is some of the most important work any of us can do. It is for our children, and our children's children, and generations yet to come... Education and sustainability are the keys to our economic future—and our ecological future."

Definitions

Two founding documents anchor internationally recognized environmental education definitions and practices: the Belgrade Charter (United Nations Education Scientific and Cultural Organization-United Nations Environment Programme [UNESCO-UNEP], 1976) and the Tbilisi Declaration (UNESCO, 1978). The Belgrade Charter provided an initial goal statement for environmental education that was adopted during a 1976 United Nations conference:

> The goal of environmental education is to develop a world population that is aware of, and concerned about the environment and its associated problems, and well as the knowledge, skills, attitudes, motivations, and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones.

A short time later, at the world's first intergovernmental conference on environmental education in 1978, The Tbilisi Declaration was created to further articulate the goals for environmental education. The goals of the declaration are:

- To foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas;
- To provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment;
- To create new patterns of behavior of individuals, groups and society as a whole towards the environment.

Even as environmental education has evolved, these two documents still remain as a shared international understanding of the core concepts needed by environmental literate citizens. Subsequent international conferences as well as substantial research to articulate the goals, objectives, and frameworks of environmental education have taken place since the late 1970's, including the development of the NAAEE's National Guidelines for Excellence Project. As the authors of a recent national literacy assessment program (McBeth, Hungerford, Marcinkowski, Volk, & Meyers, 2008) point out:

> In general, these frameworks for environmental literacy have two broad features in common: (a) they reflect at least four of the Tbilisi categories of objectives, namely Knowledge, Affect, Skills, and Participation (Behavior); and (b) they address at least three major thematic emphases apparent across the history of EE within the U.S. (Stapp, 1974; Swan, 1975), namely the natural world, environmental problems and issues, and sustainable solutions to these problems and issues. (pg. 16)

Environmental literacy. Taking the research and history of environmental education into account, and for the purposes of this document, two sources that define environmental literacy are important, those described by the Partnership for 21st Century Skills and the Campaign for Environmental Literacy.

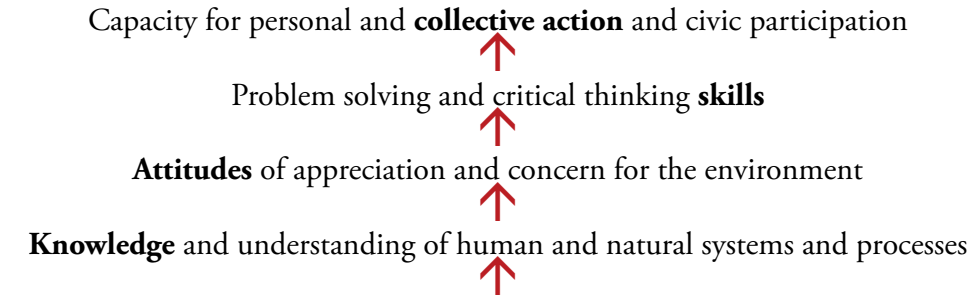
In the *Framework for 21st Century Learning*, The Partnership for 21st Century Skills identifies the core subjects and 21st century themes essential to student success. Environmental literacy is one of the interdisciplinary themes used to promote an understanding of academic content at a higher level by weaving it into the cores subjects. The Partnership for 21st Century Skills defines an environmentally literate student as one who can:

- Demonstrate knowledge and understanding of the environment and the circumstances and conditions affecting it, particularly as relates to air, climate, land, food, energy, water and ecosystems
- Demonstrate knowledge and understanding of society's impact on the natural world (e.g., population growth, population development, resource consumption rate, etc.)
- Investigate and analyze environmental issues, and make accurate conclusions about effective solutions
- Take individual and collective action towards addressing environmental challenges (e.g., participating in global actions, designing solutions that inspire action on environmental issues) (Partnership for 21st Century Skills, 2011)

The Campaign for Environmental Literacy defines environmental literacy as the following:

> ...the capacity of an individual to act successfully in daily life on a broad understanding of how people and societies relate to each other and to natural systems, and how they might do so sustainably. This requires sufficient awareness, knowledge, skills, and attitudes in order to incorporate appropriate environmental considerations into daily decisions about consumption, lifestyle, career, and civics, and to engage in individual and collective action (Campaign for Environmental Literacy, 2011).

The Campaign for Environmental Literacy (2011) then describes five essential components of environmental literacy as a loose hierarchy that builds from the simple, lower steps to more complex, higher steps.



Environmental education. Environmental education is the learning process through which students and citizens attain environmental literacy. Environmental education is neither an addition to, nor a replacement for, current classroom curricula. It is a way to enhance the curriculum and instruction of multiple subjects, especially, but not limited to, the concepts and skills found in science and social studies. Environmental education can provide meaningful, authentic, and applied learning experiences inside and outside the classroom and school day.

Environmental education is not the same as providing environmental information or facts about specific environmental problems. Environmental education is also not biased environmental advocacy. Environmental education is a process whereby students use inquiry and the scientific method to study both environmental problems, and associated social issues, to conclude and implement what they believe to be needed individual or collective actions to improve problems and/or resolve issues.

The *Excellence in Environmental Education Guidelines for Learning* (Pre K-12) (NAAEE, 2004) serves as the national standards for environmental education. These guidelines are organized into four strands that represent different aspects of environmental education and the goal of environmental literacy. The four strands, and their sub-categories are:

- Strand 1: Questioning, Analysis, and Interpretation Skills
- Strand 2: Knowledge of Environmental Processes and Systems
- Strand 3: Skills for Understanding and Addressing Environmental Issues
- Strand 4: Personal and Civic Responsibility

The historical roots, as well as current conceptions of what defines environmental literacy and environmental education, are important to provide solid footing and framework within which to build a state environmental literacy plan. The definitions cited in this section are based on over three decades of research and scholarly international collaboration on the essential aims, outcomes, and best practices of environmental education. Therefore, these definitions and guidelines are the basis for the Rhode Island Environmental Literacy Plan.

Why Environmental Education?

Over the last three decades a large volume of research has been conducted that illuminates both the effective practices and broad-reaching outcomes of Environmental Education. A recent research bibliography (Marcinkowsi & Weiss, 2010) compiled a large number of studies that investigated the effect of environmental education programs on the outcomes of environmental literacy and academic achievement. Numerous benefits are associated with environmental education. Below are some essential benefits associated with environmental education supported by a selection of both quantitative and qualitative primary research.

Linking environmental education and formal education can result in dramatic improvements in the quality of education (Archie, 2003). Studies have shown that using environmental education in schools improves **student academic engagement and motivation** (Athman & Monroe, 2004; Lieberman & Hoody, 1998; National Environmental Education & Training Foundation [NEETF], 2000; Wheeler, Thumlert, Glaser, Schoellhamer, & Bartosh, 2007). Further, environmental education has been shown to increase students' **ability to learn at high levels through increasing critical thinking, inquiry skills, and problem-solving** (Ernst & Monroe, 2004; NEETF, 2000). Environmental education has also been associated with **increased evidence of academic achievement and performance on assessments** (Bartosh, Tudor, Ferguson, & Taylor, 2006; Lieberman, & Hoody, 1998; NEETF, 2000; Wheeler et al., 2007).

Environmental education has also been shown to have a relationship with social aims of schools that can improve educational experiences for students and teachers. Studies have shown that the use of environmental education can increase **collaboration, communication and positive behavior** (and reduce negative discipline) among students (Lieberman, & Hoody, 1998; NEETF, 2000). In addition, the interdisciplinary nature of environmental education encourages and increases **collaboration among educators** (Lieberman & Hoody, 1998; Bell, Lewenstein, Shouse, & Feder, 2009).

Other important outcomes linked to environmental education include career and health goals. There is a vast body of research that connects environmental education to increased **physical and mental health** (Children and Nature Network, 2011) There is also evidence that environmental education has a positive effect on **career development** (Wheeler et al., 2007). This is important in light of the current initiatives to grow student interest in STEM and green collar occupations

Legislation

The No Child Left Inside (NCLI) legislation is a widely supported bipartisan bill; sponsored by Senators Reed (RI) in the U.S. Senate and Representative Sarbanes (MD) in the U.S. House of Representatives, it is considered one of four key pieces of legislation in the reauthorization of Elementary and Secondary School Act. Environmental Education was also included in President Obama's "Blueprint for Reform" (United States Department of Education [USDOE], 2011) and has been included in the Department of Education's proposed budget for the first time. As it is currently written, the NCLI bill includes $100 million for state educational agencies to distribute to equip teachers with the skills, knowledge, and confidence they need to integrate environmental education into their curricula. Only states with qualifying Environmental Literacy Plans will be eligible for a percentage of this funding.

In the current version of NCLI bill, state Environmental Literacy Plans must provide a state plan to ensure students develop basic environmental literacy through:

- Standards and courses/subjects where instruction will take place
- Graduation requirements
- Measurement of environmental literacy
- Professional development programs to improve teachers environmental literacy knowledge and field-based pedagogical skills
- Sustained implementation and funding

CONNECTING ENVIRONMENTAL LITERACY TO EDUCATIONAL CONTEXT

State Data

Rhode Island students' scores have improved in all assessments at all school levels since the first year of the current state assessment, the NECAP. However, only 33% of high school students are proficient in math and 29% in science. Further, there is a large gap in achievement between urban and suburban schools (Rhode Island Department of Education [RIDE], 2011).

In preparing environmentally literate students, Rhode Island schools and communities also have the opportunity to concurrently improve student's proficiency in science, math and other core academic areas. The following data obtained from RIDE (2011) is a testament to the need to improve core academic areas, especially in underserved communities and populations:

- There are less Rhode Island students proficient in science on the state assessments than in math, writing, and reading.
- A large achievement gap in science, math, reading and writing exists across all subject areas between students who attend urban and suburban schools.
- Black and Hispanic students, students with disabilities, and English-language learners scored at least 25 points below the state average in grade 4, at least 17 points below the state average in grade 8, and at least 14 points below the state average in grade 11 on the 2010 science assessment.
- The 2009 National Assessment of Education Achievement (NAEP) science assessment showed that 74% of R.I.'s Hispanic students scored below basic; nationally, 59% of Hispanic students scored below basic. R.I. had the lowest overall score in the country

among 8th grade Hispanic students.

- Over the last three years, Rhode Island student in grades 4, 8, and 11 have performed lower on the science inquiry component, than on the other three areas of physical science, earth and space, and life science.
- The proficiency demonstrated on science state assessments goes down from 44% in grade 4 to 22% in grade 8 and 20% in grade 11.

Urban challenges and opportunities. One third of Rhode Island students reside in the 6 core urban districts (Central Falls, Newport, Pawtucket, Providence, West Warwick and Woonsocket). Most economically disadvantage students reside in urban settings. Clearly, there is a significant need in Rhode Island to improve science education among our underserved urban students. Consequently, state education leaders are calling for new and innovative ways to improve science education for these. Environmental Education is one innovative way to incorporate inquiry science with hands-on lessons that are relevant to urban students.

The urban landscape offers numerous ecological lessons that can enhance science education among our most underserved population. Simply bringing students into their schoolyard or to a local city park can have long-term positive impacts. Doing so provides urban students opportunities to discover various ecological systems and interactions and debunks the common misconception that this type of experience is only found in suburban or rural settings. This concept of urban ecology illustrates the relationships between the natural and manmade environments. Lessons implemented out of the classroom will help to strengthen scientific content knowledge along with building positive experiences in urban landscapes that ultimately develop stewardship and civic responsibility.

Rhode Island environmental literacy teacher survey. Student data from state tests provided essential information to craft the ELP; however, it was also important to understand the types of practices already being used in classrooms. Therefore, a survey was sent out to teachers across Rhode Island to investigate the extent to which students' environmental literacy is being addressed (see Appendix C for copy of the survey and the detailed results). Though the survey only represents a small portion of the state's teachers, it is likely that the respondents are skewed toward teachers who do have a favorable opinion of teaching environmental literacy, as nearly all respondents felt that students' environmental literacy was important. Therefore, while the results cannot be generalized to all R.I. teachers, they likely represent a best-case scenario regarding levels of environmental education being taught and professional development needs across the state.

While no statistical difference was found in the amount of environmental education (EE) taught across grade levels, there was a statistical difference found in the amount of EE taught across subject areas. Environmental literacy was broken into three areas: (a) inquiry, earth science and ecology; (b) environmental issues inquiry; and (c) responsible citizen action. There were significantly lower degrees of environmental literacy incorporated into math than the other subject areas. Conversely, the highest degree of environmental literacy was being incorporated into science. Importantly, on a scale of 1-4 (1=not at all, 2=a little, 3=somewhat, and 4=a great extent), on average, teachers reported that the extent of environmental literacy taught for each of the three areas of environmental literacy was only 'a little.' Also, teacher's reported a greater amount of the

area, *inquiry, earth science, and ecology* being taught, followed by *environmental issue inquiry*, and then *responsible citizen action.*

There is an important, positive implication from these results: the subject areas that showed the highest average amount of environmental literacy being taught have state standards that are more aligned with environmental literacy concepts and skills articulated in the NAAEE Guidelines for Learning. The average rating for *inquiry, earth science, and ecology* for science teachers was 2.91. The average rating for *environmental issue inquiry* for social studies teachers was 2.83. These were the two highest ratings for any area of environmental literacy across all subjects and grade levels. The implication is that if the representation of environmental literacy skills and concepts are strengthened in the standards, the teaching of these will also increase.

The survey also uncovered noteworthy findings in regards to pedagogy. A substantial benefit of environmental education for students comes when educators strive to integrate subjects with real world content. However, to achieve this, teachers need to work collaboratively to integrate subject areas and must be prepared and supported to use different pedagogies such as integrating content, inquiry-based learning, outdoor and experiential contexts. The survey results uncovered that very little of these types of pedagogy are currently happening in classrooms. Small amounts of efforts to integrate subjects were reported (except from elementary teachers), and very little use of outdoor habitats, even those located on the school grounds, was reported. While funding was a barrier to taking kids on field trips, the highest barrier to using schoolyard habitats were reported as *time out of classroom* and *curriculum restrictions.* These results show that there is a great deal of professional development that is needed to support teachers in using environmental literacy concepts and skills to enhance the teaching of current state standards.

National Data

A recent national study by McBeth et al. (2008) of middle school students' environmental literacy showed that, on average, middle school students score **lower on the cognitive skills component** (issue identification, analysis, and planning) than on the other components of environmental literacy measured (e.g. ecological foundations, environment and human impact). Rhode Island students' **inquiry scores** show a similar trend.

International Data

Collected for the first time in 2006 on environmental science, the Programme for International Student Assessment (PISA) (Organisation for Economic Co-operation and Development [OECD], 2009) show findings that concur with the national data: US 15-year-olds scored lower on understanding of environmental science than all but six OECD "developed" countries (Luxemburg, Greece, Italy, Portugal, Mexico, and Turkey). Like the national and state-level findings above, the achievement went down as the cognitive skill of understanding more complicated environmental concepts and issues increased.

Reasons for low environmental literacy in students both nationally and potentially in Rhode Island *may* include the following: (a) skills and concepts associated with environmental literacy are not explicitly described in the state standards, (b) there is a lack of knowledge of environmental science on the part of teachers, and/or (c) there is a lack of pre-service and professional development for teachers on environmental education concepts and ways to use them to enhance learning across subject areas. Regardless of the contributing reasons, it is apparent from a recent survey of R.I. teachers that there is a lack of environmental education taught in the classrooms across R.I. (See Appendix C).

ENVIRONMENTAL EDUCATION TO INCREASE CURRENT EDUCATION INITIATIVES

Educational initiatives taking place throughout the state could be impacted in a positive way by the increased integration of environmental education into the states curriculum, instruction, and assessment systems. As part of the Rhode Island Strategic Plan Rhode Island's education system has a goal to meet international standards. Specific to meet this goal, the Objective, World Class Standards 1 states that Rhode Island will: *Ensure that all students have access to a rigorous curriculum aligned to internationally benchmarked standards that are taught through multiple pathways.* As districts work to create curricula that is "guaranteed and viable" the incorporation of content rooted in environmental literacy is incredibly important. Identification of after-school programs, enlistment of informal science education organizations, and incorporation of resources detailed in the RI Environmental Literacy Plan with serve to strengthen instruction by providing authentic and engaging activities for students. Making environmental issues relevant to students will greatly stimulate their academic interest and achievement in **STEM** (science, technology, engineering, and math) content and careers.

The way that we view the thinking of young children has undergone significant revision over the past few decades. Children were once thought to have limited knowledge about the world around them. Recent research, however, has revealed that children as young as those in kindergarten have surprisingly sophisticated ways of thinking about the natural world based upon direct experiences with the physical environment, such as watching objects fall or collide, and observing animals and plants (NRC, 2008). Young people learn about their world through experience gained both within and outside of school. The more exposure students have nature centers, museums, tours of seashores, walks in forests, or any experience investigating nature or topics in science can be translated into deeper understanding in a well-structured science classroom. Recognizing this research the RI Environmental Literacy Plan works to expand the base of experience of young people.

Linking Efforts

In conservation biology, scientists, environmentalists, and policy makers work hard to find ways to connect fragmented pieces of an individual species' habitat to give the species a chance to sustain and thrive, rather than dwindle and become extinct.

In Rhode Island, we have multiple education priorities, environmental initiatives, and environmental education efforts underway across the state. However, many of these efforts are disconnected and therefore, as with a species' fragmented habitat, not as powerful and sustaining as they could be if they were linked.

The Rhode Island Environmental Literacy Plan, supported by efforts like the Children in Nature Coalition, can serve as the means to create these connections and increase the ability for Rhode Island students, citizens, and environment to sustain and thrive in the 21st century.

COMPONENTS OF THE ENVIRONMENTAL LITERACY PLAN

The following sections outlines what is already in place and what is recommended for short- and long-term action in regards to each of the areas required in the No Child Left Inside legislation**.**

Standards

Current status. The analysis of the crosswalk between the Rhode Island standards in science, civics, engineering and technology and the NAAEE's *Guidelines for Learning* (Appendix B) that serve as standards for environmental literacy revealed multiple findings that can help direct the implementation of the ELP.

The areas of state standards that were found to have alignment with the *Guidelines for Learning* environmental literacy standards were Physical Science, Earth and Space Science, Life Science, Civics & Government, and Engineering and Technology. The R.I. Inquiry Constructs embedded into all the science standards and the Engineering and Technology standards are strongly aligned to NAAEE's Strand 1: Questioning, Analysis and Interpretation Skills. The R.I. Science standards are strongly aligned to NAAEE's Strand 2.1: The Earth as a Physical System and Strand 2.2: The Living Environment. The R.I. Civics and Government standards were found to align well with NAAEE's Strand 2.3: Humans and Their Societies and Strand 3: Skills for Understanding and Addressing Environmental Issues. The R.I. Engineering and Technology standards were found to have some alignment with NAAEE's Strand 2.4: Environment and Society.

The NAAEE environmental literacy areas that are least represented in the R.I. standards are NAAEE's Strand 2.4: Environment and Society, Strand 3.2: Decision-Making and Citizenship Skills, and Strand 4: Personal and Civic Responsibility. While inquiry and issue investigation skills are somewhat present in the R.I. Civics & Government and Science standards, there is only 1 standard in Life Science (2-5) that specifically references studying environmental issues. The R.I. Engineering and Technology Standard 1 does reference specific environmental issues.

There is good alignment with the skills and concepts represented in the NAAEE's *Guidelines for Learning; however,* there is little to no requirement in the R.I. standards for students to be aware, inquire, investigate, and/or develop responsible citizenship action plans or behavior for local, national, or global environmental issues. Essentially, with the exception of one Engineering and Technology standard and one Life Science standard, a student could meet all the R.I. standards without ever studying environment problems and issues (locally, nationally, and/or globally).

Another area of concern is that over half the NAAEE environmental literacy skills and concepts described in the *Guidelines for Learning* are located in the Civics & Government and Engineering and Technology state standards. These standards are not measured on the current state assessments, which creates a challenge in assessing environmental literacy that will be discussed further in the measurement section.

Student performance on the state assessment in science inquiry is the lower than any of the other areas tested on the science assessment. This may indicate that the way the science inquiry standards are currently being taught is not adequate to create independent inquiry performance in students. An inference could be made that real-world environmental issues provide an authentic and relevant context for students to practice scientific inquiry into environmental problems and social issues associated with environmental problems.

Action recommendations. The following section describes the short- and long-term action recommendations for the work on standards.

- **Short-term action recommendation:** Create an Environmental Literacy Council, composed of members from RIEEA, RIDE, and others to study the science, civics, engineering and technology state standards to identify ways environmental literacy could be more explicit and supportive of instruction to ensure that R.I. students are guaranteed the opportunity to become aware, inquire, investigate, and develop responsible citizenship action plans or behavior regarding local, national, or global environmental issues.
- **Short-term action recommendation**: The Environmental Literacy Council will lead efforts to create and document environmental education units and lesson plans, and accompanying professional development, to teach environmental literacy though current state standards.
- **Short-term action recommendation:** Work with RITES program (federally funded STEM program) to integrate the study of environmental problems and issues into tech-enhanced science units.
- **Long-term action recommendation:** On future iterations of the science, civics, engineering and technology state standards, use internationally benchmarked data from PISA and TIMMS, as well as work of the Environmental Literacy Council, to identify needs and opportunities to increase alignment with NAAEE's *Guidelines for Learning.*
- **Long-term action recommendation:** Include environmental literacy, especially environmental issue investigation and responsible citizenship action, in the future iterations of the applied 21st century skills and performance assessments.

Graduation Requirements

Current status. The K-12 Literacy, Restructuring of the Learning Environment at the Middle and High School Levels, and Proficiency Based Graduation Requirements (PBGR) At High Schools Regulations were recently revised from the 2008 *Middle-Level and High-School 2008 Regulations Guidance* (RIDE, 2011). The part that pertains to the Rhode Island Diploma System specify the following:

> Students will substantiate their proficiency by producing evidence of meeting the content standards and applied learning skills in the six core academic areas, in accordance with local diploma requirements and each student's individual learning plan (ILP). (pg.7)
>
> Each student exiting a Rhode Island high school with a diploma shall exhibit proficiency in the academic core as described in section L-6-3.1. This level of proficiency must be demonstrated through multiple sources of evidence gathered over time in a valid and reliable local assessment system, including a combination of at least two of the following performance-based assessments: graduation portfolios, exhibitions, comprehensive course assessments, or the Certificate of Mastery. (pg. 8)
>
> In a manner to be prescribed by the Commissioner, all public middle level schools and high schools shall provide evidence of the manner in which they incorporate applied learning skills including communication, problem-solving, critical thinking, research, and reflection/evaluation, and collaboration across all content areas, as well as a variety of academic, community and career-related contexts for all students. (pg. 9)

> Commencing with the graduating class of 2012, each local educational agency shall create a composite measure of each student's overall proficiency for graduation in the six core academic areas. This composite measure shall be derived from a conjunctive review of three sources of evidence: (a) individual student results on state assessments in mathematics and English language arts, and when so designated by the Board of Regents, additional content areas; and (b) successful course completion; and (c) at least two additional performance-based diploma assessments... (pg.9)

These regulations make clear that local education agencies (LEAs) need to both align their coursework and local assessments to the R.I. standards. If state standards are revised or adopted that include further alignment and/or inclusion of concepts and skills associated with environmental literacy, the graduation requirements would move toward ensuring environmental literacy for R.I. students. As the graduation requirements and state standards currently exists, it is possible for a student to meet and exceed the graduation requirements *without* explicitly studying environmental issues and problems and/or without learning many of the associated skills (issue investigation, resolution, and action).

LEAs choose which state standards they align and which integrating context they use to incorporate the applied learning skills in the performance-based graduation system. Therefore, even if the state standards included further concepts and skills associated with environmental literacy, there might be districts that would not include these standards in their performance-based systems.

Though integrating concepts and skills associated with environmental problems and issues is option, currently some students across the state design senior exhibitions that have an environmental component (conversation with R. Sietsinger, 2009).

Action recommendations. The following section describes the short- and long-term action recommendations for the work on graduation requirements.

- **Short-term action recommendation:** The Environmental Literacy Council, composed of members from RIEEA, RIDE, and others study the science, civics, engineering and technology state standards, the state applied learning standards, and the performance-based graduation system to identify ways environmental literacy would be more explicit and supportive of instruction to ensure that R.I. students are able to demonstrate their ability to inquire, investigate, and develop responsible citizenship action plans or behavior regarding local, national, or global environmental issues.

- **Long-term action recommendation:** As the performance-based graduation system is refined, identify and include specific 21st century skills that use the environmental as an integrating context for inclusion in the performance-based graduation system for each LEA.
- **Long-term action recommendation:** Environmental education can be used as a vehicle to keep secondary students engaged, to provide real-world contexts and relevant issues to develop the applied learning skills students need to be prepared for the 21st century economy, environment and society. Therefore, it is recommended that student exhibitions, portfolios and course assessments that integrate environmental literacy be developed and/or collected as models and a bank of such exemplars be available through RIDE and/or RIEEA.

Measurement

Current status. Rhode Island students currently take state assessments entitled, New England Common Assessment Project (NECAP) in English Language Arts, science, and math. The NECAP assessments are aligned to specific GLE/GSEs in the different subject areas. The questions on the assessments represent varying depths of knowledge (1-4 with one being lowest and four highest). The majority of the questions on the assessments represent depths of knowledge at levels one and two, with some level three included in constructed response items on each test. Depth of knowledge at level four is not included on the assessment. Students are supposed to be engaged in local assessments that engage students at the fourth depth of knowledge, because at this depth, students should be engaged in ongoing construction and problem-solving.

It is anticipated that state assessments will change in upcoming years. The Rhode Island Board of Regents adopted the Common Core State Standards on July 1, 2010 for the areas of mathematics and English Language Arts, including literacy in history/social studies, science, and technical subjects. The transition to curriculum and instruction that is fully aligned to the Common Core Standards will occur over several years with the expectation of full implementation by the 2013-2014 school year. The first assessment based on the Common Core Standards will take place during the 2014-2015 school year using the Partnership for the Assessment of Readiness in College and Careers (PARCC). Rhode Island is governing state in the PARCC, a state-led assessment consortium, with 11 governing states and 26 member states all together. The U.S. Department of Education awarded "Race to the Top" assessment funds to the PARCC for the development of a K-12 assessment system aligned to the Common Core State Standards in English language arts and mathematics (RIDE, 2011).

The Common Core Standards are for mathematics and English Language Arts only. Therefore, the current NECAP Science assessment and Science Grade Span Expectations (GSEs) remain in effect. This assessment may change as the state monitors the work of Achieve, Inc. in partnership with the National Research Council, American Association for the Advancement of Sciences and the National Science Teachers Association to begin the development of the "Next-Generation Science Standards."

While there is much alignment between the national environmental literacy standards and the state's science, civics, and engineering and technology (see Appenix B), there are still gaps that exist (see standards section). Therefore, the current NECAP science assessment does not provide a comprehensive assessment of environmental literacy.

Action recommendations. The following section describes the short- and long-term action

recommendations for the work on measurement.

- **Short-term action recommendation:** The Environmental Literacy Council, composed of members from RIEEA, RIDE, and others study the science, civics, engineering and technology state standards, the state applied learning standards, and the performance-based graduation system to identify ways environmental literacy could be measured.
- **Short-term action recommendation**: Investigate the possibility of implementing a separate environmental literacy assessment similar to the national recently-piloted middle school assessment funded by the National Oceanic and Atmospheric Administration and the National Science Foundation (McBeth, Hungerford, Marcinkowski, Volk, & Meyers, 2008).
- **Long-term action recommendation:** Work with NESSC to include environmental literacy in the performance-based assessment system being created across New England.
- **Long-term action recommendation:** Environmental education can be used as a vehicle to engage students in tasks and associated assessments that are at the third and fourth depth of knowledge levels. Therefore, it is recommended that student performance assessments, including, but not limited to those recommended in the graduation section (student exhibitions, portfolios and course assessments that integrate environmental literacy) be developed and/or collected to be held up as models.

Professional Development

Current status. There are a number of programs that could influence the professional development of educators around environmental literacy. Higher Education institutions, informal education programs, and public and private K-12 schools and educators could all play a role. However, currently, there is a lack of collaboration and understanding of how these organizations could work together.

The extent to which pre-service teacher preparation programs in the state prepare teachers to teach environmental education is unknown. In terms of teacher certifications there is not a specific certification for environmental education. Most of the courses within the K-12 curricula that deal with environmental content are taught by educators holding various science certifications. Many courses dealing with environmental issues spring forth from life science curricula and are often elective in nature.

There are also a multitude of environmental centers and environmental organizations working at different capacities with schools across the state, often times in isolation from each other. Currently, there are two charter schools, The Greene School and Compass School, whose focus on environmental education is innovative, though this work is not connected to other schools or districts. In addition, a number of teachers and schools around the state focus on environmental education in some aspect of their curriculum and program. Finally, many schools also use the Guiding Education in Mathematics and Science Network

(GEMS-NET) science kits and receive professional development for these kits that provide basic life, physical, earth and space, and technology lessons and activities.

There is much potential for the work that is already happening around professional development and program development in environmental education and literacy to be further organized, connected and disseminated to influence a wider range of formal and informal educators.

Action recommendations. The following section describes the short- and long-term action recommendations for the work on professional development.

- **Short-term action recommendation:** Conduct a survey of pre-service and in-service programs for educators to determine what level of professional development is currently in place in regards to environmental education. This survey would develop baseline data of both the quantity and quality of pre- and in-service professional development.
- **Short-term action recommendation:** Compile information on teachers and schools utilizing and/or implementing environmental education.
- **Short-term action recommendation:** Compile a resource directory/website for R.I. of universities, organizations, centers, schools and teachers offering professional development. Using NAAEE's guidelines for excellence for programs, create a tool and system to communicate the quality of EE professional development. This tool can be used in the RFP process of distributing ELP funds to assess the quality of the applications.
- **Short-term action recommendation:** Integrate environmental issue inquiry/investigation into the NSF-funded STEM professional development series operating in R.I., RITES or other subsequent efforts.
- **Short-term action recommendations**: Initiate a study of the standards to inform examples, methods, and ideas to further integrate environmental education in the implementation of the state standards.
- **Short-term action recommendation:** Investigate curriculum and instructional resources that could be used to implement GLE/GSE-aligned environmental education (e.g. nationally-vetted curricula like, *Investigating and Evaluating Environmental Issues and Actions* (Hungerford et al., 2003).
- **Short-term action recommendation:** Investigate the role and impact of environmental education certification for informal and/or formal educators in the state (see Appendix E for results of a recent effort to explore interest, questions, and opinions of educators in R.I. regarding environmental education certification).
- **Long-term action recommendation:** Design and implement professional development for the varying needs of Rhode Island educators who are not currently being served.
- **Long-term action recommendation:** Design professional development specifically targeted to integrating classroom learning and outdoor learning.

Implementation and Funding

Current status. The implementation steps that are underway include: (a) the draft ELP is being developed by RIEEA in collaboration with RIDE, with input from a diverse group of stakeholders; (b) RIEEA will submit the ELP to RIDE; (c) upon guidance from the U.S. Department of Education, RIDE will submit the ELP for approval to the U.S. Secretary of Education.

RIEEA will continue to initiate communication between multiple state agencies and initiatives (K-12 educators, higher education educators, DEM, Dept. of Health, STEM, after school/

service learning/internship) to determine how these efforts can be coordinated and strengthened though working together. As part of this work, RIEEA will continue to pursue the formation of statewide Children in Nature Coalition that will provide broad support and connections for the ELP.

Action recommendations. The following section describes the short- and long-term action recommendations for the work on implementation and funding.

- **Recommendations for short-term action:** Convene and hold regular meetings of the Environmental Literacy Council to guide the work of the Environmental Literacy Plan.
- **Recommendations for short-term action:** RIEEA continues to engage the governor's office in conversation to initiate an executive order or equivalent to convene multiple state agencies in a Children and Nature Coalition.
- **Recommendations for short-term action:** Create a tool to rate environmental education professional development with the NAAEE Program Guidelines to ensure that funding under NCLI goes to high quality professional development that is aligned to the state standards. The rubric could be used by RIDE, or an appointed committee, in awarding subgrants for professional development to universities, non-profits, and LEAs.
- **Recommendation for short-term action:** Create a database and calendar website of resources, including outdoor learning spaces, and professional development associated with environmental education. As recommended in the professional development section, align this database with NAAEE guidelines and provide feedback tools for evaluations of professional development to be published on website.
- **Recommendation for long-term action:** Research and publish the efforts of schools and educators to use school yard habitat and outdoor learning spaces.
- **Recommendation for long-term action:** Research the outcomes (student achievement, teacher knowledge) and effectiveness of professional development programs that provide training and support to teachers to integrate environmental education across the curriculum.

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APPENDIX A
Case for Support

Rhode Island's Environmental Literacy Plan

Leveraging resources and supporting current initiatives to prepare youth in the 21st Century.

Vision:

The Rhode Island Environmental Literacy Plan is the stepping-stone needed to prepare environmentally literate citizens to work, participate and lead in the 21st century.

Whether becoming part of a STEM (science, technology, engineering, math) profession, joining the green jobs economy, running for office, teaching, or simply being able to make informed decisions about environmental issues such as water use, air quality and land development, Rhode Island needs environmentally literate citizens.

"Right now, in the second decade of the 21st century, preparing our students to be good environmental citizens is some of the most important work any of us can do. It is for our children and our children's children, and generations yet to come." U.S. Secretary of Education, Arne Duncan, September 21, 2010

Today Rhode Island students are not competitive with their peers in the Northeast in reading, math, and science.

Rhode Island students' math performance is lower than the national average overall and for every ethnic category (i.e. white, black, Hispanic, Asian, Native American).

There are far less Rhode Island students proficient in science on state assessments than in math and reading.

Only 9% of Rhode Island students who reside in urban areas are proficient on the 2009 state science assessments, as compared to students who reside in urban ring cities (23%) and suburban areas (36%)

Less than 1 in 10 students who are categorized as Black, Hispanic, English Language Learners, low income, or having disabilities scored proficient on the 2009 and 2010 state science assessment, as compared to the statewide average of 1 in 4 students.

Over the last two years, Rhode Island student in grades 4 and 8 have performed lower on the science inquiry component, than on the other three areas of physical science, earth and space, and life science.

The proficiency demonstrated on the 2010 science state assessments goes down from 44% in grade 4 to 22% in grade 8 and 20% in grade 11.

(Source: Rhode Island Department of Education)

National Study

A recent national study of middle school students' environmental literacy showed that, on average, middle school students score **lower on the cognitive skills component** (issue identification, analysis, and planning) than on the other components of environmental literacy measured (e.g. ecological foundations, environment and human impact). Rhode Island students' **inquiry scores** show a similar trend.

(Source: 2008 National Environmental Literacy Assessment Project of EPA and NOAA).

Discover how an Environmental Literacy Plan can help reverse these trends.

Environmental Education is the learning process through which students and citizens attain environmental literacy.

Across Rhode Island, classroom teachers and environmental educators provide **hands-on, place-based activities that weave real world experiences** into the classroom.

Environmental education is neither an addition to, or replacement for, current classroom curricula. It is **a way to enhance** curriculum and instruction to provide **meaningful, authentic, and applied learning experiences** inside and outside the classroom and school day.

Research indicates that environmental education increases:

- **student academic engagement and motivation** [i,ii,iii]
- **critical thinking, inquiry skills, and problem-solving** [iv]
- **academic achievement and performance on assessments** [v,vi,vii]
- **democratic citizenship skills**
- **collaboration, communication, and positive behavior** [viii]
- **physical and mental health** [ix]
- **career development**[x] **interest in STEM and green collar occupations**
- **collaboration among educators** [xi,xii]

No Child Left Inside (NCLI) is a widely supported bipartisan legislation, co-sponsored by Senator Reed which has been included in the upcoming reauthorization of the federal Elementary and Secondary Education Act.

The NCLI language currently includes $100 million a year for 5 years for state educational agencies to distribute to equip teachers with the skills, knowledge, and confidence they need to integrate the environment into their curricula. Only states with qualifying Environmental Literacy Plans will be eligible for a percentage of this funding.

Environmental Literacy Plans must provide a state plan to ensure students develop basic environmental literacy through:

- Standards and courses/subjects where instruction will take place
- Graduation requirements
- Measurement of environmental literacy
- Professional development programs to improve teachers environmental literacy knowledge and field-based pedagogical skills

Environmental Literacy is:

- A fundamental understanding of the systems of the natural world and the interactions between the living and non-living environments,
- The ability to make responsible decisions based on scientific, economic, aesthetic, and ethical considerations, and
- The confidence and motivation to exercise rights and responsibilities as a member of a community.

Integrating Environmental Education can provide leverage to increase the effectiveness of Rhode Island education initiatives by increasing:

- Attainment of RI Commissioner's **World Class Standards** priority through alignment with environmental literacy standards and use of environmental literacy skills and content to reach proficiency in standards.
- Academic interest and achievement in **STEM** (science, technology, engineering, and math) content and careers through the study of real world, authentic environmental issues and problems.
- Students' ability to perform on **state** and local assessments through continuous engagement in meaningful and applied learning experiences that reach **greater depths of knowledge**.
  - **Educators' professional** ability to use instructional pedagogies associated with environmental education that increase student understanding.
  - **Collaboration among all educators – formal and non-formal** (after school, environmental centers, service learning, community and outdoor programs) to work together to leverage expertise and resources.
- **Health of students, both physically and mentally** through increased time outdoors.
- **Health of Rhode Island's environment and economy** through preparing citizens able to participate in making responsible decisions and ready to work in "green collar" jobs.

Linking Statewide Efforts:

In conservation biology, scientists, environmentalists, and policy makers work hard to find ways to connect fragmented pieces of a species habitat to give the species a chance to sustain, rather than dwindle and become extinct.

In Rhode Island, we have a vast amount of education, environmental, economic, and health initiatives. However, many of these efforts are not connected and therefore, as with anything fragmented, not as powerful as they could be if they were linked.

The Rhode Island Environmental Literacy Plan can serve as the means to create these connections and increase the ability for Rhode Island students, citizens, and environment to sustain and thrive in the 21st century. Further the proposed Executive Order, Rhode Island Coalition for Children in Nature, can provide the means to increase communication and collaboration statewide.

"It is impossible to make wise personal decisions or to exercise good citizenship or compete in an increasingly global economy or to begin to address the enormous challenges we face in exercising our stewardship of our environment without knowledge of science and the ability to apply that knowledge thoughtfully and appropriately."

- Judith Ramaley, President of Winona State University in Minnesota

RHODE ISLAND RiEEA
Environmental Education Association

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Rhode Island's Environmental Literacy Plan efforts are supported by The Rhode Island Foundation.

Participating Organizations

Rhode Island Department of Education • Audubon Society of Rhode Island • Girl Scouts of Rhode Island
Brown University • RI Department of Environmental Management • Norman Bird Sanctuary
RI EDC STEM Initative • Roger Williams Park Zoo • Rose Island Lighthouse Foundation • Save the Bay
URI, Office of Marine Programs • Wood-Pawcatuck Watershed Association

RIEEA Members

Apeiron Institute of Sustainable Living • Audubon Society of Rhode Island • Bridges 4 Learning AmeriCorps Collaborative Building Bridges 2012 • RI DEM, Division of Forestry • RI Envirothon • Friends of Ballard Park • Frosty Drew Nature Center and Observetory • Girl Scouts of RI • Narragansett Bay Research Reserve • Norman Bird Sanctuary • Ocean State Environmental Education Collaborative • Recycing for RI Education • RiverzEdge Arts Project • RI Families in Nature • Roger Williams Park Zoo Rose Island Lighthouse Foundation • Save the Bay • Wood-Pawcatuck Watershed Association

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Footnotes

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APPENDIX B

Analysis of National Environmental Literacy Standards aligned to RI Standards

National Environmental Literacy Standards (North American Association of Environmental Education (NAAEE) Guidelines for Learning)			RI Standards (Grade Span Expectations - GSEs)		
			Grade 4	Grade 8	Grade 11/12
Strand 1: Questioning, Analysis, and Interpretation Skills	(no sub-strands)	A. Questioning	*INQ 1, 2, 3, ET 2.1, 2.3*	*INQ 1, 2, 3, ET 2.1,*	*INQ 1, 2, 3, ET 2.1,*
		B. Designing investigations	*INQ 4, 5, 6*	*INQ 4, 5, 6, ET 2.1, 2.3*	*INQ 4, 5, 6, ET 2.1, 2.3*
		C. Collecting information	*INQ 7, 8, 9*	*INQ 7, 8, 9, ET 2.3*	*INQ 7, 8, 9, ET 2.1, 2.3*
		D. Evaluating accuracy and reliability	*INQ 11*	*INQ 11, ET 2.3*	*INQ 11, ET 2.1, 2.3*
		E. Organizing information	*INQ 10*	*INQ 10, ET 2.3*	*INQ 10, ET 2.3*
		F. Working with models and simulations	*MAS, ET 2.3*	*MAS, ET 2.3*	*MAS, ET 2.3*
		G. Drawing conclusions and developing explanations	*INQ 12, 13*	*INQ 12, 13*	*INQ 12, 13*
Strand 2: Knowledge of Environmental Processes and Systems	Strand 2.1: The Earth as a Physical System Strand	A. Processes that shape the Earth	*ESS 1-1, 1-2, 1-3, 1-4, 1-5, 1-6*	*ESS 1-1, 1-2, 1-3, 1-4, 1-5*	*ESS 1-1, 1-2, 1-3, 1-4*
		B. Changes in matter	*PS 1-1, 1-2, 1-3*	*PS 1-1, 1-2, 1-3, 1-4, 1-5*	*PS 1-1, 1-2, 1-3, 1-4*
		C. Energy	*PS 2-4, 2-5, 2-6*	*PS 2-4, 2-7*	*PS 2-4, 2-6, 2-7*
	2.2: The Living Environment	A. Organisms, populations, and communities	*LS 1-1, 1-2, 1-3, 1-4*	*LS 1-1, 1-2*	*LS 1-1*
		B. Heredity and evolution	*LS 1-3, 1-4, 3-8, 3-9*	*LS 1-2, 3-6, 3-8, 3-9*	
		C. Systems and connections	*LS 2-6, 3-7*	*LS 2-6, 2-7*	*LS 2-6*
		D. Flow of matter and energy	*LS 2-5, 2-6*	*LS 2-5, 2-6, 2-7*	*LS 2-5, 2-4*
	Strand 2.3: Humans and Their Societies	A. Individuals and groups	*C&G 2-2, 3-1, 3-2*	*C&G 3-2*	
		B. Culture	*C&G 3-1*		
		C. Political and economic systems	*C&G 1-1, 1-2, 2-1*	*C&G 1-1, 1-2, 2-1, 4-1*	*C&G 1-1, 1-2, 2-1*
		D. Global connections	*C&G 5-1, 5-2*	*C&G 5-1, 5-2*	*C&G 5-1, 5-2, ET 1.2*
		E. Change and conflict	*C&G 3-2*	*C&G 2-2, 3-2*	*C&G 2-2, 3-2*
Strand 3: Skills for Understanding and Addressing Environmental Issues	Strand 2.4: Environment and Society	A. Human/environment interactions	*C&G 5-3*	*C&G 5-3*	*LS2-3, C&G 5-3*
		B. Places			
		C. Resources			
		D. Technology	*ET 1.1, 1.2*	*ET 1.1, 1.2*	*ET 1.1, 1.2*
		E. Environmental issues	*ET 1.1, 1.2*	*ET 1.2*	*ET1.1, 1.2*
	Strand 3.1: Skills for Analyzing and Investigating Environmental Issues	A. Identifying and investigating issues	*C&G 4-3*	*C&G 4-3*	*LS 2-5, C&G 4-3*
		B. Sorting out the consequences of issues	*C&G 4-3*	*C&G 4-3, 5-3*	*C&G 5-3*
		C. Identifying and evaluating alternative solutions and courses of action	*C&G 4-3*	*C&G 4-3, 5-3*	*C&G 5-3*
		D. Working with flexibility, creativity, and openness	*C&G 4-3*	*C&G 4-3*	
	Strand 3.2: Decision-Making and Citizenship Skills	A. Forming and evaluating personal views	*C&G 4-3*	*C&G 4-2*	*C&G 3-1, 3-2, 4-3*
		B. Evaluating the need for citizen action	*C&G 4-3*		*C&G 3-2, 4-2*
		C. Planning and taking action	*C&G 4-2, 4-3*		
		D. Evaluating the results of action	*C&G 4-3*		
Strand 4: Personal and Civic Responsibility	(no sub-strands)	A. Understanding societal values and principles			
		B. Recognizing citizens' rights and responsibilities	*C&G 3-1, 4-1*	*C&G 3-1*	*C&G 3-1*
		C. Recognizing efficacy			
		D. Accepting personal responsibility			

Note: ESS = Earth & Space Science, PS = Physical Science, LS = Life Science, C&G = Civics and Government, INQ = NECAP Inquiry Schema, MAS = Models and Scales , ET = Engineering & Tech
RI Health standards are not included, though they have many parallels to the NAAEE standards, they are focused on health issues, rather than environmental issues.
*C&G and ET GSEs represent the skills addressed in the NAAEE guidelines, but most C&G focus on social issues, not issues. More ET focus on environmental problems, though not a focus on environmental issues (things people disagree on).

APPENDIX C
Survey to Teachers

Instructions

Thank you for taking 10-15 minutes out of you busy schedule to answer these important questions about environmental education. Your input is key to developing Rhode Island's environmental literacy plan.

Your responses will be 100% anonymous. To show our appreciation, please follow the link at the end of the survey to sign-up for your free 1-year RIEEA membership.

Please take a moment to read the definitions of environmental education and environmental literacy below before you answer the questions. Many thanks for your valuable time and input!

Definitions

Environmental literacy: An understanding of the systems of the natural world and the interactions between living and non-living environments. Also, the confidence, motivation and ability to make responsible decisions based on scientific, economic, aesthetic, and ethical considerations as a member of a community.

Environmental education: The learning process through which students and citizens attain environmental literacy. Can take place in classrooms, at home, school yards, nature centers, etc. Environmental education features hands-on, place-based activities that weave real world experiences and environmental issues into students' learning.

Section 1

1. Please check the grade level(s) that you are teaching this year:
2. What type of school do you teach in?
3. What is your teaching position?
4. What type of public school do you teach in?
5. What district or charter school do you teach in?

Section 2

1. Please answer the following questions about the environmental education content and skills students learn in your classes. To what extent do your students:

Not at all A little Somewhat A great extent

- **Develop questions; design investigations; collect, organize, and evaluation information; and draw conclusions about the environment and environmental topics?**
- **Demonstrate their understanding of the processes that shape the Earth?**
- **Demonstrate their understanding of changes in matter and forms of energy?**
- **Demonstrate their understanding of organisms, populations, and communities?**
- **Demonstrate their understanding of heredity and evolution?**
- **Demonstrate their understanding of ecological systems and the flow of matter and energy?**
- **Demonstrate their understanding that the environment is both influenced by and influences individuals, groups, cultures, politics and economic systems?**
- **Demonstrate their understanding of the ways the world's environment, social, economic, cultural and political systems are linked?**
- **Demonstrate their understanding of the ways that humans alter the environment, including the impact of technology?**
- **Demonstrate their understanding of the concepts of resources and resource distribution?**
- **Demonstrate their understanding of a range of local, national and global environmental issues?**
- **Identify, investigate, and evaluate action plans for local or other environmental issues?**
- **Form and evaluate their personal views on environmental issues?**
- **Plan, engage in, and evaluate the result of responsible citizen action on an environmental issue?**
- **Demonstrate their understanding of the role of citizens' rights and responsibilities in promoting the resolution of environmental issues?**
- **Recognize their responsibility and role as citizens in regards to environmental issues?**

Section 3

Think about when you teach any of the environmental literacy skills and concepts described in the last question as you answer the questions below.

1. Which Grade Level Expectations or Grade Span Expectations do you align the environmental literacy skills and concepts to? (Check all that apply)

- Science
- Reading
- Civics and Government
- Math
- Writing
- I Don't teach any of these skills or concepts (skip to the next page)
- Other (please specify)

2. How do you usually teach the environmental literacy skills and concepts?

- Departmentalized teaching (in one classroom or in one subject area)
- Interdisciplinary teaching (work with teachers on team or grade level)
- Other (please specify)

3. How are the students usually organized when teaching environmental literacy skills or concepts?

- whole class
- groups/teams
- individualized
- Other (please specify)

4. Which teaching methods and strategies do you commonly use when teaching environmental literacy skills and concepts?

- Lecture
- Projects
- Hands-on
- Labs
- Cooperative Learning
- Service Learning
- Discussion
- Inquiry
- Other (please specify)

5. Which of the following teaching/learning settings are used to teach environmental literacy skills and concepts?

- classrooms
- schoolyard habitats
- field trips to outdoors (parks, waterways)
- community settings
- science lab
- computer lab
- school library
- Other (please specify)

6. How often do you use schoolyard habitats?

7. What are the barriers to using a schoolyard habitats? (Check all that apply)

- Time out of classroom
- School grounds safety issues
- Lack of administrative support
- Discomfort teaching outdoors
- Curriculum restrictions
- Not enough money
- Lack of parent support
- Not enough staff
- Other (please specify)

8. How often do you take students to "outdoor classrooms" (e.g. parks, waterways, nature centers) that are not on school property?

9. What are the barriers to using a outdoor classrooms? (Check all that apply)

- Other (please specify)
- Time out of classroom
- Discomfort teaching outdoors
- Lack of administrative support
- Not enough money
- Curriculum restrictions
- Not enough staff
- Lack of parent support
- Transportation
- Other (please specify)

10. Does your school have a program or relationship with an environmental organization to teach environmental education (e.g. annual field trip to nature centers/outdoor centers, place-based learning, service learning)?

- Yes
- No
- If yes, please describe the program here:

Section 4

1. How many years have you been teaching?

2. What is the highest degree you have earned?

3. How many college/university courses in or involving environmental education have you completed in each of the following areas?

- Environmental Science
- Environmental Education Methods
- Outdoor/Recreational Education
- Other

4. If over the last 10 years you have participated in workshops or courses in the following areas, please write in the name of the university or organization that offered the workshop or course.

- How to teach using nature and outdoor spaces.
- How to integrate environmental education into the curriculum
- How to teach students to inquire about and investigate environmental issues.
- Specific local environmental topics (e.g. Narragansett Bay)
- Other

5. Please check the response that best reflects you views on environmental education and the environment.

Not at all Slightly Moderately Considerably Extremely

- How important is it that K-12 students are exposed to environmental education?
- How important is environmental education to you personally?
- How concerned are you about environmental problems/issues?
- How active are you in environmental protection efforts in your community or region?

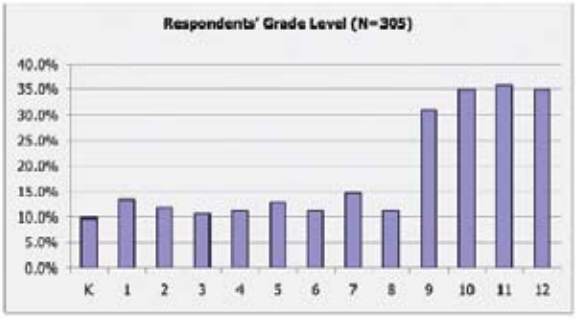
Thank you for completing this survey. Your input is incredibly valuable to the creation of Rhode Island's Environmental Literacy Plan.

If you would like to obtain more information about this effort, please write to ri.envirolitplan@gmail.com.
To obtain your free Rhode Island Environmental Education Association membership, please go to http://www.rieea.org/test/member.html to download a membership brochure. Simply put the code: ELPSurvey0910 next to the price for individual membership and mail the form to RIEEA.

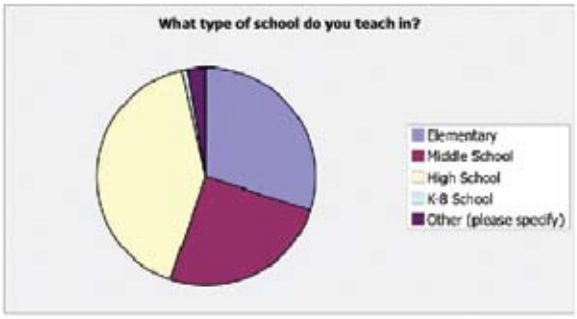
Again, thank you!

Environmental Literacy Survey

- Sent to all RI school districts and charter schools via Survey Monkey
- 15 districts and 4 charter schools distributed the survey and a total of 316 educators responded during the month of November, 2009

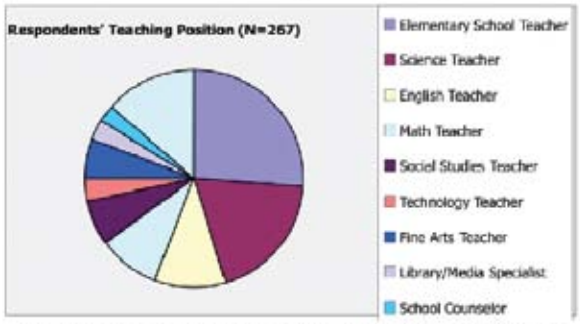


Respondents' School Level



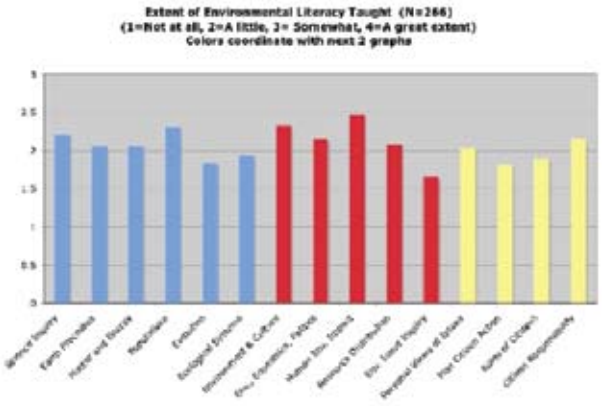
Largest percentage (41%) of respondents work in a HS

Respondents' Teaching Position (N=267)

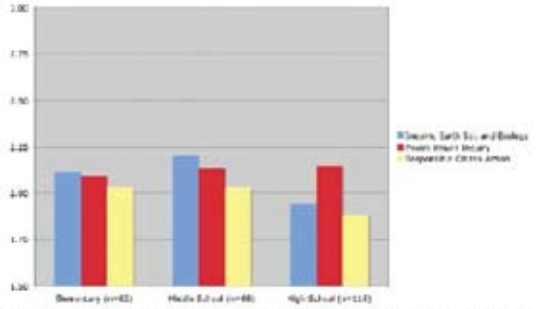


Of the secondary school teachers, the largest percentage (19%) were science teachers

The survey contained 16 questions aligned to the national EE standards to measure degree of environmental literacy taught. The 16 items were grouped into 3 categories on the next 2 graphs.



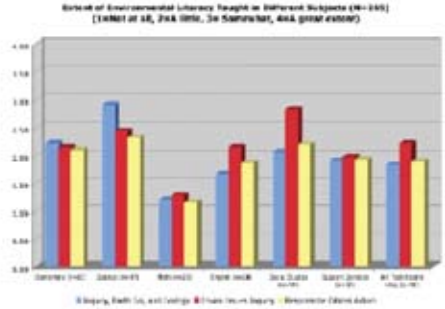
Environmental Literacy by School Level



Though some difference can be observed, there was no statistically significant difference in the extent of environmental literacy taught across school levels

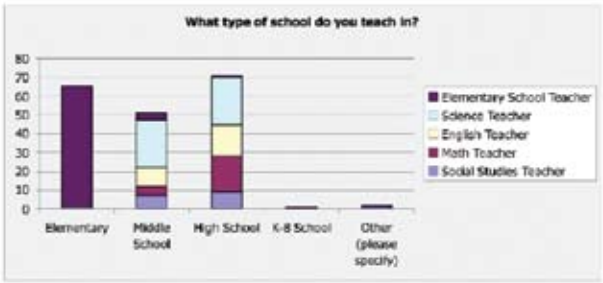
(One Way Anova used set at p<.05)

Environmental Literacy by Subject

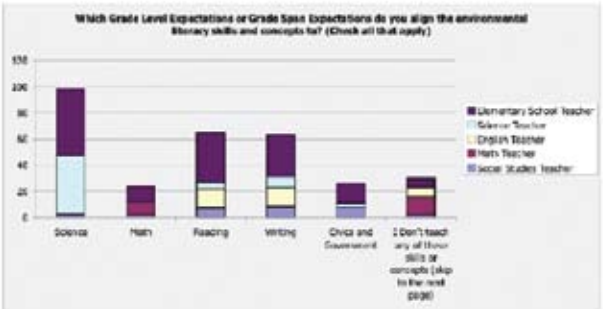


*The mean extent of environmental literacy in math was significantly (p<.05) lower for each area, and the science mean was significantly higher in the area Inquiry, Earth Sci, and Ecology only.

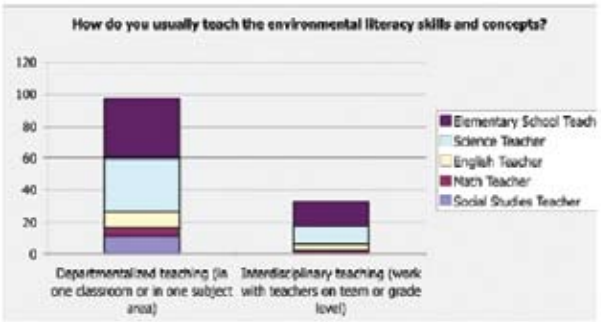
The next 9 graphs represent a smaller sample (n=169) of the core subject areas only



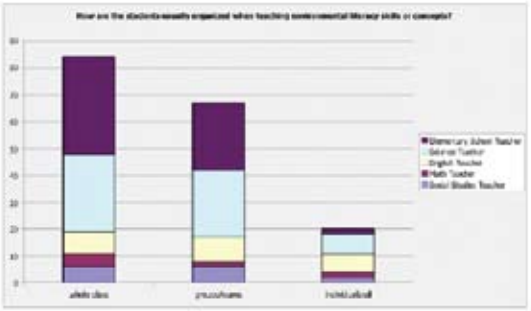
GLE Alignment



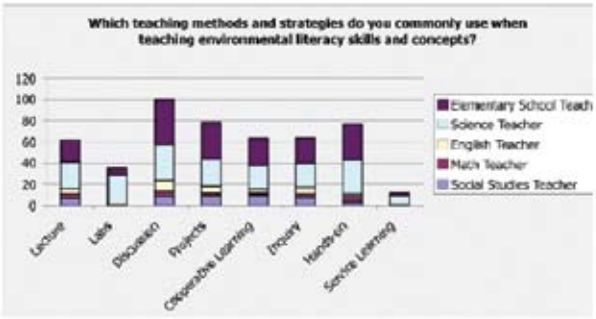
Pedagogy I



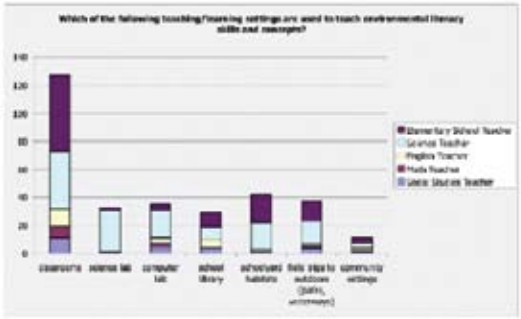
Pedagogy II



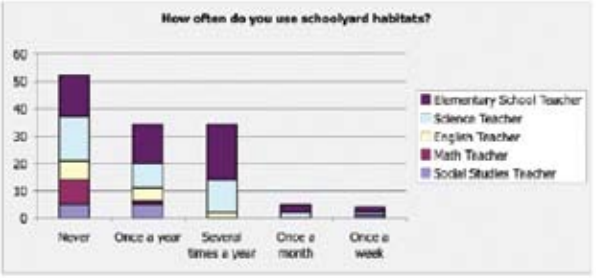
Pedagogy III



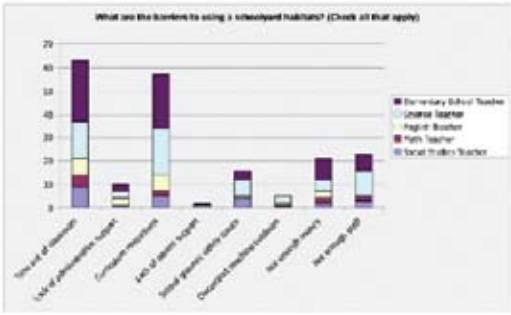
Settings



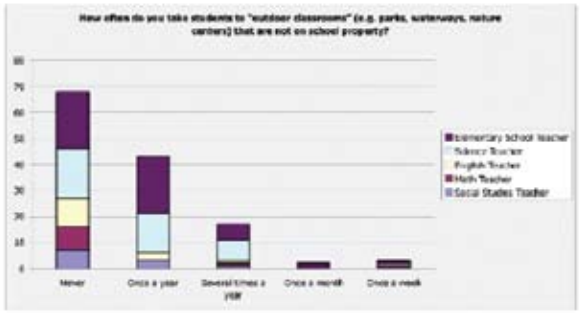
Schoolyard Habitats



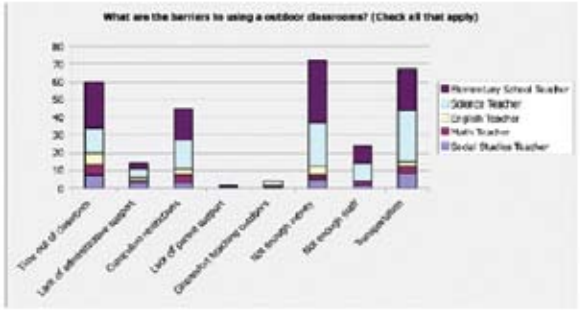
Schoolyard Barriers



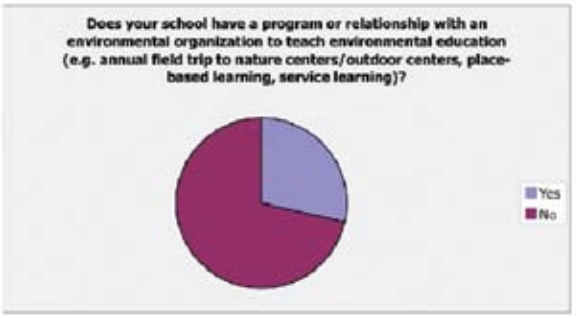
Outdoor Classrooms



Outdoor Classroom Barriers



Partnerships



Partnerships Listed

Apeiron Institute
Audubon Center
Johnston Landfill
The Nature Conservancy
The Ocean View Foundation
Block Island Conservancy
Alton Jones Environmental Ed. Center
Parker Woodland
Save the Bay
Blackstone Valley DEM
RIDEM
Mystic Aquarium
Robert Ballard's ocean program with URI

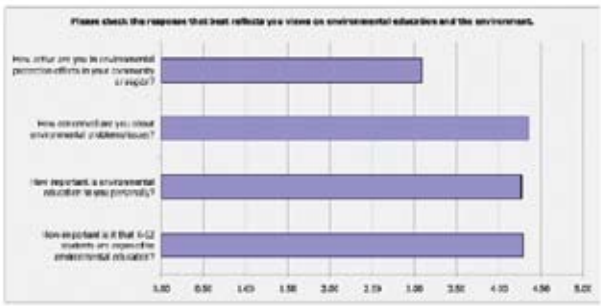
EE Workshops/Courses

- Brown Outdoor Leadership Training
- GLOBE
- Vermont Folklife Center
- Skyscrapers Astronomy Club
- Project learning tree
- Institute for Community Research, Center for Civic Education
- Oceanography graduate teacher course at URI
- roger williams zoo
- Geminet, EBEC
- Rhode Island College
- save the bay
- risd project new directions
- Blackstone River study program
- URI Coastal Institute
- Project Wet, Project Wild

- RI Geography Education Alliance
- Environmental Ed Peace Corps Volunteer
- Brown University
- Earthwatch Teacher Fellowship, Project Wild
- RIDEM, Audubon
- St Johnsbury, NGC
- Bryant College
- Partnership with URI Master Gardeners
- NOAA & Natl Geographic
- Univ. of Connecticut, Project Oceanology
- Mystic Aquarium
- Nature Journaling workshops AMC
- URI and RWU Discovery of Costal Environments

Attitudes

(1=Not at all, 2=Slightly, 3=Moderately, 4=Considerably, 5=Extremely)



APPENDIX D

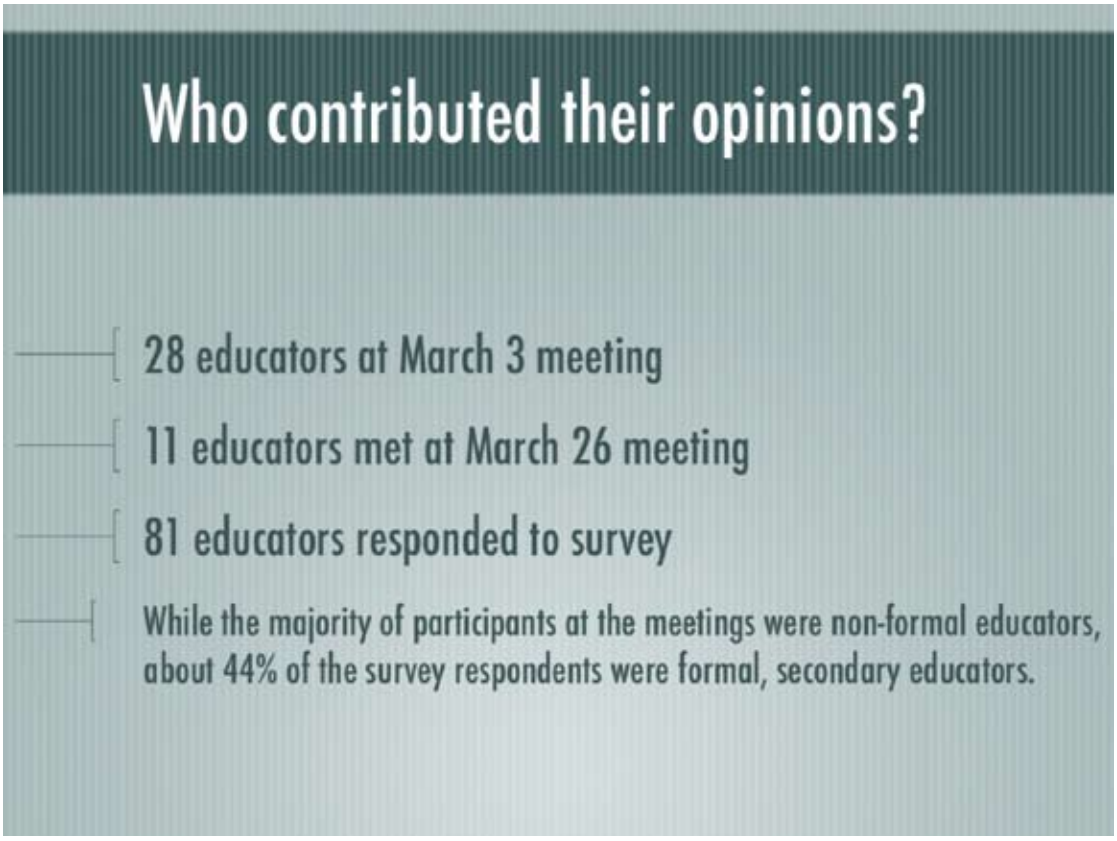
ELP Steering Committee

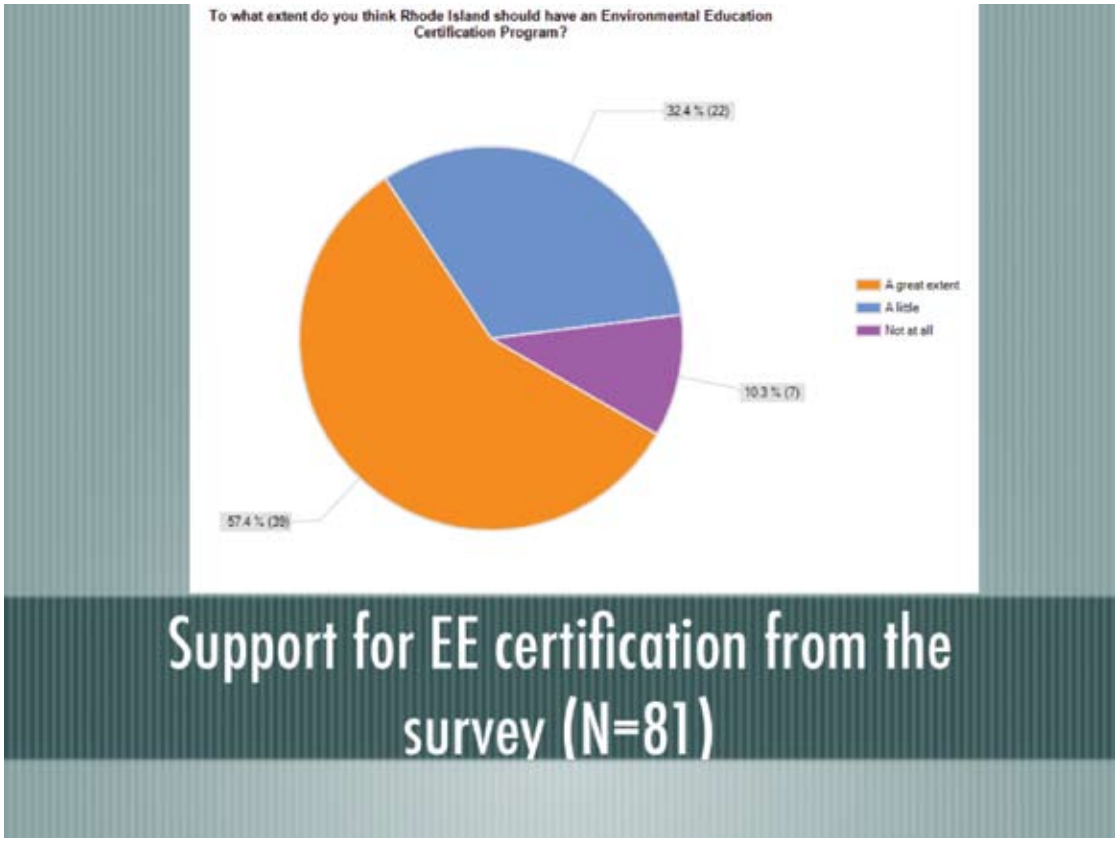
Below is a list of steering committee members who provided the guidance to develop and refine the ELP. The titles and group/organization affiliations were accurate at the time the members were on the committee.

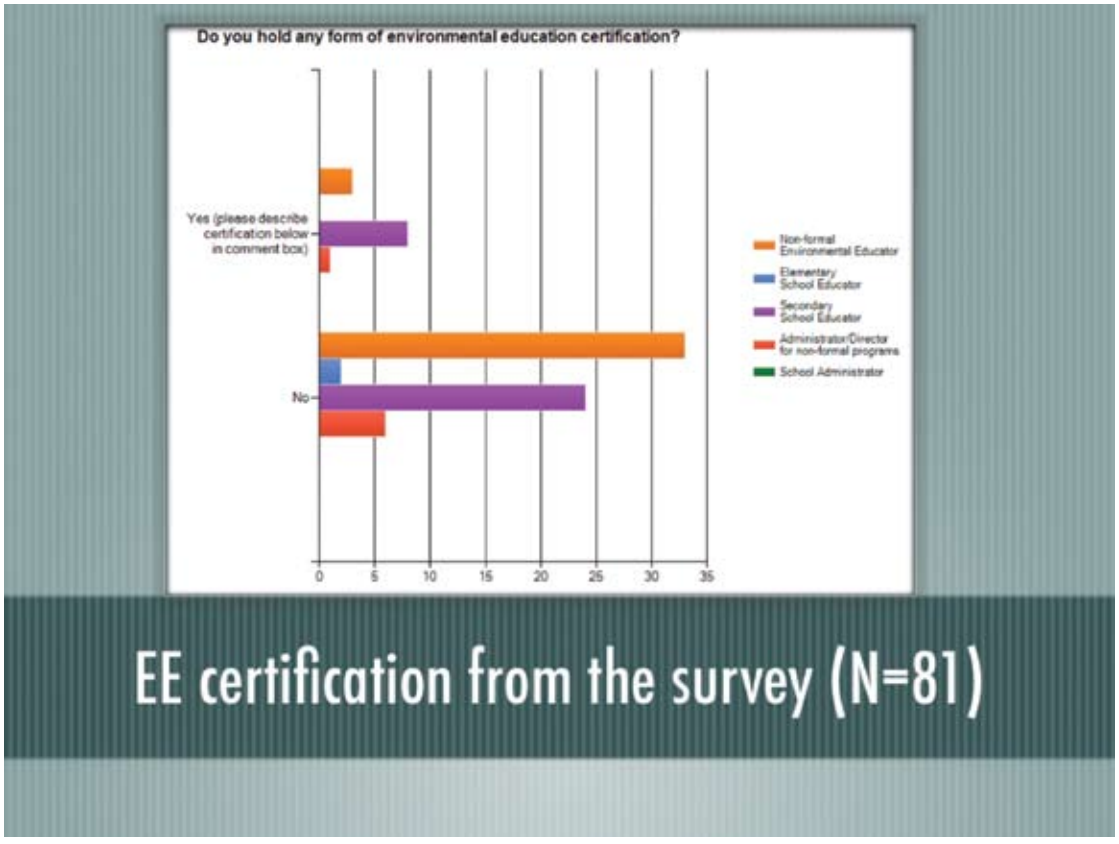
Contact	Title	Group/Organization
Bridget Kubis Prescott	Director of Education	Save The Bay
Dan "Otter" Brown	Science Teacher	Wheeler School
Dan Bisaccio	Director of Science Education	Brown University
David Cedrone	PK-16 STEM Education, Project Making the Grade	Rhode Island Economic Development Council
Denise Jenkins	Community Philanthropy Office, Education	Rhode Island Foundation
Donna Braun	ELP Consultant/Writer	Rhode Island Environmental Ed Association
Jenny Periera	Community Philanthropy Office, Environment	Rhode Island Foundation
John Lebriola	Science Teacher	Chariho Middle School
Joy Poland	Integration Consultant	Building Bridget 2010
Kate Nigh	Science and Technology Specialist	RI Dept. of Education
Kristen Swanberg	Senior Director of Education	Audubon Society of Rhode Island
Kristin Van Wagner	Educator Coordinator	Narragansett Bay National Estuarine Research Reserve
Lauren Parmelee	Manager of Initiatives	Girl Scouts of Rhode Island
MaryAnn Scholl	Professor	URI, Office of Marine Programs
Patrick Duhon	Director of Expanded Learning	Providence School Department/PASA
Peter McLaren	Science and Technology Specialist	RI Dept. of Education
Reada Evans	Director of Education	Rose Island Lighthouse Foundation
Rian Smith	Board Member	RI Environmental Ed Association
Robert O'Brien	Superintendent	Smithfield School Department
Shannon Donovan	Teacher	Scituate High School
Shareen Knowlton	Director of Education	Roger Williams Park Zoo
Sue Pfeil	Principal	Pawtucket School Department

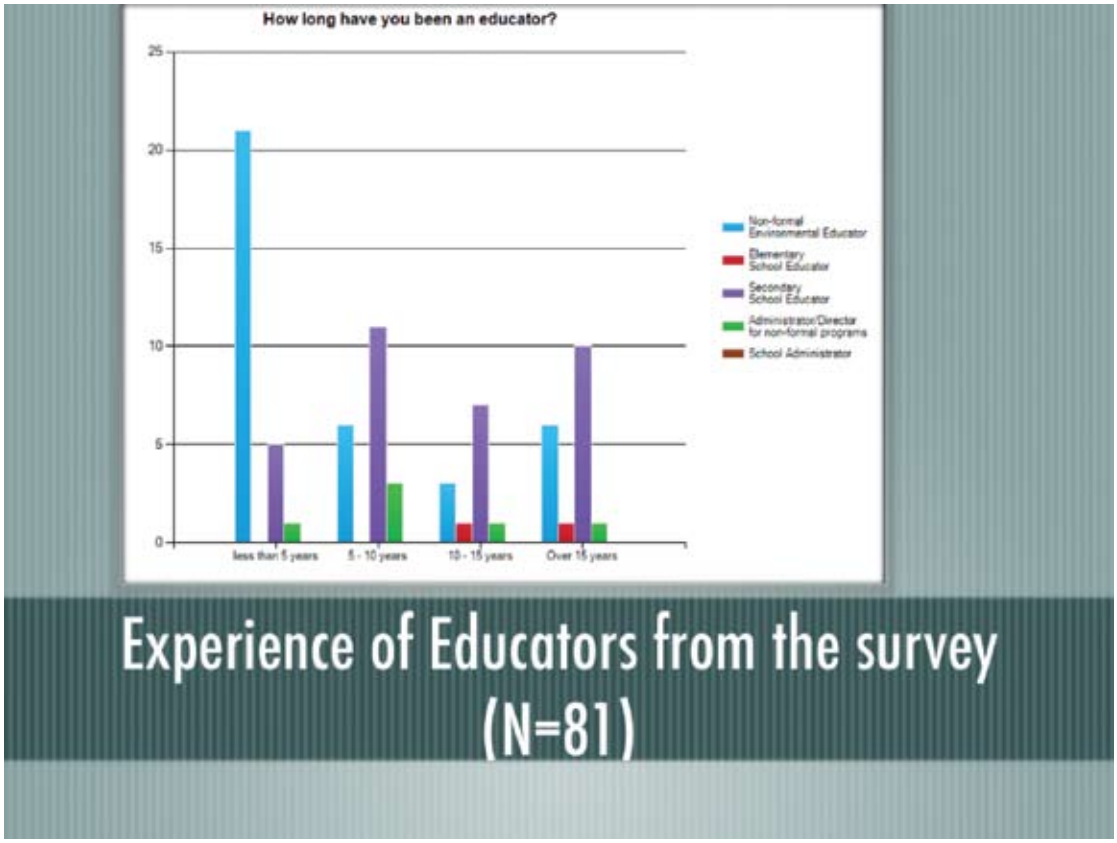
APPENDIX E

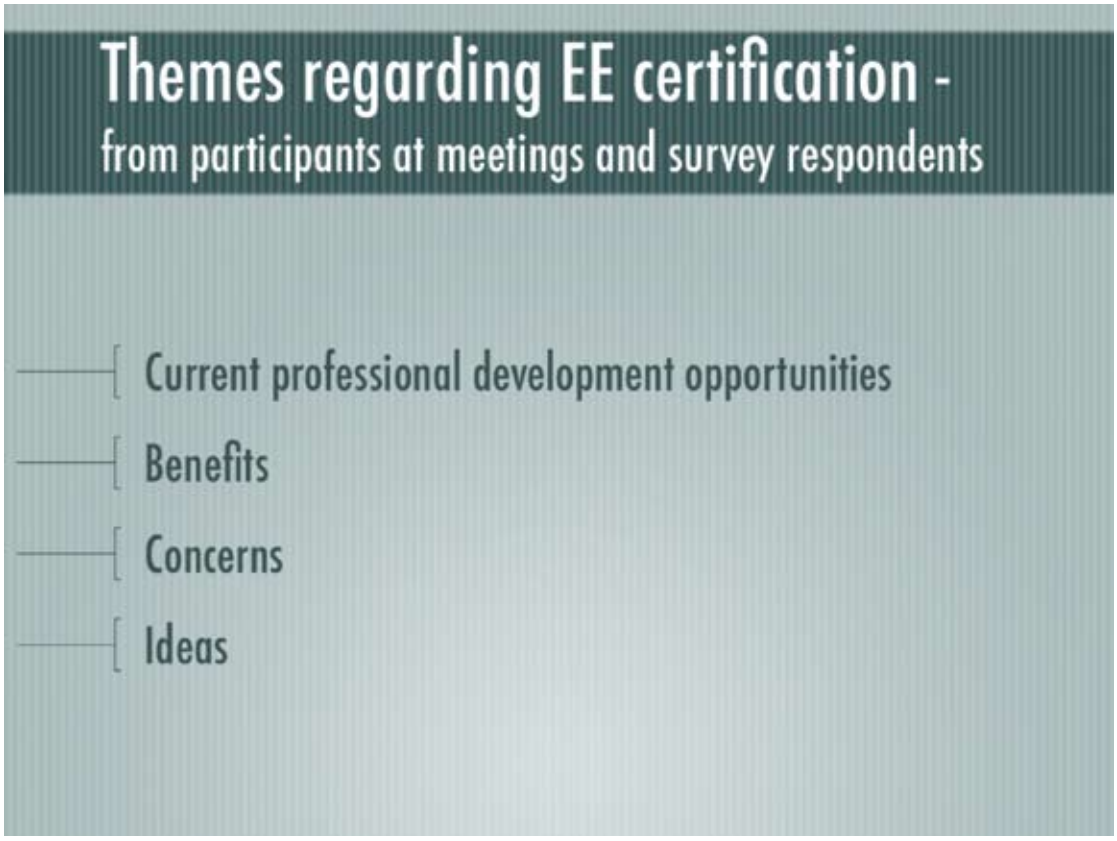
Environmental Education Certification – Results of Exploratory Meetings and Survey

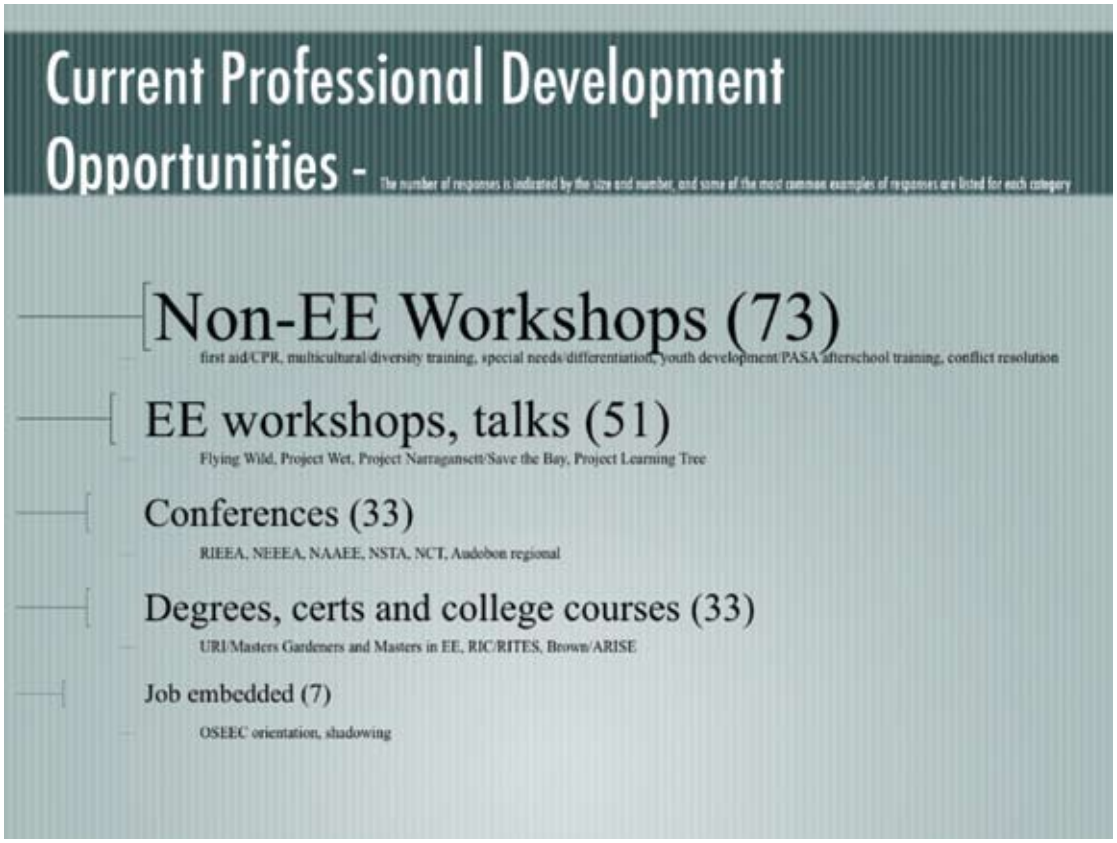


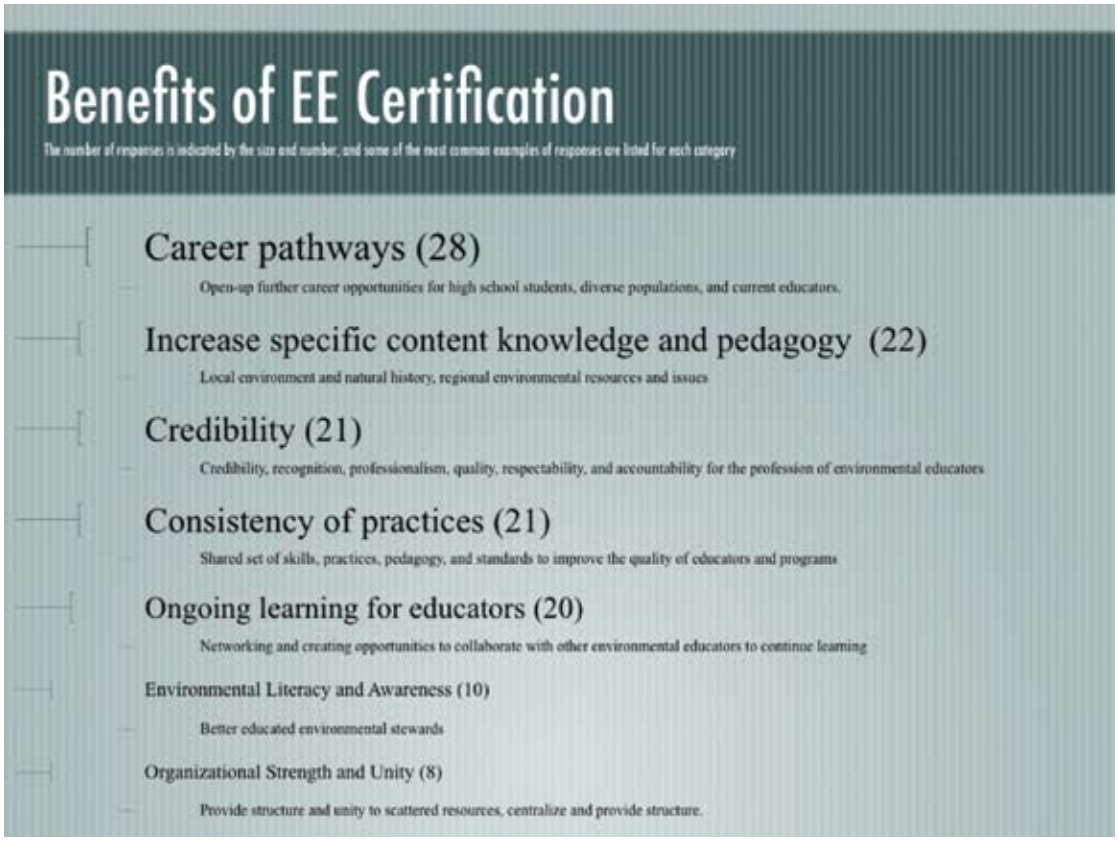

To what extent do you think Rhode Island should have an Environmental Education Certification Program?
32.4 % (22)
10.3 % (7)
57.4 % (39)
A great extent
A little
Not at all
Support for EE certification from the survey (N=81)

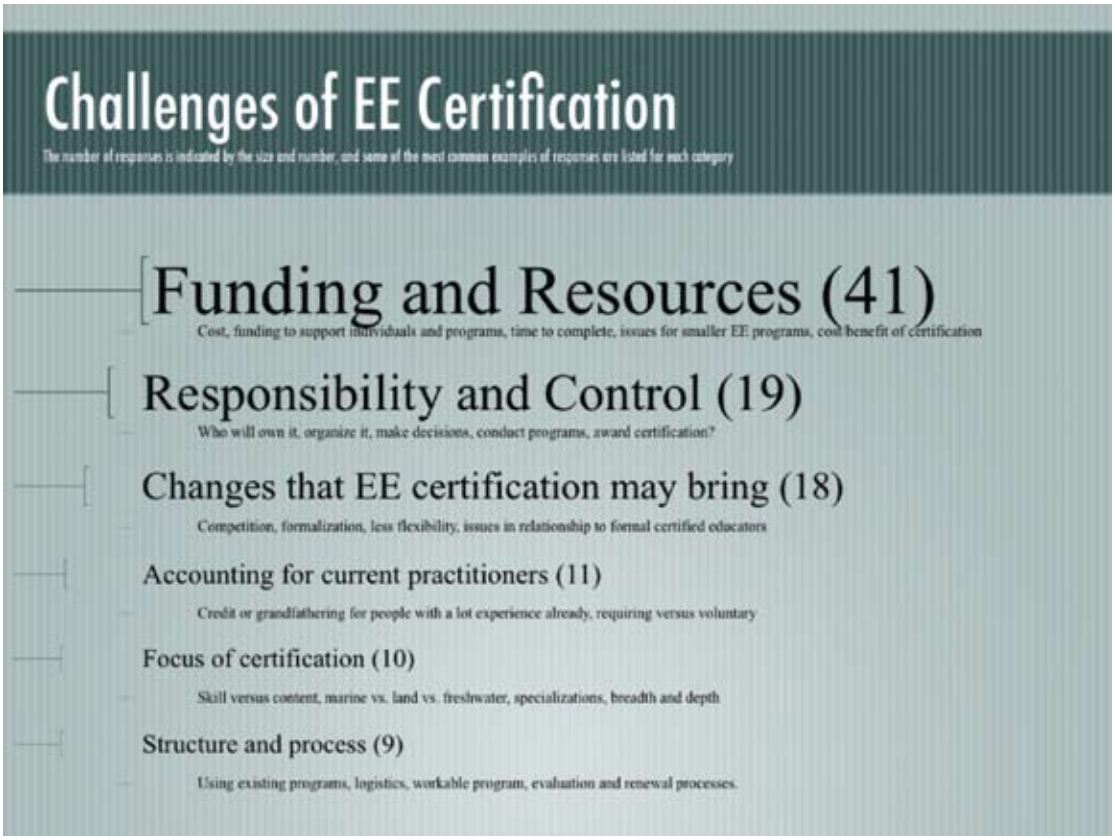

Do you hold any form of environmental education certification?
Yes (please describe certification below in comment box)
No
0
5
10
15
20
25
30
35
Non-formal Environmental Educator
Elementary School Educator
Secondary School Educator
Administrator/Director for non-formal programs
School Administrator
EE certification from the survey (N=81)

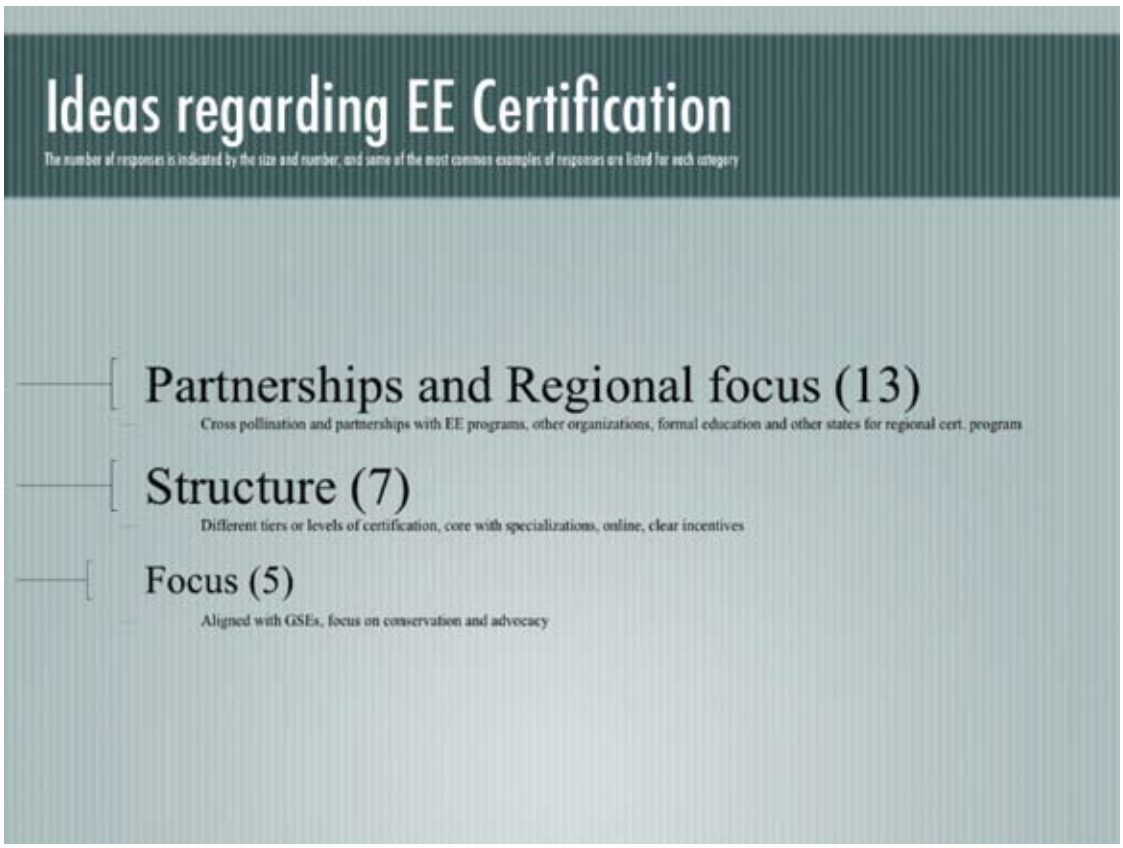

How long have you been an educator?
25
20
15
10
5
0
less than 5 years
5 - 10 years
10 - 15 years
Over 15 years
Non-formal Environmental Educator
Elementary School Educator
Secondary School Educator
Administrator/Director for non-formal programs
School Administrator
Experience of Educators from the survey (N=81)


Themes regarding EE certification -
from participants at meetings and survey respondents
Current professional development opportunities
Benefits
Concerns
Ideas


Current Professional Development Opportunities -
The number of responses is indicated by the size and number, and some of the most common examples of responses are listed for each category
Non-EE Workshops (73)
first aid/CPR, multicultural/diversity training, special needs/differentiation, youth development/PASA afterschool training, conflict resolution
EE workshops, talks (51)
Flying Wild, Project Wet, Project Narragansett/Save the Bay, Project Learning Tree
Conferences (33)
RIEEA, NEEEA, NAAEE, NSTA, NCT, Audobon regional
Degrees, certs and college courses (33)
URI/Masters Gardeners and Masters in EE, RIC/RITES, Brown/ARISE
Job embedded (7)
OSEEC orientation, shadowing


Benefits of EE Certification
The number of responses is indicated by the size and number, and some of the most common examples of responses are listed for each category
Career pathways (28)
Open-up further career opportunities for high school students, diverse populations, and current educators.
Increase specific content knowledge and pedagogy (22)
Local environment and natural history, regional environmental resources and issues
Credibility (21)
Credibility, recognition, professionalism, quality, respectability, and accountability for the profession of environmental educators
Consistency of practices (21)
Shared set of skills, practices, pedagogy, and standards to improve the quality of educators and programs
Ongoing learning for educators (20)
Networking and creating opportunities to collaborate with other environmental educators to continue learning
Environmental Literacy and Awareness (10)
Better educated environmental stewards
Organizational Strength and Unity (8)
Provide structure and unity to scattered resources, centralize and provide structure.


Challenges of EE Certification
The number of responses is indicated by the size and number, and some of the most common examples of responses are listed for each category
Funding and Resources (41)
Cost, funding to support individuals and programs, time to complete, issues for smaller EE programs, cost benefit of certification
Responsibility and Control (19)
Who will own it, organize it, make decisions, conduct programs, award certification?
Changes that EE certification may bring (18)
Competition, formalization, less flexibility, issues in relationship to formal certified educators
Accounting for current practitioners (11)
Credit or grandfathering for people with a lot experience already, requiring versus voluntary
Focus of certification (10)
Skill versus content, marine vs. land vs. freshwater, specializations, breadth and depth
Structure and process (9)
Using existing programs, logistics, workable program, evaluation and renewal processes.


Ideas regarding EE Certification
The number of responses is indicated by the size and number, and some of the most common examples of responses are listed for each category
Partnerships and Regional focus (13)
Cross pollination and partnerships with EE programs, other organizations, formal education and other states for regional cert. program
Structure (7)
Different tiers or levels of certification, core with specializations, online, clear incentives
Focus (5)
Aligned with GSEs, focus on conservation and advocacy

RHODE ISLAND RiEEA Environmental Education Association

The Rhode Island Foundation

Financial support for this project was provided by generous grants from the Rhode Island Foundation.
For more information, contact Kristen Swanberg at kswanberg@asri.org or Peter McLaren at Peter.McLaren@ride.ri.gov.