Environmental Literacy Outcomes

Management Strategy

Introduction

The National Science Foundation's (NSF) Advisory Committee for Environmental Research and Education stated in a 2003 report that in the coming decades, the public will more frequently be called upon to understand complex environmental issues, assess risk, evaluate proposed environmental plans and understand how individual decisions affect the environment at local and global scales. Creating a scientifically informed citizenry requires a concerted, systematic approach to environmental education." But the American public does not have the environmental literacy needed to tackle these challenges. Unfortunately, studies commissioned by the National Environmental Education Foundation (NEEF) find that:

> The average American adult, regardless of age, income, or level of education, mostly fails to grasp essential aspects of environmental science, important cause/effect relationships, or even basic concepts such as runoff pollution, power generation and fuel use, or water flow patterns…There is little difference in environmental knowledge levels between the average

American and those who sit on governing bodies, town councils, and in corporate board rooms, and whose decisions often have wider ramifications on the environment.

A clearer picture has also emerged about the environmental literacy of our students. The National Environmental Literacy Assessment, which was completed in 2008 by the North American Association for Environmental Education (NAAEE) and funded by the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Environmental Protection Agency (EPA), established a baseline literacy rate for middle school students in 6th and 8th grades. A follow-up study showed that schools that have environmental education programming scored significantly higher on environmental knowledge, verbal commitment, environmental sensitivity, and behaviors than schools without such programming. Building environmental literacy takes time and ongoing commitment. While environmental literacy should be reinforced throughout a child's life experiences, the foundation of knowledge and journey of inquiry is necessarily grounded and takes root in school. This management strategy addresses the Environmental Literacy Goal and its three associated outcomes.

I. Goal, Outcome and Baseline

This management strategy identifies approaches for achieving the following Goal and Outcomes:

Environmental Literacy Goal: Enable every student in the region to graduate with the knowledge and skills to act responsibly to protect and restore their local watershed

Student Outcome: Continually increase students' age-appropriate understanding of the watershed through participation in teacher-supported, meaningful watershed educational experiences and rigorous, inquiry-based instruction, with a target of at least one meaningful watershed educational experience in elementary, middle and high school depending on available resources.

Sustainable Schools Outcome: Continually increase the number of schools in the region that reduce the impact of their buildings and grounds on their local watershed, environment and human health through best practices, including student-led protection and restoration projects.

Environmental Literacy Planning Outcome: Each participating Bay jurisdiction should develop a comprehensive and systemic approach to environmental literacy for all students in the region that includes policies, practices and voluntary metrics that support the environmental literacy Goals and Outcomes of this Agreement.

Baseline and Current Condition

The Environmental Literacy Goal and Outcomes build on the work begun to advance the Mid Atlantic Elementary and Secondary Environmental Literacy Strategy, which was developed in support of Presidential Executive Order 13508 to protect and restore the Chesapeake Bay. Baselines for each of the outcomes will be established for the 2014-2015 school year using a survey instrument developed for the Chesapeake Bay Program's Education Workgroup by Measurement Incorporated, a professional evaluation firm. The survey looks at local education agency progress and capacity to implement the Environmental Literacy Goal and Outcomes of the Watershed Agreement.

II. Participating Partners

The following partners have participated in the development of this strategy. A workplan to accompany this management strategy will be completed six months after this document is finalized. It will identify specific partner commitments for implementing the strategy.

Chesapeake Bay Watershed Agreement Signatories

- State of Delaware
- District of Columbia
- State of Maryland
- Commonwealth of Pennsylvania
- Commonwealth of Virginia
- Chesapeake Bay Commission
- U.S. Environmental Protection Agency

Other Key Participants

- National Oceanic and Atmospheric Administration (NOAA)
- U.S. Fish and Wildlife Service (USFWS)
- U.S Geological Survey (USGS)
- National Park Service (NPS)
- U.S. Forest Service (USFS)
- Nongovernmental Organizations (e.g. Chesapeake Bay Foundation, National Wildlife Federation, NAAEE state affiliates)

Local Engagement

While states have the primary responsibility to advance the Chesapeake Bay Program's environmental literacy efforts, this work is done in partnership with local education agencies or school districts. In most watershed jurisdictions, local education agencies are responsible for defining their own curriculums and implementation strategies to support state standards and priorities.

III. Factors Influencing Success

The following are natural and human factors that influence the Chesapeake Bay Program's ability to attain this outcome:

State-level Advocacy for Environmental Literacy

There is a need for a high level support for environmental literacy that flows from administrations or legislatures and is communicated to school systems so there can be a shared vision among stakeholders and state leadership. Organized support from stakeholders for such positions is also important in advancing any state policy initiatives.

Local Education Agency Support for Environmental Literacy

Education in most of the states in the Chesapeake Bay watershed are controlled by local education agencies (600+ in the region), each with their own leadership and management structure. With the exception of state laws and regulations, education priorities are largely determined at the local level and may not mirror state priorities. Meaningful Watershed Educational Experiences (MWEEs) and sustainable school practices are often left out of established accountability mechanisms between state and local education agencies.

Education Reform
This is a time of tremendous change in education for many of the watershed jurisdictions. While national education reform efforts including STEM, Common Core, and Next Generation Science Standards lend themselves to using the environment as an integrating context for learning, the extensive efforts to support and implement the necessary shifts in teaching and learning required by these reforms pose on-going challenges to systemic approaches to environmental education.

Funding to Support Student Experiences and Sustainable School Projects
A major limiting factor is funding, including support for sustainable school initiatives, student projects, teacher professional development, and transportation.

Culture Disconnected from Nature
The Henry J. Kaiser Family Foundation estimates that children aged 8 to 18 spend more than 53 hours a week online or in front of electronic media, which equals around seven-and-a-half hours a day. Richard Louv argues in his 2005 book Last Child in the Woods that because children are spending less time outdoors, American children suffer from "nature deficit disorder"—or a disconnect from nature. Budget cuts and testing mandates can result in schools perpetuating the disconnect from nature by limiting recess, scaling back off-site field experiences, and restricting the use of school grounds for teaching. This loss of contact with the outdoors may ultimately lead to a citizenry with no physical and emotional connection to the natural world and no desire to actively take part in protection and restoration efforts.

In addition, the following unique factors will influence sustainable schools:

Decision Making Authority
Many facets of school sustainability (environmental performance, health and wellness, etc.) rest with disparate departments and individuals within a school division or individual school. These different groups are often not coordinated within a jurisdiction.

Underrepresented Stakeholders
Architects, school nurses, building managers, and others who might influence different facets of school sustainability are traditionally underrepresented in discussions about "green" schools.

IV. Current Efforts and Gaps

The federal government plays an important role in advancing environmental education in the region. For instance, the National Oceanic and Atmospheric Administration (NOAA) leads this cooperative effort by fostering federal-state coordination and providing critical funding for the development of model programs in support of the Chesapeake Bay Program's commitment to environmental literacy. The U.S. Fish and Wildlife Service (USFWS) works with partners to plan and implement habitat projects on school grounds and at environmental education centers. The federal government also provides critical funding to support model programs through the U.S. Environmental Protection Agency's (EPA) Environmental Education grant program, the NOAA Bay Watershed Education & Training (B-WET) Program, and the NOAA Environmental Literacy Grant Program. Additionally, the National Park Service (NPS) has expanded access to rivers, streams and open spaces for students, teachers and the general public and periodically provides grants to support the use of NPS and partner sites by school groups.

The sustainable schools effort at the Bay Program helps to support the pillars of the U.S. Department of Education Green Ribbon School award program, which recognizes schools and school districts. Departments of Education in individual states may choose to participate in this recognition program by holding a competition within their state in which schools and districts apply addressing the U.S. Green Ribbon School framework. States then nominate the top schools and districts for the award. Since the award began in 2012, each state in the watershed has participated at least one year. Sustainable Schools is an exciting new area of growth for the Bay Program and more work will need to be conducted to better understand the gaps. An Action Team for Sustainable Schools has been established under the Education Workgroup to help guide this work.

Many of the jurisdictions in the region have promoted environmental education for many years. However, over the past several years there has been an effort to renew and strengthen these programs. Delaware, Maryland, Pennsylvania, Virginia, and the District of Columbia have formal efforts underway to establish or implement plans to increase environmental literacy among students. These efforts often take different forms from formal environmental literacy plans to partnerships for children in nature to state strategies to support sustainable schools. In support of the development of these efforts, several states conducted formal needs assessments to help guide the work. Additional examples of recent state commitments to environmental education are as follows:

- Delaware passed a resolution in 2011 supporting the Delaware No Child Left Inside/Children in Nature Initiative. A taskforce with representatives from the Delaware Department of Natural Resources and Environmental Control, Department of Education, and other public and nongovernmental organizations was formed “to develop a statewide plan to increase opportunities for children to engage in nature, both in school, at home, and on public lands.”

- In 2010, the Council of the District of Columbia signed into law the Healthy Schools Act of 2010. This act requires the District Department of the Environment (DDOE) to draft an environmental literacy plan as part of a broad effort to “substantially improve the health, wellness, and nutrition of the public and charter school students in the District of Columbia.” The District’s Sustainable DC Plan set the goal of ensuring that all school-age children in the District are educated in sustainability and prepared for a changing green economy, with the target of teaching at least 50 percent of children in the District about sustainability concepts by 2032. The Sustainable DC Omnibus Act of 2014 formally adopted the District’s environmental literacy plan and mandated the creation of an Environmental Literacy Program within the Office of the State Superintendent of Education (OSSE).

- Maryland has had an education by-law for multidisciplinary environmental education in place since 1989. In 2011, Maryland passed the nation’s first environmental literacy graduation requirement mandating schools to implement a multidisciplinary environmental education program, with a specific focus on the state’s natural resources. This codified the Environmental Literacy standards developed by the Maryland Partnership for Children in Nature, a body established in 2008 by a gubernatorial Executive Order and co-chaired by the Maryland State Department of Education and the Department of Natural Resources. In addition, Environmental Science is part of Maryland's science curriculum and is assessed on the Science MSA in Grades 5 and 8. Maryland has also expressed a desire to have all schools certified as Maryland Green

Schools through the Maryland Association for Environmental and Outdoor Education. Maryland conducted a needs assessment in 2012 to help better understand and address gaps to implementation.

- The Pennsylvania Advisory Council on Environmental Education adopted an environmental literacy plan in 2012. Pennsylvania has long had rigorous, stand-alone environment and ecology standards, which include content about the Chesapeake, watersheds, and the environment. This content is included in standardized tests in the state. The state also has a new sustainable school effort bringing together partners from around the state to transform their schools.

- The Virginia Standards of Learning were originally adopted in 1995, and were revised in 2003 and again in 2010. The standards integrate environmental literacy concepts from kindergarten through 12th grade. School divisions in Virginia are responsible for implementing the standards. The Virginia Resource-Use Education Council is a voluntary, non-profit, educational organization whose membership includes Virginia's state and federal natural resource agencies, Virginia's education agencies, selected state colleges and universities, and selected non-profit organizations from around the state. The purpose of the VRUEC is to promote and facilitate environmental literacy and natural resource stewardship through education, and it is a vital partner with the Virginia Department of Education in advancing environmental literacy for the K-12 community in the Commonwealth of Virginia. Measurable goals for specific environmental projects—Meaningful Watershed Experiences, Classroom Grants, Professional Development and School Recognitions--are currently outlined in the Commonwealth's Business Plan for Environmental Education.

In addition, nonprofit providers are often the primary organizations advocating for and supporting these efforts in schools. National, regional, state, and local nonprofits support the environmental literacy outcomes by partnering with school systems to plan for environmental literacy programs, provide student Meaningful Watershed Educational Experiences (MWEEs), and offer professional development opportunities for teachers. These organizations also provide valuable tools for student data collection on school grounds and in the field, such as the National Geographic FieldScope project. Nonprofits are also often the organizations that provide certifications for sustainable schools efforts, which include the National Wildlife Federation EcoSchools Program and the MAEOE Green School certification. Without these important partners, the environmental literacy outcomes under this agreement could not be reached.

Actions, Tools and Support to Empower Local Government and Others

Ultimately, educating students is a local endeavor with the work and the accountability at the school system and even the school building level. For this reason, the more than 500 local education agencies in the region are extremely important partners in this work. The results of a 2014-2015 survey will help the states and Chesapeake Bay Program to better understand the current status of local environmental literacy efforts across the watershed, including the geographic distribution of Meaningful Watershed Educational Experience (MWEE) and sustainable school implementation by local education agencies. This will inform the priorities of the Workgroup and revisions to the management strategy.

V. Management Approaches

The Chesapeake Bay Program will work together to carry out the following actions and strategies to achieve the Environmental Literacy Goal and Outcomes. These approaches seek to address the factors affecting our ability to meet the goal and the gaps identified above. Work will be coordinated through the Education Workgroup of the Chesapeake Bay Program, which provides a forum for cross-jurisdictional coordination and support on all aspects of environmental education. For Sustainable Schools, a team has formed working under the auspices of the Education Workgroup to engage a broader group of stakeholders, explore areas of regional collaboration, and identify specific actions the Bay Program can take to achieve this outcome. The team is led by staff from the National Oceanic and Atmospheric Administration (NOAA), the U.S. Environmental Protection Agency (EPA), and the University of Maryland Environmental Finance Center. It includes individuals from state agencies, local education agencies, and non-profit organizations. These groups will work towards shared priorities as follows:

Students:

- S1: Promote sustained professional development related to scientific inquiry; the science of the environment; sustainability and natural-resources education; rigorous, outdoor learning strategies; and pedagogy to improve student learning and citizenship about the environment
- S2: Promote, develop, and implement Meaningful Watershed Educational Experiences (MWEEs) with educators, local education agencies, school administrators, and third party providers **
- S3: Communicate information about educational resources and funding opportunities to support the development and implementation of rigorous, inquiry-based instruction and MWEE programs **
- S4: Support networks of environmental education providers, including professional-development opportunities on research-based practices and up-to-date scientific and environmental information
- S5: Work with state and local education and natural resource agencies to ensure that rigorous science and environment-related content is effectively represented in the Standards of Learning and the Curriculum Frameworks, and that agency and provider educational-support materials are fully aligned with the intent of the standards**
- S6: Develop and promote student opportunities to pursue out of school leadership and enrichment programs that support in-depth understanding of environmental issues and solutions**
- S7: Support programs that provide authentic experiences to support STEM, Next Generation Science Standards or other rigorous science standards, and related disciplines to improve career and college readiness**

Sustainable Schools:

- SS1: Promote and strengthen “sustainable school” certification and recognition programs consistent with high-quality, objective, and agreed-upon criteria such as the U.S. Department of Education Green Ribbon School program
- SS2: Broaden stakeholder engagement to include focus on health, including health and nutrition, indoor air quality, chemicals, pest management, and other issues that might adversely affect health at schools**

- SS3: Promote, develop, and/or disseminate needs assessments, training, technical resources, and promotional materials for "sustainable school" stakeholders
- SS4: Identify and promote the use of best management practices at school sites related to watershed and habitat restoration, energy conservation, waste management, and overall environmental protection**

Environmental Literacy Planning

- ELP1: Identify and advocate for the local and state resources (policy, programs, and staffing) necessary for all graduates to achieve science, citizenship, and environmental literacy
- ELP2: Support the development and implementation of clearly-defined, attainable objectives necessary for all students to achieve science, citizenship, and environmental literacy by graduation
- ELP3: Promote the implementation of the Environmental Literacy Indicator Tool (ELIT) and related data visualization tools to assess progress towards student science, citizenship, and environmental literacy**
- ELP4: Disseminate information to formal and informal education stakeholders on the policies, programs, and practices that promote science, citizenship, and environmental literacy
- ELP5: Maintain an up-to-date suite of definitions and best practices documents for regional practitioners, funders, and administrators to inform program development and funding following research-based best practices
- ELP6: Maintain the Chesapeake Bay Program Education Workgroup and related state workgroups that include state department of education participation to oversee implementation of the Environmental Literacy Management Strategy
- ELP7: Ensure the implementation of Environmental Literacy outcomes include a focus on diverse and underserved students with an emphasis on career and college readiness and STEM

Cross Outcome Collaboration and Multiple Benefits

Future work for this management strategy will include coordination with all related goals and outcomes, including Water Quality, Public Access, Citizen Stewardship, and Diversity. The resulting work will be captured in action plans and/or a revision to the management strategy.

** Approaches Targeted to Local Participation

VI. Monitoring Progress

The Education Workgroup worked with a professional evaluator and state partners to establish meaningful environmental literacy metrics and a survey instrument to collect this data. The resulting Environmental Literacy Indicator Tool (ELIT) was piloted in the summer of 2014 and will be administered fully following the 2014-2015 school year. The tool is designed to be used with local education agencies. State departments of education are the lead for distributing and certifying the data collected through ELIT.

VII. Assessing Progress

The Chesapeake Bay Program will maintain the Environmental Literacy Indicator Tool and collate and report data. The survey will be administered every two to three years through the state departments of education. In FY 2014, funding from the Bay Program augmented by NOAA B-WET funding will be

available provide technical assistance to states to develop strategies to collect voluntary data from local education agencies to feed into the new Bay Program environmental literacy metrics and to support the work of a professional evaluator to review the data and establish meaningful baselines. Additional resources may be needed to continue these activities after FY 2014. The state of Maryland has a requirement for local education agencies to report on the status of its environmental literacy programs and graduation requirement every 5 years. The Bay Program has worked with the Maryland State Department of Education to use ELIT to collect this information in order to increase efficiency of the data collection.

VIII. Adaptively Managing

The Leadership Team of the Education Workgroup , which includes federal representatives from the National Oceanic and Atmospheric Administration (NOAA), the U.S. Fish and Wildlife Service (USFWS), the National Aeronautics and Space Administration (NASA), and the National Park Service (NPS) along with two representatives per state (generally from the state departments of education and lead natural resource agencies), convenes monthly to discuss priorities and progress towards meeting the Environmental Literacy Goals and Outcomes. The full Education Workgroup, which includes broader representation from federal agencies, state agencies, nonprofits, local education agencies, and others, meets twice a year.

The group holds an Environmental Literacy Summit every two years around specific issues or priorities. For example, in 2013 the Summit focused on increasing the integration of STEM, Social Studies, and Environmental Literacy. The Summits bring in outside experts and constituents around these issues to advance the policy work. At the 2015 Summit, the group plans to re-evaluate the outcomes based on what we learned in the first round of the ELIT survey. Moving forward, these Summits will serve as good opportunities to re-assess where the group is in achieving the outcomes of the agreement and adjusting strategies as appropriate.

IX. Biennial Workplan

Biennial workplans for each management strategy will be developed by December 2015. It will include the following information:

- Each key action
- Timeline for the action
- Expected outcome
- Partners responsible for each action
- Estimated resources