

Final Report

Community Environmental Education in Virginia

November 16, 2011

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Grant Year 2010

NOAA Grant #NA09NOS4190163

Task 4



Virginia Coastal Zone
MANAGEMENT PROGRAM



This project was funded by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant # NA09NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

Contents

Product #1.....	3
<i>Title: Community Education Leadership Program</i>	3
Product #2.....	4
<i>Title: Community Education Training/Workshops</i>	4
Product #3.....	5
<i>Title: Building Capacity for Delivery of Environmental Education</i>	5
Appendices.....	Error! Bookmark not defined.
Appendix A. Coastal Educator Profile Instructions.....	7
Appendix B. Coastal Educator Profile Application.....	8
Appendix C. Coastal Education Resources (web content).....	9
Appendix D. Workshop Attendees	13
Appendix E. Places We Live and Coastal GEMS workshop agenda	14
Appendix F. Preparing for Earth Day	15
Appendix G. Coastal GEMS workshop flyer	16
Appendix H. Coastal GEMS worksheet	17
Appendix I. Coastal EE Leaders Summit Agenda	19
Appendix J. 2011 MAMEA & Virginia EE Conference – Concurrent Session Schedule.....	20
Appendix K. 2011 MAMEA & Virginia EE Conference –Session Descriptions	21
Appendix L. Mid-Atlantic EE Leaders Roundtable Agenda	26
Appendix M. Draft Mid-Atlantic Environmental Literacy Plan	28
GOAL 1: Every student in the region graduates with the knowledge and skills to make informed environmental decisions.....	28
GOAL 2: All educators in the region responsible for instruction about or in the environment have access to sustained professional development opportunities, tools, and resources that support their efforts to provide students with high-quality environmental education (EE). ..	30
GOAL 3: Every school in the region maintains its buildings, grounds, and operations to support positive environmental and human health outcomes.....	32
GOAL 4: The education community in the Mid-Atlantic region functions in a unified manner and coordinates with key national, regional, and state programs and other Citizen Stewardship activities to represent the full suite of information and opportunities available for K-12 audiences.	33

Product #1

Title: Community Education Leadership Program

Percent of total project budget: 40 %

This grant supported the development of a Coastal Community Leadership Program. The Virginia Office of Environmental Education's (VOEE) Community Educator, David Ruble, coordinated the development of the Coastal Community Educator profile to complement the existing Environmental Educators Leadership Program (EELP). The new Coastal Educator Profile takes a descriptive narrative approach to recommending educator content knowledge and skills for educators wishing to be recognized as Coastal educators and/or leaders.

New educational content related to marine debris, growth management, coastal hazards, and native plants were surveyed and cataloged from a cross-section of the Virginia CZM Program's networked partners. While established stand-alone curricula in these four areas is lacking, there is a bounty of online resources available which have been consolidated onto a central website on Virginia Naturally.

Modules for the above coastal content are framed for email distribution to focus on (1) an overview of the resource issue; (2) who should be concerned about this issue; and (3) list of best available science related to this resource issue. Email distribution includes the twenty-five educators who attended the Coastal EE Leaders Summit in October 2011 as well as the networks of Regional EE Team providers across the CZM region--the Hampton Roads Association for Environmental Education, Eastern Shore Environmental Education Council, Three Rivers Environmental Educators, and NoVA Outside which reach over 750 non-formal educators and teachers.

The Coastal EE Leaders Summit focused specifically on enhancing educators' general awareness of Virginia CZM issues and the science, policy and laws behind protection and management of coastal resources. Twenty-five educators received a broad overview of CZM resources and more in-depth study of marine debris related to abandoned crab pots, challenges to sea side oyster restoration, and coastal hazards related to sea level rise that are already impacting coastal planning efforts.

Deliverables/Product Format:

The Coastal Community Educator Profile Instructions and Application are included in Appendices A and B. Workshop agendas have been included as appropriate in the Appendices. The Coastal Education Resources PowerPoint has been formatted into a webpage for online access and can be viewed online at

<http://www.deq.virginia.gov/ConnectWithDEQ/EnvironmentalInformation/VirginiaNaturally/CommunityEducation/CoastalMarineOceanEducationResources.aspx> or in Appendix C.

Product #2

Title: Community Education Training/Workshops

Percent of total project budget: 30 %

The Virginia Office of Environmental Education conducted nine workshops to support the Environmental Educators Leadership Program this year. These workshops reached 214 educators and focused on coastal content including: teaching the growth management curricula *Places We Live*; Finding Your Diamond in the Rough: Exploring Coastal GEMS; Preparing for Earth Day; the Coastal EE Leaders Summit; Pathways to Self-Certification: An Introduction to the Environmental Educators Leadership Program, and sessions at the 2011 Mid-Atlantic Marine Education & Virginia EE Conference.

Social Studies and Geography teachers indicated that *Places We Live* combined with Coastal GEMS could help address new standards of learning related to A.P. Geography and an assortment of other social studies related topics. The Virginia Council for the Social Studies was a new audience for Coastal GEMS and members seemed very receptive to the mapping tool as well as variety of additional resources available through CZM partners.

Finding Your Diamond in the Rough: Exploring Coastal GEMS, was a collaborative effort between the VOEE and CZM staff to generate a short training in the use and manipulation of the mapping tool. The training was well received and future trainings are already being scheduled across the Commonwealth.

Preparing for Earth Day prepared DEQ agency staff for Earth Day and outreach opportunities. Activities focused on DEQ's core water, air, and land re-use functions and were framed in a coastal context for the DEQ offices within the CZM area.

The Coastal EE Leaders Summit included an overview of CZM resources with focused content on marine debris, oyster restoration, and coastal hazards as related to sea-level rise. Pathways to Self-Certification: An Introduction to the Environmental Educators Leadership Program included an overview of the new Coastal EE Leader.

The 2011 Environmental Education Conference, which was co-hosted with the Mid-Atlantic Marine Education Association, included two plenary speakers and 25 concurrent session presentations that delivered new aquatic science content, new teaching resources and hands-on activities, and opportunities to expand professional networks. 117 educators attended this conference.

To reach a wider audience of teachers in a coordinated manner, a workshop [request form](#) for Projects WET, WILD, Underground, Wonders of Wetlands, Science and Civics, and Your BackYard Classrooms was developed in conjunction with the departments of Game and Inland Fisheries, Forestry and Conservation and Recreation.

Deliverables/Product Format:

The Coastal GEMS educational materials and outlines for Preparing for Earth Day have been included in Appendices D through H.

Product #3

Title: *Building Capacity for Delivery of Environmental Education*

Percent of total project budget: 30 %

This grant supported the staff time of the VOEE Director, Ann Regn and Community Educator, David Ruble in implementing the Commonwealth's master plan for environmental education, including: a) implementing and evaluating a rigorous professional development program b) providing support for regional environmental education teams, and c) working with state Department of Education to address environmental literacy within K-12 education.

In FY 2009, an update to the state's master plan for Environmental Education – "A Business Plan for Environmental Education in the Commonwealth of Virginia" was completed. New environmental literacy goals for community education were augmented with recommendations from the North American Association for Environmental Education and the Mid-Atlantic Environmental Education Leaders Roundtable. (The K-12 sector was not revised due to the delay in federal guidelines for adopting a new Elementary and Secondary Education Act.)

A significant amount of time was spent in FY10 working with the Virginia Department of Education and sister agencies to develop a regional environmental literacy strategy for state and federal agencies. Staff attended three all-day meetings, one 2-day meeting (Appendix L) and weekly conference calls between March and October. The strategy was produced as a result of the Executive Order #13508. The strategy directed the federal government to support state efforts to provide the next generation of citizen stewards with the knowledge and skills to make informed environmental decisions. As co-chair of the Chesapeake Bay Program's Education Workgroup, the VOEE Director helped plan the biennial Bay summit where the [strategy](#) was shared with 80 education and policy leaders. The strategy plan includes mutually agreed upon goals, specific outcomes and strategies for federal and state agencies for teachers, students and schools. For example, partners agreed that all state education agencies should delineate the types of age-appropriate, research-based outdoor activities that support environmental literacy (EL).

Other avenues to build capacity for delivery of high quality education exist through: the Virginia Resource Use Education Council, which represents all federal and state natural resource and education agencies in Virginia; the annual Coastal Partners Workshop; and, regional education networks, such as the Hampton Roads Alliance for Environmental Education.

The VOEE Director and Community Education Coordinator worked with community environmental education leaders in the 5 regional EE teams in the coastal zone to advance environmental education in their region by offering and promoting professional development opportunities (see Product #2). VOEE staff also recruited participants from the teams for the "Coastal Community Education Leadership Program" and Coastal EE Leaders Summit (see

Appendix I). The annual environmental education conference, held in conjunction this year with the Mid-Atlantic Marine Education Association attracted 117 educators (Appendix J and K).

VOEE staff continued to direct the direction and growth of the Virginia Naturally partnership. The network of private and public organizations was expanded to include 929 organizations. Significant additions and changes were made to the Virginia Naturally web site to help partners teach about the environment, and to share or leverage resources. A new map to help educators, citizens and students locate partners was developed. Curriculum and other resources were consolidated onto a new page, Learn about Virginia's Environment. Educator workshops and trainings are now catalogued on a Professional Development page. Bi-monthly newsletters were sent via email to more than 1,000 individuals including directors of gateway organizations such as the Virginia Science Education Leadership Association and Virginia Manufacturer's Association Outreach Committee.

The VOEE Director continued to review education grant proposals, and recommend criteria for funding, for the Chesapeake Bay Restoration Fund, the Virginia Environmental Endowment, the Foundation for Virginia's Natural Resources, and NOAA's Chesapeake Bay Office.

Deliverable/Product Format:

Appendix I. Coastal EE Leaders Summit Agenda

Appendix J. 2011 MAMEA & Virginia EE Conference – Concurrent Session Schedule

Appendix K. 2011 MAMEA & Virginia EE Conference – Session Descriptions

Appendix L. Mid-Atlantic EE Leaders Roundtable Agenda

Appendix M. Mid-Atlantic States Regional Environmental Literacy Strategy

Appendix A. Coastal Educator Profile Instructions

Environmental Educators Leadership Program Coastal Educator Application Profile

A. Understanding Coastal Resources

Coastal educators need to have received an equivalent of 8 hours of training* in coastal resource management issues such as Marine Debris, Coastal Hazards (storm surge, sea level rise, salt water intrusion, etc), Native Plants, Bay & Estuarine Ecology, Blue/Green Infrastructure, and Fisheries Science & Management. *The 8 hours may be an accumulation of shorter amounts of time from a variety of trainings.

B. Core Education Materials and Instructional Curricula related to Coastal, Bay, and Ocean

Date Completed

Curricula

Please list the date of completion for each curricula you choose from the drop menus to the right in the curricula box.

This box will contain drop down menus to select up to three core education materials and curricula you have received training in.

C. Public Programs & Presentation Delivered

Coastal education can take place in the classroom and in front of the public at libraries, homeowners associations, and civic groups. Please list the program or presentation in the following format:

Sustainable Shorelines and Community Management; CZM Partners Meeting; Richmond, VA; December 2010

D. Recommended Technical Skills and Content Completed

Date Completed

Technical Skills and Content

Please list the date of completion for each technical skill you choose from the drop menus to the right in the technical skills and content box.

This box will contain drop down menus to select up to three technical skills and content you have received training in.

E. Recommended Professional Affiliations

Level of Involvement

Professional Affiliation

Please include your level of involvement for professional affiliations selected from the drop down menus to the right (member, committee chair, etc.)

This box will contain drop down menus to select up to three affiliations to which you belong.

F. Please list additional professional affiliations and networks you participate with

Use this space to list additional professional affiliations and/or networks you participate with; please also indicate any way you serve in these affiliations using the following format:

Treasurer, Virginia Resource-Use Education Council

G. Annual Environmental Education Conferences attended (National, State, or Regional Event)

Please list the Name, Location, and Date of attendance.

Virginia Environmental Education Conference, James Madison's Montpelier, 9/15/10

H. Instruction & Training Delivered to Other Educators

Date Conducted

Curricula

Please list the date you delivered instruction and training for other educators in the curricula listed in the drop down menus to the right.

This box will contain drop down menus to select up to three core education materials and curricula you have taught.

I. Trained as Facilitator in Required Education Material

Date Completed

Curricula

Please list the date you completed training to be a facilitator or trainer in the curriculum selected from the drop down menus to the right.

This box will contain drop down menus to select up to three core education materials and curricula you are trained as a facilitator to deliver.

Appendix B. Coastal Educator Profile Application

Environmental Educators Leadership Program Coastal Educator Application Form	
Name: _____	
Which profile are you completing (choose one)	
<input type="checkbox"/> Educator <input type="checkbox"/> Advanced Educator <input type="checkbox"/> Environmental Education Leader	
A. Understanding Coastal Resources	
B. Core Education Materials and Instructional Curricula related to Coastal, Bay, and Ocean	
Date Completed	Curricula
C. Public Programs & Presentation Delivered	
D. Recommended Technical Skills and Content Completed	
Date Completed	Technical Skills and Content
E. Recommended Professional Affiliations	
Level of Involvement	Professional Affiliation
F. Please list additional professional affiliations and networks you participate with	
G. Annual Environmental Education Conferences attended (National, State, or Regional Event)	
H. Instruction & Training Delivered to Other Educators	
Date Conducted	Curricula
I. Trained as Facilitator in Required Education Material	
Date Completed	Curricula

- Curricula Choices**
- Healthy Water, Healthy People
 - Project Aquatic Wild
 - Project Underground
 - Project WET
 - Virginia's Water Resources: A Tool for Teachers
 - W.A.V.E.
 - Watershed Manager
 - Your Backyard Classroom (Bay)

- Technical Skills & Content**
- Basic GIS
 - Citizen Water Monitoring
 - First Aid & CPR
 - Identification of Common Species
 - Sediment, vegetation and fisheries sampling equipment
 - Swimming & Boating Safety Training
 - Use of marine field equipment
 - Water Quality Monitoring

- Professional Affiliations**
- NAAEE Membership
 - Certified Interpretive Guide (NAI)
 - Certified Master Naturalist
 - Mid-Atlantic Marine Educators Association
 - Local EE Networks

Appendix C. Coastal Education Resources (web content)

Bay, Coastal, Marine & Ocean Resources

Virginia's coastal region has significant resources that are interconnected with its people, wildlife, landscape, and economy. The challenges of managing the intersection of more than 3 million people, 29% of Virginia's land resources and more than 5,000 miles of shoreline is immense.

The need for highly skilled educators and outreach professionals to help teach people about these resources is tremendous. If you are an educator interested in teaching coastal issues then consider increasing your expertise and gaining recognition as a Coastal Educator through the [Environmental Educators Leadership Program](#) .

Bay, Coastal, Marine & Ocean Education Resources

[Virginia Coastal Zone Management Program](#)

Although only 29 percent of Virginia's land area lies within the coastal zone, more than 60 percent of Virginia's citizens call it home. Virginia's 2010 population was 5,044,179. Access Virginia specific coastal projects through this online resource.

[The Bridge](#)

Ocean Education Resource Center – a portal for teacher and scientist reviewed websites on marine/coastal/aquatic content, lesson plans, and opportunities for educators. Supported by NMEA and National Sea Grant Office and managed by VIMS Marine Advisory Program educators.

[Chesapeake Bay Program](#)

The Chesapeake Bay Program is a partnership of bay watershed states and the District of Columbia that provides science, policy, and educational information related to the clean-up of the Chesapeake Bay. Educators can find fact sheets, teaching tools, and additional resource partners through this online clearinghouse.

[Bay Backpack](#)

The Bay Backpack, sponsored by the Chesapeake Bay Program, links educators to curricula, training, and funding resources for Bay education. Online tools allow educators to post, sort, and review activities customized to grade level and subject matter.

[Virginia Institute of Marine Science](#) (VIMS)

VIMS conducts interdisciplinary research in coastal ocean and estuarine science, educates students and citizens, and provides advisory service to policy makers, industry, and the public. Educators can find the latest scientific research, lecture series for professional growth, and teaching resources related to marine science.

[ChesIE](#) (Chesapeake Science on the Internet for Educators)

ChesIE, a project of the [Mid-Atlantic Marine Education Association \(MAMEA\)](#), provides a catalog of teaching resources, professional development, and communication tools for classroom and non-formal educators.

[Chesapeake Bay Foundation](#)

Through **Chesapeake Classrooms**, CBF provides high-quality professional development that meets the evolving needs of teachers and schools. CBF strives to enable teachers to involve their students in outdoor Bay or stream experiences that are aligned with local school system standards. Follow this link to learn about professional development opportunities available through CBF.

[Center for Coastal Resources Management \(CCRM\)](#)

The Center for Coastal Resources Management, operated through the Virginia Institute of Marine Science, develops and supports integrated and adaptive management of coastal zone resources. Specifically the CCRM conducts coastal resource research, provides advisory services for shoreline, fisheries, and resource management, as well as outreach education on coastal resource issues.

[Centers for Ocean Sciences Education Excellence](#)

COSEE Networked Ocean World (COSEE NOW) is an online network of scientists and educators focused on using emerging Ocean Observing Systems (OOS) technologies and real time data for public education across a broad continuum including community colleges, the K-12 formal education community, and informal learning institutions.

[National Oceanic & Atmospheric Administration \(NOAA\) Ocean Explorer](#)

Since the Survey of the Coast in 1807 authorized by Thomas Jefferson, NOAA has played a critical role in the evolution of ocean exploration in the United States and the world. This site offers a comprehensive look at NOAA's 200-year history through a series of chronological essays. Also included is a rich selection of historical quotations, arranged thematically, that capture the many advances, challenges, and misunderstandings through the years as both early and modern explorers struggled to study the mysterious ocean realm.

[Nauticus](#)

Nauticus is an exciting interactive science and technology center in Norfolk that explores the naval, economic, and nautical power of the sea. Home of the Battleship *Wisconsin*, Nauticus features Battleship *Wisconsin*-related exhibits, hands-on exhibits, and national-caliber traveling exhibits for the public, school groups, and professional development.

[National Oceanic & Atmospheric Administration Estuaries 101](#)

Estuaries 101 is an online teacher curriculum designed for use with students to learn about Earth System Science using coastal and ocean data. Through this curriculum – which includes interactive investigations, field studies and data analysis – teachers and students will learn about the biotic and abiotic factors that affect wildlife, environmental quality, and society as related to estuaries.

[Data in the Classroom](#)

Data in the Classroom is an online resource sponsored by NOAA for K-12 teachers interested in using real scientific data in their teaching.

[Chesapeake Bay Interpretive Buoy System](#)

The Chesapeake Bay Interpretive Buoy System, sponsored by NOAA, provides a self-guided tour of current environmental conditions in the Chesapeake Bay as well as the historic context of Captain John Smith's 1608 voyage of the bay through voice narrated phone calls to 1-877-BUOY-BAY. Real-time wind and weather information is available

through a series of Bay Buoys with different stories of John Smith's adventures located with each buoy. Self-guided tours are accessible whether on the water or shore side.

Marine Debris

Marine debris impacts quality of life on the shore and on the water for wildlife and people. Preventing debris from entering our waters is a key strategy for addressing this issue, but what can be done about the litter after it gets in the rivers and streams? Explore these resources to learn more about where marine debris comes from and strategies for fixing the problem.

[National Oceanic & Atmospheric Administration Marine Debris](#)

Marine debris is one of the most widespread pollution problems facing the world's oceans and waterways. Learn more about the issue and arm yourself with the most accurate information!

[Environmental Protection Agency Marine Debris](#)

Explore basic information about sources of marine debris, its impacts upon the environment, economy, and human health & safety as well as what current laws and regulations are in place to address this challenge.

[EPA Marine Debris Prevention Toolkit](#)

With just a few clicks, you can find a variety of outreach materials, including video and audio public service announcements, print materials, educational tools, and promotional items that were developed by local governments, state agencies, and nonprofits.

Native Plants

Native plants possess traits that make them adapted to local conditions and can be used in landscaping and restoration efforts. Follow these links to learn more about citizen education, plant preservation, and resource strategies for using and conserving native plants in Virginia.

[Plant ES Natives Campaign](#)

Whether you want to put in a flower garden or establish or restore the landscape around your home, there are a great variety of Eastern Shore native plants from which to choose!

[Virginia Native Plant Society](#)

Habitat conservation and public education about the appropriate use of native plants in the home landscape are two facets of the mission of the Virginia Native Plant Society (VNPS).

[Virginia DCR's Natural Heritage Program](#)

Native species are those that occur in the region in which they evolved. Plants evolve over geologic time in response to physical and biotic processes characteristic of a region: the climate, soils, timing of rainfall, drought, and frost; and interactions with the other species inhabiting the local community. Thus native plants possess certain traits that make them uniquely adapted to local conditions, providing a practical and ecologically valuable alternative for landscaping, conservation and restoration projects, and as livestock forage.

Coastal Hazards

Future storm surge, shoreline erosion, and rising tides will impact coastal communities. Explore what scientists know about potential concerns and what community responses could be to a changing landscape.

[National Oceanic & Atmospheric Administration Coastal Hazards](#)

As the coastal population continues to increase, there are many competing demands for limited coastal areas and resources. Coasts are facing increasing pressures from pollution, habitat degradation, over-fishing, invasive species, and coastal hazards, including hurricanes and sea-level rise. Explore this NOAA resource to learn facts related to coastal hazards.

[United States Geological Survey Coastal Change Hazards](#)

Forecasts of sea level rise and increased hurricane activity suggest that our nation's coastlines are becoming increasingly vulnerable to the powerful forces of the ocean. Along our coasts, rising sea levels expose higher locations not usually subjected to the power of the sea and to the erosive forces of waves and currents. Explore this USGS site to learn more about shoreline and coastal vulnerability as well as potential hurricane and extreme storm impacts.

[Environmental Protection Agency \(EPA\) Region 3 Coastal Hazards](#)

EPA's compendium of research and reports related to coastal change hazards.

Blue Green Infrastructure

Blue Green Infrastructure is a broad concept of the ecological and human life support systems that incorporate natural and built landscapes. Aquatic (blue) and terrestrial (green) natural and built resources include the wide and varied networks of waterways, wetlands, woodlands, wildlife habitats and natural areas; as well as greenways, parks, conservation lands, farms, ranches & forests; wilderness and other open spaces that support native species and sustain ecological and human life systems. The web links below can help guide discussion of blue and green infrastructure that could be considered for conservation.

[Virginia CZM Blue Green Infrastructure](#)

Blue or green infrastructure comprises those natural features on the land (e.g. forests, wildlife habitat, wetlands, etc.) or in the water (e.g. anadromous fish use areas, oyster reefs, underwater grass beds, etc.) that are critical to maintaining ecosystem and human health and survival.

[Virginia DCR Blue Green Infrastructure](#)

The VCLNA models are being developed as part of a collaborative effort between the Department of Conservation and Recreation Division of Natural Heritage (DCR - DNH), the Virginia Coastal Zone Management Program (VA-CZM), the Virginia Land Conservation Foundation, and the Virginia Commonwealth University Center for Environmental Studies to map Green Infrastructure in Virginia. These maps can provide a context of ecological value for Virginia's landscape.

Appendix D. Workshop Attendees

Preparing for Earth Day

3/22/2011 – Richmond, VA

April Bahen
Keith Boisvert
Richard Browder
Steve Coe
Karen Doran

3/24/2011 – Woodbridge, VA

Sarah Baker
Stephanie Bellatotti
Tracey Buchanan
Daniel Burstein
Jennifer Carlson
June Erwin
Joseph Garner
Tammy Gumbita
Edward Stuart
John Thompson

3/28/2011 – Glen Allen, VA

Wesley Ball
Eric Deibel
Laura Galli
Alison Sinclair
Meredith Williams

3/31/2011 – Virginia Beach, VA

Laura Corl
Jeffery Deibler
Clyde Gantt
Kelly Giles
Jennifer Howell
Robin Schuhmann
Lisa Silvia
Eugene Siudyla

Finding Your Diamonds in the Rough: Using Coastal GEMS for Local Conservation Efforts

6/28/2011

Betty McCracken
Ellen Ford
Jenny McPherson

Appendix E. Places We Live and Coastal GEMS workshop agenda

Program Description

Exploring Environmental Issues: Places We Live, is a useful curriculum for teaching place-based education to help create a bond between young citizens and their communities. Students will explore current and future community environmental issues, enabling them to make informed decisions about those issues. Educators attending this session will receive the curriculum book for this education module.

Objectives

To provide training in the Project Learning Tree © Secondary Module *Exploring Environmental Issues: Places We Live* and the integration of Coastal Zone Management resources into secondary Social Studies curriculum

Content

This training will address these questions:

1. How is land use changing in the United States?
2. What environmental impacts are associated with land use decisions?
3. What societal impacts are associated with land use decisions?

Additional content and resources related to community mapping resources using the Coastal GEMS mapping application will be discussed.

Methods

Hands-on, collaborative, and facilitated teaching methods will be used to teach this module similar to the techniques used when implementing this curriculum in the classroom.

Appendix F. Preparing for Earth Day

Title

Preparing for Earth Day and Outreach Events

Description

This in-person training will introduce agency staff to basic web-based materials available through the Office of Environmental Education, existing outreach tools, and two new exhibit pieces available for Earth Day festivals, Ag Awareness Days, and other public events. Materials will be made available in Regional Offices to accompany the training and there will be time for questions throughout the presentation.

Planning for Earth Day and Outreach Events

- I. Introductions
 - a. Who is currently doing outreach?
 - b. What audiences? Schools, community groups, both?
- II. Current Resources in the Office
 - a. Jeopardy
 - b. DEQ Tabletop Exhibit
 - c. Staff Expertise in Different Media
 - i. Water Quality – Chemistry
 - ii. What Quality – Biological
 - iii. Wetlands
 - iv. Soils & Composting
 - v. Air
- III. Web Resources
 - a. Virginia Naturally
 - b. EELP
- IV. Tabletop Demonstrations
 - a. Macroinvertebrate Exploration & WWMD Kits
 - i. Conduct activity in real time
 - ii. Questions about activity
 - iii. Activity set-up and operation
 - b. Test the Alternatives
 - i. Conduct activity in real time
 - ii. Questions about activity
 - iii. Activity set-up and operation
- V. Question & Answer

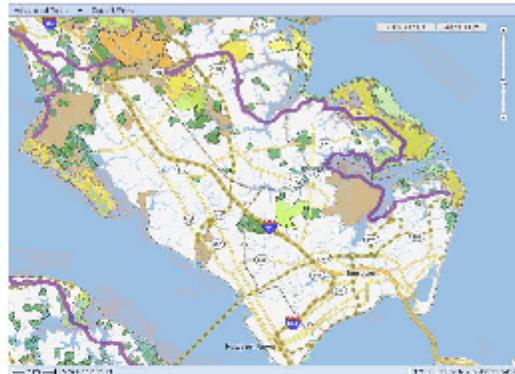
Appendix G. Coastal GEMS workshop flyer

Finding Your Diamonds in the Rough: Using Coastal GEMS for Local Conservation Efforts

Tuesday, June 28, 2011

9:00 am to 11:00 am

Department of Environmental Quality – Central Office, Richmond, VA



Maps can be used to inform local land-use decisions to build more vibrant and resilient communities. Learn the benefits and uses of the Coastal GEMS web-based mapping tool to identify critical habitat, open space, and coastal resources.

Registration is limited so please register soon at

<http://events.constantcontact.com/register/event?llr=nyolv7cab&oeidk=a07e41pz0uq2d30f182>



Please contact David Ruble with the Virginia Office of Environmental Education for questions related to the workshop or registration process via email at David.Ruble@deq.virginia.gov or phone (804) 698-4039.



Virginia Coastal Zone
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This workshop is sponsored by the Coastal Zone Management Program and the Virginia Office of Environmental Education, Department of Environmental Quality.

Appendix H. Coastal GEMS worksheet

A Guided Walk-through of Coastal GEMS

1. Click on **Zoom to Locality**
2. Using the drop down menu, select **Williamsburg**
3. Click **Go!**
4. Notice that more features are now clickable in the **Map Layers** panel.
5. Scroll down the **Map Layers** panel to see which layers are currently turned on and turn them off.
6. Look for the **Reference Layers** section and turn the following layers on:
 - a. **County Boundaries**
 - b. **Detailed Streams**
 - c. **Roads**
7. Toggle the **Roads** layer by clicking the check box. How does this affect your orientation to the map? Be sure the **Roads** layer is on before continuing.
8. Turn on the **Condemned Shellfish Areas** layer under **Conservation Planning Tools**. What changes did you notice on the map?
9. Click on the **red hashed line** that crosses **I-64** in the Northeast quadrant of the map.
10. How did the Map Layers / Results panel change on the left of the screen? *It switched to the results panel with 1 Condemned Shellfish Areas.*
11. Click on the **1 Condemned Shellfish Areas**. What additional information is presented? How large is this particular condemned shellfish area?
12. Click on the **View Factsheet** to read more about condemned shellfish areas. Read **Why should we care?** What is the primary source of concern for consuming shellfish according to what you read?
13. Click the **red x** to close the fact sheet.
14. Click **Map Layers** and turn on the **Forest Cover, Public Access Lands, Conservation Lands, and Public Access Sites** layers. Notice there is one Public Access icon near the bottom middle of the screen in between Route 132 and Route 199.
15. Hold the cursor over the **Advanced Tools** option and click on **Identify**.
16. Click on **Draw Shape**.
17. Using the cursor, draw a large rectangle around the Public Access Site on the bottom of the map. Draw with this tool by clicking a location and then moving the cursor to another point; click again and it will make another anchor; do this a third time to create a triangle and then a fourth to finish a rectangle. Double click to finish the rectangle.
18. What is now visible in the **Results Panel**?
19. Click on **Conservation Lands** to learn more about the features listed. What are the names of the features? What happens to the map when you hold the cursor over the name of a conservation land?
20. Click the **red x** to close the Identify box.



Scenarios

1. You are a county planner whose tax payers just voted to purchase some property for conservation purposes. How do you determine which lands to propose for acquisition?
2. You are the executive director of your local land trust and want to expand the boundaries of the local wildlife refuge. How do you determine which abutting lands are of greatest value to place into conservation?
3. You are a local community educator who has been asked to talk about eel grass restoration and oyster gardening at a local school. What lands are accessible for leading a field investigation to explore restoration efforts?
4. You are a concerned citizen who wants to know how much conservation area is currently set aside in your county. What lands are currently conserved and who owns them (federal, state, local, private, etc.)?

Appendix I. Coastal EE Leaders Summit Agenda

Coastal EE Leaders Summit

College of William & Mary

Williamsburg, Virginia

October 7, 2011

- 8:30 a.m. Registration & coffee
- 9 a.m. Welcome, introductions, orientation to the day & Coastal Zone Management
- 9:30 a.m. Emerging Coastal Resource Management Issues
Mountains of Marine Debris: Derelict Crab Pots
Kirk Havens, Virginia Institute of Marine Science
- Restoring Acreage: Seaside Oyster Restoration*
Jim Wesson, Virginia Marine Resource Commission
- Connections: Climate Change, Sea Level Rise, Flooding and VA's Shoreline*
Skip Stiles, Wetlands Watch
- 11:30 a.m. Networking Lunch
- 12:30 p.m. Reconvene & frame the afternoon
- 12:45 p.m. An Exploration of the Scope of Environmental Education in Virginia
- How do you fit into the state plan for EE and the new CB region environmental literacy plan?
 - What opportunities are available to support EE in VA?
 - How can nonformal educators better connect with each other & with K-12 educators?
- 2:00 p.m. Break
- 2:15 p.m. Understanding the Needs for High Quality Professional Development
- What high quality professional development opportunities already exist for non-formal educators?
 - What additional knowledge/trainings are needed to support high quality delivery of EE in Virginia?
 - What venues and where does this training need to be conducted?
- 3:15 p.m. Final thoughts & wrap-up
- 3:30 p.m. Move into evening lodging and prepare for conference opening

Appendix J. 2011 MAMEA & Virginia EE Conference – Concurrent Session Schedule

MAMEA/VA Environmental Educators Conference – Concurrent Session Schedule Saturday, October 8, 2011

Room	10-10:45 am	11-11:45 am	1:30-2:15 pm	2:30-3:15 pm	3:30-4:15 pm
Colony (Classroom Track)	<i>Marine Biology All Year!</i> Megan Dygve	<i>Oil and Water just don't mix.</i> Sean Tracy	<i>Engaging Review</i> Dawn Sherwood	<i>Photosynthesis, light, and tubeworms!</i> Tami Lunsford	<i>"We Sea Change"</i> Megan Ennes
Tidewater A (MWEE Track)	<i>Modeling topographic maps</i> Emily Ford	<i>Introduction to VA Naturally</i> Sheila Barnett	<i>Schoolyard Habitats</i> Carol Heiser	<i>How do different ground surfaces in- fluence surface water run off?</i> Candace Lutzow-Felling	<i>Seeing, Doing, Teaching: Lessons Learned by the SABN</i> Ann Faulds
Tidewater B (STEM)	<i>A Regional Snapshot – Climate Change</i> Jackie Rickards	<i>ROV-in-a-bucket</i> John Lunsford	<i>Studying the NW Eddy in the North Atlantic</i> David Wehunt	<i>Buoys in Your Classroom</i> Bart Merrick	<i>The Great Build a Buoy Challenge</i> Dan Dickerson and Stephanie Hathcock
York (PD and Programs)	<i>Integrated Watershed Education Model</i> Bill Portlock	<i>Developing a youth continuum for conservation</i> David Christopher	<i>What's in Your Informal Program Toolbox?</i> Chris Witherspoon	<i>Pathways to Self- Certification: Intro- duction to the EE Leadership Program</i> David Ruble	<i>Intro to Strategic Planning for Marine Educators</i> Caitlin Hamer
James (General)	<i>Bridge/COSEE NOW DATA Activity: Changing the Wind</i> Chris Petrone	<i>Incorporating STEM in Ocean Activities</i> Susan Walton	<i>Citizen Science Comes to Summer Camp</i> Anne Schlesinger	<i>Waves, Words and Wonder: Putting the "Sea" in Ocean Literacy for Early Learners</i> Courtney Obland	<i>The Science of Shifting Sand</i> Carol Hopper Brill

Appendix K. 2011 MAMEA & Virginia EE Conference –Session Descriptions

MAMEA/VA Environmental Educators Conference

Saturday, October 8, 2011

Concurrent Session Descriptions

SESSION 1 (10:00 - 10:45 am)

Marine Biology All Year! How to turn your Intro Biology Class into a Marine Biology Class

Megan Dygve, Robinson Secondary School
Demonstration, Grades 9-12

Track: Classroom; Room: Colony

Want to teach Marine Biology all year?! Of course we do! Let us show you how you can take it from a few lessons during ecology, to a full-year endeavor, while still meeting the state standards.

Modeling Topographic Maps

Emily Ford, State Arboretum of Virginia
Co-Presenter: Lisa Green, State Arboretum of Virginia

Hands-on Workshop, Grades 6-8

Track: MWEE; Room: Tidewater A

Join us for a workshop highlighting a unique approach to teaching topographic maps. The activity uses easy-to-find, inexpensive materials to help teach students about topography and watersheds in an engaging manner. Participants will receive activity directions and hands-on experience.

A Regional Snapshot- Climate Change, Sea Level Rise and their IMPACTS

Jackie Rickards, Middle Peninsula Planning District Commission
Research/Info

Track: STEM; Room: Tidewater B

As climate changes and sea level rises there are countless impacts that will affect the Middle Peninsula region. Consequently, how will the region adapt and manage potential impacts?

Integrated Watershed Education Model: The Chesapeake Bay Foundation's Model for Meaningful Watershed Investigation

Bill Portlock, Chesapeake Bay Foundation
Co-Presenter: Cindy Duncan, Chesapeake Bay Foundation
Research/Info, Grades 4-12

**Track: Professional Development & Programs;
Room: York**

The Chesapeake Bay Foundation's efforts in meaningful watershed education are demonstrated through a multi-faceted program of inquiry-based student field investigations and sustained high quality, professional development opportunities for teachers. Session participants gain knowledge on planning and implementing inquiry-based science programs.

Bridge/COSEE NOW DATA Activity: I'm Changing the Wind?

Chris Petrone, Delaware Sea Grant
Hands-on Workshop, Grades 6-12

Track: General Session; Room: James

Sea breezes relieve summertime temperatures and spark afternoon thunderstorms; however, their formation and strength are greatly affected by land-use changes. We will examine observing system data and radar images to identify sea breeze fronts and discuss the implications of ongoing sea breeze research.

SESSION 2 (11:00 - 11:45 am)

Oil and water just don't mix. Teaching about the uses, environmental impact, and cleanup of oil.

Sean Tracy, George Mason University and Fairfax County Public Schools

Hands-on Workshop

Track: Classroom; Room: Colony

Oil and water just don't mix; opinions on deepwater exploration are just as polar. This workshop provides teachers with resources to teach about oil in the marine environment and to bring these issues to the surface.

Introduction to Virginia Naturally

Sheila Barnett, Virginia Department of Environmental Quality Demonstration, All Grades

Track: MWEE; Room: Tidewater A

Virginia Naturally is designated as Virginia's official environmental education program. Learn about environmental stewardship and keep up-to-date with local environmental news. Presentation includes information about grant funding and environmental networking opportunities. Get additional resources for environmental education for all ages.

ROV-in-a-bucket for secondary engineering/science education

John Lunsford, Paul M. Hodgson Vocational Technical High School

Hands-on Workshop, Grades 9-12

Track: STEM; Room: Tidewater B

Remotely Operated Vehicles (ROVs) are used in the secondary classroom in order to approach disciplines of marine science, technology and engineering in a problem-based environment using SCANS (Secretaries Commission on Achieving Necessary Skills) competencies.

Developing a youth continuum for Conservation

David Christopher, National Aquarium Research/Info, All Grades

Track: Professional Development & Programs; Room: York

The National Aquarium is working to connect three existing education programs in order to create a continuum of youth experience from fourth grade through high school. The session will discuss these programs, how they connect, and the current evaluation process.

Incorporating STEM in Ocean Activities

Susan Walton, Virginia Museum of Natural History

Hands-on Workshop, Grades K-8

Track: General Session; Room: James

Participants will discuss ways to integrate technology, engineering and math concepts in activities for elementary/middle school marine science lessons. Session will include experimentation with engineering/design activities.

SESSION 3 (1:30 - 2:15 pm)

Engaging Review

Dawn Sherwood, Highland Springs High School

Hands-on Workshop, Grades 5-12

Track: Classroom; Room: Colony

Are you tired of drill and kill? Need more ideas on ways to review? This workshop will give you some ideas and templates and allow you make some yourself to take back to the classroom. Bring a computer or a jump drive and you can have electronic versions of the templates. Time to share ideas will be given at the end of the session.

Successful Schoolyard Habitat Projects

Carol A. Heiser, Virginia Dept. of Game & Inland

Fisheries

Research/Info, All Grades

Track: MWEE; Room: Tidewater A

See examples of schools that have installed habitat gardens and are using them for on-site instruction of MWEE objectives. Session includes overview of the planning process and key factors that can "make" or "break" a project.

A Study of the Gulf Stream in the North Atlantic in March

David Wehunt, Soddy Daisy High School

Research/Info, Grades 10-12

Track: STEM; Room: Tidewater B

This session combines life aboard the RV Knorr in March in the North Atlantic with the study of the eddies that form off the Gulf Stream on its way across the North Atlantic. Some surprises were found and the weather was as expected.

What's in Your Informal Program Toolbox?

Chris Witherspoon, Virginia Aquarium Demonstration, Informal Educators

Track: Professional Development & Programs;

Room: York

Join in on a discussion and demonstration of an approach to help new informal educators build skills needed to effectively develop and present programs. Using a toolbox analogy, learn how to select the proper program "tools" for a particular "project."

Citizen Science Comes to Summer Camp

Anne Schlesinger, The Marine Science Consortium

Co-Presenter: Alex Vandermeys, The Marine Science Consortium

Research/Info

Track: General Session; Room: James

Using citizen science to focus summer camp science projects engages campers and counselors in the scientific method and connects them to the natural resources at hand.

SESSION 4 (2:30 - 3:15 pm)

Photosynthesis, light, and tubeworms!

Tami Lunsford, University of Delaware
Hands-on Workshop, Grades 5-12 & College
Track: Classroom; Room: Colony
Learn how one biology teacher at both high school and college level uses the required photosynthesis unit to teach about photosynthesis, chemosynthesis, and camouflage in the ocean. A PowerPoint with content, student response questions, and hands-on demonstrations will be shared.

How do different ground surfaces influence surface water run-off and groundwater recharge?

Candace Lutzow-Felling, University of Virginia/State Arboretum of Virginia
Co-Presenter: Emily Ford, State Arboretum of Virginia
Hands-on Workshop, Grades 6-12
Track: MWEE; Room: Tidewater A
Use hydrogeology models, a wonderful hands-on method, to explore the impact of various pervious and impervious surfaces on surface water run-off and groundwater recharge. You will be given instructions to build your own models and an investigation using the models.

Buoys in Your Classroom

Bart Merrick, NOAA Chesapeake Bay Office
Co-Presenter: Andrew Larkin, NOAA Chesapeake Bay Office at Nauticus
Hands-on Workshop, All Grades
Track: STEM; Room: Tidewater B
Join staff from NOAA for an interactive session on the Chesapeake Bay Interpretive Buoy System (CBIBS). Presenters will provide an overview of the system and showcase real-time buoy data curriculum.

Pathways to Self-Certification: An Introduction to the Environmental Educators Leadership Program

David Ruble, Virginia Dept. of Environmental Quality
Demonstration, Non-formal Educators
Track: Professional Development & Programs;
Room: York
The Environmental Educators Leadership Program develops and enhances the professional skills and abilities of Virginia educators. This program serves as a roadmap for developing skills needed to teach about the environment and to earn recognition for educators.

Waves, Words & Wonder: Putting the "Sea" in

Ocean Literacy for Early Learners

Courtney Obland, Virginia Aquarium & Marine Science Center
Research/Info, Preschool
Track: General Session; Room: James
The Waves, Words & Wonder program at Virginia Aquarium builds early learner skills and literacy in science. The session will highlight strategies for working with preschoolers and developing age-appropriate science activities.

SESSION 5 (3:30 - 4:15 pm)

"We Sea Change" A Climate Change Film and Curriculum

Megan Ennes, North Carolina Aquarium at Fort Fisher

Hands-on Workshop, Grades 5-12

Track: Classroom; Room: Colony

"We Sea Change" is a student-made film on Climate Change. Watch the film and learn how to use this tool in your classroom. The film comes with a supplemental curriculum to help you teach your students about climate change.

Seeing, Doing, Teaching: Lessons Learned and Lessons Made by the Susquehanna Aquatic Biodiversity Network (SABN) Teacher Fellows

Ann Faulds, Pennsylvania Sea Grant

Co-Presenters: Pat Alexander, Jeff Kerstetter, Seth Reidenbach, Steve Wise, Brandon Collins, and Ron Reed Hands-on Workshop, Grades Upper Middle & High School

Track: MWEE; Room: Tidewater

A SABN Research Teacher Fellows present lessons inspired by their experience assisting Professor Brian Mangan with his Susquehanna River biodiversity and ecotoxicology research. Circulate through interactive stations and try a variety of activities and lessons.

The Great Build-A-Buoy Challenge

Stephanie Hathcock & Daniel Dickerson, Old Dominion University

Hands-on Workshop, Grades 3-12

Track: STEM; Room: Tidewater B

This fast-paced, hands-on workshop allows teachers to participate in and learn how to facilitate the Great Build-A-Buoy Challenge, an exciting STEM activity that can be catered to elementary students through adults.

Intro to Strategic Planning for Marine Educators

Caitlin Hamer, North Carolina Coastal Reserve

Co-Presenter: Allison Besch, North Carolina Maritime Museum

Research/Info

Track: Professional Development & Programs;

Room: York

Create or re-evaluate a strategic plan for your department or facility. Participants will work toward defining a mission and vision statement at the session and will receive a guide to help identify future goals and objectives. Additionally, participants will learn about the benefits and drawbacks of using inter-agency partnerships to enhance programming and stretch limited funding in eastern North Carolina.

The Science of Sifting Sand

Carol Hopper Brill, Virginia Institute of Marine

Science

Demonstration, Grades 5-12

Track: General Session; Room: James

By studying beaches and sand distribution, students of different ages can gain experience: collecting data in the field; organizing, graphing and analyzing data. Several field and lab activities are demonstrated using inexpensive materials that you or your students can make.

Appendix L. Mid-Atlantic EE Leaders Roundtable Agenda
Mid-Atlantic Environmental Education Leaders Roundtable

National Conservation Training Center

Shepherdstown, West Virginia

Hosted by Pennsylvania Association of Environmental Education (PAEE)

Meeting Room 151W

Monday, July 11, 2011

- 9:00 a.m. Welcome & Introductions
- 9:15 a.m. Overview of Mid-Atlantic Region Affiliates
- Break
- 11:00 a.m. Break-out #1
Building the Resource Directory of EE Programs and Leaders Capacity
- Noon Lunch
- 1:00 p.m. *Overview of Chesapeake Bay Executive Order 13508*
Amy Handen, NEMO Watershed Coordinator, National Park Service
- 1:30 p.m. Break-out #2
Identifying Regional Environmental Priorities
- 2:45 p.m. Break
- 3:00 p.m. Break-out #3
Strategies for Addressing Regional Environmental Priorities
- 4:15 p.m. Fresh air break
- 6:00 p.m. Dinner
- 7:30 p.m. Evening networking and group reflection

Tuesday, July 12, 2011

- 8:00 a.m. Morning Orientation
- 8:15 a.m. *Pairing Schools with Community Partners*
Frank Rodgers, Cacapon Institute
- 8:45 a.m. *Green Ribbon Schools*
Sharon Burton, U.S. Department of Education
- 9:00 a.m. *Table Discussions about Green Ribbon Schools*
- 9:30 a.m. *Measurable Indicators and Outcomes for Environmental Literacy Plans*
[Dr Tom Marcinkowski](#), Associate Professor, Florida Institute of Technology
- 10:15 a.m. Break
- 10:30 a.m. *Review of Draft Regional Environmental Literacy Plan*
Shannon Sprague, NOAA Chesapeake Bay Office
- 11:15 a.m. Break-out #4
Interest Group Discussion on Executive Order
- Noon Lunch
- 1:00 p.m. Break-out #5
How can each Affiliate support the regional Environmental Literacy Plan?
- 2:15 p.m. Wrap-up, Call to Action & Statements of Commitment
- 3:00 p.m. Safely Start Home!

Link to roundtable proceedings <http://archive.chesapeakebay.net/calendar.cfm?eventdetails=11480>

Appendix M. Draft Mid-Atlantic Environmental Literacy Plan

DRAFT Mid-Atlantic Affiliates 9-11 Elementary & Secondary Environmental Literacy Goals, Outcomes, and Strategies

GOAL 1: Every student in the region graduates with the knowledge and skills to make informed environmental decisions.

Mid-Atlantic Regional Roundtable Recommendations:

- Instruction for students should be place-based and include local issues investigations.
- Multi-disciplined and integrated instruction should be delivered through use of technology and other innovative avenues.
- Public and private partners should work together to identify funding to support these outdoor activities.
- Students should have easy access to current, age-appropriate information provided by Federal and state agencies, for example a calendar of environmental activities and opportunities.
- Students should receive information and opportunities related to careers in natural resources and environmental fields from their guidance counselors, teachers, and by other appropriate means.
- School divisions should engage with community partners to develop out-of-class, afterschool and summer programs related to the environment.
- Students input and feedback should be considered to shape future programming and experiences.

Outcome 1.1: States engage students at every grade level in outdoor activities designed to increase environmental literacy.

1.1 - Strategies:

1. Affiliates will encourage site visits that include guides who are knowledgeable and can present factual information on environmental challenges (e.g., visits to landfills, impaired streams, wastewater treatment plants); and environmental successes (e.g., visits to wildlife refuges, National Forests, local land conservation efforts).
2. Affiliates will help identify local opportunities to support outdoor learning and ensure this information is readily available to school divisions, schools, and educators.
3. Affiliates will support investigation of local, regional and global issues as appropriate and the development of place-based sites.

Outcome 1.2: Students participate in interdisciplinary learning about the key relationships between dynamic earth, energy, and human systems, including STEM content knowledge and thinking skills.

1.2 - Strategies:

1. Affiliates will stimulate discussion at K-12 levels in reading/technology/social studies/civics/ (integration).
2. Affiliates will facilitate service-learning/stewardship projects for increased student involvement in their communities.
3. Affiliates will encourage global connections through use of technology (skype, webchat, twitter, email “friends”) to discuss issues.

Outcome 1.3: Students have information about career opportunities and requisite skills for environment-based jobs, and the opportunity to participate in programs that prepare them for a future in these careers.

1.3 – Strategies

1. Affiliates will identify vocational opportunities, internships, green jobs corps and summer camps.
2. Affiliates will identify local volunteer, mentoring and job shadowing opportunities within the students’ communities.
3. Affiliates will provide more natural resource and environmental information to guidance counselors and more participation in career days.

Outcome 1.4: Students have the opportunity to pursue enrichment programs and experiences that support in depth understanding of environmental issues and solutions.

1.4 - Strategies:

1. Affiliates will contribute to a calendar of youth activities to do (at home, school, neighborhood, etc).
2. Affiliates will encourage multi-year, school-based investigations of environmental issues (e.g.; weather station management; energy, water, & waste tracking; stormwater runoff pollution monitoring).
3. Affiliates will identify technical and financial support for student-lead applications to address environmental challenges (e.g. student-driven recycling programs, energy & water conservation, non-point source stormwater pollution mitigation, public education campaigns).

GOAL 2: All educators in the region responsible for instruction about or in the environment have access to sustained professional development opportunities, tools, and resources that support their efforts to provide students with high-quality environmental education (EE).

Mid-Atlantic Regional Roundtable Recommendations:

- Education programs delivered to schools should meet state and Federal guidelines for best practices and be provided by educators trained in state and Federal standards.
- SEA funding for professional development should be aligned with environmental literacy plans and be fully utilized.
- EE professional development should be synchronized and aligned with SEA priorities (e.g.; STEM, Project Based Learning, 21st Century) and with Federal programs (e.g.; Green Ribbon Schools).
- High-quality professional development and best practices for teaching related to EE should be defined in each jurisdiction and adopted by state boards of education.
- Opportunities for teachers to participate in professional development focused on state priorities in the area of EE should be consistently available.
- Programs designed to increase appreciation of the importance and value of EE by school and school division administrators should be provided.
- All pre-service teachers should be provided with training in EE across the curriculum, so every teacher enters their field with a foundation in EL.
- SEAs should require professional development in the area of EE to receive teacher licensure and/or certification in elementary education, science and other appropriate fields.
- SEAs should support their affiliates programs and work with them to support non-formal EE providers who are working with schools.
- The Mid-Atlantic Environmental Education Affiliates and the Chesapeake Bay Education Workgroup should cooperate and contribute to an EE clearinghouse for educators with state-specific resources and data.

Outcome 2.1: Educators have access to high-quality curriculum-based lesson plans, resources and information on trainings that focus on environmental issues for all grade levels and subjects.

2.1 – Strategies:

1. Affiliates will encourage members to align curriculum and lesson plans with the Federal and state academic and EL standards.
2. Affiliates will work with state education agencies to disseminate materials and professional development opportunities.
3. Affiliates will encourage members to contribute to a searchable clearinghouse of EE resources.

Outcome 2.2: Teachers have sustained professional development related to EE content, outdoor learning strategies, and pedagogy to promote EL in their students.

2.2 – Strategies:

1. Affiliates will work with SEAs to ensure current research informs professional development and certification programs.
2. Affiliates will support the development of the definition of high-quality educator professional development in the area of EE.
3. Affiliates will coordinate with state and Federal partners to assess needs for professional development for teacher recertification in science and other appropriate fields.
4. Affiliates will work with states and Federal partners to provide resources for professional development in EE (e.g.; instructors, current information, locations, etc).
5. Affiliates will link natural resource managers and science experts with education community to ensure current, reliable content information is made available to educators.
6. Affiliates will identify organizations and natural resource personnel who can provide technical assistance to school divisions.
7. Affiliates will provide professional development related to the generation, use and application of environmental data.
8. Affiliates will encourage and support the work of colleges and universities to provide teachers with training in content, outdoor learning strategies, and pedagogy related to the environment.
9. Affiliates will encourage SEAs to include professional development in the area of EE as a requirement to receive teacher licensure and/or certification in elementary education, science and other appropriate fields.

Outcome 2.3: Pre-service teachers enter the workforce with knowledge and experience in interdisciplinary EE content, outdoor learning strategies and pedagogy.

2.3 - Strategies:

1. Affiliates will encourage and support the work of colleges and universities to provide pre-service science with training in content, outdoor learning strategies, and pedagogy related to the environment.
2. Affiliates will involve pre-service teachers in professional development opportunities related to Environmental Education (EE).

Outcome 2.4: Informal environmental educators in the Mid-Atlantic region understand and can communicate current scientific findings and have knowledge of research-based EE best practices.

2.4 - Strategies:

1. Affiliates will provide targeted professional development opportunities for informal environmental educators, including staff from museums, aquaria, and outdoor schools.

2. Affiliates will work to increase collaboration and communication between formal and informal environmental educators to support classroom learning related to the environment.
3. Affiliates will encourage the development or adoption of state level EE certification for informal educators aligned with the criteria defined by the North American Association for Environmental Education.
4. Affiliates will work to identify environmental educators to work with natural resource personnel on authentic research experiences.

Outcome 2.5: Federal, state and local natural resource personnel are actively engaged in EE and outreach and have adequate training in instructional techniques and the needs of educational audiences.

1. Affiliates will identify scientists and other personnel engaged in environmental professions to contribute to a strong network of Subject Matter Experts (SMEs) available to answer resource questions.
2. Affiliates will provide federal school programs with information about standards of learning, EL priorities, and other relevant information to ensure proper alignment with state learning objectives and Administrative priorities.
3. Affiliates will ensure the availability of information and training about effective outreach techniques to educational audiences for all professionals who participate in environmental outreach.

GOAL 3: Every school in the region maintains its buildings, grounds, and operations to support positive environmental and human health outcomes.

Mid-Atlantic Regional Roundtable Recommendations:

- State Education Agencies (SEAs) should encourage schools to be models of best management practices for environmental sustainability and adopt parameters for healthy schools.
- Schools should be connected to local, state, regional and national private and non-profit organizations that support environmental sustainability and environmental literacy (e.g.; Green Building Alliance, LEED, and Chesapeake Bay Landscaping Network).
- Designs for new schools should include best practices related to land use, energy conservation and pollution prevention (e.g.; green roofs, pervious surfaces, passive & active solar energy use, natural lighting, green materials, and use of recyclable materials).
- Existing schools should be reviewed for modification and incorporation of best management practices for sustainable land use, energy conservation and pollution prevention (ibid).
- Environmentally literate professionals, experts, and volunteers should be included in projects related to curriculum writing, curriculum alignment and integration, text-book

adoptions, standards revision, and professional development and all aspects of EL planning and delivery.

Outcome 3.1: School buildings, grounds, and operations are models of environmental sustainability, making continual progress towards net zero environmental impacts of carbon emissions, solid and hazardous waste disposal, non-point source air and water pollution, and other local, state, regional and Federal pollution priorities.

3.1 - Strategies:

1. Affiliates will identify local and state-wide organizations that mitigate the negative, non-sustainable, impacts of school facilities and invite those groups to be partners in establishing best management practices and public education campaigns for EL.
2. Affiliates will support best management practices that encourage student responsibility for the environment and promote EL (e.g.; schoolyard habitats, outdoor learning areas, improved grounds maintenance).

Outcome 3.2: All schools' environment, indoor and outdoor, provide a net positive effect on the health of students, staff, and surrounding community

3.2 - Strategies:

1. Affiliates will help identify local partners and stakeholders for better resource management and programs that will support the development of integrated school environmental health.
2. Affiliates will include green school concepts in their annual professional development events and conferences (e.g.; human health, facility management, nutrition, and outdoor play).

GOAL 4: The education community in the Mid-Atlantic region functions in a unified manner and coordinates with key national, regional, and state programs and other Citizen Stewardship activities to represent the full suite of information and opportunities available for K-12 audiences.

Mid-Atlantic Regional Roundtable Recommendations:

- Communications forums should be created and maintained to share ideas among Federal, state, affiliate, university, and other partners across the region.
- The Chesapeake Bay Education Workgroup should identify and disseminate best practices and pedagogy for EL.
- Federal, state, and affiliate partners should work together to determine EL evaluation metrics for the Mid Atlantic region.
- Research in the field of EE should inform Federal and state funding priorities, grant guidance and professional development.

- Federal and state grant support should be targeted to programs that reflect best practices in EE.
- Federal and state agency funding should support funding for multi-year programs.
- State education agencies should include EE professionals in the planning, development and implementation EL plans.
- Both formal (pre-service, pre-K, K-12) and non-formal educators are included in the definition of education community to ensure collaboration to meet these outcomes.

Outcome 4.1: States in the mid-Atlantic establish and implement a robust plan for ensuring that all students graduate environmentally literate.

4.1 - Strategy:

1. Affiliates will work with partners to determine regional environmental literacy evaluation metrics, including sharing local examples of successful metrics and successful impacts on learning.

Outcome 4.2: Education programs are developed and refined using the best available research on the effectiveness of environmental education, and support continued research in this field.

4.2 - Strategy:

1. Affiliates will encourage the liaison between researchers and ongoing projects to ensure actual case studies are used in evaluation research.

Outcome 4.3: Federal, state, and nongovernmental organizations with K-12 programs actively communicate to increase collaboration related to environmental literacy planning and implementation.

4.3 - Strategies:

1. Affiliates will meet annually to coordinate and share activities.
2. Affiliates will act as hub to facilitate the engagement of non-formal environmental education providers.
3. Affiliates will participate in a communications forum to share ideas specific to affiliates across the Mid-Atlantic region.
4. Affiliate will collaborate with community partners not traditionally engaged in environmental education, but whose programs address previously unexplored but issue oriented aspects of environmental education.