

A Business Plan for Environmental Education in the Commonwealth of Virginia

Submitted to:

Honorable Mark Warner, Governor
Commonwealth of Virginia

Honorable W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Honorable Belle S. Wheelan
Secretary of Education

Virginia Environmental Education Commission

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Introduction

In 2003, Governor Warner appointed the Virginia Environmental Education Commission (Executive Order #25, see Appendix) to review the plan and make recommendations for its implementation. Herein is presented that Business Plan for enhancing environmental education to ensure a viable and prosperous future for the Commonwealth.

Comprehensive in its vision, the Business Plan aims to be flexible and dynamic. Among its many sound strategies, the Business Plan includes several innovative features, including:

K-12 Education: Establish outdoor classrooms at every school to encourage authentic, real world learning and develop sustained teacher training using an integrated *Environment-Based Learning* approach.

Colleges & Universities: Encourage programs that give college students a basic level of environmental literacy appropriate to an educated citizen. Strengthen environmental education, communication, collaboration and multi-disciplinary work between colleges.

Community-based Programs: Build teams of environmental educators to help deliver on the Chesapeake 2000 commitment to provide a *Meaningful Outdoor Experience* for every student and build capacity in communities for life-long environmental education.

History:

Established by Executive Order # 68(00) on July 14th 2000, the Virginia Environmental Education Advisory Committee (VEEAC) brought together a diverse group of citizens interested in enhancing “life-long learning to foster personal responsibility, accountability and commitment for conservation of the Commonwealth’s natural resources.” The VEEAC easily reached consensus on some fundamental parameters and themes to guide its subsequent deliberations. Scientific knowledge is critical for environmental education, yet environmental education is more than science education. It has integrative and behavioral components. Specifically, it was agreed that:

- ✓ Environmental education must be based on sound science;
- ✓ Environmental education transcends the natural sciences to include integration of the social and philosophic sciences;
- ✓ The natural and built environment offers educators a unifying concept for curriculum development;
- ✓ Effective environmental education is demonstrated in behavioral changes among citizens;
- ✓ The State assumes an active role in coordinating environmental education efforts for the full range of natural and historic resources across

sectors and leveraging resources to produce high quality programs accessible to all citizens.

Culminating its first year of work, the VEEAC evaluated the current status of environmental education in Virginia and formulated 18 recommendations for strengthening the development and coordinating the delivery of the many formal and community-based programs throughout the Commonwealth.

In its second year of focus, the VEEAC (2001-02 members listed in Section III) developed a Business Plan by which key sectors can accomplish their missions, including products and services rendered, marketing strategies, management responsibilities, and financial resources necessary to support their endeavors. The 2003 committee worked hard to evaluate programs and prioritize recommendations, considering the current budget constraints and potential opportunities.

Sectoral Plans

Execution of the Business Plan for Environmental Education in Virginia requires steadfast attentiveness to the requirements of many providers and customers of environmental education in the Commonwealth. Environmental education is defined to include programs of environmental instruction and research, and communication of the products of such programs for the full range of natural and historic resources. Environmental education providers span a broad range – families, K-12 schools; Colleges and Universities; museums, research organizations, foundations, public interest organizations, corporations and other non-formal educational entities. Environmental education customers are similarly diverse - school children, college students, industry and the general public.

Virginia must take a coherent approach to address both the needs of its diverse environmental education customers and also to exploit the special capabilities of its many providers. This requires a locus of management responsibility that is characterized by:

- A formally defined statewide responsibility for environmental education;
- Robust connections to environmental education's customers and providers;
- Resources to manage the execution of the Business Plan.

The Department of Environmental Quality's newly established Office of Environmental Education (DEQ/OEE) meets these criteria and will coordinate overall execution of the Business Plan. Several agencies have specific responsibilities within each sector: the Virginia Department of Education, the State Council of Higher Education and the Department of Environmental Quality. Emphasis on a customer-orientation is essential and work is organized in sectors defined and coordinated by the principal providers of environmental education in Virginia:

- A - K-12 Schools (Department of Education);
- B - Colleges and Universities (State Council of Higher Education);
- C – Community-based Programs (Department of Environmental Quality).

Each sector above will exploit its competencies to meet its customer requirements. In doing so, each will pursue a sector-specific business plan that is both consistent with the overall Business Plan and also optimizes application of its unique capabilities to meet its customer requirements. An individual, well connected to environmental education interests, will provide leadership for each sector of the business plan to draw together the many agencies and organizations that have related programs and responsibilities.

A. K-12 Schools

Environmental education and stewardship is a lifelong learning process that needs a solid foundation. The education provided in Kindergarten through Grade 12 provides an excellent opportunity for developing this foundation. While a child's education is the ultimate responsibility of the family, the Commonwealth must provide opportunities and tools for learning in this important area. Our legislature, agencies, parents, community partners, parents, and schools must all work together to provide quality environmental educational opportunities for all Virginia children.

Background

Student achievement in all academic areas is the primary goal for the formal education system. Similarly, academic achievement in environmental and historic preservation knowledge for all K -12 students in Virginia is the primary goal within this plan. Environmental knowledge is delivered by teachers and community partners in school classrooms and is enhanced by instruction provided by community partners in outdoor, real world settings. Well-executed environmental education programs have been shown to raise student achievement in core academic areas, enhance character development and citizenship, reduce disciplinary problems, and improve student attendance.

A number of [recommendations](#) were made in 2001 as ways to strengthen environmental education in Virginia schools but the following were identified as the most critical to implement:

- *The Virginia Board of Education should develop criteria to evaluate K-12 environmental education. Adopt and monitor measures of success in environmental education, including students' performance on selected SOL questions and nationally normed surveys of environmental literacy over time.*
- *The Commonwealth should build on its Chesapeake 2000 commitment to include all Virginia students in a meaningful outdoor education experience.*
- *The Commonwealth should provide financial support through easily available mini-grants (\$500-\$2,000) for class projects and field trips.*

Goals and objectives:

These recommendations have been distilled into two major goals with measurable objectives.

- 1. To include all Virginia students in a meaningful outdoor education experience during their elementary, middle and high school studies.**

- a. establish outdoor classrooms and meaningful environmental educational programs at every school in the Commonwealth within the next decade.
- b. establish environmental education programs and/or facilities in every community with partners who can help provide off-campus experiences.
- c. offer mini-grants, training and technical assistance to teachers in schools at a rate of 150 schools per year.

2. To monitor student achievement in environmental knowledge.

- a. track trends of science student achievement.
- b. track participation of schools in Virginia Naturally exemplary model schools programs.
- c. track participation of students in environmental education programs offered by community partners.

Priority Programs:

A number of state supported programs complement the above-mentioned goals or could be aligned to support these goals. The following programs have been identified as the most expedient strategies to implement to achieve the goals and objectives identified by commission members:

- **Virginia Outdoor Classrooms**

The Commonwealth will direct new resources toward developing outdoor classrooms at schools to facilitate meaningful environmental education. Outdoor classrooms encompass a variety of facilities and landscapes that enhance instruction of natural sciences, social sciences, health, physical education, and arts. They enrich instruction by providing opportunities for meaningful investigations in the out-of-doors. Several national studies by the State Environmental Education Roundtable, the National Environmental Education and Training Foundation and by individual researchers show a variety of benefits to student learning. Outdoor classrooms can vary in shape and size depending upon resource and space constraints and can include components such as habitat plantings, vegetable gardens, weather stations, nature trails, architectural and landscape replicas from historic sites, ponds and aquatic gardens, amphitheaters, greenhouses, composting facilities and wildlife feeding/observation stations. Key to their development and use is adequate teacher training, funding, project development assistance, recognition, and evaluation. The goal is to have facilities at every school and within the next decade, at a rate of approximately 150 schools per year. For more information on implementation, see Appendix (detailed implementation plan).

Virginia Classroom Grants

This program could serve as a mechanism to fund development of outdoor classrooms. A mini-grant program was established in 2002 with \$120,00 in

private and federal funds. More than 90 schools have received grants of \$500 - \$1,000 for meaningful outdoor education projects. Funding for the program will terminate in July 2004. Based on the results of the program, an appropriation of \$100,000 would help fund 100 outdoor classrooms and reach 100,000 students or approximately 10% of Virginia's students.

- **Professional Development Institutes**

Teacher training is moving toward sustained professional development projects. A number of examples in Virginia serve as models: the Virginia Chesapeake Bay Academy, Virginia Science Standards Institutes, Our Living Environment, Teaching With Historic Places and History Under Foot. Recently, a pilot project was started with five schools using the nationally recognized EIC process (Environment as an Integrating Context). Faculty teams learned how to integrate meaningful inquiry-based instruction and outdoor classrooms into their curriculum while meeting the Standards of Learning. The cost is approximately \$500 - \$1,000 per teacher depending upon supplies and follow-up activities. To implement the outdoor classroom initiative, a series of professional development institutes around the state should be initiated. A series of 10 institutes will train 300 educators at a cost of \$150,000. Funding for 4 institutes was awarded in January 2004 from the Chesapeake Bay Restoration Fund (license plate fund).

- **Virginia Naturally Exemplary Schools**

A program was established in 2001 to recognize outstanding programs and to encourage their development. Thirty two schools have been recognized as model schools. The program is coordinated by the interagency Virginia Resource Use-Education Council and is administered by the Department of Game and Inland Fisheries. Outdoor classrooms is one of the criteria for exemplary programs.

- **Program Coordination and Development**

To help leverage available financial and in-kind resources, state, local and private programs are modestly coordinated through the Virginia Office of Environmental Education and the Virginia Resource-Use Education Council (VRUEC). Additional staff resources housed at one of the VRUEC agencies are needed to coordinate grants, provide technical assistance and develop projects, and identify private and public resources. Cost:: \$50,000 (1 FTE).

- **Evaluation Programs**

Measuring the success of environmental education efforts is a complex matter given the broad scope of the environmental arena. The first and most important measuring task will be to establish a baseline of knowledge and participation rates. While the Standards of Learning (SOLs) are not organized to cover environmental education as an independent study area a connection can be made to environmental education in a number of science and social science standards. Those reporting categories of the Standards of Learning assessments that relate more closely to this area can be identified and student performance monitored over time. Participation rates in various programs and activities such as

Envirothon, meaningful field investigations, should also be tracked as a performance measure. Additional staff resources are needed to begin tracking school programs and participation rates and measures of success. Virginia Classroom grant recipients are using a standardized reporting form to help track participation rates. Local and private programs can be encouraged to report as well. Cost: \$50,000 (1 FTE).

Measures of Success

Specific success indicators will include the number of schools that develop outdoor classrooms or meaningful environmental education programs, the number of students reached, the number of teachers trained at state-sponsored training sessions, and the number of schools added to the Virginia Naturally network. School division participation rates will provide a measure of overall success. The current participation rates are unknown for these indicators and should be tracked while implementing the goal of reaching 10% of Virginia schools each year.

A. Participation Measures:	Total in VA:	Goal (# per year):
Teachers trained each year	75,000	1,500
Schools with facilities & programs	1,900	150
Students	1,100,000	100,000
School divisions	135	13

B. Performance Measures

One discrete measure of the performance of our K – 12 educational efforts is the SOL test scores. The closest the SOLs come to representing the environmental area are in science. Trends in achievement on objective measures of academic success for schools with newly installed outdoor classrooms and trained faculty will be compared with schools overall. The number of Virginia Naturally Exemplary schools will also provide a measure of success.

Financial Resources Required

Taken by itself, the cost to provide 80,000 students (one grade level) with a meaningful outdoor field experience is approximately \$3.2 million (\$40/per student). When leveraged with other programs and partners, the cost can be significantly less and funds used in a manner that builds capacity for yearly implementation. Resources are needed, however, to facilitate collaboration among environmental educators and across agencies, initiate pilot programs to serve as models for self-sustaining efforts, and leverage support for capitalized facilities and infrastructure. The following resource requirements are a minimum level of support needed:

Goal	Cost	Cost	Lead Agency*
1. Meaningful experience			
a. 150 Classrooms Grants	\$2,500 avg.	\$375,000	DEQ/VRUEC
b. Coordination of grants, TA	staff resources	\$50,000	DEQ
c. Teacher institutes	staff & supplies	\$150,000	VRUEC
2. Program evaluation	staff resources	\$50,000	DOE

*** Lead Agency**

Several state agencies have responsibilities for various aspects of environmental education.

The Department of Education (DOE) is responsible for tracking and evaluating student achievement.

Coordination and promotion of environmental education for youth and citizens is part of the legislative mission of the Department of Environmental Quality. DEQ provides administrative support for Virginia Naturally, the Virginia Classroom Grants program, and the Virginia Resource-Use Education Council.

The Virginia Resource Use-Education Council is an interagency council of state education and natural resource agencies and higher education, that works cooperatively to deliver professional development for Virginia's preservice and inservice teachers. The Virginia Department of Education is an active member and provides leadership and direction.

Potential Sources of Revenue to Align with Stated Goals

The following federal, public and private funds should be encouraged to support the priorities listed in this plan.

- **Virginia Chesapeake Bay Restoration Fund** - <http://dls.state.va.us/cbrfac.htm>;
- **Litter and Recycling Fund Board** - *if funding is restored* <http://www.deq.state.va.us/recycle/programs.html>;
- Private grants: **VEE Minigrants** <http://www.vee.org>
- US EPA regional awards: usually \$5,000 or less – <http://www.epa.gov/enviroed/grants.html>
- NOAA **Chesapeake Bay B-WET** awards for meaningful watershed experiences - <http://noaa.chesapeakebay.net/Education/bwetgrantprogram.htm>

B. Colleges & Universities

Mission

To advance Environmental Education in Virginia colleges through leadership that will:

- Foster collaborations at the college level;
- Engage students of all ages to become educated persons respecting the environment;
- Apply environmental knowledge for the benefit of all Virginians;
- Recognize and promote research for understanding and preserving Virginia's environment;
- Integrate environmental research and teaching at Virginia's colleges and universities;
- Assemble and deploy such resources as are required to accomplish these goals.

Goals and Objectives

While this business plan aims at improving environmental education at all relevant institutions, public and private, it is expected that the application of public resources may have greater and more appropriate effect on the state's public colleges. Hereafter, "College" refers to all Commonwealth Universities, Colleges, and Community Colleges. The specific Goals addressed below are excerpted from the VEEAC 2000-01 Committee Report on *Roles of Colleges* (veeac.smv.org/new_page_4.htm). Flexible priorities are indicated in parentheses, from most important (1:x), to least important (3:x); and 'x' counts the 10 Services, or goals, in serial order.

- **Coordination, Collaboration and Communication (1:1)**

Goal A2-A. Strengthen inter-college environmental education collaboration by appointing a Statewide College Environmental Education Coordinator/ University Professor serving all public universities in Virginia as advocate for environmental education and research collaborations. The appointee, with appropriate assistance from environmental education specialists employed in state agencies, should encourage collaborations throughout Virginia. In addition, each president of a college with environmental courses and/or research should designate an On-Campus Environmental Education Coordinator and creatively exploit existing inter-college mechanisms to benefit environmental education.

Objectives are to strengthen environmental education across all commonwealth colleges by broadening the scope and depth of educational experiences provided in colleges. The means for attaining these objectives are improved collaboration, better use of the diverse resources of institutions in the state, and strong linkages to enhance competitiveness among Virginia's colleges in contending for foundation, federal and industrial grants and contracts. For example, one useful product would be an up-to-date listing of grant and contract opportunities open to Virginia colleges, spanning their broad environmental interests and capabilities.

The measurable objective would be the appointment of a Statewide College Environmental Education Coordinator/ University Professor with a budget. Since his responsibilities transcend the interests of any single college, funding could come from the state and/or from Virginia's public colleges at large, rather than from any single college.

Required base funding for a Statewide College Coordinator/ University Professor for the Environment is estimated at \$170,000 including travel, publications & communications. On-Campus Environmental Education Coordinators could take on environmental coordinator responsibilities collateral to their regular duties, or as a replacement for some of those duties according to the needs and resources of the college.

- **Determine the Status of College-level Environmental Education (1:2)**

Goal A2-B. Determine the scope and scale of environmental education at Virginia's colleges. Inventory the results and make them widely available. Critically analyze the results to draw conclusions regarding the status of public environmental education at the college level and its effectiveness in Virginia, identify exemplary models, and determine gaps that should be filled.

The measurable objective would be the development and distribution of the inventories of environmental education and research programs available at Virginia's colleges.

Funding: This is a statewide need and requires central funding estimated at \$25,000.

- **Stimulate Quality in College-Level Environmental Education (1:3)**

Goal A2-E. Encourage the design and implementation of college programs and courses that will improve the overall exposure of all college students especially including pre-service teachers, to the facts, concepts, and techniques necessary to attain a basic level of environmental literacy appropriate to an educated citizen. For example, environmental studies have been used as an integrating context within which many subjects are taught. Establish a state-funded environmental educational grants program for colleges to encourage innovation and excellence in college environmental education.

The measurable objectives include the number of curriculum offerings contributing to quality environmental education experiences for students, together with some measure of environmental content in such courses.

The incremental funding needed to realize this goal varies by college, depending on the state of development of its environmental education programs and other factors, between zero and \$3,000,000 per year at each college.

- **Research for Understanding and Preserving Virginia's Unique Natural Environment (1:4)**

Goal A2-H. Virginia's ponds, streams, rivers, and estuaries are environmental heritage features binding Virginia's citizens in common cause to preserve a quality environment. College environmental education programs can use them effectively as educational and research laboratories and help to preserve these resources.

Measurable objectives include establishing recognized environmental research environments for college environmental education and research so that Virginia's outstanding environments become natural classrooms.

Funding to incorporate natural classrooms appropriately into the infrastructure of Virginia's colleges is \$3,500,000 for construction, \$50,000 per year for maintenance, and 10 percent of infrastructure investment for operations.

- **Environmental Monitoring and Analysis Equipment for Virginia (1:5)**

Goal A2-F. To address shortfalls in funds for purchasing environmental monitoring and analysis equipment at Virginia's public colleges, earmark a portion of the State Council of Higher Education for Virginia's (SCHEV) Higher Education Equipment Trust Fund (ETF) disbursements for environmental monitoring and analysis equipment, in a manner such that every 3-year running average shall meet a specified 15% minimum of the total funds disbursed. Encourage the leveraging of the funds provided with federal and corporate supplements.

Hands-on field experiences that encourage real-life competencies are among the most effective educational means for encouraging young people to select these fields as a profession. Such experiences depend upon the availability of environmental testing equipment and instrumentation.

The measurable objectives would include creation of the earmark together with creation and operation of a Virginia Environmental Information System for organizations that depend on high quality environmental information -- educational institutions, state agencies and industry.

The funding needed to realize this goal is at least 15% of the ETF (\$14.4 million in 2000). This would be an allocation within the regular appropriated budget and would add no net cost.

- **Environmental Education, Research, and Outreach (2:6)**

Goal A2-I. Establish a Governor's Environmental Education Awards Program to honor excellence at Virginia's colleges. Use it to identify and reward outstanding individual, group, and institutional contributions for accomplishments in college environmental education. Bestow awards publicly and visibly at a Virginia College Environmental Education Conference or other event, with tangible incentives to innovate and improve college environmental education through scholarships, sabbaticals, environmental instrumentation, etc.

Measurable objectives include establishing formal awards programs, financial and other incentives, and bestowing public recognition for excellence on honorees. Funding to establish and operate awards programs is estimated to be \$20,000 per year, plus the cost of tangible incentives as may be desirable, cost yet to be estimated.

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- **Technology and the Environment: Virginia's Role in U.S. Competitiveness (2:7)**

Goal A2-D. Examine the potential for the emergence of strong new environmental education, science and technology programs at Virginia's colleges—especially those linked in mutually helpful ways to the information technology industry. Follow through with explicit action will encourage information technology and college-based environmental programs in ways that will assure that these two co-dependent sectors advance together.

Advances in environmental science, technology and management increasingly depend on information technologies for acquiring environmental and system performance data, modeling and interpretation, creating strategies for the prevention or amelioration of undesirable outcomes, and cost reduction. Likewise, the information technology sector is partly driven by an important environmental science and technology customer base—with its growing needs for sensors, data acquisition and, computationally intensive modeling, data-intensive model validation and use, and knowledge management.

Measurable objectives would include new academic programs in which students could obtain certification in both information science and environmental science. Such training would improve Virginia's high tech competitiveness and provide a technologically competent environmental workforce.

Funding for two new faculty positions that at the academic interface between information science and environmental science programs would be \$200,000 per year at each participating institution.

- **College Environmental Education Conference (2:8)**

Goal A2-C. Sponsor an annual Virginia College Environmental Education Conference to foster inter-college environmental education connections of all kinds, to report on accomplishments, to identify emerging problems, and to recognize excellence among individuals, groups and colleges in Virginia.

The measurable objective would be an annual electronic conference, with published proceedings, that would service both participants and the broader educational community.

Funding for hosting an annual Virginia College Environmental Education Conference is estimated at \$17,000 per year.

- **Academic Incentives that Promote Environmental Education, Research, and Outreach (3:9)**

Goal A2-G. Survey Virginia's public colleges to determine how supportive promotion and tenure policies are for young faculty working on interdisciplinary or multidisciplinary environmental problems. Determine whether disincentives operate on young faculty members who wish to work on interdisciplinary problems or if tenure decision officials misunderstand the nature and importance of collaborative research and outreach to environmental education. If the survey confirms a need, then address it by appropriate mechanisms among which might include an environmental grant program to support faculty members working and teaching across discipline/department lines - under the condition that the college accepting the funds shall certify that such interdisciplinary work is fully acceptable and creditable toward building a case for tenure.

The funding needed to perform the survey is \$20,000. An appropriate grants program, if found to be necessary, will be priced when the dimensions of need are accurately known.

- **Facilities Management (3.10)**

Goal A2-J. Establish a Governor's Environmental Management Awards Program for college facilities. Honor individuals, groups, and colleges mounting successful and innovative environmental and energy management programs for college facilities, buildings, and real estate. Fund any incremental costs for quality design and construction as are necessary to protect and repair unique environmental resources and/or improve designs and practices when justified by operational savings and their usefulness as environmental education laboratories. Examine incentives that pertain to colleges (e.g., do life-cycle cost savings accrue to the institution or are they recaptured by a General Fund?) and identify policy changes that would improve them.

Measurable objectives include establishing a formal facilities awards programs and making annual awards, and determining what policies and

incentives may presently inhibit good environmental and energy efficiency design and construction.

Funding to establish and operate an awards program is estimated to be \$20,000 per year. There is no net implementation cost since reforms in facilities construction and management are savings-justified. However, capital cost increments up to about 10% must be funded – they will be recouped by operating savings.

Marketing Plan

In order to advance college environmental education in Virginia, the following must be accomplished:

- Attracting students and exposing them to environmental education's many facets -- and holding their interest;
- Inspiring college environmental education providers to participate and to contribute their professional expertise;
- Securing policy and financial support from Virginia's agencies and legislature;
- Obtaining policy and financial support from the state's college administrations.

Each of the four items above defines a target audience that must be persuaded to lend its own flavor of support to a coordinated statewide effort. They are listed below, together with actions that may be helpful in securing that support.

Students

Some students are environmental enthusiasts and/or are already on degree tracks rich in environmental content. However, many others may not be aware of the environmental education content of their curricula or of the importance of environmental education to professional performance in many fields. For example, a corporate executive must often make business decisions that hinge critically on environmental factors. The quality of his/her environmental education may make the difference between corporate triumph and disaster, between personal achievement and failure.

Starting with the notion that a "Minimum Level of Environmental Literacy" is desirable for every college graduate, On-Campus Environmental Education Coordinators will encourage and coordinate proactive efforts by faculty campus-wide to promote environmental education in their courses and research. This will attract students to environmental disciplines and, for those in other disciplines, will help to integrate environmental wisdom into their professional life.

Hands-on environmental experiences in Virginia's outdoor environment are seen to be critical to a quality environmental education, and are powerfully influence young people in their future career choices. Therefore, this environmental education element will be strongly promoted. Student enthusiasm will be enhanced further by means such as designing community

service environmental projects for academic credit, teacher preparation classes on environmental topics awarding recertification points, etc.

Environmental Education Providers

On-Campus Environmental Education Coordinators can assist in developing profiles of student interest in, and exposure to, core environmental education elements. For example: What course work is aligned with environmental education? Who takes such courses, elective or required? What faculty are involved? With such knowledge, they can encourage environmental education providers in all departments to give more visibility to environmental education concepts implicit in the subjects they teach, strengthening the connections of many disciplines to environmental education in the minds of both students and professors.

On-Campus Environmental Education Coordinators can encourage departments to schedule occasional colloquia in their discipline featuring strong environmental interest components, especially bridging work in other fields, thereby strengthening the relevancy of environmental education in the day-to-day business of each department and encouraging multidisciplinary connections.

Instructors and researchers are environmental education's providers and form its delivery system in colleges. Capturing their enthusiasm is essential for improving the quality of environmental education in Virginia's colleges. They are needed to provide essential data in a survey of Virginia's environmental education resources, to assess the quality of the environmental education they are delivering, to execute steps for improvement, and to collaborate with environmental education specialists in other Virginia institutions for wide benefit.

Virginia Government

Securing the initial support of Virginia Government was accomplished with the formation of the VEEAC, completion of its initial recommendations, and the establishment of the DEQ/OEE. With those critical steps behind us, sustained support from both of these entities is necessary, especially with respect to the financial underpinnings of a successful effort. The VEEC urges the Commonwealth to seek the resources necessary to accomplish the objectives outlined in this business plan, and will provide information and testimony that is useful to that end.

State offices have special capabilities to contribute to college environmental education in Virginia, through the financial and staff support of surveys and analysis, meetings, awards, grants, communication especially via the web and newsletters, and connections to other important players such as VAN participants. We envision a dynamo for environmental education in collaboration among the Statewide College Environmental Education Coordinator/University Professor, the SCHEV, DEQ/OEE, and colleges and universities throughout the commonwealth. This partnership can bring the complementary views and strengths of state government and academia

together in a way that encourages productive innovation and disciplined progress, with latitude for independent action with appropriate controls.

College Administrations

Providers of college environmental education depend absolutely on the encouragement and support of their respective college administrations and departments. The Statewide College Environmental Education Coordinator/ University Professor will team with the On-Campus Environmental Coordinator to work with department chairs and college administrations to foster excellence in environmental education within departments, collaboration among individuals across department lines, and connections with other colleges and institutions statewide.

Such work will include surveys of environmental education activities on campus, encouragement toward formal plans for environmental management and environmental education including clear loci of responsibility, tenure policies and practices respecting inter- and multi-disciplinary work in environmental education, and identification of opportunities to improve the quality of environmental education campus-wide.

Practical matters will be addressed, with a view toward securing funding and other necessary support for the activities of the On-Campus Environmental Coordinator and interactions with the Statewide College Environmental Education Coordinator/ University Professor as necessary to encourage and cement collaborations with other institutions.

Management Plan

Because it has a formally defined statewide responsibility for environmental education, robust connections to environmental education's customers and providers, and access to resources to manage the execution of the college business plan, the DEQ/OEE will coordinate overall execution of the College Business Plan, while the State Council of Higher Education (SCHEV) should champion the plan.

The goals elaborated under Services above will be pursued by talented individuals involved in college environmental education all over Virginia, with the support of their institutions and the Virginia DEQ. They will engage college environmental education customers and providers to participate and lend support to the effort, following the approaches that are described in the Marketing Plan above. Resources will be assembled and deployed according to the Financial Plan below.

Statewide Leadership and Coordination

The effort for improving environmental education in Virginia's colleges will be coordinated by a Statewide College Environmental Education Coordinator/University Professor who serves all public universities in Virginia. Statewide duties will include: serve as advocate for collaborations in

environmental education; coordinate the development of inventories of environmental education college resources statewide; assess the effectiveness of environmental education programs in promoting consensus objectives; acting as coordinating sponsor for a periodic College Environmental Education Conference and other inter-college mechanisms/events; promote awards recognizing excellence in environmental education and educational facilities management; provide up-to-date information on environmental education grant and contract opportunities open to Virginia colleges; and update the College Environmental Education Business Plan as required.

College Leadership and Coordination

Individual colleges will be encouraged to appoint an On-Campus Environmental Education Coordinator to work across departmental lines to promote environmental education effectiveness locally and to represent his college statewide in execution of the Environmental Education Business Plan. The On-Campus Environmental Education Coordinator will serve as campus advocate for collaborations in environmental education, inventory campus environmental education resources, assess environmental education program effectiveness and examine whether campus promotion/tenure policies encourage inter- and multi-disciplinary environmental education.

Reporting Relationships

The Statewide College Environmental Education Coordinator/University Professor shall report to both DEQ and to Virginia's public colleges via an appropriate at-large mechanism. Each On-Campus Environmental Education Coordinator will report to their department and administrative hierarchy and the Statewide College Environmental Education Coordinator/University Professor. Progress against the goals outlined under Services above will be reported and tracked in periodic reviews.

Staff Support

Assistance will be provided to the Statewide College Environmental Education Coordinator/University Professor by environmental education specialists employed in the DEQ/OEE, including support for logistics, meetings and coordination with other environmental education sectors.

Financial Support

Funds adequate to support the effort directed by the Statewide College Environmental Education Coordinator/University Professor will be provided by a combination of DEQ and Virginia's public colleges at large. Funds adequate to support the activities of On-Campus Environmental Education Coordinators will be provided from a combination of departmental and college administrative budgets. Interactions with local, state, and federal government agencies, and private enterprise, to further Virginia's environmental education resource base will be encouraged. Resources to support the other services

require funding of a scale and complexity that requires a complete plan for staged funding from state, private, and federal sources.

Financial Management

DEQ will provide financial management and oversight, reviewing and approving budgets recommended by the Statewide College Environmental Education Coordinator/University Professor, and providing financial controls and disbursement services. Public colleges, as appropriate to their financial participation, will also provide financial oversight and review.

Financial Plan

The financial resources necessary to execute this Business Plan are estimated below:

Priority	Item	Cost (\$K)
(1:q)	Collaboration and Communication	170
(1:2)	Status of College-level Environmental Education	25
(1:3)	College Environmental Education Conference	17
(1:4)	Virginia's Role in U.S. Competitiveness (each participating college)	\$200
(1:5)	Quality Environmental Education (each participating college)	\$0 – 3,000
(2:6)	ETF Environmental Monitoring & Analysis Eqpmt (15% earmark)	\$0
(2:7)	Virginia's Unique Natural Environment	\$0 – 5,000
(2:8)	Environmental Education, Research, and Outreach	\$20
(3:9)	Facilities Management	\$20
(3:10)	OEE-DEQ staff support + travel + meetings	\$60

These estimated costs will be refined during the execution of the Business Plan. For example, the survey of Environmental Education resources in Virginia will influence statewide and college environmental education coordinators regarding which investments are most efficacious. Funds necessary to execute the business plan will be secured from a variety of sources, and it will take dedication, creativity and flexibility to assemble them. It is beyond the scope of this business plan to develop detailed budgets, but we can point the way forward. Funds from the State would be especially useful in initiating the highest priority recommendations, particularly if they are combined with funds from the state's colleges and universities.

The first priority among our recommendations is to establish and fund a Statewide College Coordinator/ University Professor for the Environment, since many other

elements of this business plan depend on having this person in place. He/she is necessary to establish a locus of accountability for improving environmental education among Virginia's colleges statewide, for energizing the activities of others, and to personally deliver some the educational Services recommended. It is doubtful that any real progress in improving environmental education in Virginia can be made unless a named individual formally assumes burdens of responsibility and accountability. We recommend that funds for this be assembled from the DEQ and other appropriate agencies, plus supplementary funds from one or more colleges/universities with particularly strong commitments to environmental education directly and by in-kind contributions.

Funds to support the activities of On-Campus Environmental Education Coordinators will come in combination from each responsible college, supplemented by individual departments with particularly strong commitments to environmental education on that campus. Lower cost Services, for example awards programs and conferences, would most efficiently be funded by DEQ/OEE since this office is both properly placed administratively and experienced in conducting these kinds of activities. The higher cost Services above require funding of a scale and complexity that require planned and coordinated effort over a longer period of time than was available to formulate this first business plan. We recommend that the Statewide College Coordinator/ University Professor for the Environment work closely with the SCHEV for Virginia and DEQ/OEE to formulate a complete plan for staged funding from state, private, and federal sources.

C. Community-based Programs

Statewide and local partnerships between public and private organizations create capacity for delivering environmental education and fostering stewardship of natural and historic resources in all communities. This plan outlines ways in which the Commonwealth will assist non-formal environmental education providers in delivering the information and skills needed to offer meaningful life-long learning experiences effectively and efficiently to Virginians of all ages.

Background

Community-based education providers include a wide range of public and private organizations that offer education services to youth and adults, in both traditional classroom settings as well as "community-based" venues. Community-based groups provide a critical link between schools and communities and play an important role in providing authentic and meaningful connections between people and the environment and in fostering stewardship of natural and historic resources. Community-based educators often champion issues of local concern and are considered important stakeholders when crafting broad-based solutions to the challenges of sustainable growth, economic development, historic preservation, social justice, transportation, affordable housing and health care. Thus, the Commonwealth's primary responsibility in the area of community-based education is to provide coordination, collaboration and communication services among community-based providers and between formal and non-formal educators.

A number of [recommendations](#) were made in 2001 and acted upon as ways to strengthen environmental education in Virginia schools, and the following are identified as the most critical to implement:

- *The Commonwealth should support an Office of Environmental Education and continue Virginia Naturally.*
- *The Commonwealth should create a simple funding mechanism for environmental education support.*
- *The Commonwealth should build on its Chesapeake 2000 commitment to include all Virginia students in a meaningful outdoor education experience.*

Goals and objectives:

To help Virginians of all ages understand their impact on the environment and be committed as active, life-long stewards of the Commonwealth's natural and historic resources, primary attention needs to be directed by the Commonwealth

toward building upon its previous commitments to include all Virginia students annually in a meaningful outdoor education experience and to expand and enhance the delivery of Environmental Education in Virginia.

1. The Commonwealth of Virginia will support the Virginia Office of Environmental Education by funding the Virginia Naturally program, the information clearinghouse and communications network for environmental education in Virginia.
2. The Virginia Office of Environmental Education will develop general criteria for non-formal programs and will provide communications, training, professional development and partnership opportunities linking formal and community-based sectors.
3. The Virginia Office of Environmental Education will formally recognize outstanding community-based environmental and historic preservation education activities, programs and individuals.
4. Resources and training for community partners will be directed toward building capacity for partners to deliver programs, develop facilities and create partnerships that employ local resources for meaningful outdoor education and stewardship in every community in Virginia.
5. The Commonwealth should support specific environmental and historic preservation programs in all the agencies with those responsibilities.

- **Virginia Naturally**

Virginia's formal and community-based program providers communicate among each other and to the public they serve through a communications network called Virginia Naturally. Virginia Naturally's network of 400 public and private organizations deliver environmental education in both classroom and community settings. The Virginia Office of Environmental Education maintains the Virginia Naturally web site and the list of partner organizations. With modest additional resources, the Virginia Naturally program could be enhanced to promote and coordinate activities described here. The following two goals of the network include detailed strategies for accomplishing an effective association of partners (see Appendix). The Virginia Naturally program, when fully staffed at the Virginia Office of Environmental Education, will increase awareness, effectiveness and efficiency of education and stewardship partnerships and their program development efforts. Cost: \$50,000 for a full-time staff person.

1. *Nurture collaboration among individual partners.*
2. *Enhance and maintain the network of environmental education providers in Virginia.*
3. *Provide professional development opportunities for partners.*
4. *Reach citizens of all ages with current, accurate information about Virginia's environment.*

- **Stewardship Virginia**

This new statewide initiative administered by the Department of Conservation and Recreation (DCR), enlists the assistance of citizens in projects that help enhance and conserve Virginia's natural and cultural resources. The focus of Stewardship Virginia is on projects that enhance water quality, improve wildlife habitat, control invasive species, improve recreational resources, preserve historic and cultural resources, and educate people about our recreational, historic, cultural, wildlife, & water resources. Staff resources exist at the Department of Conservation and Recreation and the cost of operating budget is approximately \$20,000.

Measures of Success

The following objectives have been identified as ways to measure success.

- The number of participating partners will increase from 400 organizations to 1,000.
- Success stories and the benefits of collaborative partnerships will be posted on the web site.
- Regular communications mechanisms, such as a monthly e-newsletter and an annual meeting, will be established to promote opportunities and address community needs.
- Assistance and professional development will be provided to partners to help develop programs and collaborations and leverage financial resources for meaningful environmental education.
- The number of groups and citizens participating in restoration activities such as Stewardship Virginia will increase by 10% annually.
- At least one service provider will be identified in every county of Virginia and linked to other education, tourism, outdoor recreation providers in their region.
- A survey will be conducted to include a complete picture of community-based programs and providers in Virginia. The survey will assess: financial resources and customers reached (including age and geographical area).

Financial Resources Required

The cost to operate the Virginia Naturally program is minor compared to the potential benefits gained from leveraging resources and developing local and regional programs. For example, staff have worked with public and private partners this past year to develop grant applications for 12 projects that will bring more than \$570,000 in federal funds from the National Oceanic and Atmospheric Administration (NOAA) to Virginia for meaningful environmental education.

Goal	Resource Required	Cost	Lead Agency*
1. Virginia Naturally coordination	1 FTE needed	\$50,000	DEQ

2. Stewardship Virginia	Operating funds	\$20,000	DCR
3. Program evaluation	Contract w/ University	\$20,000	DEQ
4. Public outreach campaign	Staff or contract	\$50,000	Office of the Secretary of Natural Resources

Potential Sources of Revenue

The following strategies are offered as ways to leverage financial resources:

1. Utilize the VAN web site to list grant opportunities as well as projects needing funding, link funding sources to providers, to create a mechanism for organizations to describe stewardship projects by funding needs, project location, age of participants, topic/issue of project and needs for volunteers. This function would require additional staff resources.
2. Investigate using environmental pollution fines or supplemental environmental projects as a source for funding EE projects, e.g., from the Virginia Environmental Remediation Program.
3. Investigate using education funds such as percentage of the state Lottery as a source for funding.
4. Create a list of meaningful field investigations, outdoor classroom projects and publish on the web site and the criteria and budget details to enable organizations looking for opportunities to support projects financially.
5. Determine current funding sources and levels of support for community-based EE through a survey.

III. Virginia Environmental Education Commission

Dr. Maile Armstrong

Girl Scouts of Virginia Skyline Council
3663 Peters Creek Road, NW
Roanoke, VA 24019
Phone: 540-387-0493
Fax: 540-387-3851
marmstrong@gsvsc.org

Tom Benjamin

Environmental Alliance for Senior Involvement
8733 Old Dumfries Road
Catlett, VA 20119
Phone: 540-788-3274
Fax: 540-788-9301
tom@easi.org
<http://www.easi.org>

Dr. Jo Lynne De Mary

Department of Education
James Monroe Building
101 North 14th Street
Richmond, VA 23218
jdemary@mail.vak12ed.edu

Delegate Jim Dillard

4709 Briar Patch Lane
Fairfax, Virginia 22032
Phone: 703-323-7354
jdillard@sytex.net

Bob Dunn

E. I. Dupont Company
P.O. Box 27001
Richmond, VA 23261
Phone: 804-383-3895
robert.l.dunn@usa.dupont.com
www.dupont.com

Jim Erickson

Manager of Corporate Communication
Southern States Cooperative Inc.
6606 West Broad Street
Richmond, VA 23260
Phone: 804-281-1392
Jim.Erickson@SSCOOP.COM

Ward Burton

Ward Burton Wildlife Foundation
PO Box 519
Halifax, VA 24558
Phone: 540-946-8447
wbe22e@gcronline.com

Ed Clark

Wildlife Center of Virginia
PO Box 1557
Waynesboro, VA 22980
Phone: 540-942-9453
eclark@wildlifecenter.com

F.E. "Burt" Deacon

Legg Mason
PO Box 55
Richmond, VA 23218
Phone: 804-833-5445
bedeacon@leggmason.com

L. Evans Drake

Honeywell
P.O. Box 761
905 East Randolph Road
Hopewell, VA 23860
Phone: 804-541-5732
Fax: 804-541-5559
evans.drake@honeywell.com

Mike Ellerbrock, PhD

Center for Economic Education
Virginia Tech
208 Hutcheson Hall
Blacksburg, VA 24061
Phone: 540-231-7722
Fax: 540-231-7417
[mebrock@vt.edu](mailto:mebrook@vt.edu)

Dr. Bethany Geldmaker

Central Virginia Asthma Coalition
2025 East Main Street
Richmond, VA 23223
Phone: 804-786-3694
bgeldmaker@carmakids.com

Talley Griffith

207 Pine Street
Stuart, VA 24171
Phone: 540-694-3165
talley@griffithlumber.net

Roberta Hylton

US Fish & Wildlife Service
330 Cummings Street
Abingdon, VA 24210
Phone: 276-623-1233
Fax: 276-623-1185
roberta_hylton@fws.gov

Suzanne Martin Lacy

Museum of Natural History
1234 Sam Lions Trail
Martinsville, VA 24115
Phone: 276-632-7394
smlacy@neocom.net

Jim Nuchols

Augusta County
Asst. Superintendent of Schools
501 Summercrest Avenue
Waynesboro, VA 22980
Phone: 540-949-0014

Phyllis Palmiero

State Council of Higher Education for Virginia
James Monroe Building
101 N. 14th Street
Richmond, VA 23219
Phone: 804-225-2611 Fax: 804-225-2604
palmiero@schev.edu

Bill Portlock

Chesapeake Bay Foundation, Virginia State
Office
1108 E. Main Street, Suite 1600
Richmond, VA 23219
Phone: 804-780-1392
Fax 804-648-4011
bportlock@cbf.org
www.savethebay.cbf.org

Dr. Bruce Hayden

University of Virginia
Environmental Sciences
P.O. Box 400123, Clark Hall
Charlottesville, VA 22904-4123
Phone: (804) 924-0545
Fax: (804) 982-2137
bph@virginia.edu

Barbara Kolb

James River High School
Botetourt County
9906 Springwood Drive
Buchanan, VA 24066
Phone: 540-254-1121
Fax: 540-884-2116
Bkolb@bcps.k12.va.us

Gerald McCarthy

Virginia Environmental Endowment
1051 East Cary Street, Suite 1400
P.O. Box 790
Richmond, VA 23218-0790
Phone: 804-644-5000
gmccarthy@cavtel.net

L.F. Payne

Wintergreen Resort
1050 Connecticut Avenue NW
Suite 1200
Washington DC 20036-5317
Phone: 202-857-2907
Fax: 202-857-1731
lfpayne@mwcllc.com

Jim Percoco

West Springfield High School
6100 Rolling Road
Springfield, VA 22152
Phone: 703-913-3800
JAPercoco@fcps.edu

Dr. Kurt Riegel

171 Gulchleigh Lane
Glasgow VA 24555
Phone: 540-258-2660
9564 Wandering Way
Columbia, MD 21045
Phone: 410-997-2241
Riegel.Kurt@comcast.net
Riegel.Kurt@apl.jhu.edu

Bob Robinson

Virginia Manufacturers Association
707 East Main Street
Suite 1600
Richmond, VA 23219-2805
Phone: 804-643-7489 ext. 22
rrobinson@vamanufacturers.com

Thomas Victory

Richmond Urban League of Greater Richmond
511 West Grace Street
Richmond, VA 23220
Phone: 804-649-8407
Fax: 804-649-1745
tvictory@urbanleaguerichmond.org

Steve Yob

Department of Public Utilities
County of Henrico
P.O. Box 27032
Richmond, VA 23273-07032
Phone: 804-261-8217
Fax: 804-261-8787
yob@co.henrico.va.us
www.co.henrico.va.us

Michael L. Ruiz

Langley Research Center
Space Projects Office/DEVELOP
Hampton, VA 23681-0001
Phone: 757-864-3784
Fax: 757-864-7890
m.l.ruiz@larc.nasa.gov

Walter R. T. Witschey, PhD, *Chairman*

Science Museum of Virginia
2500 West Broad Street
Richmond, VA 23220-2054
Phone: 804-864-1499
Fax: 804-367-8410
wwitschey@smv.org

Ann Regn, *Staff*

Department of Environmental Quality
Director, VA Office of Environmental Education
629 East Main Street
Richmond, VA 23219
Phone: 804-698-4442
Toll Free: 800-592-5482
Fax: 804-698-4522
amregn@deg.state.va.us

IV. 2001-2002 Virginia Environmental Education Advisory Council

Members:

Dr. Walter R.T. Witschey – *Science Museum of Virginia, Chair*
Diane Atkinson – *Ashland, VA (Workgroup Chair & Co-Author)*
Tom Benjamin – *Environmental Alliance for Senior Involvement*
Joressia Beyer – *John Tyler Community College*
Otis Brown – *Atlantic Rural Exposition, Inc.*
Del. Jim Dillard – *(R) District 41*
L. Evans Drake – *Honeywell*
Susan E. Dudley – *George Mason University*
Bob Dunn – *E. I. DuPont Company*
Dr. Mike Ellerbrock – *Virginia Tech (Editor & Co-Author)*
Jim Erickson – *Southern States Cooperative, Inc.*
Talley Griffith – *Stuart, VA*
Dr. Bruce Hayden – *University of Virginia*
Barbara Kolb – *James River High School*
Karen Marcus – *Richmond, VA*
Jerry McCarthy – *Virginia Environmental Endowment*
Steve Pike – *Virginia Museum of Natural History*
William S. Portlock – *Chesapeake Bay Foundation (Workgroup Chair & Co-Author)*
Dr. Kurt Riegel – *Director Environmental Technology, Dept. of Navy (Workgroup Chair/Co-Author)*
Catherine Roberts – *W.E. Walters Middle School*
Bob Robinson – *American Electric Power*
Michael L. Ruiz – *Langley Research Center*
Dr. Jeffrey Salmon – *U.S Department of Energy*
Shirley Sypolt – *William Mason Cooper School*
Dr. Karl Wenger – *(ret) U.S. Forest Service*
Steve Yob – *Browning Ferris Industries*
Ann Regn (staff) – *VA Department of Environmental Quality*

Agency Liaisons:

Dennis Casey – *VA Museum of Natural History*
David Coffman – *VA Department of Forestry*
Dennis Cooke – *Chesapeake Bay Local Assistance Department*
Delores Dalton Dunn – *VA Department of Education*
Adam Goebel – *Danville Science Center*
Lisa Deaton – *VA Department of Forestry*
Jim Firebaugh – *VA Department of Education*
Barry Fox – *Virginia State University*
Mary Olien – *State Arboretum of VA*
Pat Paul – *USDA NRCS*
Dana Raines – *Virginia Tech*
Dana Roberts – *VA Association of Soil & Water Conservation Districts*
Dawn Shank – *VA Department of Conservation & Recreation*

V. Virginia's Colleges & Universities

Colleges & Universities:

American Military University
Appalachian School of Law
Averett College
Bluefield College
Bridgewater College
Christendom College
Christopher Newport University
Community Hospital of Roanoke Valley
College of Health Sciences
College of William & Mary
Eastern Mennonite University
ECPI College of Technology
Emory & Henry College
Ferrum College
George Mason University
Hampden-Sydney College
Hampton University
Hollins University
James Madison University
Liberty University
Longwood College
Lynchburg College
Mary Baldwin College
Mary Washington College
Marymount University
Medical College of Hampton Roads
Norfolk State University
Old Dominion University
Radford University
Randolph-Macon College
Randolph-Macon Woman's College
Regent University
Richard Bland College
Roanoke College
Shenandoah University
Southern Virginia College
Sweet Briar College
University of Richmond
University of Virginia
University of Virginia College at Wise
Virginia Commonwealth University
Virginia Institute of Marine Sciences
Virginia Intermont College

Virginia Military Institute
Virginia Tech
Virginia State University
Virginia Theological Seminary
Virginia Union University
Virginia Wesleyan College
Washington & Lee University

Community Colleges:

Blue Ridge Community College
Central Virginia Community College
Community College System of Virginia
Dabney S. Lancaster Community College
Danville Community College
Eastern Shore Community College
Germanna Community College
J. Sargeant Reynolds Community College
John Tyler Community College
Lord Fairfax Community College
Mountain Empire Community College
New River Community College
Northern Virginia Community College
Patrick Henry Community College
Paul D. Camp Community College
Piedmont Virginia Community College
Rappahannock Community College
Southside Virginia Community College
Southwest Virginia Community College
Thomas Nelson Community College
Tidewater Community College
Virginia Highlands Community College
Virginia Western Community College
Wytheville Community College

VI. Appendix: K-12 Formal Agency Responsibilities

Numerous organizations and individuals have responsibilities within the school system and play various roles as providers of environmental education support services:

Virginia Board of Education

The Board of Education is charged with the general supervision of the public schools in the Commonwealth and has primary responsibility and authority for effectuating educational policy. To that end, the Board of Education prescribes the Standards of Quality, establishes the standards for accrediting the public schools, and establishes the educational objectives—commonly known as the Standards of Learning (SOL) —to implement the development of the skills that are necessary for success in school and preparation for life in the years beyond. Critical to the success of achieving an environmentally literate student body is the Board's adoption of a policy for delivering instruction that supports the academic standards and addresses delivery of "meaningful" outdoor educational experiences.

Department of Education

The DOE, as supervised by the Superintendent of Public Instruction, provides administrative assistance to the Board of Education in developing and revising educational policy, including the Standards of Quality, and the SOL's; accrediting the public schools; licensing teachers; administering state and federal grant programs; administering the state's educational testing programs; and providing technical expertise to the local school divisions. Such technical expertise includes conducting and coordinating academic reviews, the development of SOL curriculum frameworks, and other resource materials to assist with educational instruction. The Department has developed a thorough and rigorous definition of "meaningful" outdoor educational experience, as well as a variety of support materials. Continued attention to the implementation of the standards is necessary as well as professional development.

Local School Boards

Each local school board is charged with the operational supervision of the public schools in their school division. To that end, the local school boards develop, align and implement educational curriculum; transport students; implement programs and courses of instruction, including general, special, vocational, gifted and adult education; establish and implement standards *for* student conduct; and establish and implement programs for staff development. Local schools boards will be encouraged to develop outdoor educational programs if state policy requires it.

Local School Administrators

The principal, as the local school administrator, is the instructional leader of the school and is also responsible for effective school management that promotes student achievement, a safe and secure learning environment, and efficient use of resources. To that end, the principal protects instructional time; ensures that the student code of conduct is enforced; directs and requires appropriate remedial services for students; monitors and evaluates the quality of instruction; provides for staff development designed to improve instruction; and maintains student and other required records. Administrators will be encouraged to provide outdoor instructional time and other resources if state policy requires such.

Teachers/Faculty

Teachers are responsible for the daily instruction of the students in their class. To that end, they develop lesson plans that are properly paced to ensure that the full curriculum is covered; develop materials that support the instructional program as well as recognize individual learning styles of students, maintain classroom discipline; and ensure a classroom environment that is conducive to learning. Teachers need the support of their administrators and school divisions to deliver "meaningful" environmental education.

Non-Formal Organizations

Non-formal organizations are responsible for providing programmatic resources that enhance the instructional program for students. Such organizations traditionally provide access to greater content expertise and instructional experiences that are more varied and which also serve to enhance and enrich the instructional program. Further, the organizations often provide access to educational opportunities that students may be otherwise unable to access, thus providing for greater enrichment.

Virginia Office of Environmental Education

The DEQ/OEE is responsible for facilitating environmental education programs in the Commonwealth. To that end, the DEQ/OEE serves as a clearinghouse for information and resource materials; coordinates linkages between the formal education establishment and the community-based organizations; develops, maintains and updates the VAN website; and assists in the leveraging of resources to enhance environmental education in the Commonwealth. The office administers the Virginia Classroom Grants program, a public-private fund which awards \$500 - \$1,000 for meaningful environmental education projects. During school year 2002-2003, grants totalling \$69,750 were awarded to 90 schools.

VI. Appendix: What is an Outdoor Classroom?

An outdoor classroom, also sometimes referred to as a schoolyard habitat or community restoration project is a space set aside for the development of natural habitats in which students and community members can learn about science and the outdoors through a hands on experience. Outdoor classrooms can enrich instruction by providing opportunities for [meaningful investigations](#). Although most of what is done in an outdoor classroom relates to the environment, it is also an interactive opportunity for students and adults to learn how math, literature, history, art, and music are influenced by nature and our natural resources. This new setting for the classroom provides boundless educational [activities for teachers and students](#) that would not be available in a conventional learning space as well as exciting ways to implement [Virginia's Standards of Learning](#).

Outdoor classrooms help to peak the interest of students in the world around them and the importance of wildlife and natural resource conservation. Several national studies show a variety of [benefits to student learning](#). The classrooms also help to encourage citizens and other community leaders to be involved in education and the environment through the donation of labor, materials, specific instruction or financial support. The outdoor classroom becomes a sanctuary for desirable animals, as habitats that suit their basic needs are created. Students are able to learn the fundamentals of ecology and can use this knowledge to help design the classroom space based on what species they want to attract. Student involvement in the initial design and future upkeep are essential to the future success of the outdoor habitat.

Outdoor Classrooms can come in many different shapes and sizes depending on a group's resource and space constraints. Something as simple as a flower or vegetable garden or as intricate as a pond, aquatic investigation site, or weather station can be built as an outdoor classroom. Other ideas include butterfly gardens, forest trails, gardens with particular themes (art gardens), amphitheaters, courtyards, bird sanctuaries, oyster gardens, water monitoring stations, and animal tracking boxes. Creativity is crucial and will make the outdoor classroom experience a delight for all involved.