Environmental Education to Inspire Life-long Learning and Stewardship

Restore America’s Estuaries Nov 5, 2014

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Outline

• Environmental Literacy Strategy in the Mid Atlantic
• Why Ocean Literacy in Early and Elementary Education
• Model for PreK-12 Ocean and Climate Literacy
• Conclusions
Environmental Literacy in the Mid Atlantic

- EL Strategy in response to Presidential Executive Order
  - Students
  - Teachers
  - Schools
  - Education Community
Environmental Literacy in the Mid Atlantic

- Moved these goals into new Watershed Agreement
- Teacher-supported student MWEEs
- Sustainable Schools
- EL Planning
Environmental Literacy in the Mid Atlantic

Comprehensive “Collective Impact” Strategy

• Common Agenda with dedicated NOAA B-WET funding
• Shared Metrics
• Continuous Communication
• Backbone Organization
• Mutually Reinforcing Activities
Why ocean literacy in early childhood (and elementary)?
“The years of early childhood are the time to prepare the soil. Once the emotions have been aroused – a sense of the beautiful, the excitement of the new and the unknown, a feeling of sympathy, pity, admiration or love – then we wish for knowledge about the subject of our emotional response. Once found, it has lasting meaning. It is more important to pave the way for the child to want to know than to put him on a diet of facts he is not ready to assimilate.” - Rachel Carson
The Biophilia Hypothesis
by E.O. Wilson

- “Humans evolved as creatures deeply enmeshed with the intricacies of nature, and...we still have this affinity with nature ingrained in our genotype.”
- Biophilia compels us “to look to the very roots of motivation and understand why...we cherish and protect life.”

--E.O. Wilson, Biophilia (1984)
Biophilia
The Evolution of our Interconnectedness with Nature
Why ocean literacy in early childhood?
Stewardship

Photo by USFWS; Phil Delphey
A Model for Ocean Literacy

Aligns ocean literacy concepts with **local** PreK-5 curriculum and **state environmental literacy standards** to help teachers and students make connections…

"from the schoolyard to the ocean."

Ocean Literacy Principles Brochure: http://oceanliteracy.wp2.coexploration.org/
The Model

- Place-based learning and understanding of the local environment and local environmental issues.

We all live downstream lesson plan
The Model

- Builds partnerships among educators and policy makers from Federal, state, and local government (such as NOAA, the state Departments of Education, and local public school districts) and local non-profit resource conservation organizations.
The Model

- Takes a peer-based approach that encourages teachers to *work together in solving problems* and implementing lessons specific to their schools/geographic area, and *exchange ideas/share information* with one another on an on-going basis.
The Model

• Provides extensive resources for teachers and students, including a teacher resource guide that provides sources for lesson plans, field trips, funding opportunities, etc., on ocean education

• Provides on-going support to participants in carrying out lessons and activities, including giving in-class presentations to participants’ students, demonstrating lessons in the classroom, filling requests for additional materials, connecting teachers to other NOAA experts, etc.
The Pilot

DAY 1-2
Teacher training on fundamentals of the ocean called out in the
Ocean Literacy Principles & Concepts: A “Crash Course”

- Syllabus outlined the ocean concepts, where they align with their curriculum, and indicated whether they were for the benefit of teacher education or student (lesson demos)
  - physical and chemical properties of the ocean
  - adaptations for life in the ocean and ocean ecosystems
- Hands-on/experiential learning for both teachers and students
The Pilot

Example of Day 2-3 focus on Sustainable Human Use/
Fisheries Sustainability – Grades 4-5

Ocean Literacy Principle:
“The ocean and humans are inextricably connected.”

- Ecological, social, and economic elements involved in fisheries sustainability (seafood sustainability/ending overfishing/rebuilding fish stocks)
- Hands-on/experiential learning for both teachers and students.
  - Stakeholder “Pass the hat” lesson
The demand

• This type of content AND this approach are in demand

• Survey results show a definite desire on the part of teachers to learn about the ocean

• MSDE sent a letter strongly encouraging the continuation of programs like these

• MCPS (the largest school district in the state of Maryland) sent a letter requesting that NOAA make this a permanent partnership and a desire to make this workshop a “requirement for all 4th grade teachers” (Challenge: reliable funding)
Pre-Workshop Assessment

Teachable Science: Ocean Edition Pre-Workshop Survey

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answered question 24

skipped question 0
### Teachable Science: Ocean Edition Post-Workshop Survey

**Did the workshop provide useful and relevant resources to help you enrich your environmental curriculum with lessons on ocean topics?**

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- **Why or why not?**
  - answered question: 18
  - skipped question: 0
Pre-Workshop Assessment

Have you participated in professional development opportunities focused on the following areas in the past?

- Environmental Issues: 83% (2)
- Estuaries: 45% (11)
- The Chesapeake Bay: 25% (5)
- Watersheds: 25% (5)
- The Ocean: 0%

(NOAA Fisheries)
Do you see a good fit for the ocean content presented at the workshop in your curriculum?

94.4% (17) Yes
5.6% (1) No
Post-Workshop Assessment

Did the workshop help you build confidence in teaching your students about their role/responsibility in ocean stewardship?

- Yes: 88.9% (15)
- No: 11.1% (2)
## Post-Workshop Assessment

### Teachable Science: Ocean Edition Post-Workshop Survey

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<th>Would you recommend this workshop to other educators?</th>
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**Why or why not?**
- Answered question: 18
- Skipped question: 0
Conclusions

• NOAA is working hard in the Mid Atlantic and elsewhere to design and implement EL programs that foster life-long stewardship

• Early and Elementary childhood brings unique and essential value to ocean and climate stewardship

• Our surveys show: 1) there is a definite need and demand for ocean content in professional development (and pre-service learning is also important); 2) this approach is effective in helping teachers learn about the content; 3) as well as develop their confidence in their ability to teach the material
Conclusions

• The strengths of the model we present here are: 1) building partnerships across local, state, and federal government agencies, and local conservation non-profits makes sense; 2) ocean/climate content aligned with LOCAL curriculum, state EL standards (+NGSTs and Common Core); 3) place-based—i.e., content is tailored to “your place in the watershed” and your community; and 4) peer-based

• This type of content AND this approach are in demand

• Challenges: Sustainability of the Program (i.e., reliable funding)
Ocean Resources Featured and Demo-ed during the Workshop
Bay Backpack

Teaching Resources

Teaching environmental issues in your classroom is a critical component of providing your students a Meaningful Watershed Educational Experience. Discover a wealth Chesapeake Bay related books, multimedia, curriculum guides, individual lesson plans and online data sources.

Begin by choosing the criteria for your search. It is only necessary to include the criteria you wish to use to limit your search. The more specific your search the more focused and narrow the results.

If you know of a great teaching resource that is not included in the Bay Backpack please let us know by suggesting a resource.

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www.baybackpack.com
Citizen Science - Fieldscope
EcoCheck

http://ian.umces.edu/ecocheck/
Data in the Classroom

Investigate Earth processes using real data:
- El Niño
- Sea Level
- Water Quality
- Ocean Acidification

Free curriculum
We've developed four curriculum modules that demonstrate techniques for using real data in the classroom:
- El Niño
- Sea level
- Water Quality
- Ocean Acidification

Learn more
We're taking a systems approach to learning about the Earth using real scientific data. Our goal is to design easy-to-use curriculum activities and simple, intuitive computer interfaces for accessing online data. It's all part of a NOAA-supported effort called the NODE Project.

Tell us what you think
If you have used any of our curriculum modules with your students, we would appreciate getting your feedback through one of our evaluation surveys.

http://www.dataintheclassroom.org/
Google Earth

http://www.google.com/earth/