DRAFT BEST PRACTICES IN ENVIRONMENTAL LITERACY

INTRODUCTION

The Education workgroup of the Chesapeake Bay Program, in partnership with Chesapeake Bay Trust and NOAA Chesapeake Bay Office convened a STAC sponsored workshop August 27-28 2012 in Annapolis. The workshop's primary goal was to examine the definition of the "Meaningful Watershed Educational Experience" in order to reflect MWEE's role and importance in broader more systemic environmental education programs. A secondary and interrelated goal of the workshop was to discuss indicators and metrics that will assess progress toward increasing student stewardship. Some of the top researches and evaluators in the environmental education field were in attendance to share their research and provide guidance during working sessions. Attendees included key staff from state departments of education, state resource agencies, and NGOs who are integral to developing environmental literacy plans and collecting student information.

Workshop attendees were divided into three "listening workgroups" under the areas of student, educator, and Green Schools best practices. These workgroups were tasked with identifying essential and recommended best practices based upon the researcher's presentations, question and answer sessions, and their collective knowledge and experiences. Workgroups were provided with a framework document to guide their discussion. The framework included potential best practices from existing sources, such as the current MWEE definition, and the North American Association for Environmental Education's (NAAEE) *Guidelines for Excellence in Environmental Education.* Each workgroup used the framework and information for the researches to draft the best practices. Staff from Chesapeake Bay Trust and NOAA compiled and summarized the recommendations of those working groups and included them below under the headings "Students", "Educators", and "Green Schools".

The final afternoon of the workshop focused on potential mechanisms and metrics for tracking student environmental literacy in the Mid-Atlantic. Presenters during this session were asked to reflect on the Best Practices portion of the workshop and provide recommendations for tracking and developing metrics. A summary of this discussion and recommendations is included in this document as well.

STUDENTS

Essential: MWEEs must:

- include *outdoor experiences*
- include *preparation, action/outdoor experience, and reflection*
- be an integral part of *classroom instruction*
- consider the watershed (or local environment) as a system and part of a larger system
- be *multi-disciplinary and interdisciplinary*

- involve students in *external sharing and communication*
- be enhanced by *natural resource personnel*
- *occur at each level of instruction*
- be *investigative* and/or *project-based*
- locally relevant

Recommended:

- MWEEs should include analysis and evaluation periods throughout each stage of the MWEE (during preparation, action and reflection stages)
- MWEEs should include sustainability, energy, and land-use, with an explicit connection to human communities/ human interactions
- Students should participate in MWEEs every year (K-12)
- MWEEs should encourage student led issue investigations and activities, with guidance as to what is developmentally appropriate given the grade level.
- Civic engagement should be incorporated into the student led action project and follow-up phases of the MWEE where appropriate

EDUCATORS

Teachers

1. Teachers have the content knowledge and pedagogical strategies for teaching EE as appropriate by grade level and discipline.

Content Knowledge
- The nature of science
- Scientific research/investigation techniques
- Ecological processes
- Technology and Data Collection Techniques
- Local natural systems
- Community environment-based issues and resources
- Mediation and action skills

Pedagogical Strategies
- Integration across the curriculum
- Teachers as facilitators
- Effective use of community resources (from multiple sides of the issue)
- Student-involvement in community and issue investigations
- Student directed field investigations (science in the field)

- Student developed and implemented service learning and citizen engagement/action opportunities
- Interdisciplinary development

2. Teachers should view themselves as role models to their students and demonstrate environmentally responsible behaviors and attitudes to their students.

3. Teachers have ability to make environmental education relevant to specific learners at particular developmental levels.

4. Teachers present information fairly and accurately and should incorporate differing perspectives and points of view.

5. Teachers implement strategies that enhance the ability of students to think critically about environmental issues.

6. Teachers implement instruction guided by learners interests and building on their prior knowledge.

7. Teachers are able to use EE to address existing curriculum standards and state department of education initiatives. (STEM, Common Core, NGSS, Service Learning, Reading, etc)

Environmental Education Professional Development Best Practices
The following best practices in environmental professional development are critical to helping educators develop and master the practices outlined above.

- Teacher Professional Development includes at least 30 hours of instructional time in Environmental Education or related topics and includes adequate time for networking and peer discussion.

- Teacher PD should model Environmental Education Pedagogy in its delivery as much as possible, including use of the field and/or communities for instruction.

- A goal of all teacher PD in environmental education should be to increase the environmental literacy of the participating teachers, encouraging them to be environmental role models for their students.

- Teachers receive sustained support for EE throughout the school year, including:
    - Mentors and/or role models
    - Support from administration for EE
    - Exposure to nature resource personnel
    - Participation in learning communities
    - Access to continuing professional development opportunities

Important Note: This list attempts to focus on practices that are specific to environmental education; however, there was a broad base of support for best practices germane to all forms of teacher professional development.

GREEN SCHOOLS

Essential Best Practices for Green Schools

- School buildings, grounds, and operations should make continual progress towards *net-zero environmental impacts,* and;
- The school environment has a *positive effect on the health* of students, staff, and the surrounding community

In addition to these overarching environmental outcomes for schools, more specific best practices regarding how a school can best function as "green" are included below. Some of these are deemed essential, while others were only recommended. Essential practices are:

- Students are engaged and knowledgeable about school environmental outcomes and practices that are implemented to achieve those outcomes
- School administrators are aware of and support any green initiative taking place in the school
- Grounds and maintenance staff must be involved in the Green School initiatives throughout implementation
- Teachers and students should have access to school energy use, water consumption, and waste production data so it can be used in teaching

Recommended Best Practices for Green Schools

- Outdoor classrooms and learning spaces should be actively utilized for instruction, and school that do not have such spaces should include them in any renovation plans
- To the extent possible, students should be actively involved in the planning, design, construction, and maintenance of outdoor classrooms, schoolyard habitats, and other outdoor features such as rain barrels
- Schools should select green practices that have a local context that is culturally relevant, with school grounds being a venue for investigating local environmental issues and taking environmental action
- Schools should participate in a program that rates schools based on their sustainability and green practices

- Schools should designate a standing "green team" to ensure sustainable practices and teaching remain in place. Green teams should be an interdisciplinary group of teachers and when possible also include administration, and grounds and maintenance staff.

- School systems should develop facility management plans for schools that include short and long term environmental metrics that inform decision making, or include such metrics in existing management plans

Best Practices for Sustainable School ("Green School") Rating Programs

This second category of best practices under the Green School heading pertains to practices for programs that rate schools on some level of best practices. These seven characteristics recommend programs should:

- use *accountability mechanisms* to provide assurance that the data used to determine a rating are accurate

- use *performance-focused criteria* to quantitatively measure aspects of a school's sustainability performance

- include a *range of sustainability topics in curriculum and community engagement and service* (e.g. energy, waste, water, wildlife, transportation, etc.)

- *offer more than one level of recognition* (e.g., Bronze, Silver, Gold), to encourage continuous improvements

- *allow for the involvement of a variety of stakeholders* in creating and refining the system

- ensure that *schools' ratings are made available publicly*

- include *transparent criteria* that are publicly available