Virginia Resource-Use Education Council
Needs Assessment

Funded by the National Oceanic and Atmospheric Administration (NOAA) Bay Watershed Education and Training (B-WET) Grant
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Executive Summary

Barnes Technologies International, LLC (BTILLC), a Virginia small, women-owned (SWaM) business, was
hired by the principal investigators of the Virginia Resource-Use Education Council (VRUEC) to conduct a
needs assessment in environmental literacy in the Commonwealth of Virginia. The assessment informed
the VRUEC in the development of a state-wide environmental literacy plan for Virginia. The VRUEC
requested information addressing three questions:

• What is the current understanding and importance of environmental literacy?
• How are environmental literacy programs currently implemented and what resources support
  these endeavors?
• What is the difference between current practice and what would stakeholder like to see done?

Process

The VRUEC and BTILLC worked together to design the needs assessment. The process included
conducting nine focus groups and administering an on-line survey. Focus groups were held in each of
the eight Virginia Department of Education (VDOE) Regions, with two sessions held in Region 4. Group
sizes ranged from seven to sixteen participants. Each group included formal educators (e.g., teachers,
school building administrators, district supervisors, higher education faculty) and non-formal educators
(e.g., museum educators, program coordinators, non-profit organization members, and governmental
agency representatives). In all, 44 formal and 49 non-formal educators participated in the focus group
process. The web-based survey had 537 respondents, with 160 indicating that they were formal
educators, 166 non-formal educators, 26 post-secondary educators, and 185 indicating they were
community members interested in environmental literacy. Responses were collected from residents in
all 8 VDOE regions, and 7 respondents indicated that they lived outside of Virginia.

Results

Understanding of environmental literacy: One survey item asked respondents to express their
level of agreement with the definition of environmental literacy developed by the VRUEC. The
definition: “a fundamental understanding of ecological principles, the systems of the natural world, and
the relationships and interactions between natural and man-made environments.” Of the 532 people
responding to this item, 477 either agreed or strongly agreed with the definition. Response patterns of
formal and non-formal educators were nearly the same.
The importance of environmental literacy: Focus group participants and survey respondents overwhelmingly agree that environmental literacy is important. In the survey, 96.4% responded that environmental literacy is either important or very important. The opinion of formal and non-formal educators was essentially the same.

How current programs are implemented and what resources support these endeavors: The focus group and survey respondents provided dozens of examples of how environmental literacy programs are implemented across the commonwealth. Many participants provided names of programs that are offered regionally, frequently through collaborative partnerships between formal and non-formal educators. School field trips to parks and other ecologically rich destinations were frequently mentioned. Another common approach is the use of programs developed by foundations and agencies for teachers to use in schools. Some popular programs include Project WET, Project WILD, and Project Learning Tree. A key finding is that many classroom teachers rely on these outside resources – people, curricula, and grant funding – to teach environmental topics.

The difference between current practice and what would stakeholder like to see done: The needs assessment reveals that there are gaps in two major areas. The first area is the need for more organization and accessibility to information about environmental literacy. Focus group participants and survey respondents mentioned that it is challenging for educators and community members to find resources and opportunities to engage in environmental initiatives. The second area is in policy. There is a strong desire for more explicit student learning outcomes to be mandated by the state. Many mentioned that if environmental concepts are not listed in the Virginia Standards of Learning (SOL) and tested, then teachers will not feel compelled to teach the content. Related to this desire is a need to fill a perceived gap in teacher preparation and professional development programs that results in teachers feeling uncomfortable and unprepared to teach outdoors.

Promoting a higher level of environmental literacy in communities: Data were analyzed using thematic network analysis (Attride-Stirling, 2001). The needs assessment participants identified five themes, or topics, describing the most effective ways to promote a higher level of environmental literacy in communities. The first area of focus called for supporting schools systems by strengthening the emphasis on environmental literacy as an integral component of the program of study in schools. Participants recommended an integrative conceptual approach with a mandated requirement for graduation. The second topic identified was more emphasis being placed on environmental education in higher education teacher preparation, including the Master’s degree and a Certification for Environmental Educators. The third topic identified by the needs assessment focused on the community. The participants emphasized the importance of building bridges with all community environmental groups. The fourth topic that was identified by the participants when asked what would be the most effective way to promote a higher level of environmental literacy in communities was public policy. The participants stated environmental literacy is for all Virginians and must be supported by the Governor’s Office and the General Assembly. The fifth topic that emerged from the needs assessment survey was public relations. The participants emphasized a more comprehensive statewide public relations approach.
Conclusion and Recommendations

The results of this needs assessment indicate the direction of the next steps for the VRUEC. VRUEC is the logical group to lead next steps for the environmental community in the Commonwealth because it serves as an umbrella organization for this community. They have strong working relationships with regional leaders, governmental agencies, formal, and non-formal groups.

There is a need to move toward a more structured system for addressing environmental literacy. This system should include components addressing organizational strength as well as education and professional development. This organizational component should include making information more accessible, providing opportunities for stake holders to network and communicate efficiently, and informing the public of the importance of environmental issues. The professional development component should include working with state level departments to make environmental literacy of Virginians a high priority. Making teachers accountable for preparing our young citizens to participate in protecting and sustaining our environment requires a concerted effort in preparing them and providing them the resources to do so.

There is a cadre of willing non-formal educators eager to participate in the process. In fact, when asked about their needs, both formal and non-formal educators listed professional development, funds for field trips, and defined outdoor spaces in their list of top three needs. That there is a shared vision of the needs to be addressed to meet the goal of the VRUEC to have an environmental literate Virginia is a huge benefit for those who are ready to proceed with the state-wide plan, including a communication and marketing strategy within Virginia Naturally and other key organizations.
Introduction

Project Overview

Organized in 1952, the Virginia Resource-Use Education Council (VRUEC) is a statewide organization which supports environmental education across the state and includes representatives from Virginia's state and federal natural resource agencies, the Virginia Department of Education, professors in Virginia’s colleges of education, and various resource management agencies. The members of VRUEC are committed to providing Virginia’s educators with high quality natural resource materials, exemplary professional development, and support. The VRUEC is currently exploring the development of a statewide plan for Prek-16 environmental literacy. VRUEC received funding for this project through a National Oceanic and Atmospheric Administration (NOAA) Bay Watershed Education and Training (B-WET) Grant. The council required a needs assessment to inform the development of this plan for Virginia. In particular, the VRUEC needed information addressing three questions:

- What is the current understanding and importance of environmental literacy?
- How are environmental literacy programs currently implemented and what resources support these endeavors?
- What is the difference between current practice and what would stakeholder like to see done?

The Consultants

VRUEC contracted with Barnes Technologies International, LLC (BTILLC), a Virginia small, women-owned (SWaM) business, to conduct a needs assessment in environmental literacy in the Commonwealth of Virginia. BTILLC staff are very familiar with important work done by VRUEC, and they are well-informed of issues related to environmental literacy in elementary, secondary, and post-secondary education through teaching undergraduate and graduate courses in the College of Education and the College of Integrated Science and Engineering at James Madison University (JMU). Dr. Susan Barnes has worked closely with Project Learning Tree (PLT) for the past ten years, serving as a training facilitator and as a consultant on their recently published curriculum for early childhood educators. Dr. James Barnes is an internationally recognized scholar in environmental education issues. Though his work as Director of NASA RISE, he successfully led numerous projects in earth systems science that focused on studying Earth’s environment. BTILLC staff have also served as consultants to institutions funded by federal grants, including the NOAA-funded project The Intersection of Life and Land: Impacts of Ridge and Valley Land Use Practices on the Chesapeake Bay. All BTILLC staff have experience using quantitative and qualitative research methods and data analysis software.

Assessment Instruments and Data Collection

The VRUEC and BTILLC worked together to design the needs assessment. The assessment process included conducting nine focus groups and administering an on-line survey. Focus group protocol, questions for the focus groups, and items for the survey were reviewed and approved by the VRUEC leadership. In the next sections of this report, the reader will find details about the participants and the research processes.
Focus groups

Participants
Focus groups were held in each of the eight Virginia Department of Education (VDOE) Regions, with two sessions held in Region 4, one in an urban setting and one in a rural setting. To ensure diverse expertise for each focus group, participants were recruited by sending invitations to stakeholders identified by the VRUEC project leaders. The invitation to participate in the focus group included the needs assessment survey questions, allowing those who were not available to participate in the focus group to provide input to the needs assessment. Everyone who expressed an interest in participating was invited to the focus group meeting by the on-site coordinator for the region. The on-site coordinators provided directions to the meeting space and participated in the focus group. Focus group sizes ranged from seven to sixteen participants. Each group included formal educators (e.g., teachers, school building administrators, district supervisors, higher education faculty) and non-formal educators (e.g., museum educators, program coordinators, non-profit organization members, and governmental agency representatives). In all, 44 formal and 49 non-formal educators participated in the focus group process. Figure 1 provides a graphic representation of the regions. Table 1 includes the focus group dates, times, and locations as well as the number of participants from each of the educator categories.

Figure 1. Superintendent’s Regions of Virginia. Downloaded from http://www.doe.virginia.govdirectories/va_region_map.pdf
<table>
<thead>
<tr>
<th>Region and Location</th>
<th>Date and Time</th>
<th>Facility</th>
<th>Number of formal educators</th>
<th>Number of non-formal educators</th>
<th>Total for region</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Richmond</td>
<td>April 2 3:30-5:00 PM</td>
<td>VA Dept. of Game &amp; Inland Fisheries</td>
<td>2</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>2 Hampton</td>
<td>April 9 12:00-1:30 PM</td>
<td>Peninsula Workforce Development Center</td>
<td>3</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>3 Warsaw</td>
<td>March 26 3:30-5:00 PM</td>
<td>Rappahanock Community College</td>
<td>3</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>4 Fairfax</td>
<td>March 5 12:00-1:30 PM</td>
<td>George Mason University</td>
<td>4</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>5 Boyce</td>
<td>March 5 5:00-6:30 PM</td>
<td>Blandy Experimental Farm</td>
<td>5</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>6 Staunton</td>
<td>March 18 6:30-8:00 PM</td>
<td>Mary Baldwin College</td>
<td>8</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>7 Danville</td>
<td>April 16 4:00-5:30 PM</td>
<td>Danville Science Center Fairgrounds</td>
<td>5</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>8 N. Tazewell</td>
<td>April 23 9:30-11:00 AM</td>
<td>Fuller Perry Building</td>
<td>2</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>9 Farmville</td>
<td>April 23 5:30-7:00 PM</td>
<td>Longwood University</td>
<td>12</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>44</td>
</tr>
</tbody>
</table>

**Focus group protocol**

Questions for the focus groups were developed with the VRUEC leaders using a process of identifying questions that cannot be easily addressed by the survey and issues that may be more fully addressed or explained with face-to-face communication and opportunities to probe with follow-up questions. The three questions selected were:

1. What is the current state of environmental literacy?
2. What is working well and could serve as a model for other regions?
3. What would you like to see being done? What is missing and why?

It was expected that the focus group participants would be particularly helpful in addressing the question of what they would like to see being done.

Focus group participants were provided an overview of the project in an oral presentation. When all of their questions are answered satisfactorily, they were asked to respond to the focus group questions. The content of the oral presentation included three parts: the purpose, the guidelines, and the process. The handout shared with participants is found in Appendix A. The following section provides details of the information that the facilitators covered at the start of each focus group meeting.
1. **Purpose of the focus group**

The purpose is to gather information from informed stakeholders for the VRUEC Needs Assessment by providing overall impressions of Virginia environmental literacy programs as they are currently implemented, sharing what they would like to see being done, and identifying resources needed.

2. **Guidelines for focus group discussion and recording**

   1. Participants will listen to and respect each other.
   2. All ideas have value and will be recorded and considered.
   3. Ideas will be not debated by the focus group.
   4. The goal at this point is to gather information, not to build consensus.
   5. Responses will be anonymous and reported in aggregate (e.g. percentages).

**Focus group process**

   1. Greet and thank participants for sharing their time and expertise.
   2. Review the purpose of the focus group.
   3. Review guidelines for focus group discussion. See guidelines listed earlier.
   4. Ask if there are any questions.
   5. Discuss issues.
   6. Record comments so that all can see what has already been covered.
   7. Thank participants.

A BTILLC facilitator conducted the focus group discussion and a BTILLC scribe recorded responses on large sheets of chart paper as they were generated and displayed the sheets for the group so that the respondents could see what had been said and make remarks if additional clarification is needed. Participants were asked questions related to their perspectives on the current status of environmental literacy, how programs are implemented and supported, what they would like to see done, and what resources are needed. The focus groups were not audio-taped, and participants’ names were not recorded in the scribe’s notes. Notes were edited to remove any remarks that may identify an individual member of the focus group. The qualitative data was analyzed using a thematic network approach (Creswell, 2013), wherein codes were developed based on the ideas that emerged from the data and then the consultants applied those codes to identify topics and patterns.

**Web-based survey**

**Participants**

The web-based survey had 537 respondents, with 160 indicating that they were formal educators, 166 non-formal educators, 26 post-secondary educators, and 185 indicating they were community members interested in environmental literacy. Responses were collected from residents in all eight VDOE regions, and seven respondents indicated that they lived outside of Virginia. The numbers of respondents by region and by primary roles in formal education are presented in Figures 2, 3, and 4. A few respondents skipped some items, so the number of respondents varies from item to item.
Figure 2. Survey respondents by region. N = 534.
Survey development process

To develop the Needs Assessment survey, the contractor followed the DeVillis scale development process (2003). Below one finds the first six steps and how they inform the VRUEC project.

1) **Defining exactly what to measure.** The VRUEC leadership indicated that there were several measurements needed, in particular:
   - the current understanding and importance of environmental literacy
   - how environmental literacy programs are currently implemented
   - what resources are needed to support these endeavors
   - what would stakeholders like to see done

2) **Generate item pool.** An initial item pool of questions had been generated by the VRUEC. These items served as a base. Other items were created by the consultants and the principal investigators (PIs) who were subject matter experts. The consultants reviewed other instruments available to see if an item pool addressing the measures may be available, but only items generated specifically for this project were used.
3) **Format the measurement.** It was during this phase that the tool was refined. Consultants and PIs review the items for quality, including the ordering of questions and the appropriate response options. The only form of administration was web-based.

**Description of the tool:** The survey introduction included information regarding the purpose of the survey and identification of the VRUEC. The survey included a mixture of item types. Item types included multiple choice (select one of the options), multiple response (select all that apply), ratings, and constructed response. The item writers anticipated response options available for selection (to minimize unnecessary keyboarding), and they also provided opportunities for sharing information in the open-ended, constructed response format. The survey had a couple of easy, but important, initial items to give respondents confidence that they had the information needed to respond to the survey and that it was worth their time to complete it.

4) **Have item pool reviewed by experts.** Items were reviewed with VRUEC leadership and subject matter experts identified by the PI and BTILLC.

5) **Consider validation items.** Validation items (to identify respondents who are not responding to the questions truthfully or thoughtfully) were not used in this instrument.

6) **Administer items to a developmental sample.** The survey was piloted by the smaller group of potential respondents who were identified by VRUEC leaders as well-informed stakeholders who would also be appropriate to invite to participate in a focus group. This group provided feedback regarding the clarity of terms used in the survey items or selected response item options (choices) that should be added or removed. Feedback from the pilot was used to make modifications before the survey was administered to the larger group of respondents. Minor changes were made to four items. Table 2 includes a description of the changes.

<table>
<thead>
<tr>
<th>Item</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The response <em>middle or high school teacher</em> was changed to two separate options, <em>middle school teacher</em> and <em>high school teacher</em>.</td>
</tr>
<tr>
<td>1 and 5</td>
<td>The word <em>extension</em> was changed to <em>Extension</em>.</td>
</tr>
<tr>
<td>10</td>
<td>The words <em>continuing education</em> were added. New question: What type of professional development or continuing education experiences do you need?</td>
</tr>
<tr>
<td>11</td>
<td>These response options were added to list of limitations that create challenges as you work to support environmental education and environmental literacy: <em>Funds to support the costs of field trips; Convenient places to go; Defined or prepared outdoor spaces; Funds to hire others (non-profit agencies, assistants) to help</em></td>
</tr>
</tbody>
</table>

The link to the revised survey was disseminated by the VRUEC to stakeholders across the commonwealth via an email invitation from VRUEC leaders who would be likely know to the respondents. Several databases were used, including association memberships and employee contact information. The following list identifies some of the resources who provided distribution lists, however, email lists were not necessarily used in their entirety: Virginia Department of Education
(VDOE), Department of Game and Inland Fisheries (VDGIF), Project WET, Project WILD, Project Learning Tree, Virginia Association of Solid and Water Conservation Districts (VASWCD), Virginia Institute of Marine Science (VIMS), Northern VA Outside, and Virginia Department of Conservation and Recreation (DRC). Figure 5 provides a screen shot of the web-based survey as it was viewed by participants. Appendix B has the survey text in its entirety.

Data Analysis

The consultants used a mixed methods approach to analyze the data and to describe stakeholders’ current understandings and practices in environmental literacy programs and to identify needs. One can define mixed methods research as “the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concept or language into a single study” (Johnson & Onwuegbuzie, 2004, p. 17). The quantitative components of this study include the results from selected responses on the surveys and qualitative components included the data from focus groups and constructed responses (comments) on survey items. Quantitative results are reported as frequencies (counts). Qualitative results were analyzed using the thematic network approach. The initial process of analyzing the qualitative data began with developing a set of initial codes for the ideas that emerge from the data. Then an iterative process was used to review, refine, and revise those initial codes. The codes were then applied to the data sources, and themes and patterns were identified and interpreted (Attride-Stirling, 2001).

In this mixed approach, each methodology and data type, quantitative and qualitative, was relevant to the needs assessment. The qualitative survey research components, in this case the open-ended
comments, captured the perspectives of stakeholders in their own words. This information helps to explain the meaning of selected responses on the survey. These open-ended responses provided a more holistic view of the state of environmental literacy at the state and local level and of what stakeholders wish to see happen in environmental literacy initiatives. Both approaches are important in order to collect data that represent a full picture of the current status and to guide the development of the state-wide environmental literacy initiative.

**Results**

**Understanding of environmental literacy**

Three survey items were developed to assess the current understanding of environmental literacy. The first question (Item 3) asked respondents to express their level of agreement with the definition of environmental literacy developed by the VRUEC. The definition reads: “...a fundamental understanding of ecological principles, the systems of the natural world, and the relationships and interactions between natural and man-made environments.” Of the 532 people responding to this item, 477 either agreed or strongly agreed with the VRUEC definition. Response patterns of formal and non-formal educators were nearly the same. The second set of questions provided information about the understanding of the importance of environmental literacy and included “How important is environmental literacy to you?” (Item 4) and “How important are non-formal, community educators?” (Item 5). Focus group participants and survey respondents overwhelmingly agree that environmental literacy and role that non-formal community educators play are important. In the survey, 96.4% responded that environmental literacy is either important or very important. Over 88% of respondents expressed that non-formal educators are very important. Figures 6, 7, and 8 provide details of how educators and community members responded to these questions.
Figure 6. Respondents’ level of agreement with VRUEC definition of environmental literacy.  N = 532 survey responses.

Figure 7. Survey responses to item, “How important is environmental literacy to you?”  N = 531.
The current state of environmental literacy

The focus group and survey respondents shared their perspectives on the current state of environmental literacy. Table 3 presents a summary of the emerging topics from the responses.

Figure 8. Responses to survey item, “How important are non-formal community educators?” N = 532.
<table>
<thead>
<tr>
<th>Emerging topic</th>
<th>Examples</th>
</tr>
</thead>
</table>
| Lack of systemic approach                    | Definition of environmental literacy not consistent across region  
Piecemeal approach; very spotty engagement  
Lots of "lone wolfs" operating within their own networks or on their own  
Inconsistent environmental education, even within a school district  
Many environmental champions exists in region, but they are not always known  
No blanket organization for environmental literacy |
| Accountability for content                   | If content is not attached to SOL, then it does not happen  
Teachers reluctant to give up instructional time for environmental literacy  
Teachers are required to follow pacing guides - makes teaching environmental education tough  
A result of NCLB, "No Child Left Inside" |
| Teacher preparation                          | Teachers are not prepared or not able to integrate content or to make links to SOL  
Teachers do not see forest for trees; they do not see the connections  
Lack of coaching and mentoring for teachers  
Teachers feel uncomfortable in non-formal environments, especially outside  
Environmental literacy does exist in schools where teachers understand how to integrate environmental content with SOLs |
| Reliance on a few champions                  | If a champion moves out of the region, contacts are lost  
Parent involvement missing  
Depends on individual teachers and their relationships with institutions  
Hard to get the people with great programs into schools  
Communication is a concern because administrators change often  
A great deal of turnover with State Park personnel - need to keep up with changes |
| Resources                                    | Most schools limit the number of field trips to one per year  
Virginia Naturally is "scant" on resources and is difficult to navigate  
Funding is a major issue  
Many environmental camps get booked quickly  
Partnerships are needed for grants |
| Public awareness                             | There is a "green fatigue"  
The term **environment** has become politicized  
People do not have a concept of earth systems  
Some community-based programs are not always open  
Lack of information about environmental activities and programs within region  
Lots of volunteers, but cultural barriers exist, resulting in a lack of representation from minorities or low SES communities |
Six major topics emerged from the focus groups when they discussed the current status of environmental literacy in Virginia. First, they described an apparent lack of a strong, state-wide approach. Participants expressed frustration regarding the inconsistencies in expectations and support, not only from district to district, but even within individual districts. The absence of a state-wide system for supporting environmental literacy was mentioned in the contexts of widely varying goals related to student learning outcomes, professional development, and funding. A lack of regular communication regarding state-wide environmental literacy initiatives and resources was also mentioned as a consequence of a loosely bound association of environmental educators. There are many strong local networks, however, and there is a sense that building the capacity of these local collaborative is a high priority in some regions.

Another topic that emerged from the groups was accountability for environmental literacy content. Participants shared that classroom teachers are under immense pressure to demonstrate that their students have mastered the math and reading skills measured in Virginia’s high-stakes SOL assessments. Also, some teachers are required to follow the adopted schedule in a district pacing guide that has little flexibility, thus making the scheduling of other interdisciplinary activities very difficult. Related to this topic is the teacher preparation. Many teachers need coaching and mentoring in order to teach environmental literacy topics effectively. Integrating environmental literacy into the curriculum is done very well by some teachers, but it does not come easily to all. Teachers are very busy and often do not have the time to make the links from rich outdoor learning opportunities to the SOL. Unfortunately, many teachers are not comfortable taking students outside for these learning experiences. Teachers have concerns related to health and safety. Additionally, both formal and non-formal educators shared that there is a lack of convenient, appropriate outdoor spaces for student learning. All groups expressed that classroom teachers need support in learning how to best deliver environmental literacy instruction.

Reliance on other people is an important emerging topic in the discussion about the current state of environmental literacy in Virginia. The term champion was used often to describe the people who take initiative to organize, implement, and maintain environmental literacy programs and projects. Champions understand and value environmental literacy and will seek funding and partnerships to make it happen. Champions include, but are not limited to, governmental agency personnel, non-formal educators, classroom teachers, building principals, professional association members, and community volunteers. The reliance on a few champions is a risky approach. For example, when a champion school principal moves or retires, often there is nobody to pick up the charge to sustain the environmental literacy initiatives in that school.

As expected, the availability of resources for supporting environmental literacy was a prominent topic. Resources, in this case, include more than just monetary funds. Focus group participants shared that there is a limited number of environmentally rich and convenient dedicated outdoor learning spaces where students can investigate natural systems. The parks and camps that are appropriate fill up quickly. Time is also a limited resource mentioned by the groups. Planning field trips and community events, writing grants, and developing partnerships are time intensive pursuits. These activities are seen as added responsibilities to the normal work duties of busy professionals.
Public awareness and community involvement was another important topic in the discussion about the current state of environmental education. Focus group participants expressed their disappointment that many people do not understand or value environmental literacy. They shared an overall frustration with the fact that many citizens of Virginia, including many teachers, do not appreciate the importance of learning about and protecting our natural systems. The term *environment* has been overused and politicized, resulting in a “green fatigue.” The groups report that those members of the general public who are interested in participating in environmental education activities have difficulty knowing where to go and who to contact to get involved. All focus group input is provided, sorted by region, in Appendix C.

**How current programs are implemented and what resources support these endeavors**

The focus group and survey respondents provided dozens of examples of how environmental literacy programs are currently implemented across the commonwealth. Many participants provided names of programs that are offered regionally, frequently through collaborative partnerships between formal and non-formal educators. School field trips to parks and other ecologically rich destinations were frequently mentioned. Another popular approach involves implementing programs developed by foundations and agencies for teachers to use in schools. Some popular programs include *Project WET*, *Project WILD*, and *Project Learning Tree*.

**Outside resources**

A key finding from both the focus groups and survey respondents is that many classroom teachers rely on resources from outside of the formal school structure – people, curricula, and grant funding – to teach environmental topics. Appendix D provides a list of the programs, sorted by region, that were considered by focus group participants as being model programs. Appendix E features the programs that are reported by survey respondents to be aligned with the Virginia Standards of Learning (SOL) and Appendix F is a list of programs that the survey respondents said are offered, but are not specifically aligned with the standards. These last two lists provide the verbatim responses from the surveys. Exact duplicates and responses that were considered not valid were removed from the list. Non-valid responses include responses such as “I do not know” and “No comment.” Respondents listed more programs aligned with SOL than not aligned with the SOL. There were over 200 responses in each category.

**Collaborative partnerships**

One of the emerging topics from the focus group discussions was the importance of collaborative partnerships. Formal and non-formal educators described how each needed the other in order to effectively support students in learning concepts and developing skills to become environmentally literate. Non-formal educators shared how they needed a “champion” in the schools in order to gain and maintain access to classrooms. These champions are typically teachers and/or school administrators who recognize the value of environmental literacy and are willing to do the work needed to secure funding and maintain contact with the people who can provide rich outdoor experiences for the students. Partnerships with governmental agencies, parks, foundations, and community organizations were all mentioned as key to the success of programs in the schools.
Common methods of professional development in environmental literacy
The VRUEC wanted to know how formal and non-formal educators receive professional development (PD) and the kinds of PD that were desired by educators. While professional development was a consideration in some focus groups, this question was addressed directly on the survey. Survey respondents were asked to indicate the types of their recent PD experiences (Item 9). Respondents were allowed to check all that applied to them. Of the 493 people who responded to this question, 328 indicated that they engaged in some kind of self-directed study such as reading books and journals and exploring websites. Other popular methods included field trainings, workshops, seminars, and conference sessions. Only 44 people indicated that they were taking courses in environmental literacy as part of a degree program. Figure 9 presents the responses for each type of PD. Formal and non-formal educator responses are combined.

![Figure 9: Recent professional development experiences in environmental literacy. Check all that apply. N= 493 survey responses.](image)

Topics requested by educators for professional development
Data identifying topics that educators would like to see addressed in PD programs were disaggregated in order to compare the survey responses from the formal and non-formal educators (Item 10). Each response was weighted so that the most important item was weighted 12 times more than the item counted the twelfth most important. In other words, items that present at the end of the axis labeled “most important” were selected as first or second much more often that the items that are less important. Both groups were interested in topics addressing earth and life sciences. Proportionally, formal educators expressed a much greater need for training in how to implement outdoor learning experiences, and the non-formal educators were more interested in some job related technical and...
management skills. About the same proportion of formal and non-formal educators expressed a desire for PD in teaching and general environmental education pedagogy. Figure 10 presents the topic areas and the number of respondents indicating that topic area of interest. The actual responses are found in Appendices G and H.

Figure 10. Topics requested for professional development. Formal educators: N = 45 survey responses; Non-formal educators N = 102 survey responses.

**Educators’ rankings of their most important needs**
The survey asked educators to rank challenges or problems (Item 11). Twelve areas of need were provided. The same list was given to the formal and non-formal educators and the data were disaggregated in order to see if formal and non-formal educators responded differently. The most important needs of formal educators, starting with the most important, were: funds for field trips, defined outdoor spaces, professional development, and curriculum materials. The most important needs for the non-formal educators were: defined outdoor spaces, professional development, funds for field trips, and curriculum materials. Note that while the order is slightly different, the same needs were
identified by both groups of educators. Figures 11 and 12 provide the ranking of needed resources for formal and non-formal educators.

Figure 11. Survey responses to the most important needs of formal educators. N = 167.

Figure 12. Survey responses to the most important needs of non-formal educators and community members. N = 336.
What educators would like to see being done

The focus groups participants were asked to share their thoughts on what they would like to see in environmental literacy. Five topics emerged from these data. The topics and samples from the focus group are found in Table 4. Appendix H has all of the responses sorted into regions.

Table 4

<table>
<thead>
<tr>
<th>Emerging topic</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organized and accessible resources</td>
<td>A central repository of environmental education information</td>
</tr>
<tr>
<td></td>
<td>Use technology better to get the message out</td>
</tr>
<tr>
<td></td>
<td>Communication network to allow agencies and schools to know about programs</td>
</tr>
<tr>
<td></td>
<td>Identify champions</td>
</tr>
<tr>
<td></td>
<td>A resource book of agencies, organizations, resources</td>
</tr>
<tr>
<td></td>
<td>Calendar of environmental events</td>
</tr>
<tr>
<td>(35)</td>
<td>Buy in from school administrators</td>
</tr>
<tr>
<td></td>
<td>Stipends for teachers</td>
</tr>
<tr>
<td></td>
<td>Get the environmental experts into the schools</td>
</tr>
<tr>
<td></td>
<td>Consistent funding support for environmental education experiences</td>
</tr>
<tr>
<td></td>
<td>School yard areas for teaching and learning</td>
</tr>
<tr>
<td></td>
<td>Provide more training opportunities</td>
</tr>
<tr>
<td></td>
<td>Schools share scholarship opportunities with students</td>
</tr>
<tr>
<td>Administrative support</td>
<td>Engage people through neighborhood Community learning centers and programs</td>
</tr>
<tr>
<td>(28)</td>
<td>Enforce LEED facilities regulations for community use</td>
</tr>
<tr>
<td>Community education</td>
<td>Publicize Virginia Naturally</td>
</tr>
<tr>
<td>(40)</td>
<td>Improve service learning activities</td>
</tr>
<tr>
<td></td>
<td>Train volunteers</td>
</tr>
<tr>
<td></td>
<td>Incentives</td>
</tr>
<tr>
<td>Systematic approach</td>
<td>VDOE should help define what should be done</td>
</tr>
<tr>
<td>(58)</td>
<td>More accountability, an environmental policy in the curriculum framework</td>
</tr>
<tr>
<td></td>
<td>Integrate environmental literacy every year</td>
</tr>
<tr>
<td></td>
<td>Students should graduate with understanding of natural work</td>
</tr>
<tr>
<td></td>
<td>An integrated curriculum</td>
</tr>
<tr>
<td></td>
<td>Organization to do strategic planning for sustainability and environmental literacy</td>
</tr>
<tr>
<td>Teacher preparation and PD</td>
<td>Require teachers to learn about environment in higher education programs</td>
</tr>
<tr>
<td>(24)</td>
<td>Teach teachers about systems</td>
</tr>
<tr>
<td></td>
<td>Teachers need to be trained to be more comfortable and confident teaching outside</td>
</tr>
<tr>
<td></td>
<td>Handbook that will link environmental education with the SOL</td>
</tr>
</tbody>
</table>

The difference between current practice and what stakeholders would like

The needs assessment reveals that there are gaps in two major areas. First, there is a need for more organization of and accessibility to information about environmental literacy. Focus group participants and survey respondents mentioned that it is challenging for educators and community members to find
resources and opportunities to engage in environmental initiatives. Some websites, such as Virginia Naturally, have great background information, but current information about experts in the localities and events scheduled in local communities is difficult to find. During the focus groups, participants frequently shared information with other participants who were surprised to learn that some guide or reference material they were working on had already been developed by someone else.

The second area of need is in policy. There is a strong desire for more explicit student learning outcomes to be mandated by the state. Many participants mentioned that if environmental concepts are not specifically listed in the Virginia Standards of Learning (SOL) and tested, then teachers will not feel compelled to teach the content. Many teachers were prepared in traditional teacher education programs wherein the methods for the disciplines were not taught in using an integrated approach. Formal educators, a group that includes classroom teachers and other school personnel, and non-formal educators shared that many teachers are struggling to find ways to squeeze environmental literacy into an already packed day instead of seeing environmental literacy as a way to address many student learning outcomes in several content areas simultaneously. Local constraints, such as district pacing guides, are also challenging to a teacher who wants to try to take an approach that is different from the one that has been adopted in the school. The result of this challenge is often that environmental literacy experiences, such as field trips to environmentally rich learning locations, are scheduled for the end of the school year, after the state standardized tests have been administered. The timing of this instruction gives the impression to students that the content is not as important as the other content that was addressed and reviewed before the tests. Teachers who take students on these trips are often not experts in environmental education and leave the teaching to the on-site volunteer or specialized personnel from the agency or association hosting the experience. Teachers’ lack of active engagement with field trip activities (e.g., just watching, seeing trips as “break time) serves to exacerbate the situation. Related to this desire to make learners more accountable for environmental literacy content is a need to fill the perceived gap in teacher preparation and professional development programs that results in teachers feeling uncomfortable or ill prepared to teach outdoors.

Promoting a higher level of environmental literacy in communities
The survey respondents were asked what would be the most effective way to promote a higher level of environmental literacy in communities (Item 12). Five topics emerged from these data. The topics and samples from the survey responses are found in Table 5. Sample comments were selected that represented the various types of comments that fit into the category in order to give the reader a general idea of the scope of the topic. Appendix J has all of the responses.

The first topic identified by the participants when asked what would be the most effective way to promote a higher level of environmental literacy in communities dealt with the school system. The participants in all regions stressed that there needs to be an integrative approach toward environmental education with less emphasis on teaching discrete topics narrowly aligned with SOL items. Implementing this type of curriculum requires educators to coordinate their efforts with teachers in other content areas. Teachers need extensive professional development to learn how to integrate curriculum using a hands-on approach and the tools that support this type of curriculum. The
participants also emphasized that there should be a mandatory environmental education requirement for graduation in the public schools. There must be greater support for non-formal activities, such as field trips and schoolyard exploration.
Table 5

*Sample Responses to Survey Item 12: In your opinion, what would be the most effective way to promote a higher level of environmental literacy in communities?*

<table>
<thead>
<tr>
<th>Topic</th>
<th>Sample comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>School System (146)</strong></td>
<td>Mandate requirements for graduation in the public school system.</td>
</tr>
<tr>
<td></td>
<td>Have Virginia standards of what our expectations are for strong environmental literacy.</td>
</tr>
<tr>
<td></td>
<td>Move away from teaching to SOL tests and more into conceptual.</td>
</tr>
<tr>
<td></td>
<td>More hands on material and training for teachers.</td>
</tr>
<tr>
<td></td>
<td>Schools allowing more time for non-formal education (field trips, school yard exploration).</td>
</tr>
<tr>
<td></td>
<td>More Hunter Safety Courses and Bowhunting Courses in the schools, especially if aligned with existing programs such as National Archery in Schools Program (NASP).</td>
</tr>
<tr>
<td></td>
<td>Integrate environmental education into current curriculums (and not as a separate course). Provide teachers with hands-on experiences &amp; tools so they can transform all lessons</td>
</tr>
<tr>
<td><strong>Higher Education (64)</strong></td>
<td>We need leadership training for teachers to complete Master’s degree programs as leaders in EE to act as local resource persons.</td>
</tr>
<tr>
<td></td>
<td>Train teachers who teach students. Students take action and participate in community-wide education initiatives. If students understand and are asked/required to take action, they are likely to have a greater impact on the uninformed adult community around them. These adults hold the purse strings for impact in the future.</td>
</tr>
<tr>
<td></td>
<td>Connect with STARS (Sustainability Tracking Assessment and Rating System) for higher ed.</td>
</tr>
<tr>
<td></td>
<td>Have an environmental literacy component for pre-teachers.</td>
</tr>
<tr>
<td></td>
<td>Provide a method for Certification for Environmental Educators.</td>
</tr>
<tr>
<td></td>
<td>How about an incentive for businesses to go greener and get employees involved?</td>
</tr>
<tr>
<td></td>
<td>How about incentives for families to go green... help homeowners to get geothermal?</td>
</tr>
<tr>
<td></td>
<td>In school programs followed by community activities that re-enforce the benefit.</td>
</tr>
<tr>
<td></td>
<td>Expand the grassroots organizations such as Synergy, Truxtun Millenium with resources and policy and leadership presence.</td>
</tr>
<tr>
<td></td>
<td>Continue to bridge between education community and the agencies and groups actually doing the work to improve the environment. By bridging these groups you raise the conscience of the community from the ground up – starting with children.</td>
</tr>
<tr>
<td></td>
<td>Free programming in museum or library setting. But it must be hands-on in the field or bring the field into the classroom.</td>
</tr>
<tr>
<td></td>
<td>Tie it to economic development.</td>
</tr>
<tr>
<td><strong>Community (153)</strong></td>
<td>The most effective way to promote a higher level of environmental literacy is to start at the top – the reason this is important to all Virginians should be supported by the Governor’s office and the General Assembly.</td>
</tr>
<tr>
<td><strong>Public Policy (27)</strong></td>
<td>Every public school should have an active environmental education program, whether through internal curriculum or external partnerships. (Requires policy at the state level.)</td>
</tr>
<tr>
<td></td>
<td>Support state policy and funded environmental literacy objectives vis a vis North Carolina.</td>
</tr>
<tr>
<td></td>
<td>Develop a method of block grants that would recognize and support the work of allied non-profits delivering EE in areas without easy accessible state resource capabilities.</td>
</tr>
<tr>
<td><strong>Public Relations (82)</strong></td>
<td>More exposure at meetings, conventions, etc.</td>
</tr>
<tr>
<td></td>
<td>Appealing local service oriented activities that involve residents where they live.</td>
</tr>
<tr>
<td></td>
<td>Gatherings in public spaces such as Earth Day celebrations.</td>
</tr>
<tr>
<td></td>
<td>Paid advertising on TV, radio, social media, cartoons.</td>
</tr>
<tr>
<td></td>
<td>More information to provide parents. More awareness.</td>
</tr>
</tbody>
</table>
The second topic that emerged from the needs assessment survey when asked what would be the most effective way to promote a higher level of environmental literacy in communities was higher education. The participants strongly urged teacher education programs to place more emphasis on environmental education. This emphasis should include initial teacher preparation, a component in the Master’s degree program, and a Certification for Environmental Educators. The participants stressed that pre-service teachers need to be actively involved in community-wide environmental programs and resource persons so they can develop a more comprehensive understanding of environmental education. These programs should connect with STARS (Sustainability Tracking Assessment and Rating System) for higher education.

The third topic identified by the needs assessment focused on the community. The participants emphasized the importance of building bridges with all community environmental groups. It is crucial to tie in economic development. Community programs must provide opportunities for youth through seniors. There needs to be a mechanism that connects community environmental groups.

The fourth topic that was identified by the participants when asked what would be the most effective way to promote a higher level of environmental literacy in communities was public policy. The participants stated environmental literacy is for all Virginians and must be supported by the Governor’s Office and the General Assembly. Therefore, greater interaction must take place with these groups. In order for environmental education to become a graduation requirement and part of every school, a policy change at the state level is needed. Block grants should provide a means for supporting non-profit environmental groups.

The fifth topic that emerged from the needs assessment survey was public relations. The participants emphasized a more comprehensive statewide public relations approach. This approach would include paid advertising on TV, radio, social media, cartoons, seminars, participation in local county fairs and school in-services.

**Conclusion and Recommendations**

The results of this needs assessment indicate the direction of the next steps for the VRUEC. There is a need to move toward a more structured system for addressing environmental literacy. This system should include components addressing organizational strength as well as education and professional development. This organizational component should include making information more accessible, providing opportunities for stakeholders to network and communicate efficiently, and informing the public of the importance of environmental issues. The professional development component should include working with state level departments to make environmental literacy of Virginians a high priority. Making teachers accountable for preparing our young citizens to participate in protecting and sustaining our environment requires a concerted effort in preparing them and providing them the resources to do so.

VRUEC is the logical group to lead next steps for the environmental community in the Commonwealth because it serves as an umbrella organization for this community. They have strong working
relationships with regional leaders, governmental agencies, formal, and non-formal groups. In particular, leaders of the Virginia Department of Education and Virginia’s Interagency Education Workgroup (VIEW) subcommittee seem to be well-positioned to coordinate plans to meet the needs of teachers, given their existing infrastructure supporting collaboration among Virginia science teachers and two key foundations, the Chesapeake Bay Foundation and the Virginia Foundation for Agriculture in the Classroom. It seems reasonable to consider providing support for formal and non-formal educators using a regional approach, given that when asked about their needs, both formal and non-formal educators listed professional development, funds for field trips, and defined outdoor spaces in their list of top three needs.

The Virginia Office of Environmental Education, Department of Conservation and Recreation, home of Virginia Naturally, should be considered as a place to start on addressing public relations issues, especially in providing information to citizens who are not connected to the schools. Virginia Naturally is the official environmental education program of the Commonwealth and has the infrastructure in place to disseminate information to and from stakeholders who work to promote environmental literacy through non-formal education channels.

There is a cadre of willing non-formal educators eager to participate in these environmental literacy initiatives. That there is a shared vision of the needs to be addressed to meet the goal of the VRUEC to have an environmental literate Virginia is a huge benefit for those who are ready to proceed with the state-wide plan, including a communication and marketing strategy within Virginia Naturally and other key organizations.
Barnes Technologies International, LLC

Barnes Technologies International, LLC (BTILLC) is a Virginia small, women-owned (SWaM) assessment and evaluation business. BTILLC has successfully conducted third party/independent evaluations, program evaluations, needs assessments, workforce studies, training programs, and curriculum development initiatives since 1985. BTILLC has become an internationally recognized leader in assessments and third party evaluations. Dr. Susan K. Barnes, Owner and Director of Operations, and Dr. James L. Barnes, Director of Research and Business Development, lead BTILLC. The staff is comprised of a cadre of worldwide associates with a plethora of expertise and experience. BTILLC integrates its highly capable and technically competent staff in order to tailor its services specifically to suit each client’s needs.

BTILLC’s staff have served as project directors and consultants to numerous leadership programs, curriculum development projects, and educational reform movements. The staff have conducted research projects, nationally and internationally, on problem solving and a framework for the study of technology. The staff members are actively involved in leadership at local, state, national, and international technology, education, evaluation and assessment, and training associations and organizations. This leadership included testifying before state and national technology, science, and educational hearings.

BTILLC clients are universities, Ministries of Education, State Departments of Education, school districts, and corporations in the European Union, United Kingdom, Germany, Poland, Slovakia, Belgium, Netherlands, Canada, and United States. Recent clients include the U.S. Department of Education, Virginia Department of Social Services, Virginia Department of Education, Harrisonburg-Rockingham United Way, the European Union, Purdue University, Penn State University, the Dublin Institute of Technology, the Hochschule Darmstadt and the Universitat Politècnica de Catalunya.

BTILLC is dedicated to providing the highest quality technology economic development, evaluation and assessment to improve client productivity and efficiency. BTILLC’s work product is design around three key competencies: assessment and measurement; education and training; and curriculum development.

Assessment and Measurement
BTILLC helps companies, non-profits organizations, municipalities, and educational institutions to measure their efficiency and performance. BTILLC will custom design instruments to uniquely assess or evaluate growth. BTILLC uses these instruments to conduct needs assessments, research studies, and third-party/independent evaluations to yield a thorough assessment or evaluation. BTILLC is committed to providing quality assessments and evaluations through:

Needs Assessment. BTILLC helps its clients assess expected learning, behavior and performance, cost-benefits of projects and options for desired change. BTILLC will conduct custom needs assessment to determine:

- Programmatic needs.
- Performance improvement and training needs.
- Curriculum needs.

Research Studies. To meet funding and accreditation requirements, BTILLC helps its clients understand global impacts and consequences due to political, economic, social and technological change. BTILLC will conduct qualitative and quantitative research studies to examine:
• Technological change.
• Public opinion about technology.
• Technology and the future.

Program Assessment and Evaluation. BTILLC conducts third party/independent evaluations in educational and corporate settings for curriculum implementation and training programs to assess standards performance and effectiveness. BTILLC will conduct custom third party evaluations of:

• Training programs.
• Curriculum innovations and implementations.
• Standards and quality assessment.
• School readiness and emergency management.

Education and Training
Providing the appropriate learning environment to facilitate the learning process is critical to student and workforce learning. BTILLC will custom design and implement educational and training workshops in curriculum development, technological literacy, national standards, cooperative learning, team building, problem solving, and critical thinking.

Train-the Trainer. BTILLC will custom design and implement educational and training workshops in curriculum development, technological literacy, national standards, cooperative learning and team building. BTILLC will conduct custom train-the trainer workshops in:

• Technological awareness.
• Technology education.
• Quality improvement.
• National and state educational standards.
• Problem solving.

Team Building. BTILLC helps educational institutions improve the teaching and learning process and helps companies improve efficiency through innovative seminars and workshops. BTILLC will conduct custom seminars and workshops in:

• Team teaching.
• Quality teaming.
• Cooperative learning.
• Collaborative learning.

Curriculum Development
Designing curriculum that is interactive and addresses learner's needs and diversity is key to educating and training students or the workforce. BTILLC will develop standards-based curriculum (E-Learning, On-Demand Learning, Computer-Assisted Learning, or traditional printed) for educational settings and training materials for corporate settings. BTILLC will develop standards-based curriculum for educational settings and training materials for corporate settings. BTILLC will develop custom educational and training materials that include:

• E-Learning.
• On-Demand Learning.
• Computer-Assisted Learning.
• Curriculum guides.
• Instructor guides.
• Training guides.
Key Personnel

Susan K. Barnes, PhD.  Dr. Barnes has over twenty-two years of experience in education and assessment and evaluation.  She became Managing Director of Operations of BTILLC when the company moved from Michigan to Virginia.  Dr. Barnes specializes in instrument design and data analysis.  Dr. Barnes is also an associate professor in the College of Education at James Madison University and has served as an adjunct instructor for the Virginia Community College System.  She taught pre-school and elementary education in both public and private schools.  Dr. Barnes has served as the lead teacher at the International Pre-School of The University of Michigan.  Dr. Barnes has served as a third-party evaluator for numerous BTILLC projects funded by U.S. Department of Education, including the Fund for the Improvement of Postsecondary Education (FIPSE) grant for Purdue University and No Child Left Behind Improving Teacher Quality grants (Title I) for James Madison University and Mary Baldwin College. Other program evaluation projects include Ford Motor Company’s targeted technology training programs, Federal Administration for Children and Families Early Learning Opportunity Act (ELOA) grant, Virginia Early Childhood Foundation partnership grants, and the Virginia Department of Social Services HAND training program.  Most of these projects required scale development to measure unique learning outcomes.  She is experienced in using quantitative and qualitative data analysis software. Dr. Barnes has an earned A.B in Education and an A.M. in Educational Studies from The University of Michigan in Ann Arbor and a Ph.D. in Assessment and Measurement from James Madison University.

James L. Barnes, EdD.  Dr. Barnes oversees all proposal development and research design.  He coordinates all needs assessment and benchmarking studies.  He is certified in National Incident Management Systems (NIMS) and Incident Command System (ICS) courses, Crime Prevention through Environmental Design (CPTED), Crisis Management and is very familiar with NIMS standards and protocol: (1) National Incident Management Systems, An Introduction; (2) National Response Plan, An Introduction; (3) Introduction to the Incident Command System; (4) ICS for Single Resources and Initial Action Response; and (5) Intermediate Incident Command Systems.  As Director of Research and Business Development, Dr. Barnes oversees all proposal development and research design.  He coordinates all needs assessment and benchmarking studies.  Dr. Barnes is the former Assistant Economic Development Director for Technology for the City of Harrisonburg, and is currently Professor Emeritus of Integrated Science and Technology at James Madison University.  He has worked in the science and technology field for over thirty-five years.  Dr. Barnes is also a co-principal of Barnes Technologies International LLC.  Prior to joining the faculty at James Madison University, Dr. Barnes was the Director of NASA RISE, a NASA research institute at Eastern Michigan University.  Dr. Barnes has also directed a technology research center at The University of Texas at Austin and has served as President and CEO of two technology research companies.  Dr. Barnes earned his baccalaureate and doctorate degrees at Virginia Tech and his masters at Virginia State University.  Dr. Barnes has conducted many research projects, published numerous articles, and has authored several books in his research areas of Innovation, Problem Solving and Sustainability.  His current research examines how understanding systems and their interaction influence solving complex global problems.
Appendix A: Focus Group Guidelines

Focus Group Protocol  Virginia Resource-Use Education Council Needs Assessment

I. Purpose of the focus group

The purpose is to gather information from informed stakeholders for the VRUEC Needs Assessment by providing overall impressions of Virginia environmental literacy programs as they are currently implemented, sharing what they would like to see being done, and identifying resources needed.

II. Guidelines for focus group discussion and recording

1. Participants will listen to and respect each other.
2. All ideas have value and will be recorded and considered.
3. Ideas will not be debated by the focus group. The goal is to gather information, not to build consensus.
4. Responses will be anonymous and reported in aggregate.

III. Materials

1. Copy of survey and a pencil for each participant.
2. Paper and markers for recording notes (facilitators).

IV. Focus group process:

1. Greet and thank participants for sharing their time and expertise. Invite them to get a snack.
2. Provide a copy of the VRUEC Survey Comment Form and pencil or pen. Invite participants to jot down comments about the survey. Allow no more than 10 minutes for this process after the stated start time.
3. Introductions. Announcements from the host (rest rooms, parking, etc.).
4. Review the purpose of the focus group. See notes in section I.
5. Review guidelines for focus group discussion. See notes in section II.
6. Describe the straw poll and round robin reporting techniques for probing opinions quickly and then allowing all participants to share.
7. Give overview of the three questions. They will all be discussed.

   What is the current state of environmental literacy?
   What is working well and could serve as a model for other regions?
   What would you like to see being done? What is missing and why?

8. Answer any questions.
9. Start discussion.
10. End at announced time.

Thank you for your time!
Appendix B: Survey Text Used to Create Web-based Survey

   (Full-time/part-time) Primary Audience (people with whom you work at least 50% of the time)
   - PreK5 classroom teacher
   - Middle or high school teacher
   - PreK12 resource or special education teacher
   - School administrator (e.g., principal, curriculum supervisor, school board representative)
   - Parent or other involved family member (people who help with environment education projects or chaperone field trips, but who are not professional environment educators)
   - Non-formal natural resource/environmental community educator (e.g., nonprofit environmental educator, state park staff, SWCD educators, Master Naturalists, extension, museum staff)
   - Natural resource professional whose primary responsibility is not teaching (e.g., farmer, rancher, forester, miner, logger, landscaper, mariner, researcher)
   - Federal government representative (federal resource agency, park service, military facilities)
   - State government representative (legislators, state agency personnel)
   - Local government (e.g., county administrators, planning district commissioners, mayors, board of supervisors members)
   - Business representative (people who primarily work with agribusiness, green industries and other environmental business enterprises)
   - Adult student
   - Other

2. Please select one region, the one in which you live, and then add the name of your county or city in box at the bottom of the list.
   - Region 1 Central VA
   - Region 2 Tidewater
   - Region 3 Northern Neck
   - Region 4 Northern VA
   - Region 5 Valley
   - Region 6 Western
   - Region 7 Southwest
   - Region 8 Southside
   - Outside of Virginia

3. The VRUEC Policy Committee defines the term "environmental literacy" as a fundamental understanding of ecological principles, the systems of the natural world, and the relationships and interactions between natural and manmade environments. To what degree do you agree with this definition?
   - Strongly disagree     Disagree      Neither agree or disagree      Agree      Strongly agree
   Comments

4. How important is environmental literacy to you?
   - Not very important    Somewhat important    Important     Very important
   Comments
5. How important are non-formal, community educators (e.g., state park staff, Master Naturalists, extension, and SWCD educators) in providing programs and services to PreK-16 audiences?
Not very important  Somewhat important  Important  Very important  I do know

Please tell us about the programs and services being implemented in your region that support environmental education and literacy. In the first column list the programs that you know are intentionally aligned with the Virginia Standards of Learning (SOL). In the second box, list programs offered that may not be aligned with the SOL but address environmental issues. In the third box, list programs that you would like to see offered in your region, but are not implemented. You may list several programs in each box. Simply put a period between each program title or brief description.

6. Programs offered that are aligned with the Virginia Standards of Learning (SOL)

7. Environmental education programs offered that are not intentionally aligned with the SOL

8. Programs that you would like to see offered, but are not implemented in your region

9. Identify your recent professional development experiences or trainings in environmental literacy. Check all that apply.
(See list after number 10)

10. What type of professional development experiences do you need? Check all that apply. Please include topics or areas of interest.
Field trainings
Webinar (single session)
Conference session
Meeting or seminar
One day workshop
Multiple day workshop
Courses online
Courses delivered face-to-face
Certification program
Degree program
Self-directed study (e.g., reading books, journals, websites
Other (Please specify.)

11. Of the limitations listed below, which three create the greatest challenges for you as you work to support environmental education and environmental literacy for your students, workforce, or clients? Rank the biggest problem as 1.
Time for teaching/training
Space (classrooms or meeting facilities) for teaching/training
Training materials or curriculum
Funds to purchase training materials and supplies
Professional development for myself
Trainers to facilitate professional development sessions
Support from my supervisor/administrator
Funds for travel

12. In your opinion, what would be the most effective way to promote a higher level of environmental literacy in communities?
Appendix C: What is the Current State of Environmental Literacy?

Focus group response from Region 1

If not attached to SOL it does not happen.
Teachers not involved when non-formal educators come to work (break-time).
Teachers make value judgment and cancel Blue Sky field trip.
Some commitment to get outside, but not from all schools.
SOLs have strong connection to environmental literacy, but many teachers do not see forest for trees.
   They do not see the connections.
A result of NCLB - "No Child Left Inside."
Teachers through more professional development are getting more aware of environmental literacy.
Not enough people to go around.
Parent involvement missing.
Lots of volunteers, but some cultural barriers. Lack of reaching out to minorities or low SES communities
   -- lack of representative participation -- due to result of need to focus on other essential
   demands on limited resources or time.
Lots of "lone wolfs" operating within their own networks or on their own.
Virginia Naturally is "scant" on resources and not laid out in a way that is easy to navigate.
Hard to get people with great programs into schools.
Inconsistent environmental education even within the school district -- depends on AYP - what they do.
Community-based programs are not always open -- depends on the community.

Focus group response from Region 2

Norfolk Southern programs.
One shot programs.
No blanket organization for environmental literacy.
School programs that have supportive administrators are maintained.
VIMS-NASAS - Other programs not coordinated.
UVA's Learning Barge.
Virginia Power's programs.
Not all schools have easy access for outside environmental experts and volunteers.
NASA Langley conducts professional development for teachers.
Environmental literacy exists in schools where teachers understand how to integrate environmental
   content with SOLs.
Many environmental champions exists in region, but not always known.
Difficult to transport students to participate in environmental programs.
Need to teacher workshops.
Many environmental camps get booked quickly.
Most schools limit the number of field trips to one per year.
Teachers are reluctant to repeat the same field trip year after year.
Environmental activities must be tied to SOLs.
Appendix C Continued: What is the Current State of Environmental Literacy?

Teachers are too busy to make connections from workshops to classroom. Lack of knowing about environmental activities and programs within region.

Focus group response from Region 3

Outside of school system there are a lot of retiree programs. But access is missing for younger/school aged children, i.e., Master Naturalist classes taught during school hours.

Very spotty -- some engaged - some absent
Depends on individual teachers and their relationships with institutions.
Some administrators are passionate
High turnover of teachers -- the young/new teachers are concerned about meeting the pacing guide -- they feel they do not have time for environmental literacy -- it is an add-on.

Funding is a major issue.
Piecemeal approach.
Cannot reach all people.
Communication is a concern -- administrators change often.
Teachers do what they need to do to meet SOLs and pacing guide requirements.
When teachers bring in someone from the outside they give up an instructional block.
Some schools do environmental literacy in a systemic way.
Community participation is spotty.
Interdisciplinary approaches do exist.

Focus group response from Region 4 GMU

Arlington really engaged -- Fairfax somewhat engaged.
Urban area has greater sense of responsibility.
Some regions are not planned.
More volunteers in Arlington.
Definition of environmental literacy not consistent across region.
Some have taken on national frameworks.
There is a "green fatigue".
People in region do not have a concept of earth systems.
The term "environment" has become politicized.
Sustainability is a vague term in region.
Not every flexible -- do not tailor programs for different audiences.
People exist who have backgrounds in various aspects of environment, but not a good way of identifying them.

Focus group response from Region 4 BEF

Rural-based programs.
Some families/children are disconnected from the real world.
Lack of systems approach.
Appendix C Continued: What is the Current State of Environmental Literacy?

People realize how little they know about the environment after some exposure. There are some teachers who are environmental literacy champions. Lack of a consistent definition of environmental literacy. Communication lacking do not know about other programs being offered by other groups. People who are interest in the environment exist within region, but unless they take the initiative, they are not known. Lack of alignment with SOLs. Teachers feel uncomfortable in non-formal environments. Science Fair model not aligned with environmental literacy. Lack of coaching and mentoring for teachers. Lack of accountability.

Focus group response from Region 5

Some elective and AP environmental literacy classes in schools. Building capacity through teacher training. Lack of resources. SOLs a roadblock. Lack of environmental literacy champions in schools. Lack of know community experts. Lack of school field trips. Lack of community involvement. Environmental literacy stakeholders meet infrequently. Virginia is behind the curve, compared to other states. Lack of regional and state network.

Focus group response from Region 6

Overall lack of environmental literacy. Not included in science or social studies in middle school. Included in some elementary and high schools. Some elementary schools have recycling programs. Individuals monitoring the Dan River. Kiwanis funds school field trips. Lack of grant-funded projects. Gifted program in schools has some emphasis on environmental literacy. Danville Parks and Recreation programs, including summer activities. NOAS B-Wet grant. Stream team clean-up. Several strong non-formal environmental groups.
Appendix C Continued: What is the Current State of Environmental Literacy?

Focus group response from Region 7

A great deal of turnover with State Park personnel - hard to keep up with changes.
Regional population is not dense.
Geography makes it difficult to participate in programs.
SWEET - Southwest Environmental Education Team.
Upper Tennessee Roundtable.
New River initiative.
Use e-mail to connect environmental educators.
Lack of education funding for agencies.
Learned to live with a lot of frustration.
Teachers and professors write grants to implement programs.
Partnerships needed for grants.
Eco-tourism is growing in region.
Informal educators in schools.
Need balancing of funding for environmental education -- not all money going to the Bay.
VISTA has money for teacher training.
SOLs are improved through agencies working with schools.
Teachers are required to follow pacing guides - makes teaching environmental education tough.
Coal is a big factor in region.
Environmental activities and programs are spotty in region.
No consistency of programs.
The rivers are studied by people from people outside the region -- some local water monitoring projects.
 Variety of outreach programs.
Environmental activities exist in schools where there is strong leadership.

Focus group response from Region 8

Master gardener programs.
Master naturalist programs.
Environmentalists are not working as a community -- work in isolation.
Friends of the Appomattox River.
State Parks.
Bird Clubs.
Hunting Clubs.
4H.
Ecology Club in elementary and high schools.
Globalization Society.
Wildlife Society.
Soil and Water Conservation Workshops for teachers and students.
Longwood University Summer Programs.
Landowner workshops.
VCE.
Online workshops for farmers.
Rainbow Workshops for professions -- information sharing.
Websites, Facebooks, etc.
People find out about environmental programs by word of mouth, newspaper, and annual reports.
A lot of movements, but lack of coordination.
Not a sustainable approach to high school curriculum.
Farm Bureau is active.
Smokey the Bear visits schools.
SOLs create problem for introducing environment education.
Limited time in schools to teach environmental education.
Lack of community understanding about environmental issues.
Teachers lack confidence, knowledge, and training to implement scientific method.
Children reluctant to go outside for environmental activities.
Teacher fear taking children outside because of liability issues.
Lack of partnerships.
If a champion moves out of the region, contacts are lost.
Video link to Guatemala to chat with students about irrigation system.
SOLs emphasize Chesapeake Bay, but not any other watersheds.
More funding for areas outside the Chesapeake Bay eater shed.
Environmental education is viewed as an add-on.
Teachers do not know how to transition education to the outdoors.
Teaches do not know how to integrate curriculum that could be done through environmental studies.
Appendix D: What Is Working Well and Could Serve as a Model for Other Regions?

Focus group response from Region 1

Blue Sky (Richmond b/a school) -- outdoor education -- emphasis in 3rd, 5th, and 7th grades + summer weekend program.
Randolph Farm.
Family Fun Days (with tree planting).
Environmental Education Wheel by Akiima Price -- EE capacity project.
Conference activities.
Greenwich Environmental Educators Network.
Virginia State University - 4H - speakers and agriculture programs.
Virginia Naturally.
Ellen Reynolds - Boyle Preserve Farm
Virginia Cooperative Extension Service works with Petersburg City Schools.
Farm to School Program.  Grow Local, Buy Local Movement.
Food system education.
Summer camps.
Farmer’s markets.
Doug Tallaway - Habitat and water monitoring projects -- People’s National Park.
Ag in the Classroom.
Project Wild.

Focus group response from Region 2

Hampton Parks and Recreation partners with NASA Langley.
UVA Summer Eastern Shore Camp.
VIMS Summer Camps (free).
Department of Forestry Camps (free).
Soil and Water Conservation Summer Camps (free).
Williamsburg Botanical Gardens.
Anheuser Bush funds projects.
NASA Langley teacher and student programs.
School outdoor learning gardens/outdoor classrooms
Virginia Space Grant Consortium programs.
GLOBE.
Virginia Tech Cooperative Extension.
North Westover Park.
Chesapeake Parks and Recreation.
Chesapeake Public Works Department.
Various river projects such as the University of Virginia Learning Barge and Virginia Power.
Wetland planting restoration project.
Hampton Rhodes Green Grants.
Ag in the Classroom.
Using Google Earth to follow Chesapeake Bay Watershed.
Linking Eastern Shore schools to track bird migration to South America.
E Pals projects that study Dismal Swamp and Chesapeake Bay Watershed.
Mary Baldwin NOAA program for teachers.
World monitoring projects.
Appendix D Continued: What Is Working Well and Could Serve as a Model for Other Regions?

ESRI.
Environmental literacy is seen as part of greater STEM culture.
Clean the Bay Weekend.
Hampton Roads Association for Environmental Education.
Chesapeake Environmental Council.
Virginia Living Museum - Hummingbird Activities.

Focus group response from Region 3
River-Bay Partnership with William C. Sandy Point State Park.
Friends of the Rappahannock involved with schools in Fredericksburg.
Enthusiastic teachers.
Gloucester County Public Schools -- all teachers are teaching environmental literacy.
Three River Environmental Group -- "A River Runs Through Us"
Teacher training in summer and school year programs brought to schools -- lessons align with pacing guide.
State parks provide opportunities for environmental literacy.
Belk Isle -- wetlands -- community effort
VIMS Discovery Lab -- provides environmental literacy opportunities for families in evenings once per month.
NOAA Community Education Programs for general public.
NPRA - Spring Paddle to learn about watershed.
Rain barrel workshops.
River Stewardship Day.
Trips to Hewlett's Point or Westmoreland - tied to SOLs.
John Smith Water Trail, estuaries, camps -- some paid for so children can gain new experiences.
School age children use social media to share information -- students self-select to participate in agency-sponsored programs.
Green Dreams - interest group of people who do not go to formal programs.
Gleaning programs.
Organic farming program -- cooperative.
State competitions.
Field trips on the Rappahannock.

Focus group response from Region 4 GMU
Work with affordable housing.
4H - WHEP.
Green Drink.
Environmental contests - junior wind energy.
School Environmental Showcase.
Project-based learning.
Networking opportunities.
Train-the-trainer workshops.
Master junior gardener.
Appendix D Continued: What Is Working Well and Could Serve as a Model for Other Regions?

Focus group response from Region 4 Blandy Experimental Farm

- Blandy Experimental Farm programs.
- Work of county easement authority.
- Ducks and Wetlands.
- National Park Service programs.
- Chesapeake Bay Foundation.
- Water conservation programs.
- Trout in the classroom.
- Virginia Cooperative Extension programs.
- AITC.
- Parks and Recreation.
- Civic groups – Rotary, Lions, etc.
- Smithsonian programs.
- Some school field trips.

Focus group response from Region 5

- Master Naturalist program.
- Master Gardener program.
- Forestry camp.
- James River Outreach, sponsored by Dominion.
- Green Adventure.
- Project NOAA at Mary Baldwin.
- Soil and Conservation District programs.
- FFA, where available.
- 4H.
- Higher education environmental science department grants.
- Teachers provide placements for higher education student research and field experience.
- Project-based learning.

Focus group response from Region 6

- Project Wet.
- Butterfly station garden.
- Harvest Foundation Funds.
- Master Gardener.
- Kiwanis funding field trips.
- 4H and Scouts.
- YMCA/YWCA.
- Master Naturalist.
- Henry County - Duck and Willy Trail.
- Galileo Project.
- Foundation funds from hospital partnership.
- Goldstar - Poster contest.
- Parks and Recreation programs.
Appendix D Continued: What Is Working Well and Could Serve as a Model for Other Regions?

Danville City landscape staff training.
Philadelphia water report provides a nice communication model.
DARVA.
National Geographic Field Scope provides a nice model.
Virginia Cooperative Extension.
piedmont Transportation Tire Program.
James River Expedition could be model for Dan River.
Virginia Wind Consortium.

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Focus group response from Region 7

Project Wild.
Project Wet.
Project Underground.
Natural Tunnel State Park.
Lake Estonoa.
Geospatial program with Virginia Community Colleges.
KidsTech University.
Bookfest.
Virginia Science Festival.
Bridge programs for braking college bubble.
Norton-based forestry teacher program.
Industry-based programs.
Church-based programs.
DGIF - safety education program.
College of older adults -- many classes emphasize a naturalist approach.
Forest makeover program in Grayson, Carroll, and Wythe counties.
Upper Tennessee Roundtable.
Project Learning Tree.
GLOBE.
KARST.
4th Grade Field trip to Virginia Tech to Geology Museum.
Department of Forestry Education Centers.
Local meetings on environmental issues.
Summer camps -- GIS.
Master Gardener Day camp.
Master Naturalist.
4H
Virginia Tech and partners week-long water quality/wildlife/forestry program for 5th graders.
Kids in the Creek - 6th grade program.
Kids in the Outdoors for families.
New River Initiative.
Forestry in the Schools.

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Focus group response from Region 8

Master gardener programs.
Master naturalist programs.
Appendix D Continued: What Is Working Well and Could Serve as a Model for Other Regions?

Friends of the Appomattox River.
State Parks.
Bird Clubs.
Hunting Clubs.
4H.
Ecology Club in elementary and high schools.
Globalization Society.
Wildlife Society.
Soil and Water Conservation Workshops for teachers and students.
Longwood University Summer Programs.
Landowner workshops.
VCE.
Project WILD.
Project WETet.
Project Learning Tree.
Ag in the Classroom.
Project Underground.
FFA.
Girl Scouts.
Partnerships amongst agencies.
MWEE - watershed activity.
Environmental Integrative Context.
Cumberland County Education for Sustainability Pilot.
NOAA and National Geographic Chesapeake Initiative.
Nature Explore Teacher Training for Arbor Day.
Tangier Island research.
Appendix E: Survey Responses to Item 6 - Programs Offered Aligned with the SOL

Valid and unedited survey responses to item 6

3 programs.
3rd-12th Coastal Ecology Program. MWEE opportunities.
4H Boxerwood Woodland Garden
4-H Forestry School Enrichment Program
4-H natural resource programs
4-H Programs
4-H Programs, SWCD Programs, Virginia State Parks: Your backyard Classrooms, Project Learning Tree, Project WILD,
4-H school enrichment programs - tree seedlings, Virginia resources,
4th grade in-school 4H clubs  6th grade science enrichment classes  Per-educator workshops
4th grade watershed activity
4th grade watershed curriculum
A River Runs through Us (TREE MWEE program).  At the River’s Edge (FOR’s Field Education Program).
Student Stream Team (FOR’s MWEE program). Urbanna Oyster Festival Think Outside the Sink (NNSWCD field experience program) Teacher-in-training env. ed. internship
A wide range of programs are offered to schools by the Fairfax County Park Authority, including MWEE programs. There are too many to list.
ADVANCE TRAINING THROUGH LYNCHBURG COLLEGE @ CLAYTOR CENTER
Ag Day SWCD King William and King and Queen Counties
All of the programs through the Danville Science Center are vital In the past, we have used Project Learning Tree and Project WET. It would be great to have refresher courses available..
all programs that are public-school oriented. many home-school oriented programs. Envirothon.
Regionwide litter/recycling initiative.
All public ed core classes
All the local agencies and locations have aligned their programs to meet the SOL standards very effectively.
all the Projects such as WET, WILD, PLT. Rivanna Conservation Society. Green Adventure Project. Camp Albemarle.
ANS- Rust sanctuary
askHRgreen.org
Biology
Biology Courses
Blandy Experimental Farm Field Investigations (18+ programs)
Blandy Experimental Farm preK-12 Ed programs.  BLue Ridge Wildlife Center Outreach programs
Discovery Museum
Blandy Experimental Farm PreK-12 Programs. Smithsonian Conservation Biology Institute School Programs. Shenandoah National Park K-12 education programs
Appendix E Continued: Unedited Survey Responses Listing Programs Aligned with SOL (Item 6)

Blandy Experimental Farm Programs - formal and informal educational programs K-12 students and teachers. Project Wild Programs in various locations. Student outreach programs SNP. Student outreach programs Sky Meadows State Park. Teacher workshops through SNP.

Blue Sky
Blue Sky Fund Outdoor Education
Boxerwood Education Association, Rockbridge County.
Boxerwood Gardens and Education Center. READY 21st century grant-some programs.

BWET
Camp Albemarle for Albemarle County and City of Charlottesville fourth graders. Envirothon.
Camp Albemarle MWEEs Project Wet Project Wild School visits Project Undergrounds
CBF Field Programs, GK12 PERFECT Program - VIMS, CBNERRS field studies trips & lab support trunks, VA Living Museum programs
CBF field trips. Friends of Dragon Run Activities.

Chesapeake Bay field trip experiences
Chesapeake Bay Foundation professional development
Chesapeake Bay Foundation routinely emails information. The Portsmouth Public Schools science department has implemented a class, textbook, and library materials for an environmental education program called "Growing Up Wild.

Chesapeake Bay Foundation school/group programs
Chesapeake Bay foundation teacher programs.
Chesapeake Bay Governor's School for Marine & Environmental Science (this is a public k-12 program, not non-formal ed; not only does CBGS intensively educate its own students, but also does various forms of outreach to the community, local elementary schools, etc)

Chesapeake Experience Chesapeake Bay Foundation Department of Conservation Resources (DCR)
York River State Park
Chesapeake Studies - The objective of the Chesapeake Studies project is to provide every 7th grade student in Gloucester, Mathews, and York Counties with a meaningful Chesapeake Bay experience that is deeply integrated into the classroom. Climate Education for a Changing Bay - The overall objective of CECB is to improve climate literacy within local high schools by advancing the use of locally relevant environmental data and information in classroom curriculum, field experiences, and professional teacher training. Teacher Professional Development - Various trainings offered including Estuaries 101 which is correlated to the state standards.

Chesapeake Studies for VA Middle Schools Climate Education for a Changing Bay for Gloucester and Mathews High School classroom presentations, outreach, lessons for teacher to take to classrooms
Appendix E Continued: Unedited Survey Responses Listing Programs Aligned with SOL (Item 6)

Claytor Nature Study Center PreK-12 Environmental Education Programs including field trips, classroom lessons and afterschool classes offered through 21st Century Grant Partnerships (CLCs). Programs offered by Lynchburg Parks and Recreation Nature Zone Environmental Interpretation Programs offered through the state parks James River Association Paddle Experiences
Clean Valley Council programming Blue Ridge Land Conservancy Bay Day Western VA Water Authority programming
Clean Valley Council, Camp Roanoke (to a certain extent), Science Museum of Western VA, Apple Ridge Farms
Clean Virginia Waterways/Longwood University offer professional development workshops for teachers. These focus on the Chesapeake Bay, water conservation, watersheds & related issues. Workshops stress inquiry-based, student led investigations.
composting, water harvesting, soil health, recycling, Earthday/arbor day tree programs, erosion, soil and water conservation practices
Danville Science Museum programs
DCR Your Backyard Classroom. Projects Wet, Wild and Learning Tree
e.g VA Cooperative Extension Junior Master Gardeners (JMG) - old correlations were done as labor of love but need updating. (very cumbersome), Ready set grow for 4th graders,
Earth Science class in Augusta County school district. Ecology class in Waynesboro school district
Eastern Shore Soil and Water Conservation District Outreach Programs Chincoteague Bay Field Station Coastal Ecology and Young Coastal Explorers School programs Chincoteague National Wildlife Refuge outreach programs
Ecology (portion of biology test)
Ecology Class in High School Earth Science
Ecosystems Alive
Educational programs offered to teachers at the 1-5 level Watershed education
EE programs like Wet, wild and PLT. some State Park interpretive program
Elementary and middle school programs
Environmental education programs at the State Arboretum of VA (Blandy Experimental Farm), Boyce. Shenandoah Valley Discovery Museum, Winchester. NOVA 4-H Center, Front Royal. Outreach programs by Friends of the Shenandoah River. Outreach programs by the Friends of the North Fork of the Shenandoah River. Environmental Fair at Powhatan School, Clarke County. Programs at Andy Guest State Park. School programs at Shenandoah National Park. Programs by Lord Fairfax Soil & Water Conservation District.
Environmental Focus Elementary school. Project WET. Project WILD. Growing Up Wild. Project Underground
Environmental literacy should be supported in the classroom; I am honestly unsure of how true this is for our region.

Environmental Science courses at the high school level. Science courses in general k-12 Programs offered in our area through non-profits, etc.

Environmental sciences at the middle and high school level

Enviroscape  water cycle activities

Enviroscape model demonstration  project wet watershed lessons such as ""incredible journey"", water cycle game

Enviroscape watershed presentations, soil structure and fertility, Water Wizard-includes Incredible Journey, groundwater model presentation, Macroinvertebrate Mayhem, chem. and biological water testing


Enviroscape, Kids in the Creek, Animal tracks/furs, Forestry

Envirothon, Meaningful Watershed Education Experiences (MWEE), SWCD Farm Days, SWCD Classroom Programs/presentations

Establishing butterfly gardens & other plantings with native plants

Farm Day  Classroom presentations

Farm Field Day for 3rd graders. Soils presentations for 3rd Graders.

field trip opportunities at informal science centers

Field Trips and outreach programs provided by a variety of places: Maymont, JRA, Rockwood, Three Lakes, James River Science in the Park, Lewis Ginter Botanical Garden. Project WET, WILD, PLT, etc

Field trips for elementary aged children on different natural topics aligned with SOL's; Ecology; Pond Studies; Watershed Programs; Seasonal Nature Programs;

field trips w/2,3,5,grades at ESNWR watershed festival for all grades w/ESSWCD

Game and Inland Fisheries workshops  Project Learning Tree & Project Wet  Math Science Innovation Center workshops

Garrett County's Hickory Environmental Education Center provides programs for K-12, per Maryland's Environmental Literacy Standards. Teachers wrote a lesson for each grade with MD Common Core Framework.

Green Adventure Project- offers MWEE, nature camps, support for summer camp, programs for Boys & Girls Club, programs for Parks & Rec. Chesapeake Bay Foundation. Boxerwood Nature Center. Ivy Creek Natural Area- some programs.

Green Adventure Project's Amazing Animal Adaptations for 3rd graders. Burley Middle School MWEE program. Woodbrook Elementary and Walton Middle School pilot programs: Discover your outdoor world project. Camp Albemarle school field trips.

Green kids thru Audubon Naturalist Society (Rust Sanctuary)
Appendix E Continued: Unedited Survey Responses Listing Programs Aligned with SOL (Item 6)

Growing Up Wild  Project Learning Tree
Growing Wetlands in the Classroom, MWEE,
Untangle a Food Web.A Day in the Life of Prey.Fill the Bill.Snakes Alive.Deadly Links.Water Hits the
Soil and the Soil Runs Away.Soil Layers Let's Get to the Bottom of Them
High school students teach sixth graders MWEE at a local park.
http://www.vmhn.net/content/File/Documents/1EducationGuide13-14webLRFinal.pdf
Hunter Safety Course

I am responding as Director of the Chesapeake Bay Governor's School for Marine & Environmental
Science. A key element of our curriculum is environmental education. The science courses offered
are: Marine & Environmental Education I & II; Foundations of Science, Chemistry, and Physics. Not
all of these courses include SOL or the SOL tests. Students also receive dual enrollment through
Rappahannock Community College.

I am unsure of other organization’s program alignment with SOLs Some of the Blue Ridge Wildlife
Center’s programs cover some SOL topics
I have been conducting a Meaningful Watershed Program called ""Focus on Fisheries"" with my classes
for over eight years. VIMS has started a pilot program on Climate Change and Sea Level rise with
our freshmen Earth Science students.

I think that meeting the SOL are important. It is a great way for park interpreters to have a way into
school classrooms. It is a justified way to meet the standards and hopefully get children excited
about their local parks and the programs they offer. I also require that if we are making school visits
that the school comes out to the park to continue the program.

I trust there are some, but I am not connected to that segment of the EE community.

I typically use project Wet, PLT, and Wild in my in-school enrichment programs throughout the school
year. I work with 4th, and 6th grade on environmental literacy, and STEM. I also offer day camps
that get youth outdoors and discovering their surrounding and understanding simple environmental
relationships.

I’m sure that my children are learning about the environment at school in the classroom. As to which
sols these may align with, I could not say.

In classroom presentations to 3rd, 4th and 6th grade students. Field trips for 3rd, 5th and 6th grade
students. Equipment/material loan program for teachers.

In school enrichment programs, field trips
In your own Back yard--state parks Clean valley counsel
In-school elementary and middle school: ecology, watershed, soil & water health, litter & recycling.
Middle school outdoor Field experiences. High school Envirothon. Girls Scouts watershed, soil.
Elementary: rain barrels.

iSchool for the Future’s learning approach that combines science, technology, engineering, arts, math
and social and emotion lifeskills (STEAM SEL). In our hands-on program, students learn science
through their environment, and in turn use that science to improve the environment they are in.

James River Watershed Academy
Appendix E Continued: Unedited Survey Responses Listing Programs Aligned with SOL (Item 6)

K-12 Aquatic / Watershed based programming
K-12 Education Programs at Blandy Farm
K-12 programs offered at the Virginia State Arboretum (Blandy Experimental Farm)
Kids in the Creek  Kids in the Woods  Groundwater Festival  Educational programs provide by SWCD and Litter Office
Kids in the Creek for 6th graders, adapted from the Meaningful watershed experience
Lake Anna Star Park Programing  Tri-County SWCD Programming
Let's Untangle a Food Web, Habitat Secrets, Old, Old Oak Tree, A Day in the Life of Prey, Fill the Bill, Snakes Alive!, Deadly Links, Soil Layers: Let's get to the Bottom of Them, Water Hits the Soil and the Soil Runs Away, Groundwater: The River Below Your Feet and Watershed Wonders: Discover how Pollution Begins and Ends with YOU.
Living In Your Watershed - Grade 4  I Love Soil! - Grade 3  Who Polluted the River? - All
Living In Your Watershed Classroom Program for Grade 4  I LOVE SOIL! Classroom Program for Grade 3 Envirothon
many
Marine Science Consortium, 4H, Envirothon teams
Mary Baldwin College Environment-Based Learning Program  Boxerwood Gradens  SWCD educational programs
Mary Baldwin environmental education program. Headwaters Soil and Water Conservation District.
Maymont SOL programs
MBC classes which are environmental in nature.agricultural classes from VA Farm Bureau
Appendix E Continued: Unedited Survey Responses Listing Programs Aligned with SOL (Item 6)

Meaningful Watershed Educational Experiences for all 7th grade students in Fairfax County Public Schools through the county Park Authority - Project Wet training for teachers - Enviroscope teacher and volunteer training and direct presentations for students - Classroom and assembly presentations at all levels

Meaningful Watershed Education Experience/MWEE (7)

Monarch Initiative Estuaries to Ocean Field Trip
Monarch Initiative VIMS outreach programs

MWE - Stream testing for high school Ecology classes. Field days for 5th graders. Field day for 2nd graders. Week-long field school in conjunction with two other SWCD's. Programs for Elementary Ecology Club. 3rd grade soils program.

MWEE - Henrico Co. River Day for instance New Kent Forestry Center school programs any programs I offer

MWEE Watershed Academy

MWEE Activities, Project Wet, Project Learning Tree, Project Underground, Project Wild
MWEE and Project WET for elementary schools and educators

MWEE Experiences for 6th Grade Students through Blandy Experimental Farm

MWEE experiences for Life Science students aligned with VA Science SOL 6.7 and other Life Science standards

MWEE field trips offered by county park staff

MWEE in the middle schools Wallops Island middle school trip

MWEE lessons in schools field days

MWEE programs in the local community, led by Master Naturalists, Soil and Water district staff, and teachers School and camp programs offered by Green Adventure Project and other non-profits Wide variety of camps, classes through community college, non-profit programs

MWEE, CBF

MWEE, WET, WILD, WOW/POW, Underground, PLT

MWEE. Learning tree. Project Wet. Project Wild. Your Backyard Classroom


My college Biology course, BIO 107, Biology of the Environment

NASA Resources, Digital Learning Network (DLN), NASA Innovations in Climate Education (NICE), Student Cloud Observations On Line (S’COOL), MyNASAData among others.

National Wild Turkey Federation JAKES Program NWTF Education Boxes

National Wild Turkey Federation JAKES program. Hunter Education.

National Zoo in DC Chesapeake Bay Foundation

Natural Resource Classroom Programs developed by our soil & water district for elementary ed; Envirothon - high school

Nauticus- Environmental Afterschool Clubs, Aquarium Exhibits, Environmental Based Education School, Camp, and Public Programs Other Organization Programs in Area- CBF, ERP, NOAA, KNB
Appendix E Continued: Unedited Survey Responses Listing Programs Aligned with SOL (Item 6)

NOAA workshops and projects  City Parks Workshop assistance  State Parks Field trips and programs  
Chesapeake Bay Foundation workshops and projects  Virginia Natural Area Field trips Grandview and 
and Ragged Island  Kayak trips with Chesapeake Bay experiences  Projects with Christopher Newport 
University  
NOAA/BWET env education  Claytor Nature Center EE programs  
Norfolk Botanical Garden's School Field trips  
North Fork Exploration Summer Camp for 6th-12th graders  Shenandoah River Players Summer Camp for  
1st-3rd graders  Stanley the Stoneroller Stands Up For the River Middle School Workbook  School 
Programs and School Field Days  
North Fork Exploration Summer Camps 6th-12th  River Exploration Summer Camp 2nd-4th  Watershed 
and River Programs K-12th  
Northern Neck Soil & Water Conservation District Soil and Water Quality Programs for local schools  
(often in cooperation with many local partners)  
Northern Neck Soil and Water Conservation District  Friends of the Rappahannock  Menokin Foundation  
Friends of the Rappahannock  4H  
NOVA 4-H Center Environmental Education Programs  
Outdoor classroom  
Outdoor Classroom with Pollinator garden and butterfly/ bird way stations, enhanced library resources  
Oyster Reef-Dichotomous Key  
Peak at the Bay  National Park programs  
Plant a Seed  Envirothon  Meaningful Watershed Experience  Peak at the Bay  
PLT GLOBE NASA VIMS  
PLT WILD WET  
PLT, Project WET, Project WILD/Aquatic Wild  
PLT, WET, WILD  
PLT. Project Wild. WET  
PLT. PU. WET. WILD. Kids in the Creek. MWEE. Watershed Institutes.  
PLT. WILD. Aquatics  
Pollution Solutions, Project WILD, Project WET, Project Underground, Your Backyard Classroom, Project  
Learning Tree  
Prince William National Forest has programs.  Friends of the Rappahannok.  
Professional Development through:  VIMS  CBF  Lynnhaven River Now  
programs at Holiday Lake 4-H Center--offered to area schools  
Programs at the Science Center - particularly related to our garden and the Dan River  Programs at other  
science museums in the region  School-based curriculum that covers the spectrum of requirements  
Programs at the Science Center for school age children  
Programs focused on specific animals (i.e. frogs - their behaviors, habitat, ecological importance, etc.) -  
Historical programs focused on games played by early American children -Programs with an  
emphasis on watersheds, pollution, and water quality monitoring
Appendix E Continued: Unedited Survey Responses Listing Programs Aligned with SOL (Item 6)

Programs from Project Learning Tree, a variety of educational Program at Natural Tunnel State Park:
- Ranger Docket (2nd grade) Kids in the creek, Cave Tours, Enviroscape program etc.
- Programs offered at state parks Local parks / nature centers science museum
- Programs through our local SWD and Extension Service. Hunter's Education Courses. Boater's
  Education Courses.
- Project Growing Up Wild. Grasses in the Classes. Local watershed improvements with an elementary
  school. SCHEV Grant with a focus on local environment and work with local non-profit.
- Project Learning Tree (4)
- Project Learning Tree Chesapeake Bay Foundation Programs Project Wild Project Wet Project Aquatic
  Wild Soil and Water Conservation Camp Forestry Camp Envirothon Virginia Agricultural Education
  Classes
- Project Learning Tree Danville Science Center exhibits/programs
- Project Learning Tree Project Wet Project Wet Project Underground
- Project Learning Tree Project WET Project WILD Project Aquatic WILD Flying WILD Project
  Underground Schoolyard Habitats through VDGIF Master Naturalist Ag in the Classroom
- Project Learning Tree Project Wet Project Wild Project Underground CBF's VA Watershed Ed. Program
  JMU Alternative Energy Educational Resources
- Project Learning Tree Project WILD Science & Civics Project WET
- Project Learning Tree VIMS - Oyster Restoration Watershed Bay Academy
- Project Learning Tree Chesapeake Bay Foundation Programs. State and National Parks
- Project underground in the park (cumberland gap nhp) we go to schools and other groups to talk about
  bear, karst, plants, bats, birds, etc
- Project WET (2)
- Project WET Project WILD Growing Up WILD Learning Tree Water and Soil - MWEE Day for Hanover
  6th graders
- Project Wet Project WILD Watershed Educator certificate components
- Project Wet and other similar PD Programs for area educators.
- Project WET and PLT
- Project WET, project WILD, Discover a Watershed
- Project WET. Project Learning Tree. Project Plant It. MWEE with Caroline-Hanover Water and Soil.
  Project WILD
- Project WET. Project Wild. Project Learning Tree.
- Project Wild (2)
- Project WILD Project WET Project Underground Project Learning Tree Trainings provided by the
  Department of Game and Inland Fisheries
- Project Wild and affiliated programs
- Project Wild, Chesapeake Bay teacher programs
- Project WILD, Project Learning Tree, Western Water Authority/Enviroscape
- Project WILD. Project WET. Project Learning Tree. And other programs like these.
Appendix E Continued: Unedited Survey Responses Listing Programs Aligned with SOL (Item 6)

- Project WILD. Project WET. Project Wild Aquatic. Project Learning Tree. Your Backyard Classroom.
- Project Underground. Meaningful Watershed Education, Healthy Water, Healthy people. Claytor Lake State Park field trips and outreach programs with local schools. Claytor Nature Study Center field trip programs and outreach in Lynchburg. Field trips and outreach from Natural Tunnel State Park, New River Trail State Park, Hungry Mother State Park, Smith Mountain Lake State Park, and all other state parks in VA. Roanoke Water Authority field trips that are SOL based lead at Carbens Cove in Roanoke.
- Project WILD. Project WILD/Aquatic. Project Learning Tree. Project Underground. Flying WILD.
- Project WILD. Growing Up WILD. PLT. Project WET. NASP.
- Rappahannock County Watershed Education Field Day
- Recycling, watershed programs & activities, soils programs, summer day camp environmental programs, MWEE programs
- Renewable and Sustainability Courses at Cumberland High School; Learning through Nature middle school course; CMS/CHS Life Skills science class; Science classes.
- River Day for middle school & elementary home schoolers
- School age (in-school and special event) programs addressing soils, trees, and food chains.
- School programs offered at Blandy Exptl Farm and by other area organizations (e.g., Discovery Museum)
- School-based environmental ed programs, some Master Gardener programs, county Urban Forestry Management Division outreach programs for schools, some Park Authority programs, Project Learning Tree, Project WILD, etc
- Sci museum of Western VA. Cooperative extension. Mill Mtn Zoo.
- Science Center programming
- S’COOL Project. MY NASA DATA Project. The GLOBE Program.
- Shenandoah National Park
- Shenandoah National Park Education Programs
- Shenandoah National Park education programs Wildlife Center of Virginia education programs Dept. of Environmental Quality studies
- Shore People Advancing Readiness for Knowledge, SPARK, a nature-based family learning program I originated. See sparkfamilies.org
- Skillathon. Watershed Walk.
- Soils, horticulture, watersheds, Predator/prey/habitat/niche,
- Some 4H Some State Park Programs
- Some State Parks programs. Some 4-H programs
- SOS. Kids In Woods. Kids In the Creek. Envirotan. Ground Water Festival
- State park outreach programs (project WET, underground, WILD, YBC)
- State parks offer programs Blandy Farms offer programs
- STEM Programs at Lewis Ginter offered for teachers Chesapeake Bay Foundation Classes for teachers
- Teacher workshops held in different counties
Appendix E Continued: Unedited Survey Responses Listing Programs Aligned with SOL (Item 6)

SUMS (Students Using Math and Science) afterschool program at Lancaster Primary School. Master Gardener 3rd Grade Science programs in Northumberland and Lancaster Elementary schools. 6th grade 'Water Festival' programs in N and L middle schools. Sustainability and Renewable Technology course at CHS. Learning Through Nature course at CMS. SWCD programming. 4H programming.

Virginia Watersheds Program -- Shenandoah Valley Discovery Museum
VJAS programs and opportunities to participate as students and others to serve as reviewers and judges.
Water quality education  Soil education
Watershed education/ Enviroscape presentation- 4th/6th grade  Soil investigations/ water cycle - 3rd grade  renewable/nonrenewable resources - 5th grade  Envirothon - high school
Watershed Festival- held in the Fall focusing on 3rd-6th grade SOL's  -Skill-a-thon a one day event held at the Northampton elementary schools for 3rd graders to review their Science SOL's  -Envirothon program for High School Students  -Environmental Education Outreach to classrooms on topics such as Soils, Plants, and Watersheds
Watershed in the classroom
Watershed Programs (and others) at Boxerwood in Lexington.
Way too many to list
Wet  Wild  Wild Aquatic
WET and PLT
Your Backyard Classroom

Note: Responses are authentic, unedited. Total responses: n=306. After deleting the non-valid responses (e.g. I do not know) (19) and exact duplicates (13): n=284 unique responses.
Appendix F: Programs Offered That Are Not Intentionally Aligned with the SOL (Item 7)

Valid and unedited responses to survey item

4-H
4-H After-school intro to 4-H King and Queen Elementary school School-yard habitat Cool Springs Primary, King William Gardens, West Point Public Schools, King William 4-H Junior Summer Camp 4-H clubs with an earth/nature/gardening focus
4H Junior Naturalist Clubs. Master Naturalists. Albemarle County Jail Horticulture education 4H Junior naturalists Park (state, national, local) presentations
4-H Natural Resources Weekend 4-H Environmental Clubs Wildlife Habitat Education Program 4-H Forestry Camp
4-H Outdoor Adventure Program 4-H WHEP (Wildlife Habitat Education Program)
Stewardship/Restoration Projects Citizen Science / Monitoring Projects
4H programming
4-H programs Wildlife Refuge Programs Soil and Water Conservation District programs Project Wild Master Naturalists
4-H residential camp at Jamestown 4-H Center local 4-H day camps local 4-H canoe trips 4-H envirothon team
4H Statewide fishing camp Environmental Christmas Camp NRE programs at the 4H Center Day camps Nottoway 4H Shooting sports club Jr.4H Camp Cloverbud 4H Camp Mother Daughter Weekend 4-H.hunter education
83 nature programs that I do that have very little to do with SOL
After school environmental clubs
All are created with Learning Standards in mind
Annual Conservation Poster Contest- I develop a program around the the poster contest topic and visit classrooms to present the program and encourage the students to create a poster -Rain Barrel Workshops- participants attend these workshops and learn about best management practices and make a rain barrel to take home with them -Eastern Shore Birding & Wildlife Festival- Family Passport day- various environmental agencies have booths and provide hands on learning and education outreach to the public -Nature Detective Camp- a one week 1/2 day camp for 7-12 year olds -Arbor Day Celebration- educating people about trees and giving away free trees - Outreach programs at the local libraries
AP Env Science Ecology classes Envirathon Environmental Studies Academy Boy/Girl Scouts
AP Environmental Science course (2)
AP Human Geography Academies (supporting the goals of Advanced Placement Courses)
Appendix F Continued: Unedited Survey Responses Listing Programs Not Aligned with SOL (Item 7)

At Green Spring Gardens, we offer adult programs for lay and professional audiences that have strong environmental education elements delivered by trained professionals and Master Gardener and Master Naturalist volunteers.


Audubon at Home, Native Plant Sale with educational components twice a year

Belle Isle State Park  Northern Neck Land Conservancy  Master Naturalists  Master Gardeners

Blackberry Bramble Outdoor Preschool

Blandy's Young Naturalists and Summer Camp  SCBI summer camp.  Blue Ridge Wildlife Center Summer Camp

Blue Ridge Land Conservancy Garden Club  Youth Birding Club  Nature Investigations  Muddy Squirrels

Blue Ridge Wildlife Center Summer Camps. Blandy Experimental Farm Summer Camps. County Park system summer camp programs. State park youth programs

Botating Safety


Camps, youth, and adult programs at Blandy Exptl Farm and by other area organizations (e.g., Blue Ridge Wildlife Center)

Caring for Our Watersheds  Earth Force Instructional Model  School Environmental Action Showcase  KidWind Challenge

Chesapeake Bay Governor's School

City of Roanoke Clean and Green Committee Green Academy- program for adults covering green topics

CLAYTOR CENTER[BEDFORD]

Claytor Lake State Park Summer programs about wildlife and nature. All other Virginia State Park programs other than field trips and outreach programs that are offered. SEEDS programs at the Price House Nature Center in Blacksburg, Va. Montgomery Floyd Regional Library Programs such as Falconry programs. Science Museum of Western Virginia displays and programs. Center in the Square programs and displays in Roanoke, Virginia. United States Forest Service Eastern Divide Ranger Station summer programs in the ranger station and at Pandapas Pond. New River Valley Bird Club monthly meeting programs and birding field trips. Master Naturalist trainings and field trips. Native Plant Society monthly meeting programs. Mill Mountian Zoo programs for kids and families and for school groups.


College Environmental Science Degree Programs


What is a watershed programs for campers and community groups. Arbor Day. Rain Barrel Workshops. Girl Scouts Patches outreach programs. Library outreach programs.
Appendix F Continued: Unedited Survey Responses Listing Programs Not Aligned with SOL (Item 7)

Conservation Relay - program where kids do a relay...but with water related names. Cross the pond, hop on the lily pads, etc. Rain barrel workshops, Producer Meetings/wkshops
Conserve Water  Certain Ag- In-The-Classroom Activities
Danville Science Museum summer programs
day camps
Deltaville Maritime Museum Activities. VIMS Activities.
DGIF Hunter Safety Programs DGIF Boating Safety Classes
Earth Day Events  River festivals  Fish Fries  Rain barrel workshops  Sustainable landscaping workshops
Eco-April - Month of activities provided to schools, university community, community at large, other agencies and organizations.
Ecology class
Edible soil profile  recycling
edible soil profile  material recycling - non renewable and renewable resources
Educational and outside activities of the Mattaponi Pamunky Rivers Assoc
Elizabeth River Project programs  Lynnhaven River Now programs
Environmental Educators- Peter Francisco Soil and Water District
Environmentally based summer camps, family programs, scout programs, preschool programs
Envirotroh (5)
Envirotrohon competitions - Science Fair organizational awards for environmental projects - Youth Conservation Camp recruitment and attendance - VASWCD Scholarships for seniors and 1st year college students
Envirotrohon. James River Association Ecology School
Explore the Outdoors community event  scout programs
Family Fun Day on the River  School Programs
Fish printing, Backyard gardens, Butterfly gardens
Forestry & Game Conservation Course, 2 year degree
forestry, where cutting of trees is explained and supported. Farming, where sights, smells odors, noises are explained as part of the process of procuding the food we eat and most of the clotjhes we wear. FOR's Summer Camps  Breaks for the Bay (FOR's spring break program) Wildlife Festival (FOR's weekend ed. program)
Girl & Boy Scout badges
Girls Environmental leadership academy (Chesapeake Bay Experience)
Gold Mine Tours, Guided Hikes, Guided Canoe Trips, Roving Interpretation, Point Duty Interpretation, Nature based programs, Jr. and Little Ranger programs, Fishing 101, Geocaching, Orienteering, Macro-invertebrates, etc.
Grant writing help.
Green Adventure Project/Triple C Camp
Green Building Design
Green Ribbon Schools
Habitat At Home. programs available through local parks and non profits
Appendix F Continued: Unedited Survey Responses Listing Programs Not Aligned with SOL (Item 7)

Hunter Education (11)
Hunter Education Scouting Boy Scouts and Girl Scouts
Hunter Education and volunteering opportunities with DGIF
Hunter Education classes Virginia Hunter Skills Weekends
Hunter Education courses which require principles of conservation as a key component.
HUNTER EDUCATION 4-H OUTDOORS EDUCATION
Hunter Education Trapper Education
Hunter Safety Education (4)
Impact Streamside Trees in the Classroom Tub of Bugs
Ivy Creek Nature Center programs. The Mountain Institute.
Izaak Walton League conservation education programs
JRA ecology School
Junior Master Gardeners, Farm to school Mystery Garden Detective, Agriculture in the classroom,
Kids in the Creek Days, Outdoor classrooms,
Kids in the outdoors Hunter safety education
Lake Anna State Park Programming Lake Anna Civic Association Water Quality Monitoring Program
Spotsylvania Greenways Initiative/Master Naturalists
learning tree, Wild, wet,
Leave No Trace Forestry Programs for Children and Teachers Training offered at Game and Inland Fishery
Leave No Trace and Tread Lightly
lecture series from several groups (i.e. Blandy Farm, SCBI, VNPS). walks on public and private land (VNPS, Audubon).
Local state parks (Westmoreland, Belle Isle) have various programs (don't know to what extent these are aligned to SOLs)
Longwood University's Integrated Environmental Sciences major. Some State Parks programs. Some 4-H programs. Virginia Forest Landowners Discussion List.
Lots for all ages thru Loudoun Wildlife, others
Loudoun Wildlife Conservancy programs. Stream monitoring Benthic MacroInvertebrates.
Lynchburg Parks & Recreation's Naturalist Outreach Environmental Education programs (such as
Animals of Virginia, Hibernating Animals, Pond studies, just to name a few)
Lynnhaven River NOW
Lynnhaven river now, project learning tree, save our streams
many
Many of my specialty club look at issues that plague farmers, towns, and citizens.
Marine Mapping and human uses. Ocean acidification and climate change. Migratory songbird biology,
Master Gardeners (2)
Appendix F Continued: Unedited Survey Responses Listing Programs Not Aligned with SOL (Item 7)

Master Naturalist Program
master naturalist course, master naturalist responses to requests for exhibits, speakers, talk and walks
master naturalist junior naturalist program
Master Naturalist programs at the local library, earth day, farmers markets, bioblitzes, nature walks.
Master Naturalist programs, some Master Gardener programs, some Park Authority programs including Invasive Management Area programs
Master naturalist programs; Virginia outdoor women programs; bird club programs; bee club programs;
seminars on university campus; community service by university students; outreach by Clean Virginia Waterways (e.g., rain barrel workshops)
Master Naturalist training course Piedmont Virginia Community College course on Virginia natural history Programs through Ivy Creek Foundation and other non-profits
Master Naturalists (2)
Master Naturalists Native Species groups
Master Naturalists Course
Meaningful Watershed Educational Experiences
Menokin's Fibonacci Sequence and 18th century Architecture.
Monarch Way Stations, Nature Summer Camps, Audubon At Home (for schools, residents and businesses)
Most offerings from VA Cooperative Extension that are for youth - including Junior Master Naturalists, JMG,
Most that I know of include SOL relationships. I can't think of any that don't.
Multitude of State Park interpretive programs. Blandy Educational Programs.
Museum programming and/or camps through the Danville Science Center and Virginia Museum of Natural History. 4-H activities.
MWEE education for 4th grade Rain barrel workshops Native plant presentations
nature based summer camps
Nature Generation, Audubon Society, VA Naturally
Nature Investigations, Library programs
nature walks with all ages on fisherman island NWR
Newsletters, e-zine to general community about enviornmental education
NOAA Ocean Literacy Professional Development
Outdoor activities such as guided hikes, kayak trips with interpretation, environmental based events.
Outdoor Adventure 4-H Day Camp. Forestry 4-H Day Camp. Geocaching as a way to learn about habitats and local history.
Outreach through 4 H Trout Unlimited- trout in the classroom
Oyster restoration with Oyster Reefkeepers of VA, Lynnhaven River NOW, and Chesapeake Bay Foundation
Park programs for the general public
Appendix F Continued: Unedited Survey Responses Listing Programs Not Aligned with SOL (Item 7)

Parks and Recreation programming
PD Workshops for area teachers that we offer at the UVa Anheuser-Busch Coastal Research Center on the Eastern Shore.
poltics and legl issue
private environmental camps/nature centers
private school programs. home-school programs. scout programs. adult trainings or forums. waterways cleanups. wetlands and nature walks. technical trainings, i.e., for engineers. water and land cleanups.
Professional Development through: VIMS  CBF  Lynnhaven River Now
Programs at the Science Center for the general public but still primarily related to our garden and the Dan River Programs at other science museums in the region  DRBA conservation programs and projects  City Outdoor Recreation programs related to our parks and river  Master Gardener and Master Naturalist classes and programs  State park programs  A lot of programs in the Roanoke area, but don't know specifics
Programs offered through our Public Works Department.
Programs with an environmental emphasis, but that are designed specifically for summer park visitors (point duty/ touch table programs, etc.)
Project Plant It with Dominion Power
Project WET, WOW, PLT, Project WILD (all)
Project Wild and Wet
Project WILD. Boy Scouts of America.
Public Programs provided by: Maymont, JRA, Rockwood, Three Lakes, James River and Richmond City parks, local state parks, Lewis Ginter Botanical Garden. JRAC Clean up days and events. FrogWatch USA. Earth Day events.
Public programs such as Kite Festival, Earth Day Festival, birthday parties, sleepovers, and scouts, etc.
rain barrel workshops  farm tours
Rain barrel workshops, producer updates, stormwater education programs, back to the farm programs, ag days fro children,
Research Mentorship, Science Fair
River camp for ages 8 - 16
Scouting programs. Summer camp programs
Sewer Science program (offered by Fairfax County)  Enviroscape Presentations  Stormdrain Marking Program  Stream Monitoring Program  Regional and Local Watershed Cleanups
site-specific programs developed at Bear Creek Lake State Park. Master Naturalist program
Sky Meadows State Park. Front Royal Appalachian Trail Community.
Sky Meadows State Park. Front Royal Appalachian Trail Community.
Smith Mountain Lake Water Quality Program
Some State Park interpretive programs
Some State Park Interpretive Programs. Master Naturalist Program.
Appendix F Continued: Unedited Survey Responses Listing Programs Not Aligned with SOL (Item 7)

Some Virginia State Parks, Master Gardener programs
SOS. Leafpack.
SPARK Creek-Watchers. An outgrowth of SPARK for experienced SPARK families devoted to water testing and clean up of our creeks.
State Park natural resource programs Virginia Herpetological Society education programs
State park programs.
Storm water pollution -5th, 6th grade wetlands education Gardening activities - soil and animal habitat, conservation practices water quality assessments - macro invertebrates identification, chemical and physical testing
Summer Camps- many with marine science emphasis Christchurch School offers 3 weeks of these programs
Summer Marine science camps Discovery Labs
SWCD Day Camps, 4-H after-school programs, 4-H Day Camps, State Parks Jr. Ranger programs, State Parks interpretive programs
SWCD farm day. State park nature hikes/paddles.
The Wonders of Wetlands
There are currently some being offered...but only on the basis of instructor interest...for instance the ecology class uses some of the PLT activities.
There are literature and classes available at parks, recreation centers, libraries, garden centers, the local extension service that provide information about taking care of the environment.
This is a great way to extend learning to normal summer visitors, homeschool groups and the community to teach the things that are important that are not covered in the SOLs.
tours of the James river ecosystem
trainings associated with the VA Master Naturalists
Tree planting at your school
Trout in the Classroom (3)
Trout In The Classroom in Augusta County, Waynesboro, Staunton, and Highland County school districts
Envirothon in Augusta County Riverfest in Waynesboro
Tumbler-style Compost Workshops, Rain Barrel Workshops, Tree seedling promotion, residential septic programs,
VA DGIF Hunter Safety Program and Boater Safety program BOW programs. Trout Unlimited programs
VA Geographic Alliance (with funding from NOAA & National Geographic Society) offer professional development workshops/institutes for teachers. These focus on the Chesapeake Bay & watersheds through a geographic/social sciences approach.
Appendix F Continued: Unedited Survey Responses Listing Programs Not Aligned with SOL (Item 7)


VA Master Naturalists, Cooperative Extension workshops for adults
VA Master Naturalists. Adult Learner Programs Blandy Experimental Farm, Summer Camp at the Blue Ridge Wildlife Center. General Public Educational Programming at Sky Meadows and Shenandoah River State Parks. Adult lecture series at SCBI. Speaker series Blandy Experimental Farm.

Various gardening series partnering w/ Master Gardeners - Adult Education
Various programs offered by Master Naturalists groups, SCBI in Front Royal, programs at State Parks
VCU Go Fish, VCU Stream Team
VIMS Open House in May is superb
VIMS Summer Camps - CBNERR and VIMS conduct multi-day programs during the summer for students going into grades 1-8. These hands-on camps will enable students to learn about the Chesapeake Bay and are tailored to meet the learning stages of each age group. Camps are free, thanks for a private donor. Camps cover topics such as wetlands, environmental stewardship, and general Chesapeake Bay exploration. Discovery Labs - The monthly Discovery Lab series provides fun, family-friendly experiences and lifelong learning. Each lab focuses on a specific topic through a series of stations that provide hands-on activities for kids and adults.

Virginia Hunter Education
Virginia Cooperative Extension agriculture/Natural Resources programs, Virginia Cooperative Extension 4H programs, Junior Master Gardeners, Master Gardeners and Master Naturalists, Tree Stewards, Virginia Dept of Game and Fisheries outdoor education courses and programs
Virginia Herpetological Society events throughout the state, including surveys for herpetofaunal species and annual meeting that includes presentations on various herptological topics and research in Virginia
Virginia Hunter Education Program International Bowhunter Education Program
Virginia Hunter Safety Instructor Courses International Bowhunter Education Program 4H Outdoor programs at the Holiday Lake facility (Outstanding) Smithsonian Outdoor Education Programs and Research Papers Quality Deer Management Certification Programs Southeast Deer Study Group, a sub-group of the Wildlife Society US Wildlife Society US Fish and Wildlife Service - Continuing education programs National Geographic education programs US and Virginia Forest Service education programs
Virginia Master Naturalist
Virginia Master Naturalist Certification Program
Appendix F Continued: Unedited Survey Responses Listing Programs Not Aligned with SOL (Item 7)

Virginia Master Naturalist Program  Audubon At Home Program  Loudoun Wildlife Conservancy programs
Virginia Master Naturalists
Virginia Save Our Streams
Virginia State Parks visitor programs  Virginia State Parks Environmental Education Programs  County and City public programs through Parks and Recreation, schools, etc. Private non-profit organization programs and classes (Maymont, CBF, etc.) Public radio and TV programs  For-Profit TV programs (NOVA, Cosmos, Outdoor programs, etc.) Local newspaper and magazine articles and coverage Hunter Education Programs  Master Naturalist certification program
Walk with a Naturalist
Watershed and River Presentations to community groups - all ages
Watershed groups.  4-H groups.  church youth groups.
Way too many to list
We recycle paper at school. Every teacher has been supplied a box which is collected by the fifth grade class once a week. This program was started by a parent member of the PTO just this year.
We teach 6 Hunter Safety Courses and 6 International Bowhunter Education Programs per year. Both courses emphasize habitat awareness, carrying capacity, and wise management of wildlife resources.
What's the buzz. Fish Faces, Nature's Bingo, Skin and Bones, Feathered Friends, Feeling Froggy, Who Gives a Hoot, Feeding Frenzy, Homes Hike, Animal Tracks, I Spy Hike
Who Polluted the River? Classroom Program for Grades K-5
Young Naturalists Programs at Blandy Farm
Your survey says PreK-16, so I include university degree programs which are not, of course, aligned with the SOLs. Environmental Studies major and general education courses at Shenandoah University, Winchester. Natural history courses at Lord Fairfax Community College, Middletown.
Youth Conservation Camp, SWCD Farm Days

Note: Responses are authentic, unedited. Total responses: n=258. After deleting the non-valid responses (e.g. I do not know) (21) and exact duplicates (22): n=215 unique responses.
Appendix G: Professional Development Topics Desired by Formal Educators (Item 10)

Professional development topic topics and unedited survey responses to Item 10

Emerging topic: Teaching and general environmental education pedagogy

All areas of environmental education. Specifically focusing on Virginia.
always a student...love to learn new stuff...makes me a better teacher/trainer
Classroom assistance
Middle School Science, Ecology, Sustainability, Environmental Education of ANY type that I can bring
into my classroom
Teacher PD experiences that demonstrate how EE can be used to teach SOL content in the classroom

Field experiences and outdoor teaching

Bringing field training experiences to students.
field experiences for students ( ideas for local park use and student exposure to field work)
Field trainings are #1 on my list!
Hands On/Field application of educational experiences
outdoor classroom design
Outdoor Education facilitation and safety (ie. school grounds or field trips). Local community
resources and collaborators (such as NVSWCD).
Topics related to the marine environment and field studies for AP environmental science

Emerging topic: Partnerships and community involvement

Educational hiking trips related to any area of environmental literacy to encourage fitness as well as
sociable interest among like minded people.
External support for environmental major degree programs at Virginia public institutions of higher
education.
University EE people meeting to address this together and what is being done on their campuses

Emerging topic: Earth science, climate, and water

Climate Change, aquatic ecology
climate change, solar and wind energy for home owners
Earth Force
habitats and management of resources
How and if recycling may hurt the environment.... Ie. fumes from plastic recycling.
land, air, and water pollution
Local environmental issues, rain garden workshops, bayscaping
Natural history, field work on local streams/rivers, ecology
Sea level rise and its effect on our local community, role of invasive species, native plants of Virginia
Soils, water, wildlife (includes fish, mammals, birds, reptiles), human/wildlife issues, invasive species
VA geology
Water - keeping it clean, run off,
watershed education
Appendix G Continued: Professional Development Topics of Formal Educators (Item 10)

Emerging topic: Advocacy, policy, and citizenship

- Advocacy for the environment
- Inquiry based projects; research experiences for middle school students
- Green living
- Citizen science opportunities
- Understanding environmental issues in my city, county and state. Wetlands and water quality. Virginia’s invasive species and endangered species. In social studies: tools for community groups, towns and cities to address local environmental problems.

Emerging topic: Life science, forestry, and marine

- Soils, water, wildlife (includes fish, mammals, birds, reptiles), human/wildlife issues, invasive species
- Oceanography, deforestation/reforestation, consumption reduction; conservation/species/habitats
- Forest management
- Forest health

Emerging topic: Anything, all topics

- Anything environmentally related
- Anything that relates to our students lives and their future. Local as well as world wide exposure.

Emerging topic: I do not need training

- I am doing a lot of these things on a regular basis as part of my job/learning
- I do not need more training at the moment

Emerging topic: Professional schedules, credential, and degree programs

- I hoped to take MBCs Nature Journaling Class this summer but cannot now. Would it be possible to offer it in Garrett County? Any EE program provided by MBC is valuable!
- I hoped to take MBCs Nature Journaling Class this summer but cannot now. Would it be possible to offer it in Garrett County? Any EE program provided by MBC is valuable!
- Continuing education
- Graduate courses that teachers can take
- Graduate level for-credit courses online are greatly needed to meet the demand for instructors
- Master Naturalist Program

Note: Text responses are authentic, without editing. Some responses are in found in more than one topic. N = 174; Valid responses N = 33; Missing N = 141.
Emerging topic: Teaching and general environmental education pedagogy

A recycling program for the young child.
Chesapeake watershed ecology, species identification, conducting field science, explaining science & how to set up experiments, communicating climate change
Courses dealing with teaching soil & water concepts in K-12; Integrating soil & water issues into adult gardening classes
Environmental literacy for adult audiences

Envirothon
Global Climate Change activities to help people understand it and how they effect environmental and human resources. Programs on effects of current human activities on natural and human world. Effects of human-caused changes on biodiversity and species health. How to get kids out of classrooms and into the field, even in their own campuses to learn about nature. How to teach big picture concepts when kids are forced to learn bite-sized SOL standards with no reference to real world. Teaching science without SOL limitations.

Local flora and fauna. Creative hands on ways to explore and deliver key concepts in ecology and science. A system to collaborative with other educators on ideas and methods that have proved to be engaging in the classroom.

PLT, Project Wet, Project WILD, MWEE
Program development for 3rd grade

Project Wild & Project Underground Certification
Resources & ideas for outdoor Ed at little cost
Teaching Climate Change, Teaching Sea Level Rise, Developing Project -based learning units, Wetlands Ecology, Native Plants
Things all classroom teachers can do to integrate EBL into their teaching

Emerging topic: Field experiences and outdoor teaching

Answering for my nature center colleagues as well. Climate change, inquiry field science, using appropriate technology in the field
Chesapeake watershed ecology, species identification, conducting field science, explaining science & how to set up experiments, communicating climate change
Field studies on any topic

Emerging topic: Partnerships with schools and community involvement

Connecting agencies with schools; studies citing benefits of getting kids outdoors; today's learning styles
Appendix H Continued: Non-formal Educators’ Unedited Responses Identifying PD Topics (Item 10)

How/why formal educators (schools) are embracing (or resisting) the incorporation of environmental issues into curriculum requirements.
I am interested in promoting sustainability in schools - plus working partnerships, collaboration eg.
encouraging Cooperative Extension to join NOVA Outside as a partner
I think it would be helpful if somehow the schools could develop a program that would help nonformal educators learn how best to assist them in taking students outside and what their expectations are of an outdoor field experience. It has been my experience that many teachers, even though they attend trainings (Flying Wild, Learning Tree, etc.) still do not ""have the time"" or the desire to change tried and true teaching methods that have provided the needed student test results.
Local flora and fauna. Creative hands on ways to explore and deliver key concepts in ecology and science. A system to collaborate with other educators on ideas and methods that have proved to be engaging in the classroom.
Partnership/collaboration, funding/resourcing, networking, application of network analysis watershed education, working with formal educators

Emerging topic: Earth science, climate, soil and water

- answering for my nature center colleagues as well. climate change, inquiry field science, using appropriate technology in the field
- any soil and water conservation topics that I have not been aware of
- Botany, field biology, water quality and systems
- Chesapeake watershed ecology, species identification, conducting field science, explaining science & how to set up experiments, communicating climate change
- Global Climate Change activities to help people understand it and how they effect environmental and human resources. Programs on effects of current human activities on natural and human world. Effects of human-caused changes on biodiversity and species health. How to get kids out of classrooms and into the field, even in their own campuses to learn about nature. How to teach big picture concepts when kids are forced to learn bite-sized SOL standards with no reference to real world. Teaching science without SOL limitations.
- ecology, conservation
- ecology; native plants; agriculture; watersheds; water quality; climate change
- native plants, habitat, ecology, other natural history topics
- Natural History, No global warming propaganda, no push for wilderness.
- natural history, evolutionary dynamics, cosmology, geology, astronomy, etc.
- Ocean Acidification, Carbon footprint in urban centers
- Oceanography, Fracking, Climate Change, Behavior Modification, Renewable Energy
- plant ID and ecology; geology of Northern VA
- shoreline management; water quality (Chesapeake Bay)
- Soil
Appendix H Continued: Non-formal Educators’ Unedited Responses Identifying PD Topics (Item 10)

Soil - Water - Air - Climate Relationships with forecasts on future issues
soils biology
water quality, nutrient and wetland banks, agricultural practices
watershed

Emerging topic: Public policy, citizenship, and advocacy
Communicating complex issues to elected officials
Topics focused on the ecology and environment of Virginia and the Mid Atlantic as well as programs that keep me current on national and international issues.

Food Residual Energy Economy - Permaculture
how to inspire people to care; updates, new research and solid information on emerging topics, i.e.,
sea level rise effects and how to prepare,
Natural History, No global warming propaganda, no push for wilderness.
soils, stormwater laws

Emerging topic: Life science, forestry, and marine
Aquaculture, Habitats, Soils, Birds and Birding, wildlife, etc.
Botany, Ornithology, any nature subject
ecology; native plants; agriculture; watersheds; water quality; climate change
Forest and aquatic ecology, invasive species, global warming impacts on populations
Forestry
Forestry, Tidal Regions
freshwater ecology, wetlands, raingardens, pollination and pollinators
karst, bats
Local flora and fauna. Creative hands on ways to explore and deliver key concepts in ecology and science. A system to collaborative with other educators on ideas and methods that have proved to be engaging in the classroom.
Macroinvertebrates, ecology of forests, herpetology,
native plants, habitat, ecology, other natural history topics
natural history, evolutionary dynamics, cosmology, geology, astronomy, etc.
plant ID and ecology; geology of Northern VA
Plant identification and ecology.
plant identification, wetland species and ecosystems, entomology
River Ecology
soils biology
Topics focused on the ecology and environment of Virginia and the Mid Atlantic as well as programs that keep me current on national and international issues.
trees, ecology
wildflowers, butterflies and pollinators, invertebrate aquatic ecology, herps
Appendix H Continued: Non-formal Educators’ Unedited Responses Identifying PD Topics (Item 10)

Wildlife, tracking, habitat

Emerging topic: Technology (digital and other tools)
answering for my nature center colleagues as well. climate change, inquiry field science, using appropriate technology in the field

Social Media, Websites
Technology and the environment ie- using an ipad for Environmental Education, learning how to make handmade tools for Environmental Education ie solar ovens, composters,

Emerging topic: Management and technical job skills
current issues in wildlife management, hunter education, current fisheries management, resources available to volunteers

Archery, Bow Tuning
Disease resistant varieties - Vegetables. Integrated Pest Management Controls.

Giving effective presentations, Effective ways to involve teachers in environmental education.

Habitat improvement
natural stream channel design
Program Evaluation, Research/Monitoring Techniques, Non-Traditional Audiences

TECHNICAL training - how to do a site assessment, evaluate a stream or wetland, create a plant profile for a restoration - HIGHER LEVEL training that will enable us to do higher level programs

trail clearing the appropriate way
watershed training; urban BMPs

wildlife management, outdoor safety, first/self aid, firearms & bow/cross bow safety, fire safety, game processing and care

outdoor sports

Wildlife population management, habitat management, Conservation as it relates to hunting Cleaning Streams, Planting for wildlife, wise management of game species

Emerging topic: Anything, all topics

Advanced level information on current topics and emerging issues
all the hot topics: pharmaceuticals, hydrofracking, etc.

I'm always looking for more opportunities that fit my budget and my needs!

While I do not need any of the above for professional development, all are welcome.

I could benefit from all of the above but I don't have funds to pay for further training.

I would take any that apply to my interests and certification needs.

Emerging topic: Professional schedules, credential, and degree programs

As a trainer and EE coordinator it would nice to have some higher level training and information providing seminars on current environmental issues

Continued Trng in environment and hunter safety
Appendix H Continued: Non-formal Educators’ Unedited Responses Identifying PD Topics (Item 10)

courses offered that are not during the regular school hours. So many conferences are for the informal educators during the school day.

Game conservation

Giving effective presentations, Effective ways to involve teachers in environmental education.

I maintain master naturalist certification and take trainings as an environmental educator, but would like to pursue something more in-depth and focused without having to go to graduate school.

I must obtain annual continuing education for three certifications I have acquired

I need to develop my awareness of what is being offered. I don't do a very good job of seeking out that which might be of use to me. Job/volunteer commitments/household duties consume most of my time.

I would love a certification program for environmental educators.

Note: Survey text responses are authentic, without editing. Some responses are in found in more than one topic. Total N = 363; Valid responses N = 102; Missing: N = 261.
Appendix I: What Would You Like to See Being Done? What is Missing and Why?

Focus group response from Region 1

Using the schoolyard for environmental education.
Buy-in from school administrators.
A systematic approach to environmental literacy.
Place-based education.
Problem-based learning approach.
Neighborhood learning projects/events/sites.
Professional development is the way to get to teachers to think about environmental education as a system. Teachers need systems training.
Central repository of environmental education.
Reverse the trend that the average citizen does not have a clue what is going on in environmental education.
Do not see agriculture and environment as a separate thing.
Enforce LEED facilities to let community use facility and make it sustainable.
Children graduate with an understanding of our natural world because their teachers know how to teach it.
Training certification program. Teacher endorsement for VDOE.
Interdisciplinary curriculum -- food-residential-energy.
Companies adopt a creek.
School boards understanding the importance of landscaping as a component of outdoor environmental education.
Schools model environmental ethics.
Stipend for teacher-based projects so teacher do not have to spend their own money.
Operation composting.
A system established to teach systems.
Teachers trained on how to integrate the environmental concepts with other subjects.
Teacher with more science content and pedagogy/methods -- building confidence.
A mind shift -- people who see the value of teaching outside -- teachers will do it if their principals support it.
A way to getting environmental experts in the door at schools.
Community center open on weekends.
Community programs -- learning labs.

Focus group response from Region 2

VRUEC to facilitate partnership.
VDOE to help define what should be done.
Getting programs into schools.
Teachers applying what they learn in professional development workshops in their classroom - make teachers comfortable.
Get teachers outside the school using schoolyard and surroundings.
Continued sustained effort for existing programs that work.
Teachers need more that professional development, they need a certification program.
Need staff for coordinating regional activities.
Need to utilize technology better.
Appendix I Continued: What Would You Like to See Being Done?

Communication network to allow agencies and schools to know about activities and programs.
Integration, especially with STEM.
Focus on relevant field trips.
More community involvement.
Field guides for using schoolyards for environmental education.
Assessment plan for environmental literacy.
Getting politics out of science.
Eliminate competitive environment for professional development, field trips, and other environmental programs.
Environmental program in kindergarten.
Teachers with better science content knowledge.
Teachers comfortable with teaching science.
Tying science with real world problems.
Get ESRI more involved in region.
Build better relationship with agencies to provide greater access to experts and volunteers.

Focus group response from Region 3
Junior master naturalist program.
Programs for home schoolers.
Place-based education.
Better communication.
Accountability for grade in a meaningful way -- to give students another reasons to participate.
Good programs that teachers can buy in to.
More emphasis on environmental literacy in SOLs.
Good training for volunteers.
Knowing what programs exist.
Improve environmental service learning activities.
More activities for children on the bay.
HR Green -- local website with resources.
Northern Neck Connect that works.
Publicize Virginia Naturally.
Include study of early Virginia Indians.
Professional development for teachers.
Topic-based schools or grades.
Environmental literacy should be integrated in schools with every student, every year.
More accountability.
Consistent funding support.
Make environmental literacy a graduation requirement.
Programs for school superintendents.
Get school boards involved.

Focus group response from Region 4 GMU
More funding.
Being able to address ESL population better.
Improve school curriculum.
Find better ways to engage public.
Appendix I Continued: What Would You Like to See Being Done?

Need more influential people involved.
Every student needs a watershed program.
A certification for environmental educators.
A holistic approach.
New definition of environmental literacy.
More youth programs.
Identifying more champions.
Balance better school and community activities.
Better ways to get the message out.

Focus group response from Region 4 BEF

More accountability.
More professional development for teachers.
Better alignment of environmental literacy with SOLs.
New environmental literacy definition.
More emphasis on environmental literacy in schools.
Helping teaching improve pedagogy.
More funding.
An environmental policy.
Better communication.
Web-based directory of environmental speakers.
Better use of social media to promote environmental literacy and activities.

Focus group response from Region 5

A system where teachers could learn about resources and how they correlate to SOLs.
Updated resource book.
More resource people -- to focus on larger system.
More advocates.
Authentic experiences -- not just going outside for 20 minutes.
Support beyond the division level.
Environmental literacy needs to be part of the school curriculum.
Use evidenced-based practice.
More environmental science degrees.
Develop a model that can be replicated in other regions.
A paid person who can be the champion for the state.
Build an environmental literacy network.
A conference that unites formal and non-formal educators.
Link community environmental resources/activities to school websites.
Need more best practice models.
A new curriculum framework that includes environmental literacy.
Magnet environmental schools and more support for schools that focus on environmental literacy.
VDOE and legislators working together.
Teacher recognition for teachers running successful environmental programs/activities.
Professional development for helping teaching integrate environmental literacy with other subjects.
Recycling block grants.
A resident school naturalist.
Appendix I Continued: What Would You Like to See Being Done?

Focus group response from Region 6

Area-wide education about environmental literacy.
Streamline volunteer background checks.
More access and use of agency data.
Resource book.
More outdoor education, both formal and non-formal.
Remove cultural barriers.
Programs for special needs individuals.
Weekend events and projects for the community.
Incentives to motivated people to become involved.
Calendar of local environmental activities.
Innovative ways to invite people to get involved.
More after school activities.
Overcoming historical acceptance of individuals.
Integrated school curriculum.
A manual that links environmental education with SOLs.
Classroom energy experts.
Take advantage of recent water contamination by Duke. Have Duke fund environmental education in schools.
Funds for Evans Park Environmental Center.
More emphasis on recycling.

Focus group response from Region 7

Require earth science for every high school student.
Money for programs, training, etc.
Require schools to help teachers know about and connect to resources that are available.
Need Richmond to tell districts what they want and what it looks like -- leadership beyond the Richmond area.
A watershed idea for region that is recognized at the state level.
KARST.
Utilizing the Center on Coal Heritage Trail.
Better and stronger Internet networks -- spotty in region. Funding to continue program that are working well.
More volunteers to work in schools. Training to use the tools that exist -- PL:T, GLOBE, Project Underground, etc.
More often training opportunities.
Getting school counselors involved and knowledgeable - available opportunities and scholarships for students.
Greater job awareness.

Focus group response from Region 8

Need to get school administrators and teachers environmental literate.
Need to get local and state politicians environmental literate.
Strategic plan for sustainability and environmental literacy.
A way to connect resources.
Appendix I Continued: What Would You Like to See Being Done?

Organization -- A group to think-vision-mission-goals.
Collaboration across county/school district lines.
VDOE and VRUEC pursue more funding for south of 460.
Database for curriculum.
Certification program for environmental literacy.
A required environmental literacy course for all teachers.
More emphasis on environmental literacy in teacher trainings programs.
Need better buy-in for school administrators.
Get more subject matter teachers involved in teaching environmental literacy.
More constructivist approach to learning.
Integrated environmental literacy curriculum and methodology.
Crosswalk between SOL and environmental literacy standards with plenty of professional development opportunities.
Appendix J: Unedited survey responses to Item 12: What would be the most effective way to promote a higher level of environmental literacy in communities?

Responses of preschool and elementary teachers

Have spots on television that are interesting and apply to specific areas geared at children. Maybe on Saturdays during cartoons?

Training
Include Environmental Ed in elem and secondary curriculum.
More programs in schools.
Field experience is helpful to learn the value of nature. My students seem to spend a lot of time indoors using technology. They do not know the value of nature.
short workshops offered in local areas for easy travel time
Taking an active interest and making a stand.
More activities for adults!

School programs
There are many SOL's that support outdoor/environmental education. Classroom teachers need ways to make the connections. The watershed experience in middle school is a great example of a step to include these experiences in the curriculum.

Prepared sessions set up for families to participate, possibly within the park area.
I don't believe there is a "most" effective way -- all communities are different -- but one effective tool would be for local government/Richmond to offer incentive programs (e.g. tax deductions) that encourage/reward environmental stewardship.

**The above list would not let me re-order it. The most effective way to promote a higher level of environmental literacy is to start at the top- the reason this is important to all Virginians should be supported by the Governor's office and the General Assembly.
Site based information sessions in city schools would be a good way to increase the awareness of environmental literacy.
It starts small with local community leaders who have a great reputation for honesty and loyalty to the cause.
Recognizing or rewarding (plaque or small gift) organizations, schools, etc. that promote environmental awareness.
Make it a priority in the schools. Right now the focus is so heavy on reading and math and educators have little time for science.
The general public needs to be informed bit by bit. Teaching the next generation to appreciate the environment will also make a difference in the future.
Start with the school age child. Get them engaged and they will engage the family
If we could eradicate hunger in our school and the drug problems then I would be more willing to work about environmental literacy and my students would be more invested as well.

Responses of middle school educators

Advertising relevant training opportunities
Having active teachers and community members who could come and assist
Education of school aged children (stewards of our environment in the future)
Through teacher training so the teachers can effectively apply it in the classroom/curriculum.
VDOE needs to include science SOLs for environmental literacy in every grade level, K-8 and for every high school science course. This would show students the importance of chemistry and physics as well as the biological sciences and earth science in promoting environmental literacy.
Appendix J Continued: Unedited responses to Item 12: “What would be the most effective way to promote a higher level of environmental literacy in communities?” (Middle school teachers, continued)

Field studies.
I think an effective way is for students to share what they are learning in the field and how communities can work with govt agencies to effect positive change.

Why not an ad campaign on TV, radio, which addresses environmental issues? The kids are so teachable. Seems the adults are most indifferent to environmental issues. How about an incentive for businesses to go greener and get employees involved? How about incentives for families to go green, an organization that helps homeowners to get geothermal?

Scientists coming in to the classroom to spend the day doing an activity with the students. This is extremely effective in making meaningful connections for the students and is the most cost effective for the teacher. The teacher needs to make sure they do enough preparation beforehand to get the children primed and ready and then follow up as well.

Youth programs Environmental/science/nature/outdoor clubs
Education opportunities for general public; specific topic learning activities with general appeal; one day learning/education activities; family appeal activities
Teach it in the schools.
Implement and train integrated outdoor learning in existing classes that is correlated to the SOLs.
Offer courses at the middle and high school levels.
Include them in the SOLs in a constructive way don't add another criteria to the SOL list that is too full as it is
Field experiences, Placed Based Learning
Restoration/project learning
Having the opportunity to apply the knowledge gained on the subject to a task or project that would have a positive impact on the environment in the local community.
engagethe schools- partnerships with environmental organizations and schools
Affective assessment
Service-action projects
Fund our schools with programs to take kids outdoors!
Introduce environmental literacy into core curriculum such as English and History hands-on learning
have webinars or workshops - include weekends for teachers who are interested, but unable to get days off
partner with festival and other regions & local events - sponsor, contribute learning booths/activities, make message omnipresent; then advertise workshops, camps, outreach
get kids outside
By reinforcing environmental literacy in the classroom.
By getting the students involved in hands-on activities both in the classroom and field experiences, they will make their families more aware of environmental literacy.
Provide HS science teachers with environmentally focused college classes at no or low tuition.
Encourage the English departments to introduce environmentally themed literature.
Appendix J Continued: Unedited responses to Item 12: “What would be the most effective way to promote a higher level of environmental literacy in communities?”

Responses of high school educators

To have Virginia standards of what our expectations our for strong environmental literacy looks like, sounds like, etc.
Seminars, participation in local county fairs, school inservices..
Community action events like clean up days
More hands on material and training for teachers
Train teachers who teach students. Students take action and participate in community-wide education initiatives. If students understand and are asked/required to take action, they are likely to have a greater impact on the uninformed adult community around them. These adults hold the purse strings for impact in the future.
More informal education opportunities
Hands On Activities in the environment
Financial benefits.
More programs offered that are close to home.
More opportunities provided at low or no cost. Having community events at local libraries, rec centers, etc. where people and go learn and see animals, plants, fossils. Anything that will get their attention and make them want to learn more.
Once students are involved in environmental activities that relate to their lives, they will 'get the word out' to the community. Having time, proper training materials, and space outside to work are crucial.
Have more community activities.
Getting to take the kids on field trips to see why understanding b their environment is important.
Have a mandatory secondary educational course.
More promotion of SOL related workshops for teachers and better communication of local resources available to those educators. Most of us are unaware of what is out there in our own communities.
Increase awareness of available programs funding
Provide an incentive.
more opportunities! Better communication.
Offer free curbside recycling.
Have more interactive field days with the general public. Urban areas will need more training

Responses of resource teachers

Do a project involving the community in environmental literacy. Include pre-service teachers to participate and be involved.
Getting the community’ s involvement especially administrative support for recycling and watershed activities
In public schools could have environmental clubs
more volunteers. Master Naturalists are great but don’t cmmit to lng term activities in a school. I am a MN volunteer.
information
Appendix J Continued: Unedited responses to Item 12: “What would be the most effective way to promote a higher level of environmental literacy in communities?” (Resource teachers, continued)

Involve students with community efforts. You must show in an engaging and hands-on way how their choices affect others and the environment.
Continuous job-embedded professional development, required by schools systems with required curriculum in the classroom.
Make it impact the community - show all stakeholders how it can help them and their community so they can see the impact while being fairly easy to implement.
Hands-on opportunities designed to promote awareness of environmental issues.
Community awareness programs
Extended school days Test concepts in SOL science test.
Free or low cost programs offered at the school site in classrooms and clearly aligned with the VA standards of learning.
Teaching students is the best way. They in turn share the information with parents and then this spreads to the community.
Better communication about the need.
through classes sponsored by the schools that include opportunities for parents to attend with students.
I know several parents who would attend the CBF bay trips and then want to become more active in EE in their community
More resources and training
Offering programs (exhibits) open to the community at an environmental fair or through other community gatherings.
Holding events in the community.

Responses of school administrators
When young persons know about the environment, they tend to tell others. I think it needs to start with our students.
Offer more workshops and community event days
through the school system on professional development days
Keep encouraging the Project workshops. Everyone loves them!
Organized local meetings of collaborative organizations to promote available resources.
Visible programs that are constantly active in the community. They should involved, in an aggressive way, existing communities, such as schools and churches.
Programs offered through the schools and PTAs that parents could enjoy with their families
Teachers want someone to provide engaging learning experiences for their students. If there were people available to accompany classes to an environmentally appropriate site, such as an outdoor classroom, and lead the activity, more teachers would participate.
I believe grants that fund school divisions or community organizations to train their staff and provide materials and relevant experiences that staff members can replicate to a larger audience is effective.
Continue to bridge between education community and the agencies and groups actually doing the work to improve the environment. By bridging these groups you raise the conscience of the community from the ground up - starting with children.
Offer online credit classes at the graduate level as these are needed by many community college instructors and high school teachers.
Appendix J Continued: Unedited responses to Item 12: “What would be the most effective way to promote a higher level of environmental literacy in communities?” (School administrators, continued)

Bring educators (formal, nonformal, prek-16) together to identify local and regional natural history and environmental issues that can be examined in preK-16 education. So little connection is made b/w schools and their communities and regions. Then revamp the whole educational objectives (SOL) approach to permit more attention (time, funding, space, training) for environment-related investigation, evaluating and problem-solving in prek_12.

Identify existing community organizations that educate others (faith based or Rotary or PTA for example) and use them to magnify impact.

By seriously addressing it in the PK-16 context through rigorous, interdisciplinary, relevant work that includes field experiences. We must engage students in meaningful work and teach science through that work. Enough worksheets. Let's TEACH. If we reach that audience in a sustained way, we can make change.

Teach the concept of ""Place Value"" to all students at an early age.

Place-Based Education

Train teachers, administrators, and leaders in communities. Create a cohort of persons, provide them with resources and support and help them get the word out. We need support from the heads of Education and a break out of environmental education for SOL's that connect to training of children, their teachers and administrators. Further we need leadership training for teachers to complete Master's degree programs as leaders in EE to act as local resource persons.

Promote the concept of science-in-place so that teachers and students can relate to real-world environmental issues that they can observe. Further, environmental literacy should be the concern of all academic disciplines. Getting teachers to talk amongst themselves (across disciplines as well as grades) to see how a Virginia environmental issue can promote not only deeper learning opportunities about our world, but also enhance learning in their discipline.

Work with the schools and student organizations

Mentoring programs Noncredit courses offered to public (adults)

This is always a challenge. I believe any activity that brings like minded people together in pursuit of a common cause of interest and of service is always valuable.

outreach between environmental agencies/universities and the community

Political leadership. Media coverage.

EL in K-12 schools should be a priority  Public Libraries are also an untapped resource for EL programs

Facilitate communication networks between individuals, organizations, and agencies producing environmental education programming. Also, fully fund a statewide EE conference for professional development opportunities across sectors. Establish an endowment for field trip travel for K-16 (not just K-5.) Finally, adopt guidelines for creating and adopting effective programming - specifically the Guidelines for Excellence created by NAAEE and the National Project for Excellence in EE. There is absolutely no need to waste time and money reinventing this particular wheel.

Establish environmental education centers, including gardens and natural spaces, around the schools.

Work in the school districts

Opportunities for teachers to participate in environmental literacy professional development programs that are held after school hours.

We need buy-in from the local school administrators and teachers. We have great resources available here on the Eastern Shore, but it is hard to get them into the public school classrooms or to get public schools to participate in field trips (even when we have full funding for them).
Appendix J Continued: Unedited responses to Item 12: “What would be the most effective way to promote a higher level of environmental literacy in communities?”

Responses of postsecondary educators

Mandate requirements for graduation in the public school system.
by example
Have it part of a policy and connect with STARS (Sustainability Tracking Assessment and Rating System) for higher ed
The state needs educational environmental centers in addition to state parks. All future teachers need training in environmental literacy.
Training teachers and teachers to be, training administrator too. In fact administrators should be shown how EE can meet their SOL needs better than sitting in a class room in a seat.
Every public school should have an active environmental education program, whether through internal curriculum or external partnerships. This would require policy at the state level.
Professional development for teachers and awareness programs for community members.
N/a
Offer workshops in Public Libraries, Schools, and Master Naturalist meetings.
require it in the classroom

Responses of parents, business owners, and adult students

no comment
Unsure.
Get involved in individual schools.
more public programs presence at festivals more school programs (mewe) presentations to legislators/ government environmental literacy
Having a central staff member coordinate with educators and Science Dept. Chairs across the state to better facilitate trainings for divisional field staff.
Have a higher number of teachers and administrators who are committed to integrating environmental literacy into all aspects of education, for all students.
Marketing.
Make it important to public and private school students. Get them on board about not littering while we are at it.
Start in the school.
Teach in school
Programs like Verdun or Learning Tree Farms
Targeted outdoor activities
More information to provide parents. More awareness.
Stop couching it in terms of global worming.
mobil class room
Hands on
OUTSIDE HANDS ON ACTIVITIES ""AWAY"" FROM COMPUTERS, CELL PHONES AND TABLETS.
Interject training in elementary and high school programs that are fun and educational. County Agents to visit farmers and land owners to discuss farming practices that benefit wildlife.
Community outreach
Stop pushing global warming hysteria.
Appendix J Continued: Unedited responses to Item 12: “What would be the most effective way to promote a higher level of environmental literacy in communities? (Parents, business owners, adult students, continued)

State policy and funded environmental literacy objectives vis a vis North Carolina. Developing. Parental leadership and adult environmental literacy via community action research
Promote outdoor-based EE learning for PreK-12 students & develop community-based EE activities that include training along with a stewardship activity
teacher training
Provide opportunities to be engaged in hands on activities that have results.
K-12 students (public, private & home-schooled) need more exposure to inquiry based outdoor investigations. This requires buy in from school administrators, adequate funding to facilitate these experiences, and increased personnel at informal education sites in order to provide enough well-qualified staff to implement these programs
Get all agencies associated involved and in support of it.
increased public school environmental literacy training
Resources... Agencies collaborating together with same mission/ programs.
Newsletters, brochures and articles in the local papers. Regular workshops offered for the general public.
Start early. The children are often the path to moving the adults. Find elements of the message to target to remove apathy, and deliver the message in the language of the people of the community.
More focus on schools and exciting school activities to get children excited about the environment. If children are excited and have a high level of environmental literacy then they will likely pass on that information on to their parents.
 Improve fundamental teaching in our schools. Build knowledge and appreciation of the issues from the ground up.
We have a huge population in Fairfax County to serve. Having more staff would allow us to outreach more to schools and students and provide more environmental literacy programs.
Free programming in museum or library setting. But it must be hands-on in the field or bring the field into the classroom.
Bringing scientists to the classroom. Working with curriculum developers to incorporate good environmental literacy thinking. Teacher programs directly tied to SOLs. Increased parent/child programing at state parks linked to SOLs.
Partnerships with local government and other organizations; Demonstration sites of conservation practices; public relation campaign
By engaging all members of communities. Students, teachers, adminstration, parents, all socioeconomic groups.
Integrate environmental education into current curriculums (and not as a separate course). Provide teachers with hands-on experiences & tools so they can transform all lessons (English, art, math, etc.) into lessons that raise "...understanding of ecological principles, the systems of the natural world, and the relationships and interactions between natural and man-made environments...
Training for parents so that they can teach their kids about the natural world and know where it's safe for them to go. Family activities that engage parents/grandparents and their children and include some definite teaching about the outdoors
Project-based and service learning through community-based collaborations
Appendix J Continued: Unedited responses to Item 12: “What would be the most effective way to promote a higher level of environmental literacy in communities? (Parents, business owners, adult students, continued)

One of the problems we face is the increasing liability concerns for offering courses at all age levels, but particularly school aged children. New requirements discourage volunteers from acting as instructors and sponsors of informal programs and formal programs have higher administrative and personnel costs.

Setting up something like MD has for environmental education training exchange of info, networking and a continual process of training for youth leaders particularly in school - where I notice low confidence/competence levels in some staff with concept of going outdoors....also set eventually set some EE literacy standards like MD for graduation?

involvement of programs already in existence, particularly ones for rural children--such as changing lots of the 4H stuff.

Highlight community citizen science projects in public spaces with varying levels of commitment and high visibility of results.

Continue offering programs at all levels but be sure to include in schools.

consolidate efforts by many organizations into one unified front.

Take advantage of existing volunteer with skills by inventoring who they are & giving them incentives to help.

Each community needs an entity or entities working in ongoing strategic planning with local school divisions to provide and promote a high level of systemic implementation of field-based EE learning throughout school grades. That is what we do in Rockbridge and it is working very well: all 10 ES and MS in 3 local divisions are involved at multiple grade levels: 2,000 Prek - 8 students engaged in 11,000 hours of field based programming last year as well as 32 science teachers (teaching 1500 of these students) in ongoing pd support through our partnership, bringing lessons back to schoolyards in new pilot programs. So what's the problem? Funding to underwrite collaborative partnerships between public/private entities like Boxerwood. We have the capacity to accomplish EE goals and the local demand, but unlike a state agency, we must earn our keep from revenue. Many rural schools can't underwrite the full value of our efforts, so we seek grants for subsidies. This constant seeking for competitive funding is a real drain on our energies and introduces chronic instability in program delivery which undermines the goal of institutionalizing EE. Unfortunately, your choices in question 11 above do not include program underwriting among choices of greatest challenge but by far that is the main threat to widespread EE implementation at least in our area. In sum, it's not the capacity or demand: we have both: it's the funding for us to do our work. My one wish is for VA to develop a method of block grants that would recognize and support the work of allied non-profits such as ours in delivering EE in areas without easy accessible state resource capabilities. The second big wish would be FUNDED mandates from VDOE for each school division to carry out MWEES (or other EE-like initiatives) across multiple grade levels have it in the schools community clubs

High profile projects and broad avenues for engagement with tangible """"rewards

Connect formal and nonformal educators so that they can collaborate on increasing environmental literacy,

lessen emphasis on SOL's and let kids get outdoors and go on file trips

free programs offered to all student and adult groups

Social marketing

Provide a method for Certification for Environmental Educators so that what we do has validity.
Appendix J Continued: Unedited responses to Item 12: “What would be the most effective way to promote a higher level of environmental literacy in communities? (Parents, business owners, adult students, continued)

Correlating to SOL’s or tie to Continuing Credits for educators.
Educate the Boards of Supervisors, Mayors & Co Mgrs, Planning Commissions, administrative staffs of municipalities, dept of parks & rec, education, planning, etc. Without support from the top, getting any educational programs into schools, parks, rec programs, etc, is extremely difficult.
Creating well known outreach programs that teachers and groups knew of and could easily call on to promote engaged learning on environmental topics. Having an easily accessible compiled source of lesson plans and hands on opportunities aligned with state standards that teachers could use when needed.
Communications campaign must connect environmental literacy to what non-environmental literate people think is important: financial security, jobs, power, prestige, food, shelter....etc.
Provide opportunities for school children, both public and private or home schooled. Educate senior citizens.
Support nonprofits and training volunteers to supply high quality EE as support programs for teachers and public school systems
Getting students and the public out into the natural environment to appreciate/evaluate it and to learn and apply skills there. Hands On! As it is not always easy to get school children/allot of the public out into the natural spaces in their area, technology is a means to bring their local natural environment to them.
Provide classroom teachers with enough background knowledge to include env. ed. in their curriculum. Emphasize the importance of env. related SOLs by always including these questions on SOL tests. (Not sure if this happens already.) Include env. literacy as a core college course. Basically, it cannot be optional.
reach out to more elementary schools, with opportunities to build and maintain gardens, bird/animal sanctuaries, rain gardens...
More free events and workshops. Mandatory training for all school teachers on their professional development days. Teaching school administrators and science coordinators
Tie it more closely with state curricula and standards
more outreach, more hands-on, field training
Bring it in to the communities.
Administrators need to support and buy in to environmental literacy programs. Administrators and classroom educators need to be trained on how to implement these programs within the school systems and also need to be educated about what resources exist in their communities to help implement these programs. Additional funding should be directed to pay for environmental specialists in each school who will provide resources and training to school teachers. Funding is also needed to support staffing needs of non formal/community environmental educators working with the schools
By incorporating it into the curriculum of public school systems. This should include not only in class study of ecological principles, but also opportunities for outdoor education and outdoor classrooms at schools.
EE teachers in every school
Hands-on experiential learning
To be active at different levels- in the classroom, day long workshops ie. rain barrel workshops for community members, educational festivals- for a larger audience- birding and watershed festivals.
Appendix J Continued: Unedited responses to Item 12: “What would be the most effective way to promote a higher level of environmental literacy in communities? (Parents, business owners, adult students, continued)

non formal educators, community based projects
We have to figure out a way to get people to make an emotional connection to the environment. If they’re connected emotionally they’re willing to learn more about it and how they can become better stewards. No connection = they don’t care.

Funding for more personnel
More people do the work and school administration understanding the need for it
Research shows that one time workshops/webinars are not effective without follow through, extended collaboration, and accountability. This was proven in the localities that truly followed the Reading First guidelines. We are in need of intentional, explicit, hands-on and sustained instruction for make a positive long term impact.

More direct exposure for our young people to the effects of poor environmental practices. That is like a picture....worth a million bucks!

more televised publicity
Increased levels of publicity about how environmental choices and problems are affecting the economy and well-being of average people. Accompanying the publicity, school lessons can be prepared to delve deeper into the inter-relationships.

I find that there are a lot of opportunities for training an education
more outdoor time exploring. Groups working together to promote
start with youth
If all school administrators were allowed to have time for the students to engage in environmental education. As much as it is stated that children are exploring environmental education, the reality is that when push comes to shove in getting the SOLs for Math and Reading covered, science time is always the first to be cut back.

I do not know
Farm to School. Connect E.E to food systems and food systems to STEM. Most human effort and environmental impact is expended toward food production. Creating an environmental education developmental track and certification. Developing a workforce initiative to put an environmental educator in each school and and rotated through preschool child care centers. Educators could be hired by the government and private sector such as river outfitters, tour companies, parks.

media, media, media, schools, churches, decision-makers, clubs
Appendix J Continued: Unedited responses to Item 12: “What would be the most effective way to promote a higher level of environmental literacy in communities? (Parents, business owners, adult students, continued)

Give full time benefited job positions to the individuals that are hired each year to lead programs during the summer seasons and state parks, nature centers, the U.S. Forest Service. This would give those already trained individuals a chance to keep their jobs throughout the school year so that they could actually lead environmental education programs for school groups and other interested groups of children like home school groups, scout groups etc. These employees are limited by budgets across the state but the qualified individuals to fill the jobs already exist but can't work during the winter because of 1500 hour constraints thus they are laid off during the most critical time of the year for doing EE programs. I am not saying that we should make more positions first although I do believe that doing that as well could be the second most effective way to promote a higher level of environmental literacy. I do believe that we have the individuals already promoting environmental literacy employed and trained on how to promote good EE programs we just don't employ them well enough to keep them around either. They are over worked and under paid and do not receive insurance from their 40 hour or more a week jobs that are not full time thus they must quite and move on to a job that doesn't teach environmental literacy so they can earn a living and they take with them all of the professional development knowledge about environmental education and env. literacy that we have invested time and money into them.

Free, Fun, Active, and accessible opportunities, for communities member to have a hand in caring for and learning about the environment in which they live. Programs with specific emphasis on how the health of their local environment ultimately benefits the comity itself.

Engaging People to Spend more time outdoors
get local government involved, train all classroom teachers/professors
community meetings
Tie it to economic development
If schools were more involved in hands on environmental education; gardens at the school could serve as places where parents and other community volunteers could come and help with maintenance. Work days could incorporate different themes such as water quality, organic gardening, etc.
Environmental programs offered at our local nature parks and or gardens should be family oriented, hands-on and FREE.

offer teachers guidance in planning units that promote environmental literacy
make planning commissioners be students for a day to learn, and to then visit places hurt by poor planning decisions
Offer programs
Make environmental literacy standards in Virginia Schools (like Maryland). Provide relevant outreach at popular community events, outreach to faith-based groups. continue in the schools with an increased focus and interdisciplinary approach
Involve and encourage an experiential learning environment.
Appendix J Continued: Unedited responses to Item 12: “What would be the most effective way to promote a higher level of environmental literacy in communities? (Non-formal natural resource educators)

Responses of non-formal natural resource educators

Appealing local service oriented activities that involve residents where they live.
MORE EXPOSURE AT MEETINGS, CONVENTIONS, ETC
starting at a young age and having the information constantly available and part of regular curriculum.
funding
Hire educators like myself to give teacher training, workshops and seminars.
Public presentations and activities Gatherings in public spaces such as Earth Day celebrations
more urban programs, free programs, getting kids outside even for an English or art class; any connection with the natural world such as digging in the dirt, holding a bird, having animal artifacts, rocks, leaves to touch (so a connection is made between human and nature).
Paid advertising on TV, Radio, social media
Partner with and promote Master Naturalist, Master Gardener, Chesapeake Classrooms. Continue to hold workshops, train teachers, gain funding for training teachers, hold family events, promote ""Caring for God’s Creation"" programs, partner with and find ways to connect with non-traditional groups.
move away from teaching to SOL tests and more into conceptual learning and multi subject collaboration. Train teachers so they are comfortable in the outdoor settings at early stages. Get kids into the parks and environmental lands or at least in places to get them dirty and connected to the Earth. Remove barriers (time limitations, strict curriculum adherence, etc)
political/social activism, including churches
Schools allowing more time for non-formal education (field trips, school yard exploration, arts, etc.)
Pathways of Environmental Literacy Awareness- Website Programming, Outreach, and In-House field trips for Groups
Field days or festivals with activities
In general, cultivating environmental literacy requires that one tap into the intrinsic motivations of the audience. For example, many people - including young people - love outdoor adventures in beautiful places. Thus a good strategy is to take them to such places and use that as the occasion to integrate good ecological science, systems thinking, etc. (in accord with your definition of enviro lit above). Many people are fascinated by wildlife. The trick is to couple that raw fascination to substantive learning. And so on.
buy in from schools
I think offering courses for master naturalists is very important.
Getting children engaged at a young age and keeping them engaged as they grow up by providing expanded programs--e.g. overnight events incorporating stewardship projects and fun field activities
Having transportation for youth to and from sites.
Creating a community project which included a child with their guardian or neighbor.
Get people outdoors and involved in the things we want them to care about. Easier said than done.
Experiential is the word
Free programs at all local parks!
Target families and adults as well as children. If it is reinforced in the home environment, children will live by it.
The master naturalist program has taken off very well. I believe that there is a thirst for knowing more about the environment and spending time outdoors.
Appendix J Continued: Unedited responses to Item 12: “What would be the most effective way to promote a higher level of environmental literacy in communities? (Non-formal natural resource educators, continued)

To continue to reach out to youth and in still in them a sense of their place in their local ecology
Gathering a network of individuals and organizations together that are working toward the same goal. This would help in idea sharing and be a point of contact for teachers and non-formal educator looking for information or contacts that can help promote environmental literacy in a community.

Focus on school age participants.
Educate children and their parents
Support from our local leaders would help promote higher level of environmental literacy in our area.
We have many prepared and knowledgeable educators who need public support!

Media exposure
Teaching in schools to reach the next generation.
I think a lot is being done, so continuation of current efforts at all levels.
Have a Certified Environmental Educator program like the State of NC
Have an environmental literacy component for per-teachers and administration
Offer weekend programs for adults as well as children. Encourage more school-age and preschool-age teachers to take classes that meet environmental SOLs in June or August.

In school programming and field trips
In school programs followed by community activities that re-enforce the benefit
Direct advertisement to schools and partnering agencies Social Media, farmers markets
More outreach to public officials
More opportunities for activities to be held.
Youth education
Get the students outside and seeing things for themselves
more objectivity, less political correctness
More Hunter Safety Courses and Bowhunting Courses in the schools, especially if aligned with existing programs such as National Archery in Schools Program (NASP)
more local workshops
COMMUNITY WORKSHOPS.COUNTY EXTENSION..
Seminars in places where people gather. Churches, 4H Centers, YMCA
More time is needed to develop environmental literacy in our hunter Safety course. Time has been shortened recently.
More advertising of available programs, more access to areas to conduct the training - both classrooms and outdoor areas
Offer more local environmental courses/workshops/etc
Extra curricula activities at the secondary school level.
Use volunteers
Hands on outdoor activities
Marketing by advertising River health in central Virginia. The James River would be a good barometer, and some of the data points could be water clarity, oxygen levels, pollutant levels with likely sources of said pollution, including residential pollution.

Classes
Hands-on experiences for all ages, demonstrating impact on all in a cradle-to-grave approach, perhaps.
Classes on various subjects, field trips, meetings on issues on peoples property (like Audubon at Home0
Hands on classes
Appendix J Continued: Unedited responses to Item 12: “What would be the most effective way to promote a higher level of environmental literacy in communities? (Non-formal natural resource educators, continued)

Incorporate into schools (during and after)
We need more volunteers to become involved and work within the community.
Articles in local newspapers,
Field trips to farms to learn more about where food comes from. Summer camp programs to familiarize youngsters with the joys of being outdoors.
Work with local schools, provide curriculum/videos/presentations free of charge. Sponsor summer camps/workshops for youth.
Field day seminars
add to school curriculum and have after hours/weekend fun events for the kids to bring the parents to Awareness of the need - spread the word
some sort of "traveling circus" that can offer programs to established groups/clubs on specific topics of interest. For instance: our 4H program has conducted programs for the scouts (GSA and BSA). VDGIF conducts competitions (YHEC). My rifle and pistol club has conducted programs for church groups, BSA, GSA. I have personally taken groups of VT students to the range. The 4H has a superlative environmental education program at Holiday Lake for example. Funding some of these programs as well as financial support for some of the specialty camps might allow them to expand their reach.
More programs like Master Naturalists.
Additional outdoor programs
Doing programs targeting different audiences- ie. classroom programs for school children; best management practices workshops for adults.
Broad outreach through classes in middle/high school; HE classes in schools coupled with outdoor programs.
Certification for train the trainer courses and funds to train volunteers.
More involvement with schools and cooperation with school administrations.
More programs like SPARK
Schools and businesses making an obvious effort to recycle and reuse. Getting rid of non-biodegradable materials for food services.
Offer free field trips to middle school aged children led by good communicators
Interacting with the community at events and meetings to determine their needs as a community.
More visibility and outreach in an informal, non proselytizing style: neighborhood based events for families, workshops focused on "green" actions for homeowners. Work with groundskeepers in our rural and suburban "planned communities" to reduce use of pesticides and herbicides.
Offering free programs or events that attract a wide variety of people from different backgrounds and education levels.
Teach them in school classes. Train teachers for this just they are trained to teach any subject
Offering exciting multimedia educational opportunities. Reach out and engage children through social media.
Allow teachers time to include meaningful outdoor experiences for K-12 and provide (restore) funding for these types of activities (field trips).
Appendix J Continued: Unedited responses to Item 12: “What would be the most effective way to promote a higher level of environmental literacy in communities? (Non-formal natural resource educators, continued)

Put MWEE to rest, and go back to more generalized promotion of high quality EE in public schools. There is a new generation of teachers and administrators who need to be ""enlightened."" Expand community based efforts outside of K-12 and the usual cast of characters (Master Naturalists etc.) Increase support of established successful programs such as Envirothon.

More field experiences for students and more trainings for teachers.

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<tr>
<th>Responses of natural resource non-educators</th>
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<tbody>
<tr>
<td>dedicated funding sources for those who provide programs.</td>
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<td>Expand the outreach through schools (all grades) and engage more volunteers such as master naturalists in this activity.</td>
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<td>less emphasis on SoLs in primary schools - more support for hands-on learning experiences.</td>
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<td>Have professional Environmental literacy folks teach children in schools</td>
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<td>Having environment educators on staff at all levels of schools.</td>
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<td>Designed interaction with the community</td>
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<td>Conducting activities outdoors that involve all ages and all genders.</td>
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<td>More grass-roots actions and organizations. Premiere spots at the things which we do attend and plenty of literature and demonstrations.</td>
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<td>For communities, one way might be to show the economic benefits of better environmental policies and practices.</td>
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<td>Make it a priority; motivate people to understand the importance.</td>
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<tr>
<th>Responses of government agency personnel</th>
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<tr>
<td>1) Refocus current K-12 curriculum 2) Social Media Campaign, with resources (where, what, etc) of outdoor opportunities.</td>
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<td>Field trips, both youth and adult education initiatives</td>
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<td>Development of a consistent message that encourages individuals to explore the natural world and ask questions.</td>
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<td>More involvement/time in schools. Events that bring in both the parent and child. Working with churches and civic organizations to do environmental events such as stream cleanups.</td>
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<tr>
<td>Same messages coming at people from everywhere greater outreach to notify citizens of training/education opportunities.</td>
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<td>community-wide environmental issues day where youth identify environmental issues in their communities and present them to the community members including representations from government, civic groups, and industries</td>
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<tr>
<td>Interpretive hiking trails and displays in state parks. After these are implemented local advertising should be utilized to get the word out.</td>
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<tr>
<td>Establish partnerships between school &amp; community. work with soil and water conservation districts and FFA and 4 H</td>
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Appendix J Continued: Unedited responses to Item 12: “What would be the most effective way to promote a higher level of environmental literacy in communities?” (Government personnel, continued)

i think it starts at a grade school level. If they dont take that info home, at least as they get older they will remember the importance of protecting their environment. with that being said, i might also suggest that during different festivals or events, it could be helpful to offer something for people and kids to do to lure them in to talk to them about the importance, not just preaching the gospel from the side. If you can get the schools and the teachers to teach it, you are that much closer in my opinion.

Support groups like the SWCDs who are found all across the state and typically have an environmental position on staff. Field Days and meaningful watershed experiences are excellent ways to reach students. SWCDs need funding support and training support.

develop materials for schoolkids to take home and share with their parents
None
Well advertised and open enrollment courses
For local agencies and the schools to continue to work together to provide educational, hands on programs to provide a diverse learning environment that actually teaches the children and the teachers.

Let them know we are here and what we do
Grassroots community projects that neighborhoods want
Expand the grassroots organizations such as Synergy, Truxtun Millenium with resources and policy and leadership presence. Elizabeth River is not the only organization concerned about the environment. The writer contacted Robin Dunbar about the Hampton Roads Environmental Association last year. Robin never responded. Ms Barnett sent an e-mal of recommendation about the writer. No respond. Robin Dunbar is aware of writer as contact person of Mt Hermon Pre-School. The school is a Model School. This school represents environmental literacy to urban children.

Educating students in the classroom moreso than is done now and those students bringing home that information to their parents. Also more community trainings and events available to the general public on current and important environmental topics.

Something that could recruit AND retain more members of the community, something that would generate high interest and excitement such as a high quality nature/discovery center for most local areas, with plenty of outdoor (and outdoor-related) classes/experiences offered, as well as activities to help demonstrate to everyone the importance of a healthy environment funds to be used to educate the public
Anything to get people outdoors and interested. They will learn best if they want to know more.
A presence at community events (Earth Day)
Speakers should visit Ruritan Clubs and other civic organizations.
Public engagement/advertising.
More green events geared towards the year generation
Introduce to Students starting at the 6th grade level
VDIGF time added to address environmental issues between hunters and land owners along with other concerned community members
put hunters ed back in schools
A coordinated effort between mass media and local opportunities for personal participation. The mass media portion would develop standard messaging (and possibly celebrities delivering the message) followed by a call to action and the provision of local information (classes, places to go, etc.)

More promotion, advertisement
Appendix J Continued: Unedited responses to Item 12: “What would be the most effective way to promote a higher level of environmental literacy in communities?” (Government personnel, continued)

informal public awareness programs such as Co. fairs etc.
Teach this in the schools at an early age
Consistent exposure to the relevant environmental challenges directly related to every day life.
Programs that engage adults with children
environmental professionals in the classroom, local or regional issues and practices promoted in the classroom, hands on experience....growing things.
More hands on teaching with the students. Outdoor areas, funding to help promote these better integration into mainstream education
Program correlation or even standardized between regions resulting in wider acceptance of programs by schools.
additional bodies on the ground to deliver programs as well as funding to support training and materials
1. Put an emphasis on actually DOING something constructive to address a local environmental problem.
   2. Completely re-make the outdoor environments surrounding our schools - most of them are currently biological deserts. Some schools have moved in this direction; but lots more needs to be done.
Getting it more firmly entrenched in the schools.
EE groups need to reach out more to ADULTS in the community; there's too much emphasis on schools and children. We need trainings for Homeowner Associations, Church leaders, Urban League, Developers, etc.. 30 years of EE hasn't done much to change people's basic attitudes about how they use the land - They still dump their yard debris next to streams, they still clear their property to plant lawn, they still buy invasive plants, and they're still building huge developments with tons of impermeable concrete and asphalt. It's a myth that ""the kids will go home and teach the parents."" If that were true, the kids we've trained over the past 30 years would be adults making DIFFERENT land choices now!
Engaging the community in activities which are fun and promote environmental literacy funding
Start early with the kids and ensure teens & adults are brought onboard by focused and interest-based outreach (without the teens/adults really knowing about it ...)

Note: Responses are authentic, unedited. Total responses: n=395.
References


