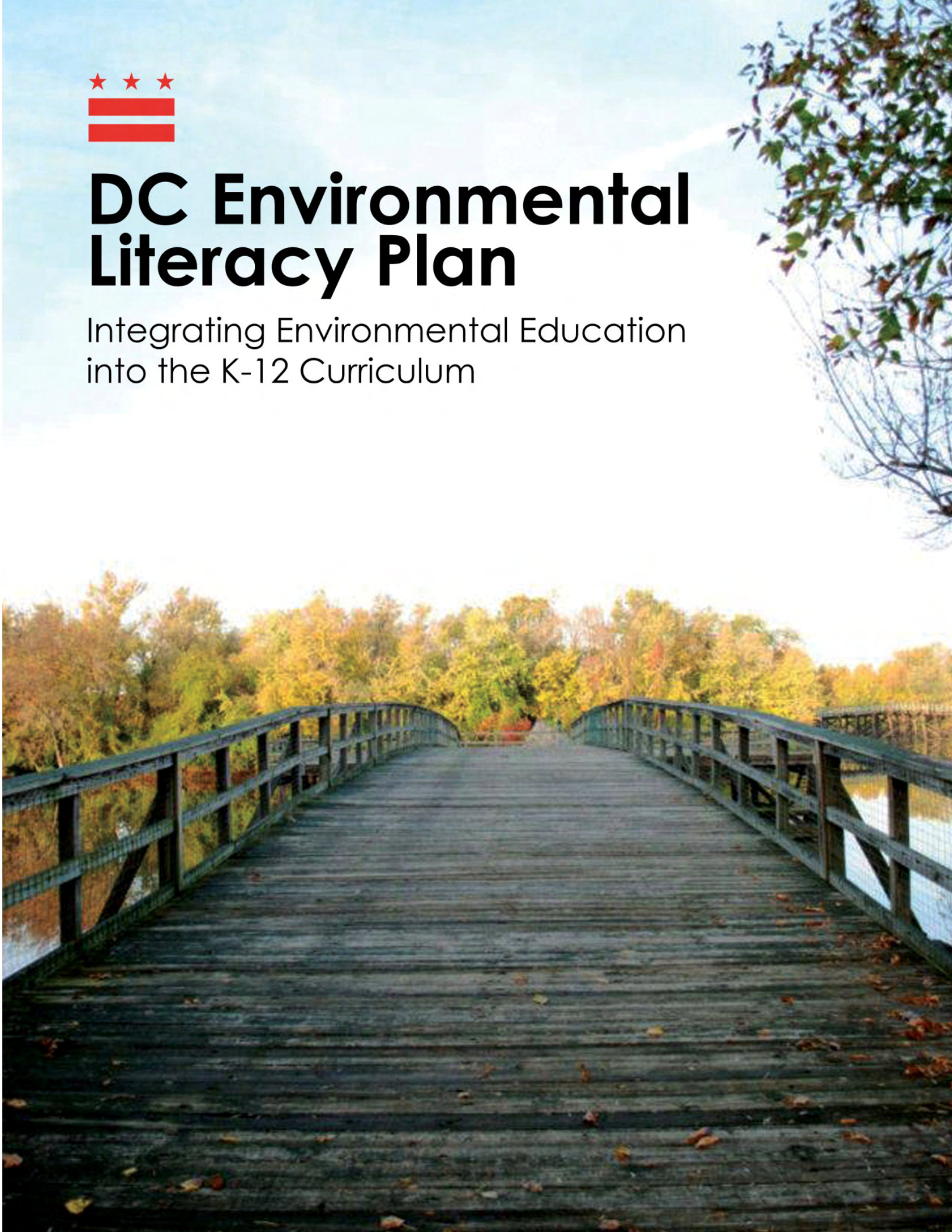




DC Environmental Literacy Plan

Integrating Environmental Education
into the K-12 Curriculum



PREPARED BY THE DC ENVIRONMENTAL LITERACY PLAN WORKGROUP

Project Lead

District Department of the Environment

Partner Agencies and Organizations

DC Public Schools

DC Office of the State Superintendent of Education

DC Public Charter School Board

DC State Board of Education

DC Department of Parks and Recreation

University of the District of Columbia

DC Environmental Education Consortium

See Appendix A for a complete list of collaborators.

PHOTO CREDITS

Alice Ferguson Foundation

Anacostia Watershed Society

DC Environmental Education Consortium

District Department of the Environment

Earth Force

Living Classrooms – National Capital Region*

Project Learning Tree

Saturday Environmental Academy

Student Conservation Association

The Washington Post

Washington Youth Garden

* Cover Photo – Kingman Island Bridge



DISTRICT OF COLUMBIA
PUBLIC SCHOOLS



EXECUTIVE SUMMARY

We live in an age of increasing change and interdependency. Across the world, opportunities and challenges present themselves on almost a daily basis. Yet today's students – the future leaders of our country – often do not receive the education necessary to meet the demands of our competitive world. However, we can change this situation. In the District of Columbia, students deserve an education that addresses the relevant health, economic, and environmental concerns of our local and global community. They also deserve an education that creates opportunities for innovation and success. The DC Environmental Literacy Plan seeks to address many of these interrelated concerns and also empower today's students with the knowledge, skills, and environment worthy of a world-class education.

Environmental literacy is defined as the development of knowledge, attitudes, and skills necessary to make informed decisions concerning the relationships among natural and urban systems. In the District, an environmentally literate person discusses and describes ecological and environmental systems and human impacts on these systems; engages in hands-on, outdoor learning experiences that involve discovery, inquiry, and problem solving; formulates questions and analyzes information pertaining to his or her surrounding environment; and understands how to take actions that respect, restore, protect, and sustain the health and well-being of human communities and environmental systems.

With the unanimous passage of the Healthy Schools Act of 2010, the Council of the District of Columbia instituted legislation that prioritized the health and wellness of students throughout the District. This landmark piece of legislation addresses poor nutrition and inadequate physical activity. It also asserts that the environment plays a central role in supporting learning outcomes and maintaining life-long healthy behaviors.

As a result, the Healthy Schools Act calls for an environmental literacy plan for the District – a road map *that will lay the foundation for* District-wide implementation and integration of environmental education into the K-12 curriculum. This initiative facilitates the collaboration between key community stakeholders, including District education agencies, District schools, environmental education providers, health advocates and many others. The DC Environmental Literacy Plan provides a framework to further guide these efforts and ensure that District students will be prepared to make informed decisions concerning the opportunities and challenges of the 21st century.

The District Department of the Environment has led this effort, and has collaborated with District agencies, non-profit organizations, and other community members to create the DC Environmental Literacy Plan. Furthermore, the plan is the local component for regional and national environmental literacy efforts, such as the Chesapeake Bay Executive Order 13508 (issued on May 12, 2009) Citizen Stewardship mandate and the No Child Left Inside Act of 2011 (introduced into both chambers of Congress on July 14, 2011). These initiatives seek to empower future generations to make effective environmental decisions and become caretakers of our shared community.

The DC Environmental Literacy Plan (ELP) outlines the following objectives and goals for reaching them:

1) Integrate environmental literacy concepts into the K-12 curriculum.

- Align environmental literacy concepts with current standards.
- Engage every student in at least one Meaningful Outdoor Educational Experience at each grade level.
- Provide downloadable materials and on-line access to environmental literacy resources.
- Create a strategy for integrating environmental literacy into Next Generation Science Standards roll-out to schools.

2) Increase and improve environmental education and training for all stakeholders.

- Prepare pre-service and in-service teachers to be able to teach environmental education and foster environmental literacy.
- Provide workshops and training for environmental education professionals.
- Develop communities of practice to foster dialogue and capacity for environmental literacy.

3) Integrate environmental literacy into the secondary school experience.

- Increase the number of high school students enrolled in an environmental science course.
- Ensure that environmental literacy and meaningful outdoor educational experiences are discussed and addressed during revisions of the science graduation requirements.
- Increase participation in environmental service-learning as part of the community service graduation requirement.

4) Create meaningful measures of student environmental literacy.

- Collect baseline information of student performance in environmental literacy concepts within current science standards.
- Create environmental literacy assessment opportunities that are not test-driven.
- Incorporate environmental literacy into future student assessment tools.

5) Maximize school facilities and grounds to create learning opportunities for all students.

- School facilities support environmental concepts and practices.
- Create and maintain outdoor schoolyards spaces to encourage and support outdoor learning experiences.
- Encourage schools to apply to the U.S. Green Ribbon Schools program.

6) Encourage collaboration and engagement across all sectors involved in implementation.

- Cultivate and foster the knowledge and awareness necessary for the development and implementation of the DC Environmental Literacy Plan at Local Education Agencies (LEAs).
- Individual LEAs develop an Environmental Literacy Scope of Work and Implementation Plan.
- Each District agency demonstrates commitment and ownership of an Environmental Literacy Scope of Work and Implementation Plan.
- Create state infrastructure for implementation of the DC Environmental Literacy Plan.

To read the complete plan, please visit: <http://ddoe.dc.gov/education>.

June 2012

TABLE OF CONTENTS

EXECUTIVE SUMMARY	2
INTRODUCTION	5
CONTENT STANDARDS	8
PROFESSIONAL DEVELOPMENT	12
HIGH SCHOOL GRADUATION REQUIREMENTS	16
STUDENT ASSESSMENT (EVALUATION)	20
SCHOOL FACILITIES	26
IMPLEMENTATION	31
WORKS CITED.....	35
Appendix A. DC Environmental Literacy Plan Workgroup	39
Appendix B. The District of Columbia’s Education Landscape.....	42
Appendix C. Status of Environmental Literacy in the District.....	44
Appendix D. Acronyms and Glossary of Terms	46
Appendix E. Existing Science and High School Social Studies Standards that Support Environmental Literacy	50
Appendix F. Organizations with Environmental Literacy Resources for Schools.....	81
Appendix G. Case Studies of Environmental Literacy in Schools	87



INTRODUCTION

“Right now, in the second decade of the 21st century, preparing our students to be good environmental citizens is some of the most important work that any of us can do. It’s for our children, it’s for our children’s children, and it’s for generations to come.”

*— Education Secretary Arne Duncan,
Sustainability Education Summit,
September 21, 2010*



In response to the growing health, educational, and environmental concerns across Washington, DC, the Council of the District of Columbia unanimously passed the Healthy Schools Act of May 2010. This unprecedented legislation seeks to improve the health and wellness of all students attending DC Public and Public Charter Schools. Specifically, the Act addresses nutrition, health education, physical education and physical activity, Farm-to-School programs, and school gardens. The Act also acknowledges that creating and sustaining an environmentally-friendly school environment and integrating environmental education into the schools’ curriculum are essential to the health and wellness of students, as well as the health of the local environment and community.

The Healthy Schools Act also includes provisions that incorporate environmental stewardship behaviors (such as recycling and energy reduction) into building practices, meet LEED (Leadership in Energy and Environmental Design) Gold Level certification when renovating or constructing new schools, assist schools in receiving Green Ribbon Schools recognition from the U.S. Department of Education, and develop an Environmental Literacy Plan for DC Public Schools and Public Charter Schools. The Healthy Schools Act Amendments of 2011 clarified the components to be included in the DC Environmental Literacy Plan, and added the provision that a draft be submitted to the DC Council in June 2012. Championed by the DC Environmental Education Consortium, inclusion of the Environmental Literacy Plan in the healthy schools legislation represents a seminal opportunity for advancing the education of the District’s students in the 21st century.

Components of a State Environmental Literacy Plan

An **environmental literacy plan** creates the framework for standards, achievement, professional development, assessment, and leadership for individuals and organizations to thrive and achieve innovation in education.

As mandated in the Healthy Schools Amendment Act of 2011, the DC Environmental Literacy Plan describes the following:

- Relevant teaching and learning standards adopted by the State Board of Education;
- Professional development opportunities for teachers;
- How to measure environmental literacy;
- Governmental and nongovernmental entities that can assist schools; and
- Implementation of the plan.

These components are consistent with the requirements described in the North American Association for Environmental Education (NAAEE)'s guidance document, *Developing a State Environmental Literacy Plan* (NAAEE, 2008).

Definition of Environmental Literacy

In August 2011, the DC Environmental Literacy Workgroup¹ developed and adopted the following definition of environmental literacy:

Environmental literacy is the development of knowledge, attitudes, and skills necessary to make informed decisions concerning the relationships among natural and urban systems.

An environmentally literate person:

- discusses and describes ecological and environmental systems and human impacts on these systems;
- engages in hands-on, outdoor learning experiences that involve discovery, inquiry, and problem solving;
- formulates questions and analyzes information pertaining to his or her surrounding environment; and
- understands how to take actions that respect, restore, protect, and sustain the health and well-being of human communities and environmental systems.

Broader Landscape of Environmental Literacy

At the national level, there have been three prongs of advocacy for environmental literacy. First, the No Child Left Inside Act is a bi-partisan bill first introduced in the House of Representatives in 2008 and the Senate in 2009. As with bills formerly introduced, the No Child Left Inside Act of 2011 (S.1372 and H.R.2547) includes a provision that federal funding for environmental literacy would become available provided that the state department of education has a formally adopted environmental literacy plan. The second strategy has been to propose a grant program entitled "Well-Rounded Education" which makes environmental education a subject eligible for funding under Title IV of the Elementary and

¹ See Appendix A for a list of Workgroup members.

Secondary Education Act. These initiatives will empower future generations to make effective environmental decisions and become caretakers of our natural resources. Finally, two federal agencies have been promoting environmental literacy in unparalleled ways. The Department of Interior has spearheaded the America's Great Outdoors initiative – a program to engage youth in outdoor pursuits and learning opportunities aimed at creating a life-long interest in conservation and stewardship. Furthermore, the U.S. Department of Education has launched the Green Ribbon Schools recognition program – the first comprehensive green schools program at the federal level. It is the hope that this document will provide the necessary direction for the establishment of environmental literacy as an integral part of lifelong learning.

Regional environmental literacy efforts are driven by the Chesapeake Bay Executive Order 13508: *Strategy for Protecting and Restoring the Chesapeake Bay Watershed* (issued on May 12, 2009). The Fiscal Year 2011 action plan contains a goal of expanding citizen stewardship, with a specific conservation strategy (CS.7) that the National Oceanic and Atmospheric Administration will be responsible for overseeing the goal of initiating a robust elementary and secondary environmental literacy initiative. The Mid-Atlantic Elementary and Secondary Environmental Literacy Strategy is scheduled for release in June 2012.

The District's State Environmental Literacy Plan

The DC Environmental Literacy Plan is the local component for these national and regional environmental literacy efforts. The DC Environmental Literacy Plan is a roadmap *that will lay the foundation for* District-wide implementation of the integration of environmental education into the K-12 curriculum. This initiative facilitates the collaboration between environmental education providers, health advocates, District education agencies, and District schools. The DC Environmental Literacy Plan provides a framework to further guide these efforts and ensure that students attending school in the District will have meaningful outdoor experiences and will be well prepared to make informed and responsible decisions.

The DC Environmental Literacy Plan is divided into sections that describe the initial objectives and goals in the following areas: Content Standards, Professional Development, Graduation Requirements, Student Assessment, School Facilities, Implementation, and Funding.

Each section includes the following components:

Background Rationale: Research that justifies the need for these environmental literacy initiatives.

Current Context: A snapshot of “where we are” in the District regarding environmental literacy.

Objectives, Goals and Action Items: A table describing what will be accomplished in the next five years.

Status: Progress that has been made through the course of the development of the Environmental Literacy Plan.

Implementation Recommendations: A brief framework of how to get to the desired outcomes.

Next steps: Actions different District agencies and organizations can take now to move forward.

CONTENT STANDARDS

“The District of Columbia is committed to environmental stewardship, and this begins in our schools... the Office of the State Superintendent of Education will continue to encourage and support school programs that build the next generation of environmental stewards.”

*—State Superintendent Hosanna Mahaley,
April 20, 2012*



Background Rationale:

Although many students engage in standards-based environmental education experiences during their years in District schools, the environment is not always emphasized nor is there a District-wide plan for integrating environmental education into a school's curriculum.

Research repeatedly indicates that environmental education improves learning in other subjects. Coyle (2005) cites State Environmental Education Roundtable study findings that show environment-based education stimulates science interest and that, while most students in integrated environment-based programs show improvement across disciplines, science is the one educational subject where 100 percent of the students improve. Similarly, Athman and Monroe (2004) suggest that students' critical thinking and standardized scores are positively affected by environment-based education.

Schroeder, Scott, Tolson, Huang, and Lee (2007) conducted a meta-analysis of U.S. research published from 1980 to 2004 on the effect of specific science teaching strategies on student achievement. The analysis shows that enhanced context strategies (e.g., using problem-based learning, taking field trips, using the schoolyard for lessons, and encouraging reflection) are effective for enhancing student learning. The researchers found that effective teachers relate learning to students' previous experiences or knowledge; additionally, they engage students' interest through relating learning to the students'/school's environment or setting (Schroeder et al., 2007).

Current Context:

Content standards are an important building block of a school's curriculum. The District's current science standards have been recognized by outside education analysts as being rigorous and among the strongest in the nation (Peterson & Hess, 2006; Fordham Institute, 2012). While most of the standards are universal in their content (inquiry, scientific method, etc.), the District's science standards have localized content that reflects the District's urban environment. Table 1 lists examples of these standards.

Table 1. District of Columbia Science Standards that Reflect the Local Environment

1.4.5	Identify the external features that local plants and animals have (such as those found in schoolyards or in city neighborhoods) that enable them to survive in their environment.
2.7.5	Observe and describe how the local environment (water, dry land) supports a wide variety of plants and animals, some unique to the Chesapeake Bay .
4.7.10	Investigate the Chesapeake Bay watershed and wetlands and describe how they support a wide variety of plant and animal life that interact with other living and non-living things.
5.12.2	Identify organisms that are not native to the Washington, D.C. area and how they undergo changes to increase their chance of survival in the area.
6.6.7	Describe that most rainwater that falls in Washington, D.C. , will eventually drain into the Chesapeake Bay .
7.8.8	Explain why in urban environments , a species (mostly human beings) settles in dense concentrations.
B.19.2	Assess the method for monitoring and safeguarding water quality, including local waterways such as the Anacostia and Potomac rivers , and know that macroinvertebrates can be early warning signs of decreasing water quality.
E.6.7	Collect, record, and interpret data from physical, chemical, and biological sources to evaluate the health of the Chesapeake Bay watershed and wetlands and describe how the Bay supports a wide variety of plant and animal life that interact with other living and non-living things.

While the science standards are strong in emphasizing local, relevant applications to science content, it is difficult to determine how these standards are taught. At the elementary school level, there is no set policy regarding the level of science instruction and it is left to the discretion of the school's principal. At some schools, science might only be taught once a week for 45-60 minutes; however, some schools are ensuring that science is offered on a regular basis.

The structure of the school teaching schedule has also not been as flexible to allow for outdoor experiences. Some DC Public Schools and Public Charter Schools have individually created opportunities for environmental and outdoor education. At least 31 organizations provide school-based outdoor learning experiences and 28 provide field experiences for District students (see Appendix F). However, a survey of teachers, conducted by the DC Environmental Education Consortium (2001), revealed barriers to participating in environmental education to include lack of principal support, scheduling conflicts, and the lower priority placed on environmental education compared to reading, mathematics, and test taking. Today, many teachers anecdotally report that many of these barriers still exist.

On the horizon is the potential adoption of the Next Generation Science Standards (NGSS) by the DC State Board of Education. The NGSS are new K–12 science standards currently being developed through a collaborative, state-led process. These standards will be rich in content and practice, arranged in a coherent manner across disciplines and grades to provide all students an internationally benchmarked science education. The NGSS will be based on the *Framework for K–12 Science Education* developed by the National Research Council (Achieve, Inc., 2011). The first round of public comment for the draft standards took place in May 2012, and a revised version will be available for public comment in Fall 2012. It is anticipated that the final release of the standards will be in Spring 2013.

Objective 1: Integrate environmental literacy (EL) concepts into the K-12 curriculum.

Goal	Action Items	Lead Organizations	Timeline
A. Align environmental literacy (EL) concepts with current standards.	i. Analyze current standards and identify those that include EL concepts.	DDOE DCEEC	Completed See Appendix E
	ii. Create a cross-walk of the District's existing content standards with NAAEE Guidelines and Next Generation Science Standards to identify overlap and content gaps.	OSSE	Spring 2013
	iii. Integrate EL concepts into existing DCPS scope and sequence documents.	DCPS DDOE	December 2012
	iv. Determine best practices currently in place in District schools.	DDOE OSSE	December 2012
B. Engage every student in at least one Meaningful Outdoor Educational Experience at each grade level.	i. Provide schools with a comprehensive list of outdoor opportunities on school grounds and throughout the District to be updated every 3 years.	DCEEC	In progress
	ii. Provide standards-based EL framework for schools to scaffold into their curriculum.	DDOE DCEEC	2013
C. Provide downloadable materials and on-line access to environmental literacy resources.	i. Create searchable database for all environmental literacy resources.	DCEEC	Summer 2013
	ii. Update DCPS Science Educator Portal to include EL information.	DCPS DDOE	In progress
	iii. Submit EL information to be included in the PCSB Tuesday Bulletin.	DDOE	2012
D. Create a strategy for integrating EL into Next Generation Science Standards roll-out to schools.	i. Ensure the District's potential adoption of the Next Generation Science Standards maintains local and relevant content that resonates with students.	SBoE OSSE DCEEC	2014

Status:

Members of the DC Environmental Literacy Plan Workgroup have analyzed the District's science standards and high school social studies standards to create a document of existing standards that support environmental literacy (see Appendix E). Many organizations offer standards-based resources to assist District schools with integrating environmental literacy into a school's individual curriculum. The District Department of the Environment has compiled a directory of environmental organizations that provide these resources (see Appendix F).

By adopting the Common Core State Standards for Literacy, DC Public Schools (DCPS) has integrated science and social studies content into the English/Language Arts unit overviews, in order to broaden the curriculum and increase students' understanding of core knowledge and concepts. Some Public Charter schools already weave environmental education into their individual curriculum. Of the 22 charter schools designated as "high performing" by the DC Public Charter School Board's Performance Management Framework (2011), 17 schools have environmental education components in their

curriculum and/or engage members of the DC Environmental Education Consortium for environmental education programming. Case studies of DC Public Schools and Public Charter Schools with examples of best practices are described in Appendix G.

Two District agencies have grant programs to assist schools with components of an environmental curriculum. In 2011, the District Department of the Environment Natural Resources Administration awarded almost \$100,000 to fund three projects that offered meaningful stream or Chesapeake Bay experiences to District students for approximately 750 students from 16 schools. The experiences included boat trips on the Anacostia and Potomac rivers, a pilot trash-free schools initiative, and overnight visits to Alice Ferguson Foundation's Hard Bargain Farm Environmental Center. These projects have grant periods for up to three years, pending available funding. In 2012, the Office of the State Superintendent of Education's School Garden Program awarded approximately \$200,000 to 22 schools to support the integration of curricula into their school garden programs, while also providing professional development to garden coordinators and school-based staff.

The DC Department of Parks and Recreation (DPR) is also increasing its environmental education efforts. In Fall 2011, DPR adopted the new slogan: "Move. Grow. Be Green with DPR." Be Green" refers to the agency's environmental stewardship initiatives – such as the Summer 2012 environmental, garden-themed summer camp session, "Green Buds," at the Lederer Youth Garden – and also the goal of integrating environmental education into all 68 DPR sites throughout the District.

Implementation Recommendations:

- Develop scope and sequence documents that include meaningful outdoor educational experiences at every grade level. This will help establish consistency of instruction – in different grade levels and subject areas – by providing clear guidance on what teachers should teach and when they should teach it (Appendix G describes schools that have outdoor experiences at different grade levels).
- Develop unit overviews that provide teachers with recommended content and other resources for English/language arts and mathematics content, such as books, websites, lesson ideas and strategies for teaching each unit. The overviews should be available for teachers at every grade level throughout the school year.
- Utilize schoolyards for outdoor learning experiences through professional development, technical support, and funding.
- Explore content integration for Common Core State Standards for Mathematics.
- Identify local content applications for integration with the Next Generation Science Standards.

Next Steps:

- Start with three grades where there is the most curricular overlap to weave in experiences and then design the frameworks for integration. Aim to have experiences at all grade levels by 2017.
- Complete a preliminary cross-walk of the District's existing content standards with NAAEE Guidelines and Next Generation Science Standards to identify overlap and content gaps by December 2012.
- Update the Green DC Map to include environmental literacy resources. Explore the creation of an on-line database, similar to website thebridgeprojectdc.org.

PROFESSIONAL DEVELOPMENT

“Being green and teaching green makes our schools healthier and safer places for our students... Teaching our children early about the importance of the environment around them will make them smart, strong stewards of their communities.”

—DC Public Schools Chancellor
Kaya Henderson, April 23, 2012



Background Rationale:

In the report *Environmental Literacy in America* (2005), Coyle cites research by the North American Association for Environmental Education (NAAEE) and the Environmental Literacy Council that shows environmental education is taught by 83 percent of elementary school teachers, but only 44 percent of high school teachers. A study by Ruskey, Wilke, and Beasley (2001) found that although more than half of the teachers surveyed report teaching environmental subjects, only 10 percent of teachers have had specific training on environmental education teaching methods, and only one in four has had any environmental science or related courses.

There is overwhelming research to suggest that teacher training should not end upon receipt of a degree and certification in the field. Teachers benefit from continued professional development and training, not only regarding teaching strategies, but also focused on specific content that must be taught. Studies have shown that the vast majority of American adults may have been exposed to issues relating to environmental literacy, but lack a true understanding of those issues. For example, Coyle (2005) states that only one-to-two percent of adults in America have sufficient environmental knowledge and skill to be considered environmentally literate, meaning most adult decision-makers, such as business leaders, elected officials, and community volunteers, are lacking in environmental education and literacy.

Current Context:

Federal law requires all public elementary and secondary school students to be taught by teachers who are certified as being “highly qualified.” This means teachers in the core academic areas (defined as: English, reading/language arts, mathematics, science, foreign languages, civics/government/economics, arts, history, and geography) must hold a bachelor’s degree, have full state certification, and demonstrate subject matter competency. Teachers at charter schools are exempt from needing full state certification. According to the 2009-2010 State Report Card on Teacher Quality, 85 percent (3,475) of the teachers possessed a valid teaching license while teaching in District schools. Additionally, 77

percent of the core classes taught in the District (9,959) were taught by Highly Qualified Teachers (OSSE, 2011a).

Teachers can follow different pathways to become certified teachers in the District. For pre-service teachers, the Office of the State Superintendent of Education (OSSE) manages the DC State Accreditation and Program Approval and publishes the Directory of Approved Educator Preparation Programs. Of the 13 institutions or organizations with state-approved programs, 11 of the institutions or organizations on the list offer either or both traditional and alternative route educator preparation programs in elementary education. Fewer organizations offer secondary biology and/or general science programs (OSSE, 2011c).

Similarly, the current process for District teachers to renew a Standard, Professional or Regular II District of Columbia license has been in place since 2009. Applicants must submit evidence of six (6) semester hours or 90 contact hours (or a combination of the two) of professional development activities completed within the four (4) years prior to the date of the licensure application submission as outlined below:

- A minimum of three (3) semester hours/45 clock hours of the professional development activities must be directly related to the field (subject content) of the license being renewed.
- The remaining required three (3) semester hours/45 clock hours may include any professional development activity relevant to Pre-K – 12 education and/or serving Pre-K – 12 students. These general education classes/workshops may be used to renew more than one license, as long as the professional development was completed within the renewal timeframe (four years prior to the submission of a renewal application for Regular II license holders; five years for Standard and Professional license holders) (OSSE, 2011f).

Because research demonstrates that the best way to improve student achievement for all students is through effective teaching (Sanders & Rivers, 1996; Rivkin, Hanushek, & Kain, 2005), the District has committed to increasing the number of highly effective teachers in its classrooms. In 2009, DC Public Schools unveiled the new Teaching and Learning Framework that includes Teach Domain Standards and provisions for professional development and support.



For many years, the District Department of the Environment (DDOE) has offered teacher professional development. The agency provides training in various national environmental education curricula, such as Project Learning Tree and Project WET, and trains other environmental educators and teachers to become facilitators to lead their own workshops. Additionally, DDOE has received grants for Chesapeake Bay Watershed training and also incorporates teacher training into its RiverSmart Schools program. Thirty-two

organizations provide professional development for District teachers in areas that support environmental literacy. These opportunities may be offered by one organization or in collaboration with other non-profits. In 2012, OSSE is offering offer professional development training in cooperation with members of the DC Environmental Education Consortium and non-profits to support the implementation of garden curriculum by school garden coordinators and other service providers.

Objective 2: Increase and improve environmental education and training for all stakeholders.

Goal	Action Item	Lead Organizations	Timeline
A. Prepare pre-service teachers to be able to teach environmental education and foster environmental literacy.	i. Work with local universities and teacher prep programs to offer at least 6 contact hours of training in environmental education.	DDOE UDC	2014
B. Provide in-service teachers with workshops about how to teach environmental education and foster environmental literacy.	i. Create a crosswalk of the DCPS Teaching and Learning Framework and the NAAEE <i>Guidelines for the Preparation and Professional Development of Environmental Educators</i> to determine existing overlap and any gaps.	DCPS	2013
	ii. Provide broad-based EL workshops for all District teachers.	DDOE OSSE UDC DCEEC	On-going Fall 2012 2014 On-going
	iii. Create a Summer Academy for teachers that provides intensive training in relevant grade bands.	UDC OSSE	2015 2014
C. Provide workshops and training for EE professionals.	i. Hold at least 3 workshops per year for EE providers – intro courses and supplemental workshops.	DDOE DCEEC	2013
	ii. Integrate EE workshops into existing DPR staff training.	DPR	2012
D. Develop communities of practice to foster dialogue and capacity for environmental literacy.	i. Create Professional Learning Communities or other networks focused on environmental literacy.	OSSE	Summer 2014

Status:

During the 2011-2012 school year, DC Public Schools hosted a Science and Social Studies Expo and four designated Science and Social Studies Professional Development Days for teachers of grades 6-12. There were environmental education representatives at all of these events. Fifty-one teachers participated in environmental education professional development workshops over the course of the year. Currently, a platform does not exist to reach elementary school teachers during designated professional development days because most of the training has been focused on Common Core State Standards for English/Language Arts and Mathematics content. Because OSSE offers professional opportunities that are system-wide (both DC Public Schools and Public Charter Schools), there is potential to have science professional development with an environmental literacy focus as an offering in a future professional development calendar.

Implementation Recommendations:

- Require teachers at the K-12 levels to obtain a minimum of 1 Continuing Education Unit (CEU) in subject areas that support environmental literacy each year. While this cannot also be required of Public Charter School teachers, it is strongly recommended that each Local Education Agency (LEA) adopt a similar policy.
- Review the opportunities at local universities and identify two institutions to pilot an environmental literacy initiative, and then expand. Environmental literacy concepts can be introduced during teaching methods courses. This can be done through integrated workshops using national environmental education curricula (such as Project Learning Tree and Project WET) adapted with a local focus.
- Align environmental literacy professional development for teachers with other requirements of the Healthy Schools Act of 2010, such as Physical and Health Education requirements.
- Ensure teachers have an opportunity to advance in the content area in which they are interested.

Next Steps:

- Contact local teacher preparation programs.
- Meet with OSSE to find out more about the Professional Development Calendar.
- Create a catalog of Environmental Literacy training programs offered by DC Environmental Education Consortium member organizations for District teachers.
- Support DC Environmental Education Consortium member organizations in ensuring that their training programs qualify for teachers to receive CEUs.
- Partner with a higher education institution to provide certification opportunities for middle and secondary teachers with a concentration in environmental science.
- Work with DCPS to identify environmental literacy professional development offerings to be placed in the Professional Development course syllabus for the 2012-2013 school year.



HIGH SCHOOL GRADUATION REQUIREMENTS

“[Our goal is that] at least 75% of entering 9th graders will graduate from high school in four years... DCPS will explore new ways to make the high school experience vibrant and relevant.”

*—DC Public Schools’ five-year strategic plan,
A Capital Commitment, April 18, 2012*



Background Rationale:

According to the National Environmental Education Foundation (2008), an abundance of environmental education curricula and programs exist throughout our country. However, the majority of the resources are aimed at K-8 students, which creates an “environmental knowledge gap” at the high school level.

From a global perspective, the Programme for International Student Assessment (PISA) assessment compares scores in mathematics and science from 65 developed and non-developed countries and education systems. In 2009, American students scored well below average in mathematics learning, and just one point above average in science.² Overall, 30 countries had higher scores in mathematics, while 22 scored higher in science (PISA, 2010). Students in the United States need to be prepared to be competitive in the global marketplace, and those enrolled in District public schools are no exception. Similarly, CBS/MTV (2006) conducted a poll of 13-24 year olds on the environment and global warming and found that:

- The environment ranked first with 22 percent of the respondents saying it is the most important problem their generation will face in the coming years.
- Nearly half (49 percent) of respondents have heard little or nothing at all about what they can do to help the environment and slow global warming.
- Fifty-nine (59) percent believe that in 20 years the environment will be worse than it is now.

In 1996, the College Board introduced the Advanced Placement Environmental Science exam. The number of students taking this exam has grown from 5,186 in 1996; 35,208 in 2006; to 79,738 in 2011 (College Board, 2012). Environmental science continues to be ranked as one of the fastest growing AP courses in the country (Robelen, 2012). However, students’ scores in Environmental Science remain the

² The next PISA assessment will be administered in 2012.

lowest when compared to the other ten AP STEM (Science, Technology, Engineering, and Mathematics) subject exams. In 2011, less than half of the students (47.6 percent) received a score that allows the course to count for college credit (3 or higher) (College Board, 2012).

The number of high school students participating in environmentally-themed community service and/or service-learning is also growing. Studies indicate that students participating in these activities show enhanced academic achievement. In a study by Davila and Mora (2007), students who participated in service-learning activities in high school were 22 percentage points more likely to graduate from college than those who did not participate, and students who participated in service-learning scored 6.7 percent higher in reading and 5.9 percent higher in science than those who did not participate in service-learning. Additionally, Yamauchi, Billing, Meyer, and Hofschire (2006) showed students in service-learning relative to nonparticipating students had a stronger set of job and career related skills and aspirations, including knowledge of how to plan activities, desire to pursue postsecondary education, and job interview skills.

Current Context:

The District of Columbia's baseline data on graduation rates and postsecondary enrollment is the 2006 report *Doubling the Numbers for College Success* (The Bridgespan Group, 2006). Based on a sample of the high school ninth graders in 2001-2002, the Bridgespan Group reported that less than half of the District's ninth graders (43 percent) graduate from high school within five years. Moreover, many of those graduates still required remedial classes in college or to complete job training programs. As a result, the group reported, of the District's ninth graders who attend college, only nine percent complete college within five years of high school graduation (The Bridgespan Group, 2006).

Since 2006, the District has instituted school reform interventions and accountability measures (such as transcript audits, credit recovery programs, and expanded summer school) to improve the high school graduation rate (OSSE, 2011e). As calculated by the Adjusted Cohort Graduation Rate (ACGR) method now required for all states by the U.S. Department of Education, 58.6 percent of District students graduated from high school on a four year, on time schedule in 2010-2011, exceeding the 43 percent adjusted cohort average reported by Education Week's *Quality Counts National Highlights Report* in January 2012 (OSSE, 2012a).

In recent years, there has been an increase in the number of Advanced Placement (AP) course offerings in District schools, as well as an increase in the level of rigor in the DC Comprehensive Assessment System (DC CAS) that is aligned with state academic standards. In 2010, 241 students took the AP Environmental Science exam, with 135 students (56 percent) receiving a score of 3 or higher (College Board, 2010). However, with 17,855 high school students in the District, the current scope of available



opportunities to spark interest in environmental issues and expose students to environmental careers is limited. Currently, two of the graduation requirements needed to obtain a high school diploma in the District of Columbia Public Education System are: 4 units of science (including biology, 2 lab sciences, and 1 other science) and 100 community service hours [(District of Columbia Municipal Regulations (DCMR) Title 5 (Education), Chapter 22 (as of May 2007))] (SBoE, 2004).

Objective 3: Integrate environmental literacy into the secondary school experience.

Goal	Action Items	Lead Organizations	Timeline
A. Increase the number of high school students enrolled in an environmental science course.	i. Determine which schools currently offer this course and the existing barriers to schools offering this course.	OSSE DCPS PCSB	Begin in 2012
	ii. Offer an environmental science course in every District high school as an elective or science class.	DCPS Charter LEAs	Completed by 2017
	iii. Monitor enrollment trends with the Statewide Longitudinal Education Data System (SLED).	OSSE	On-going
B. Ensure that environmental literacy and meaningful outdoor educational experiences are discussed and addressed during revisions of the science graduation requirements.	i. Define components that would qualify for a meaningful outdoor educational experience.	SBoE	Summer-Fall 2012
	ii. Analyze the implementation and results of environmental literacy graduation requirements in other states to determine applications for the District.	SBoE	2012
C. Increase participation in environmental service-learning as part of the community service graduation requirement.	i. Provide comprehensive information to the DCPS Office of Secondary School Transformation for inclusion in the DCPS Community Service Handbook.	DDOE DCEEC	Begin in Summer 2012
	ii. Meet with the DCPS Community Service Coordinators and Charter LEA representatives so they know about opportunities available.	DCPS Charter LEAs	Begin in Fall 2012
	iii. Work with environmental education providers to provide meaningful volunteer opportunities.	DPR UDC DCEEC	On-going
	iv. Determine current number of students participating in environmental service-learning; determine whether the number increases over time.	DCPS Charter LEAs	Begin in Summer 2012 On-going

Status:

As of October 2011, the DC State Board of Education (SBoE) has begun to discuss the revision of the science graduation requirements. The DC Environmental Education Consortium provided testimony at the October 19, 2011 meeting that described recommendations for how environmental literacy can be integrated into the graduation requirements. The SBoE anticipates that it will continue discussions with hearings in 2012, with a confirmation vote tentatively set in November 2012.

The DC Department of Parks and Recreation and University of the District of Columbia currently provide meaningful volunteer opportunities to District youth, as do many environmental organizations in the District. The District Department of the Environment plans to compile volunteer information to disseminate to Community Service Coordinators within DC Public Schools and to the Public Charter Schools for the 2012-2013 school year.

Implementation Recommendations:

- Amend the current graduation requirements to integrate environmental literacy, which will also support the District's goal of increasing the number of students who graduate ready to succeed in college and careers.
- Increase number of environmental tracks, courses, and programs offered at every school, including AP Environmental Science courses, and increase student participation in these initiatives. Funding may be needed to hire environmental science teachers where the position currently does not exist on the high school teaching staff. Additional funding will be needed for purchasing supplies to ensure proper implementation of the course.
- Increase the visibility of and access to environmental community service projects. Create a coordinated approach to deliver this information to school counselors, community service coordinators, teachers, parents, and students.

Next Steps:

When the DC State Board of Education is prepared to review the high school graduation requirements, members of the environmental education community are prepared to submit testimonies of support. Members of the DC Environmental Literacy Plan Workgroup are willing to assist the DC State Board of Education in the development of criteria for meaningful outdoor educational experiences.



STUDENT ASSESSMENT (EVALUATION)

“By including science in the [student testing] system, students will receive richer instruction across all content areas and become better lifelong learners through integration of math and science skills.”

—Office of the State Superintendent of Education, ESEA Flexibility Waiver Application, February 28, 2012



Background Rationale:

Numerous studies have shown the correlation between environmental literacy, student performance, and academic achievement. In the report *Back to School: Back Outside* (2010), Coyle includes an overview of research that supports the integration of environmental education into school time. Studies reveal a positive impact on student behaviors such as motivation, enthusiasm to learn, concentration, and discipline issues, as well as increase in academic achievement (Coyle, 2010). Of the research cited, the following studies suggest a symbiotic relationship between sustained environmental education and improved academic achievement:

- Using data collected from 1997-2002, Bartosh (2003) conducted a study of schools with integrated environmental education (EE) programs for three or more years compared against schools that did not have EE programs. Bartosh found that the EE schools had consistent improvement and/or higher test scores in mathematics, reading, and writing.
- In 2000, the National Environmental Education Foundation examined case studies of schools that used environmental education as the focus of their curriculum. The report shows evidence of improvement in academic performance across the curriculum, particularly in reading and mathematics scores as well as improved performance in science and social studies (Glenn, 2000).
- In 1998, Lieberman and Hoody conducted the seminal State Education and Environment Roundtable (SEER) study that documents students attending schools with integrated environmental learning curricula exhibit increased achievement (Lieberman & Hoody, 1998). Since then, additional studies have produced results consistent with the original study (SEER, 2000). Another SEER study conducted in 2006 showed that students in environment-based instructional programs score as well or better on standardized measures in reading, mathematics, language, and spelling. Overall, these programs have shown that they foster cooperative learning and civic responsibility (SEER, 2005).

In response to a growing need to clarify what is meant by environmental literacy, the North American Association for Environmental Education (NAAEE) released a new, comprehensive, research-based

description of environmental literacy and applies that work to the creation of a framework for an assessment of environmental literacy in December 2011. This framework is proposed as an optional component in the Organisation for Economic Co-operation and Development's (OECD) Programme for International Student Assessment (PISA) 2015 (NAAEE, 2011b).

Current Context:

In 2010, the DC State Board of Education (SBoE) adopted the Common Core State Standards for English/Language Arts and Mathematics. The current science standards were adopted in June 2006; however, the SBoE potentially plans to adopt the Next Generation Science Standards when they become available. In December 2011, the Office of the State Superintendent of Education (OSSE) created a committee to review the National Research Council's *Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Ideas* (NRC's *Framework*) to gather feedback in preparation for the potential adoption of the Next Generation Science Standards. Three District science teachers are part of the national writing team for these new standards.

Currently, the DC Comprehensive Assessment System (DC CAS) is mandated by OSSE. This end-of-year exam measures students' academic proficiency relative to their mastery of the following DC Content Standards: English/Language Arts, Mathematics, Science, and Health.³ Per the federal requirements of the Elementary and Secondary Education Act (ESEA) legislation, the goal of measuring Adequate Yearly Progress (AYP) will be attained by tracking students' reading and mathematics performance (OSSE, 2011b). In February 2012, OSSE submitted the District's federal waiver application to the U.S. Department of Education for flexibility regarding the implementation of the ESEA. The ESEA waiver application proposes that the DC CAS science assessment become part of the District's accountability plan in 2014. The proposal seeks to include science in the accountability index at half of the weight of



³ Students are assessed in Reading in grades 3-8 and 10; Writing Skills/Composition in Grades 4, 7, 10; Mathematics in grades 3-8 and 10. The Health assessment (added in fiscal year 2012) is given to students in grades 5, 8 and the high school grade in which health is taught.

reading or mathematics. The ESEA waiver application suggests that including science in the accountability system is important to promote a comprehensive, well rounded curriculum not limited to just reading and mathematics. Supporting high quality science instruction will also bolster efforts underway at some schools to engage students through hands-on STEM (science, technology, engineering, and mathematics) programs (OSSE, 2012b).

Even though environmental literacy is a cross-curricular, interdisciplinary subject, environmental concepts can be assessed within the science standards. The DC CAS for science includes 47 multiple choice items and three constructed response items. Each assessment is composed of these operational items along with additional field-tested items which may be used during a future assessment.⁴ Beginning in 2011, the science content tested is described in Table 2 below:

Table 2. DC CAS – Science (2011 Blueprint)		
Grade 5	Grade 8	Biology
Science and Technology	Scientific Thinking and Inquiry	Cell Biology and Biochemistry
Earth and Space Science	Matter and Reactions	Genetics and Evolution
Physical Science	Forces	Multicellular Organisms: Plants and Animals
Life Science	Energy and Waves	Ecosystems



⁴ Note that field-tested items do not count toward a student's overall score.

Past performance on the DC CAS shows that the 80 percent of fifth grade students receive a Basic Proficiency Score or higher in science. However, in eighth grade, only 67 percent of students received a Basic Proficiency Score or higher in science, and 68 percent of high school students receive a Basic Proficiency Score or higher in biology (OSSE, 2011d) Figures 1-3 show science proficiency on the DC CAS in 2011.

With the adoption of the English/Language Arts and Mathematics Common Core State Standards, the District is part of the multi-state initiative to develop common assessment systems. Twenty-four states are members of the Partnership for Assessment of Readiness for College and Careers (PARCC), and the District is one of 18 governing states in PARCC that is leading the assessment development effort. A similar assessment process is anticipated as the Next Generation Science Standards are developed and potentially adopted by the District.

Currently, DC Public Schools also administers Paced Interim Assessments (PIAs) five times per year to measure students' knowledge and skills in mathematics and reading. These tests are aligned to the standards measured on the DC CAS for Grades 2-10.

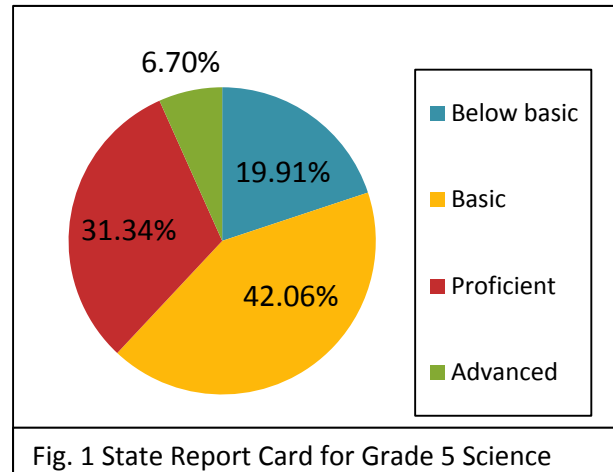


Fig. 1 State Report Card for Grade 5 Science

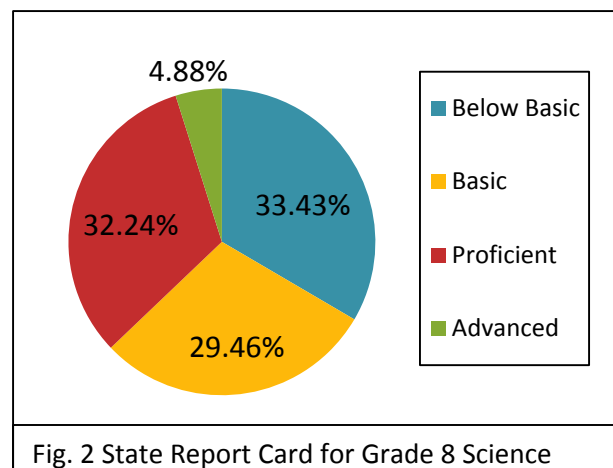


Fig. 2 State Report Card for Grade 8 Science

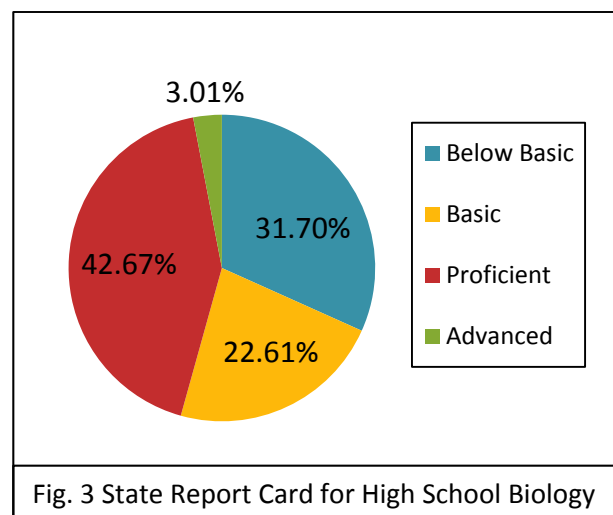


Fig. 3 State Report Card for High School Biology

Objective 4: Create meaningful measures of student environmental literacy (assessment).

Goal	Action Items	Lead Organizations	Timeline
A. Collect baseline information of student performance in environmental literacy (EL) concepts within current science standards.	i. Convene a panel to designate science standards that contain EL concepts and write corresponding justifications.	DDOE	In progress
	ii. Analyze student performance data from 2007-2011 on these standards to create a baseline of what students know.	OSSE	2014
	iii. Determine best practices based on student performance (curriculum reviews, teacher interviews).	DDOE	2013
	iv. Participate in the item development and selection process for upcoming DC CAS tests.	DDOE	Summer 2012 and 2013
B. Create environmental literacy assessment opportunities that are not test-driven.	i. Encourage and support student interest in completing an EL Capstone Project, Science Fair project, Portfolio, etc., and provide a showcase for EL student presentations.	DCEEC	2013
	ii. Establish a tracking mechanism to monitor and evaluate student engagement/performance.	DCPS Charter LEAs	2014
C. Incorporate environmental literacy into future student assessment tools.	i. Determine if and how EL can be integrated in to Common Core State Standards assessments developed by PARCC.	OSSE	In progress
	ii. Monitor the development of the assessment items for the Next Generation Science Standards and EL correlations.	OSSE	Begin in Fall 2012

Status:

Members of the DC Environmental Literacy Plan Workgroup have analyzed the District's science standards to create a document of existing standards support environmental literacy (see Appendix E). OSSE has expressed willingness to gather and analyze past DC CAS data to create baseline data points.

Additionally, District agency representatives of the DC Environmental Literacy Plan Workgroup are part of a team led by OSSE that is coming together to examine and review the National Research Council's *Framework for K-12 Science Education* and provide feedback on how this document can support science education and build capacity for state science educators.

As the Partnership for Assessment of Readiness for College and Careers (PARCC) develops new assessments in English and mathematics, it may be possible to incorporate environmental themes as engaging, cross-cutting contexts for instructional assessment. Members of OSSE's Assessment and Accountability Division who represent the District at PARCC meetings are willing to discuss with the writing team about the possibility of selecting environmental themes.

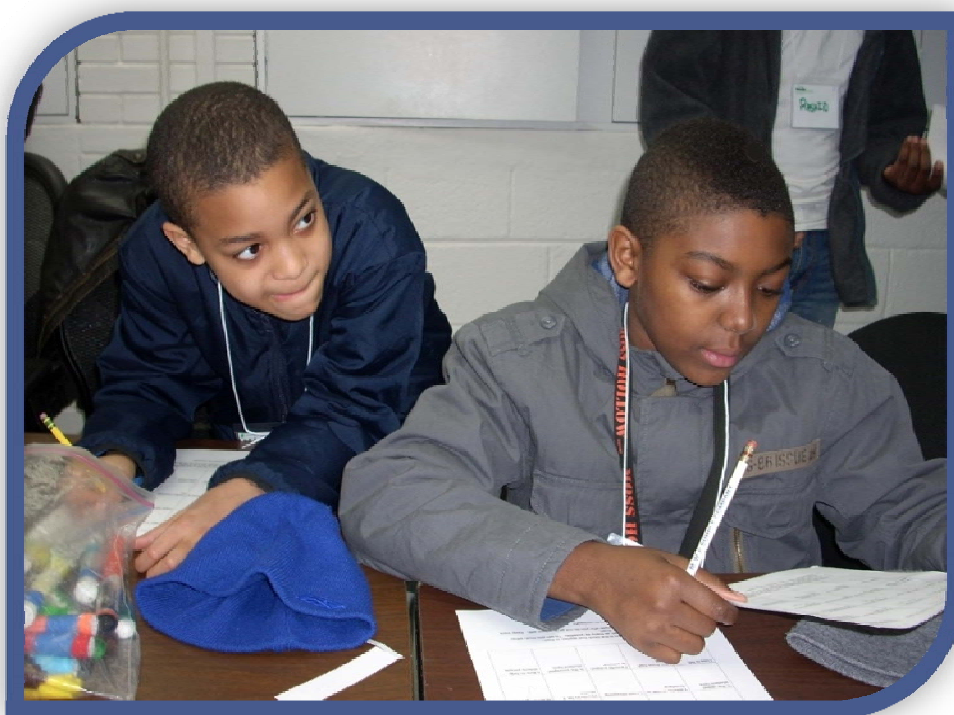
Regarding the Next Generation Science Standards, it is too soon to know what any new assessments will look like. However, OSSE will continue to work with its state team to solicit feedback leading up to a potential adoption.

Implementation Recommendations:

- Gather and analyze past DC CAS data to create baseline data points for science standards that contain relevant environmental content.
- Create a yearly opportunity to showcase student environmental literacy projects, such as a Youth Summit, Environmental Literacy Week, or designate an environmental literacy day as part of DC School Garden Week.
- Determine whether OSSE's academic assessments can reflect the shift of environmental literacy becoming increasingly integrated into DC content standards.

Next Steps:

- Work within current structure of science item development for DC CAS and encourage OSSE to explore the inclusion of environmental themes in PARCC assessments.
- Maintain open lines of communication between OSSE and DDOE that can assist in developing a comprehensive understanding of testing requirements, limitations, and opportunities.
- Support members of the DC Environmental Education Consortium in continued efforts to explore hosting an environmental youth summit in 2013.



SCHOOL FACILITIES

“Every child deserves to learn in an environment that supports the delivery of a high quality education... Most importantly, however, the school building must support the academic program and, as a resource, contribute to student achievement.”

— Office of Public Education Facilities Modernization,
DC Public Schools Master Facilities Plan 2010



Background Rationale:

Designers, developers, educators, political leaders and citizens throughout society have been urged to make changes in our modern built environments to provide children with positive contact with nature – where children live, play, and learn (Kellert, 2005). According to the groundbreaking report, *Greening America's Schools: Costs and Benefits* (2006), Kats surveyed over 30 green schools nationwide and found that on average, green school practices can save \$100,000 a year on operating costs – the equivalent of two full-time teacher salaries, 5,000 new textbooks, or 250 new computers. Furthermore, Kats found that green schools can reduce student absenteeism and air pollution, while simultaneously increasing teacher retention and school morale (Kats, 2006). In a study of Chicago and District schools, Schneider (2002) that found that better school facilities can add three to four percentage points to a school's standardized test scores, even after controlling for demographic factors.

When using the natural characteristics of the school grounds and local community as the foundational framework for a school's curriculum, students in environment-based instructional programs score as well or better on standardized measures in four basic subject areas – reading, mathematics, language and spelling. These programs also foster cooperative learning and civic responsibility (SEER, 2005). In 2005, Dymont conducted a study at 45 elementary, middle, and high schools in the Toronto District School Board and found that 90 percent of respondents reported that student enthusiasm and engagement in learning increased on green school grounds as compared to teaching indoors. Additionally, 70 percent of respondents reported that their motivation for teaching increased on green school grounds as compared to teaching indoors (Dymont, 2005). Blair (2009) highlights the various reasons why schools might have school gardens – providing children experiences with natural ecosystems, enhancing children's understanding of food systems, helping children develop environmental attitudes and behaviors, and serving as a basis for experiential learning. Blair further reports significant and positive impacts of gardening with regard to test measures, which includes children's science achievement and food consumption behavior (Blair, 2009).

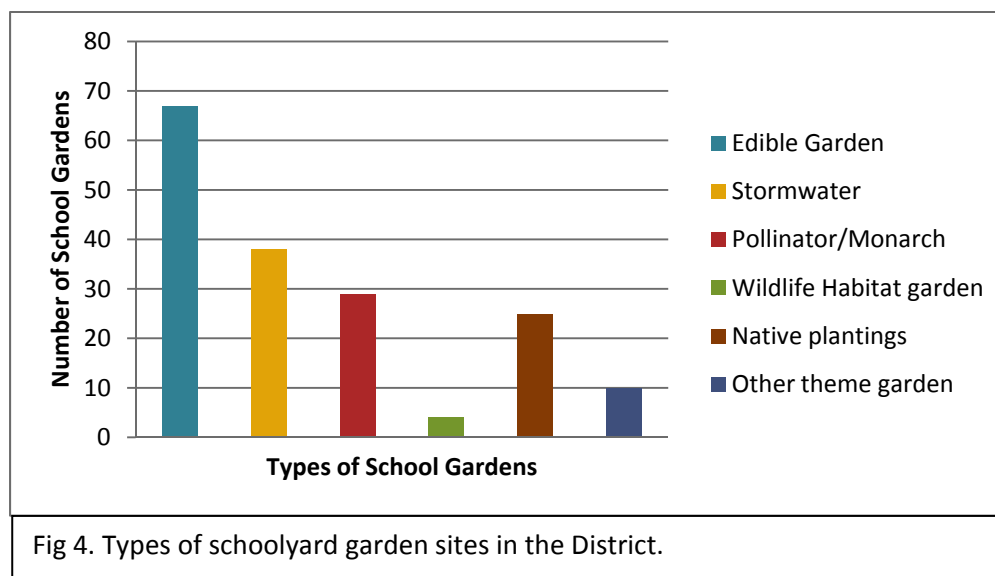
Current Context:

Inside all District public school buildings, the Healthy Schools Act of 2010 mandates that there be recycling, energy reduction, integrated pest management, and other environmentally-friendly practices. Additionally, the schools must test drinking water for lead and ensure compliance with U.S. Environmental Protection Agency standards for indoor air quality and lead removal. At least 16 organizations provide in-class presentations regarding indoor air quality and energy efficiency for schools (see Appendix F). The 2010 DC Public Schools Master Facilities Plan emphasizes the creation of classrooms that support educational needs and provide safe, positive learning environments to the children of the District. This is one of the most aggressive and ambitious school modernization plans in the United States. With this \$3.2 billion modernization plan, all renovations and new construction must meet LEED (Leadership in Energy and Environment Design) Gold Certification.

For over ten years, many District teachers and organizations have been working to extend classroom learning opportunities to the outdoor school grounds. To date, these include:

- One hundred five (106) schools have gardens and/or outdoor classrooms.
- Seventeen (17) schools that are LEED-certified or with applications pending.
- Nine (9) schools with low impact development (LID)/green infrastructure improvements in 2010-2011.

Figure 4 shows the different types of schoolyard gardens in the District. Some schools have more than one type of garden and the gardens have varying degrees of use.

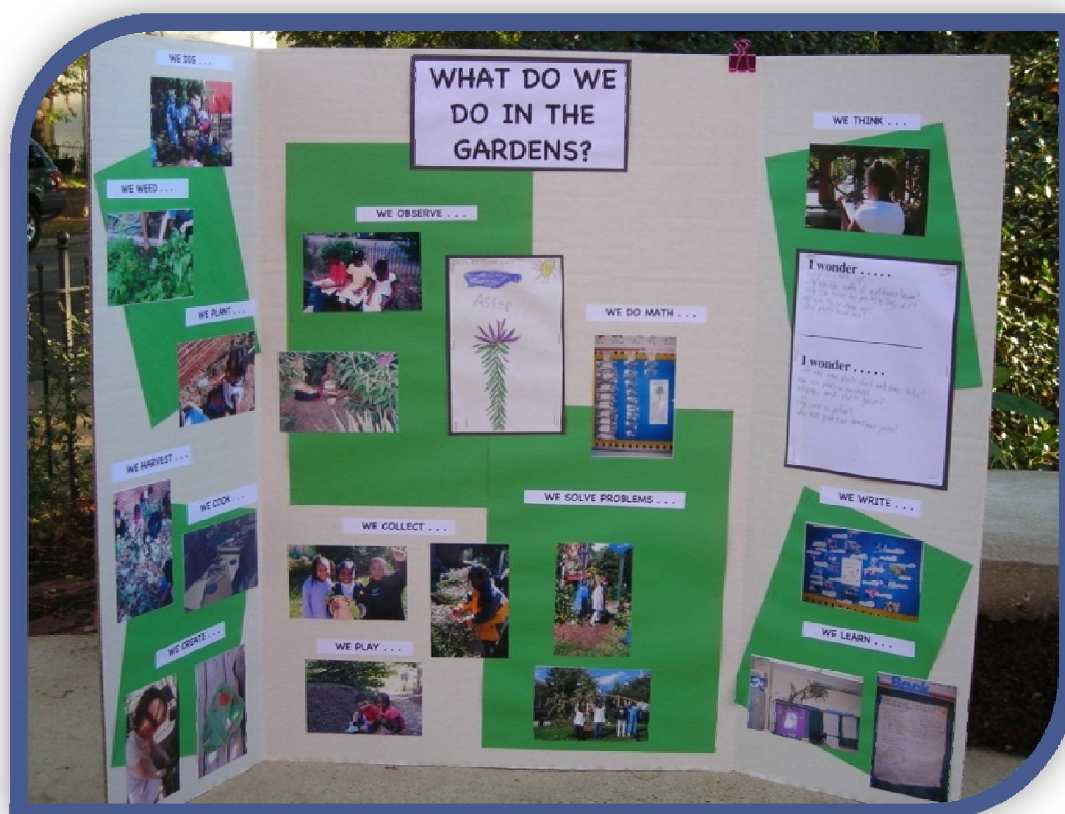


The Healthy Schools Act has numerous provisions that support the relationship between a school's physical environment and the academic success of its students. The creation of the School Garden Program within the Office of the State Superintendent of Education is an excellent example of the commitment to support District schools in establishing and maintaining school gardens as an integral part of a school's curriculum, programs, and culture. This program will provide technical and financial support as well as training to participating schools in an effort to effectively utilize school gardens as a meaningful teaching resource (OSSE, 2012c). The District Department of the Environment's RiverSmart

Schools program improves school grounds by incorporating landscape design principles that create habitat for wildlife, emphasize the use of native plants, highlight water conservation, and retain and filter stormwater runoff. These sites have the added benefits of an outdoor classroom that supports effective teaching practices and promotes student learning (DDOE, 2012). Members of the DC Environmental Education Consortium and other organizations also have schoolyard greening programs that assist schools in the creation of educational green spaces, provide professional development for teachers, and conduct in-class presentations that include outdoor components (see Appendix F).

Launched in September 2011, Sustainable DC is Mayor Vincent Gray's initiative to make the District of Columbia the greenest, healthiest, most livable city in the nation. Working groups have highlighted the importance of creating and maintaining school facilities with features that support students in environmental learning. Draft recommendations include targeting schoolyards for LID projects, rehabilitating school greenhouses to use for education and training, and developing public school buildings as year-round sustainability learning centers.

The Department of General Services (DGS) is a new District agency, established in October 2011, to oversee the functions and responsibilities of the former Department of Real Estate Services (DRES), former Office of Public Education Facilities Modernization (OPEFM), and the capital construction and real property management functions of several other District agencies. DGS is responsible for construction and maintenance of DCPS buildings as well as District owned buildings (former DCPS schools) that are leased by many of the public charter schools.



Objective 5: Maximize school facilities and grounds to create learning opportunities for all students.

Goal	Action Items	Lead Organizations	Timeline
A. School facilities support environmental concepts and practices.	i. In keeping with LEED requirements, establish model schools that show the development of green building curricular integration best practices.	DGS	2014
		UDC	2015
	ii. Coordinated integration of HSA requirements as described in Section 501(Environment) at all District schools.	DGS	On-going
	iii. Next update of Local Wellness Policy to include greater emphasis on environmental sustainability and alignment with the DC Environmental Literacy Plan.	OSSE	2014
	iv. Incorporate environmental literacy indicators into School Health Profiles.	OSSE	2014
B. Create and maintain outdoor schoolyard spaces to encourage and support outdoor learning experiences.	i. Increase the number of school gardens by 35%.	DCEEC, OSSE, DDOE, UDC	2014
	ii. Revise current DCPS Design Guidelines to include more information regarding parameters and best practices for schoolyard design to include outdoor learning environments (e.g., school gardens and outdoor classrooms) and community involvement.	DGS	2013
C. Encourage schools to apply to the U.S. Green Ribbon Schools program.	i. Create and implement a DC Green Schools recognition program.	DDOE DCEEC	2013
	ii. Submit four qualified applicants to the U.S. Green Ribbon Schools recognition program.	OSSE	2014

Status:

The Department of General Services' newly-created Sustainability and Energy Management Division has expressed interest in integrating environmental literacy initiatives into school facilities, and has begun to coordinate meetings between agencies to collaborate.

Two District agencies have grant programs to provide support for outdoor learning spaces. In 2011, the District Department of the Environment (DDOE) Natural Resources Administration awarded almost \$240,000 for DDOE's RiverSmart Schools program, which includes teacher training and project implementation/installation at five District schools. These innovative schoolyard greening projects focus on incorporating landscape design principles that create habitat for wildlife, emphasize the use of native plants, highlight water conservation, and retain and filter stormwater runoff. With funding from the



Healthy Schools Act of 2010, the Office of the State Superintendent of Education (OSSE) started the School Garden Grant program with the goal of supporting on-going school garden programs or providing start-up funding for projects at new sites. In March 2012, OSSE awarded \$200,000 in funding to 22 school projects throughout the District. Launched in 2009, the Mayor's Sustainability Award (formerly Environmental Excellence Award)

recognizes outstanding examples of environmental leadership and contributions to the Mayor's vision that the District becomes the greenest, healthiest, and most livable city in the nation. Coordinated by the District Department of the Environment, the first Outstanding Achievement by an Educational Facility award was given to Thurgood Marshall Academy Public Charter High School in 2011. In March 2012, OSSE submitted four school nominations to the pilot U.S. Department of Education Green Ribbon School recognition program, and two District schools – Sidwell Friends Middle School and Stoddert Elementary School – received the award in April 2012. There is great potential to build these efforts into a synchronized Green Schools recognition program for District schools.

Implementation Recommendations:

- Streamline the process of engagement and communications regarding school grounds as part of facilities modernization across all participating District agencies and non-profit organizations.
- Integrate sustainable building features as active learning opportunities and tools for teachers, students, and community members.
- Create a synchronized Green Schools award program for the District in conjunction with existing recognition opportunities, such as the Mayor's Sustainability Award.
- Create an organizational support system for schools interested in pursuing the U.S. Green Ribbon Schools recognition program, to include contact information for local resources, webinars, and information sessions.

Next Steps:

- DDOE and OSSE should coordinate with the Department of General Services' Sustainability and Energy Management Division to streamline informational requests related to green buildings, schoolyard gardens, and environmental practices.
- Organize key stakeholders to meet about a Green Schools award program for the District.



IMPLEMENTATION

“We must plan for a city that is sustainable—not just environmentally, but economically and socially as well. We must continue our investments to revitalize neighborhoods, expand transportation choices, better our health, restore rivers and parks, and improve our schools.”

— Mayor Vincent Gray,
A Vision for Sustainability, April 2012



Background Rationale:

In response to the mobilizing efforts of the No Child Left Inside Coalition and the potential for federal funding for states with environmental literacy plans, many states are in some stage of developing their own environmental literacy plan. As of 2012, 48 states plus the District are in the process of developing a state environmental literacy plan and nine have a plan formally adopted (Price, 2012).

Although each state’s environmental literacy plan includes a section for implementation, it is too early to determine the success of each individual state’s plan. Early successes, such as Maryland being the first state with an environmental literacy plan (in 2009) and subsequently being the first in the nation to adopt an environmental literacy graduation requirement in 2011, are news stories rather than empirical research; however, various environmental education associations throughout the country have anecdotally noted the increased shared efforts between state education agencies, local education agencies, natural resource agencies, university researchers, and environmental educators (NAAEE, 2011a). Additionally, the U.S. Department of Education’s Green Ribbon Schools recognition program has identified and promoted environmental literacy as one of its three core pillars for demonstrating achievement. This designation has not only increased environmental literacy actions in thousands of schools nationwide, but it has spawned unprecedented collaboration among state and local health, education, and environmental agencies.

Current Context

Established in 1993, the DC Environmental Education Consortium originally brought together District teachers and local environmental education providers to share resources and network together. Over the years, membership has changed to focus on building the professional network of providers to maximize services and outreach to teachers.

In 2001, the DC Environmental Education Consortium conducted a survey of teachers to collect baseline information about the status of environmental education in the District. The survey asked about teachers’ perceptions of barriers to environmental education, and responses included lack of the following: school time, funding, instructional materials, knowledge, liability, and transportation (DCEEC

et al., 2001). Turnover in administration and shifting priorities has made systemic collaboration with District schools difficult for program providers. As a result, many teachers anecdotally report that many of these barriers still exist. Thus, the approach for many organizations has been to work directly with District teachers to supplement lessons with environmental education content and/or experiences.

With the creation of the DC Environmental Literacy Plan Workgroup in June 2011, District agencies and environmental education providers are finally at the table – all at once – to create environmental education policies and strategies for implementation. For the first time, representatives from the education agencies directly meet with representatives from environmental education providers to discuss needs and priorities. As a result of the improved communication, there has been an increase in environmental literacy activities during the development of the DC Environmental Literacy Plan. By formalizing a commitment for ensuring District students access to academic courses, outdoor field experiences, and volunteer opportunities that reflect the diversity of prospective careers within the environmental field, the vision of well-informed District students graduating high school who are prepared to be competitive in the green economy can be realized.

Objective 6: Encourage collaboration and engagement across all sectors involved in implementing the DC Environmental Literacy Plan (ELP).

Goal	Action Items	Lead Organizations	Timeline
A. Cultivate and foster the knowledge and awareness necessary for the development and implementation of ELP at Local Education Agencies (LEAs).	i. Require administrators and guidance counselors to attend environmental literacy meetings and share information about resources.	DDOE	2013
	ii. Create mechanisms for informational exchange to encourage local, District-specific EE opportunities, such as web-based database and teacher's night.	DCEEC	On-going
B. Individual LEAs develop an Environmental Literacy Scope of Work and Implementation Plan based on framework template.	i. Explore integration of science/EL into DCPS School-Level Scorecards.	DCPS	2014
	ii. Identify how the implementation plans can support U.S. Green Ribbon Schools applications.	OSSE	2012
	iii. Develop LEA Guidelines and Training.	DDOE	2013
	iv. Create approval process for LEA plans.	OSSE	2014
C. Each District agency demonstrates commitment and ownership of an Environmental Literacy Scope of Work and Implementation Plan that supports schools.	i. Create implementation plans that are agency specific, city-wide, and collaborative in nature.	DDOE DPR UDC	2014
	ii. Agencies incorporate sections of ELP into missions, goals, strategic plans, and budget projections.		
	iii. Develop Agency Guidelines/Training.	DDOE	2013
D. Create state infrastructure for implementation of the ELP.	i. Establish a permanent Environmental Literacy Council or Advisory Board.	OSSE	2012
	ii. Create a new EL coordinator (Full-Time) position within OSSE.	OSSE	2014
	iii. Designate staff within DDOE to support ELP efforts.	DDOE	2012

Status:

In March 2012, members of the DC Environmental Literacy Plan Workgroup attended meetings in Maryland to learn how school districts are progressing with their state level and local level implementation plans. Additionally, the DC Environmental Literacy Plan Workgroup can gather implementation recommendations from OSSE regarding the implementation of other District-wide policies, such as Race to the Top, School Health Profiles, and Local Wellness Policies.

Released in April 2012, education is a component of Mayor Gray's *A Vision for Sustainability* (see Figure 5). The vision includes the short-term action to incorporate an Environmental Literacy Plan into the curriculum for all District schools. It might also ultimately serve as a driver of plan implementation. This effort can potentially serve as the platform for an executive order to adopt the plan and establish a permanent Environmental Literacy Council. Another possibility could be through the Healthy Youth and Schools Commission, appointed in May 2012, which advises the Mayor and Council on improving students' health and nutrition.



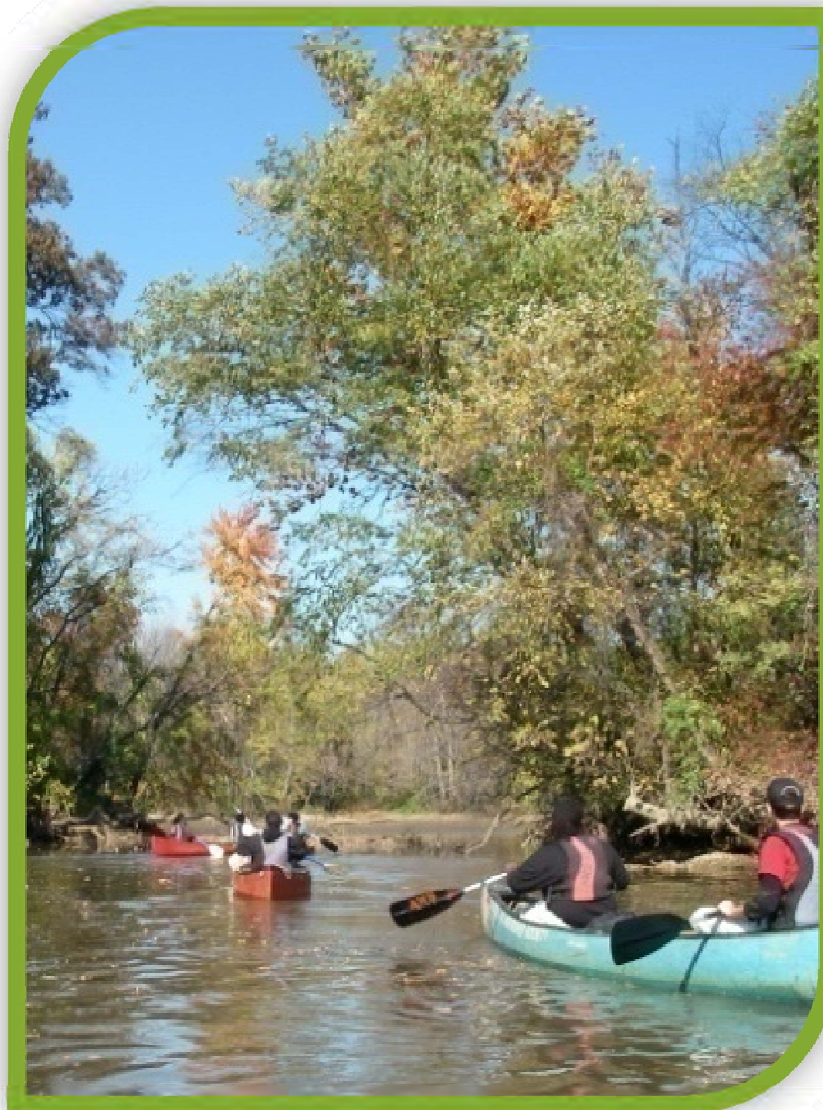
Fig. 5. Mayor Gray's 2012 Sustainable DC Vision

Implementation Recommendations:

- Establish a permanent Environmental Literacy Council or Advisory Board to guide and oversee the implementation of the DC Environmental Literacy Plan.
- Include an Environmental Literacy Plan Implementation Contractor in addition to the School Garden Specialist within the Nutrition Program team at the Office of the State Superintendent of Education in the Healthy Schools Act budget.
- Develop an implementation strategy for each agency that describes actions within the plan that can be implemented with little to no funding, and a prioritized list of goals.
- Create a network of individuals from District agencies and non-profit organizations that will be available to assist Local Education Agencies (LEAs) with developing an Environmental Literacy Implementation Plan.
- Design a framework template of environmental literacy integration based upon best practices currently in place at District schools. This framework should describe how the LEA could provide training for all instructional staff, including an introduction to environmental literacy and an explanation of how it can be integrated into current teaching standards, mapping of the environmental literacy concepts in curriculum by grade level and content area, and feedback and reflection specifically focused on implementation of an environmental literacy plan.
- Create a recognition program to highlight the successful implementation of environmental literacy best practices.

Next steps:

- Each agency should begin to implement the collaborative actions agreed upon in this draft document, and develop a five-year action plan and budget based on this document.
- The DC Environmental Education Consortium has funding to hire a Program Coordinator under a one-year contract. This position can support some of the actions outlined in the DC Environmental Literacy Plan.



WORKS CITED

- Achieve, Inc. (2011). *Next Generation Science Standards*. Retrieved April 11, 2012, from Next Generation Science Standards: <http://www.nextgenscience.org/>
- Athman, J., & Monroe, M. (2004). The effects of environment-based education on students' achievement motivation. *Journal of Interpretation Research*, 9, 9 – 25.
- Bartosh, O. (2003). *Environmental Education: Improving Student Achievement. Thesis for a Masters in Environmental Studies*. Olympia: Evergreen State College.
- Blair, D. (2009). The child in the garden: an evaluative review of the benefits of school gardening. *Journal of Environmental Education*, 40 (2), 15-38.
- CBS/MTV. (2006). *MTV/CBS Environment Poll 2006*. Retrieved March 28, 2012, from Rock the Vote: http://www.rockthevote.com/assets/publications/research/mtv_cbs_environment_poll-2006.pdf
- College Board. (2010). *AP Exam Grades: Summary Reports 2010*. Retrieved March 28, 2012, from College Board: http://www.collegeboard.com/student/testing/ap/exgrd_sum/2010.html
- College Board. (2012). *Supporting STEM*. Retrieved April 5, 2012, from 8th Annual AP Report to the Nation: <http://apreport.collegeboard.org/goals-and-findings/supporting-stem>
- Coyle, K. (2010). *Back to School: Back Outside*. Washington, DC: National Wildlife Federation.
- Coyle, K. (2005). *Environmental Literacy in America: What 10 years of NEETF/Roper Research and related studies say about environmental literacy in the US*. Washington, DC: The National Environmental Education and Training Foundation.
- Davila, A., & Mora, M. (2007). *Civic engagement and high school academic progress: An analysis using NELS data*. College Park: The Center for Information & Research on Civic Learning & Engagement.
- DC Environmental Education Consortium, DC Public Schools, and Environmental Health Administration. (2001). *Environmental Education Survey: Summary of Results*. Washington, DC: The Wilderness Society.
- DC Public Charter School Board. (2011). *Charter School Board Announces List of High Performing Charter Schools; Report cards show schools' annual performance*. Retrieved March 28, 2012, from DC Public Charter School Board: <http://www.dcpubliccharter.com/News-Room.aspx?id=232>
- District Department of the Environment. (2012). *RiverSmart Schools*. Retrieved March 28, 2012, from District Department of the Environment: <http://ddoe.dc.gov/service/riversmart-schools>
- District of Columbia Board of Education. (2004). *Amendments to District of Columbia Municipal Regulations Title 5 Chapter 22 regarding grades, promotion, and graduation*. Retrieved March 28, 2012, from District of Columbia Register: http://os.dc.gov/os/lib/os/info/odai/title_5/amendments/chapter_22-all.pdf
- Dyment, J. (2005). *Gaining ground: The power and potential of school ground greening in the Toronto District School Board*. Toronto: Evergreen.

Fordham Institute. (2012). *The State of State Science Standards 2012*. Washington, DC: Thomas B. Fordham Institute.

Glenn, J. (2000). *Environment-based Education: Creating High Performance Schools and Students*. Washington, DC: National Environmental Education and Training Foundation.

Kats, G. (2006). *Greening America's Schools: Costs and Benefits, A Capital E Report*. Washington, DC: U.S. Green Building Council.

Kellert, S. (2005). Nature and Childhood Development . In S. Kellert, *Building for Life: Designing and Understanding the Human-Nature Connection*. Washington, D.C: Island Press.

Lieberman, G., & Hoody, L. (1998). *Closing the Achievement Gap: Using the Environment as an Integrating Context for Learning*. Poway: State Education and Environment Roundtable.

National Environmental Education Foundation (NEEF). (2008). *Why Teach Environmental Education at the High School Level?* Retrieved March 28, 2012, from Classroom Earth: <http://www.classroomearth.org/node/252>

North American Association for Environmental Education (NAAEE). (2011a). *Advocacy for Environmental Education*. Retrieved March 28, 2012, from North American Association for Environmental Education: <http://www.naaee.net/advocacy>

North America Association for Environmental Education (NAAEE). (2011b). *Framework to Assess Environmental Literacy*. Retrieved March 28, 2012, from North American Association for Environmental Education: <http://www.naaee.net/framework>

North American Association for Environmental Education (NAAEE). (2008). *Developing a State Environmental Literacy Plan*. Washington, DC: North American Association for Environmental Education.

Office of the State Superintendent of Education (OSSE). (2012a). *District High School Adjusted Cohort Graduation Rates Released*. Retrieved June 19, 2012, from Office of the State Superintendent of Education: <http://osse.dc.gov/release/district-high-school-adjusted-cohort-graduation-rates-released>

Office of the State Superintendent of Education (OSSE). (2012b). *ESEA Flexibility Waiver*. Retrieved April 4, 2012, from Office of the State Superintendent of Education: <http://osse.dc.gov/page/esea-flexibility-waiver>

Office of the State Superintendent of Education (OSSE). (2012c). *Healthy Schools Act*. Retrieved March 28, 2012, from Office of the State Superintendent of Education: <http://osse.dc.gov/service/healthy-schools-act>

Office of the State Superintendent of Education (OSSE). (2011a). *2009-2010 State Report Card: Teacher Quality Information*. Retrieved March 28, 2012, from Office of the State Superintendent of Education: http://osse.dc.gov/sites/default/files/dc/sites/osse/publication/attachments/2009_10_Statewide_Report.pdf

Office of the State Superintendent of Education (OSSE). (2011b). *DC CAS*. Retrieved March 28, 2012, from Office of the State Superintendent of Education: <http://osse.dc.gov/service/dc-cas>

Office of the State Superintendent of Education (OSSE). (2011c). *Directory of Approved Educator Preparation Programs*. Retrieved April 13, 2012, from Office of the State Superintendent of Education: <http://osse.dc.gov/publication/directory-approved-educator-preparation-programs-1>

Office of the State Superintendent of Education (OSSE). (2011d). *OSSE State and LEA Report Cards for DC CAS in Science*. Retrieved March 28, 2012, from Office of the State Superintendent of Education: <http://www.nclb.osse.dc.gov/reportcards.asp>

Office of the State Superintendent of Education (OSSE). (2011e). *Race to the Top Phase II Application*. Retrieved March 28, 2012, from Office of the State Superintendent of Education: <http://osse.dc.gov/publication/rttt-phase-ii-application>

Office of the State Superintendent of Education (OSSE). (2011f). *Teacher and Service Provider License Renewal*. Retrieved April 30, 2012, from Office of the State Superintendent of Education: <http://osse.dc.gov/service/teacher-and-service-provider-license-renewal>

Peterson, P., & Hess, F. (2006, July 30). Keeping an Eye on State Standards. *Hoover Digest* (3).

Price, T. (2012, May 7). Co-chair, NAAEE Advocacy Committee. (G. Manubay, Interviewer)

Programme for International Student Assessment. (2010). *2009 Technical Report*. Paris: Organisation for Economic Cooperation and Development.

Rivkin, S. G., Hanushek, E. A., & Kain, J. F. (2005, March). Teachers, schools, and academic achievement. *Econometrica*, 73 (2), pp. 417-458.

Robelen, E. W. (2012). *Among AP Courses, Geography and Environment Are Hot*. Retrieved May 7, 2012, from Education Week: <http://www.edweek.org/ew/articles/2012/02/22/21ap-popularity.h31.html>

Ruskey, A., Wilke, R., & Beasley, T. (2001). A survey of the status of state-level environmental education in the United States – 1998 Update. *Journal of Environmental Education*, 32 (3), 4-14.

Sanders, W., & Rivers, J. (1996). *Cumulative and Residual Effects of Teachers on Future Student Academic Achievement*. Knoxville: University of Tennessee Value-Added Research and Assessment Center.

Schneider, M. (2002). *Public School Facilities and Teaching: Washington, DC and Chicago*. Chicago: Neighborhood Capital Budget Group.

Schroeder, C. M., Scott, T. P., Tolson, H., Huang, T.-Y., & Lee, Y.-H. (2007). A meta-analysis of national research: Effects of teaching strategies on student achievement in science in the United States. *Journal of Research in Science Teaching*, 44, 1436–1460.

State Education and Environment Roundtable. (2005). *California Student Assessment Project Phase Two: The Effects of Environment-Based Education on Student Achievement*. Ponway: SEER.

State Education and Environment Roundtable. (2000). *California Student Assessment Project*. Ponway: SEER.

The Bridgespan Group. (2006). *Double the Numbers for College Success: A Call to Action for the District of Columbia*. . New York City: The Bridgespan Group.

Yamauchi, L., Billig, A. H., Meyer, S., & Hofschire, L. (2006). Student outcomes associated with service-learning in a culturally relevant high school program. *Journal of Prevention & Intervention in the Community*, 32 (1), 149-164.