



Chesapeake Bay Watershed 2017 Environmental Literacy Report

Results from Watershed ELIT Survey

Version: 01.31.2018

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Background

**Study Purpose, Methods,
and Response Rates**

Background: Chesapeake Bay Watershed ELIT

ELIT Background & Purpose

The Chesapeake Bay Watershed Environmental Literacy Indicator Tool (ELIT) was developed to monitor the capacity and progress of public school districts toward meeting the environmental literacy goal stated in the 2014 Chesapeake Bay Watershed Agreement:

Enable every student in the region to graduate with the knowledge and skills to act responsibly to protect and restore their local watershed.

Three outcomes are stated in the Agreement:

- 1. Students:** Increase age-appropriate understanding of the watershed through meaningful watershed educational experiences (MWEEs) and rigorous, inquiry-based instruction, with a target of at least one MWEE in elementary, middle, and high school, depending on available resources.
- 2. Sustainable Schools:** Increase the number of schools that reduce impact of buildings and grounds on their local watershed, environment, and human health through best practices, including student-led protection and restoration projects.
- 3. Environmental Literacy Planning:** Develop a comprehensive and systemic approach to environmental literacy for all students, including policies, practices and voluntary metrics that support environmental literacy goals and outcomes.

The ELIT monitors public school districts' progress toward these three outcomes, collecting data within four topics:

- School district preparedness to implement a comprehensive and systemic approach to environmental literacy education (Outcome 3);
- Student participation in MWEEs during the school year (Outcome 1);
- Sustainability practices at schools (Outcome 2);
- School district needs to support further improvements in environmental literacy education.

The ELIT is administered biennially to all local education agencies (LEAs) in six jurisdictions: the District of Columbia, Delaware, Maryland, Pennsylvania, Virginia, and West Virginia. This report presents results only from LEAs that fall within the Chesapeake Bay Watershed.

Background: Chesapeake Bay Watershed ELIT

ELIT Data Collection

Data Collection Procedure

The ELIT is administered every two years as an electronic survey to be completed by a single representative from each LEA's administration who is able to report on district-wide activities. Any data-points that could be obtained reliably through non-survey means (e.g., location in/out of watershed; student enrollment) was identified and merged with the survey responses.

NOAA's Chesapeake Bay Program organized data collection, and representatives from each state's education office led distribution of the survey to LEAs within their jurisdiction. ELIT data collection targeted only public school districts. However, some jurisdictions also collected the same data for charter schools to support their internal information and planning efforts.

Data Collection Timing

The ELIT asks districts to report on the status of activities for the 2016-17 school year. To this end, the ELIT survey opened in May 2017 and was available to LEAs throughout the spring and summer. However, because many LEAs have limited staff capacity at the end of the school year and summer, the survey remained open through the start of the 2017-18 school year. The survey was closed in early December 2017.

Survey Completion Support

In addition to distribution of the survey request, representatives from state education agencies were the primary points-of-contact to encourage and help districts complete the ELIT. Additionally, the Chesapeake Bay Program provided any district who responded to the 2015 ELIT (a pilot version of the tool) with a report of the district's prior answers. Although some questions changed for 2017, this process facilitated completion for those districts who have previously reported data, and is a practice we advise be maintained in future surveys.

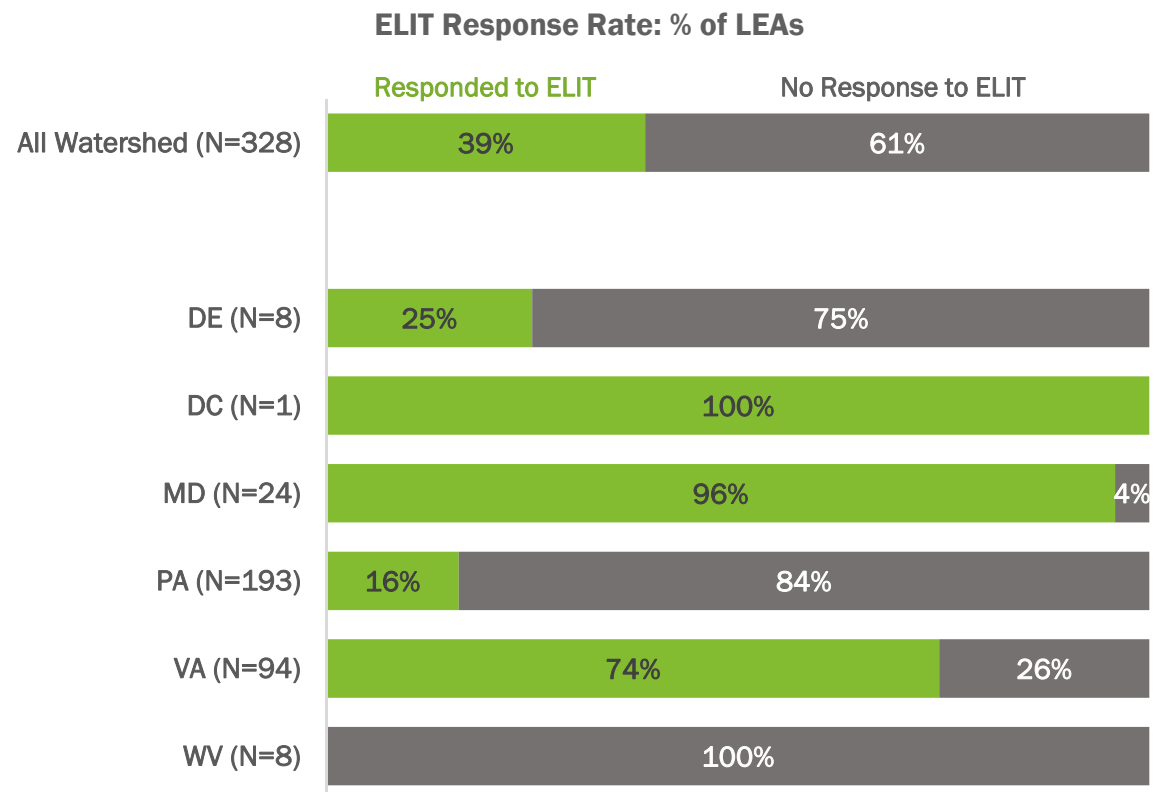
Background: Chesapeake Bay Watershed ELIT

2017 ELIT Response Rate: By District

128 surveys were completed by LEAs in the watershed, which constituted 39% of all districts in the watershed.

The main factor in response rate was state. Maryland and Virginia obtained responses from 74% or more of LEAs in their jurisdictions. The District of Columbia, with only one public school district, had a complete response rate. No responses were obtained from West Virginia, and only two responses were received from Delaware. Pennsylvania had 31 responses, but this was far short of the 193 districts within the Chesapeake Bay watershed in that state.

This state-by-state variation mirrors the 2015 response. This report will aggregate data across the watershed, but interpretation of results should consider the bias toward what is occurring in states with high response rates.



Background: Chesapeake Bay Watershed ELIT

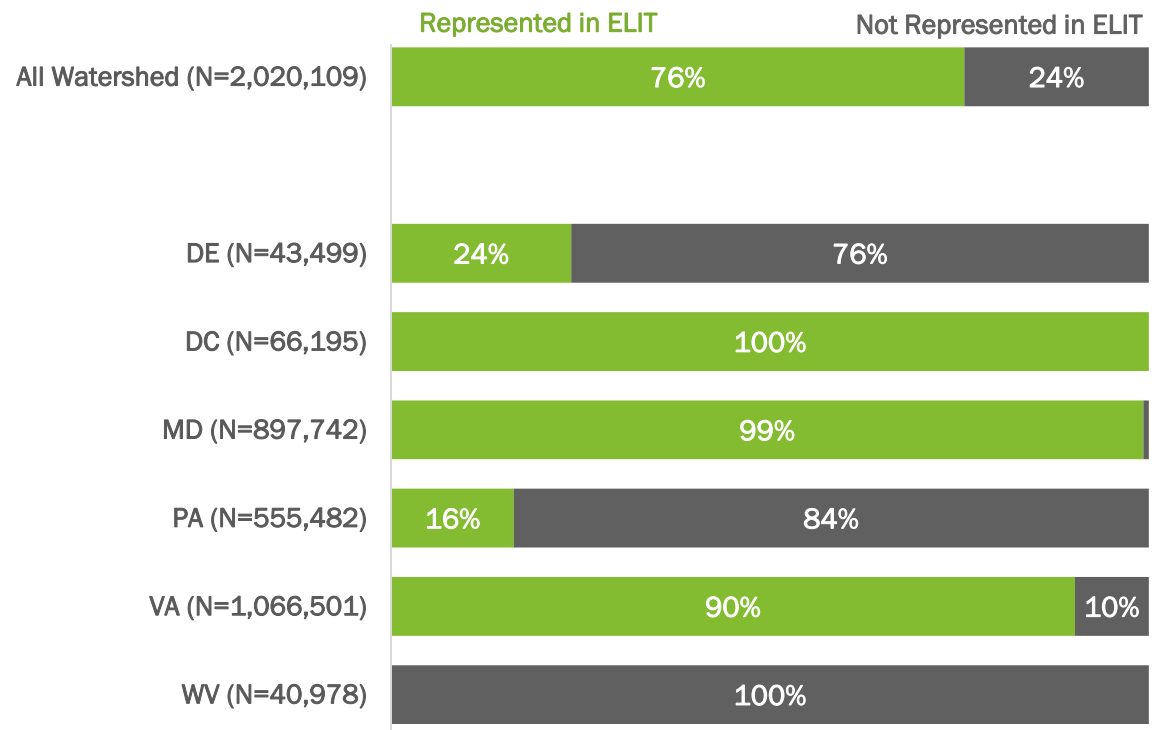
2017 ELIT Response Rate: By Enrollment

When examining response based on the students enrolled in each LEA, the ELIT data represents 76% of all students in the watershed.

This difference reflects that Virginia and Maryland have the most students within the watershed – over 1 million and nearly 900,000, respectively. These states' high response rates accounts for strong representation of all students in the watershed.

This also underscores how differently LEAs are organized. Maryland's 900,000 students are contained in 24 districts, while Pennsylvania's 555,000 students are spread across 193. This does not fully account for response rate (i.e., Virginia successfully collected data with nearly 100 districts), but it was a more challenging task for less centralized systems.

ELIT Response Rate: % of Enrolled Students within LEAs



Results

**Preparedness to Implement
Environmental Education**

Results: Environmental Literacy Preparedness

Measurement: LEA Preparedness

To assess each LEA's current capacity to implement a comprehensive and systemic approach to environmental education (EE), respondents considered six elements (right) and indicated for each whether it was:

- Not in place
- Partially in place
- Fully in place

The response for each element was scored with a value of 0, 1, or 2, respectively. These values were summed to arrive at a total preparedness score for the district.

- a) An established program leader for environmental education (providing effective, sustained, and system leadership)
- b) An integrated program infusing environmental concepts into appropriate curricular areas
- c) Regular communication among staff responsible for environmental education curriculum and program implementation.
- d) A support system in place that enables teachers and administrators to engage in high quality professional development in content knowledge, instructional materials, and methodology related to environmental education.
- e) A plan to ensure opportunities for all students to engage in meaningful watershed educational experiences (MWEEs) at the elementary, middle and high school levels.
- f) Established community partnerships for delivery of environmental education, including implementation of MWEEs

Results: Environmental Literacy Preparedness

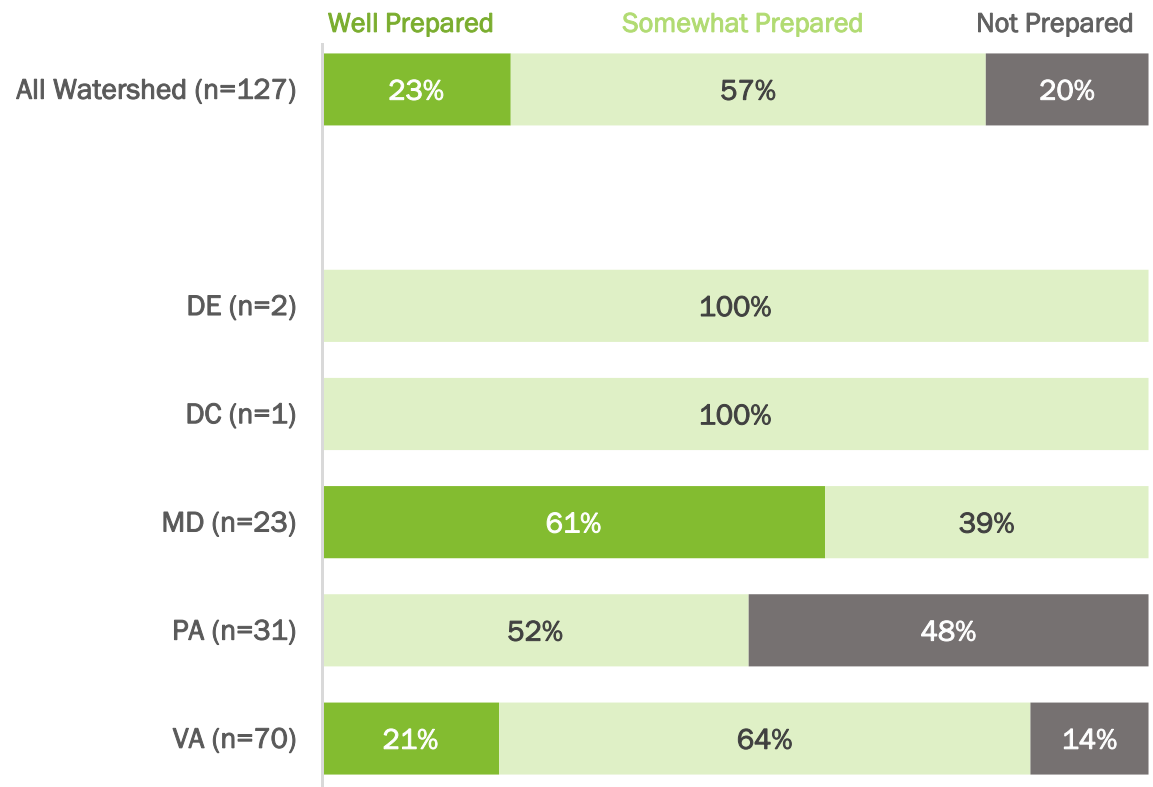
LEA Preparedness to Implement EE

The majority of responding LEAs in the watershed are somewhat prepared to implement high quality environmental education.

Responding LEAs rated how fully their district has implemented six indicators of planning and infrastructure for high quality EE. Total preparedness scores were grouped into three levels of preparedness:

- Well Prepared: scores from 9-12
- Somewhat Prepared: scores from 4-8
- Not Prepared: scores from 0-3

Preparedness varied between the states. Nearly all of the well prepared districts were in Maryland, with others coming from Virginia. Pennsylvania had the highest rate of responding districts that were unprepared (low response rates in PA and DE limits generalizability of these data).



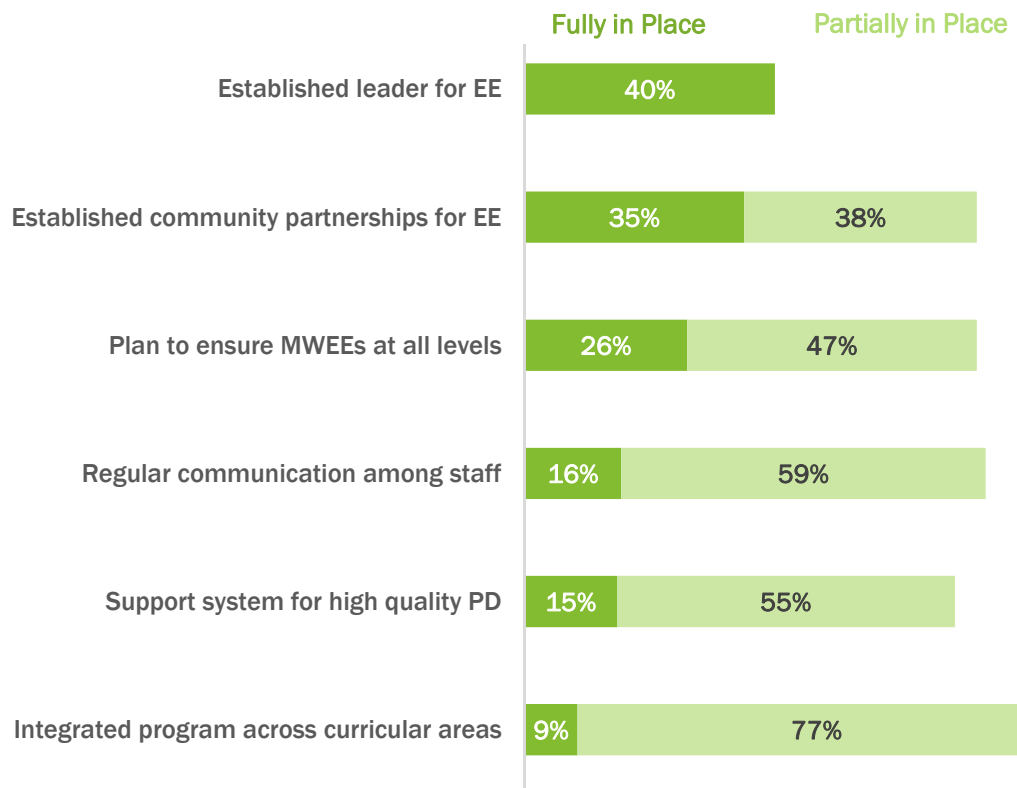
Preparedness

Results: Environmental Literacy Preparedness

LEA Preparedness within Elements of Readiness

The most common planning and infrastructure elements fully in place within LEAs are having established district leader and community partnerships for EE delivery.

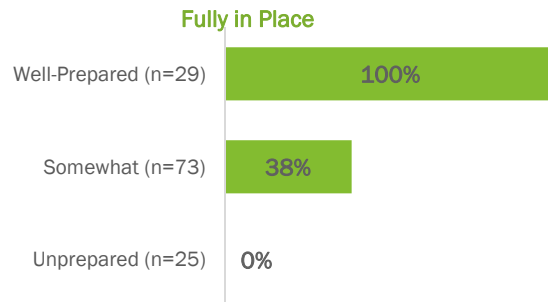
These data suggest that one of the most challenging preparedness elements to fully implement is an integrated program that infuses environmental topics across the curriculum. However, it is the element that received the strongest reports of districts at least making efforts in this direction, even if they have not yet been able to fully implement.



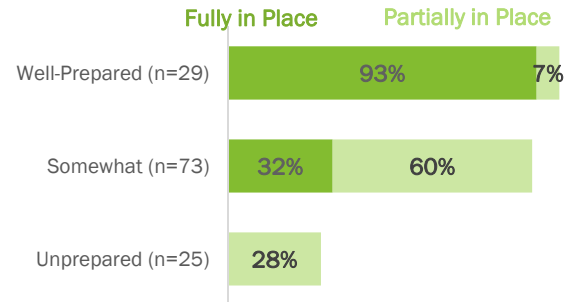
Results: Environmental Literacy Preparedness

Strengths and Challenges in Readiness: Comparing LEA Profiles by their Level of Preparedness

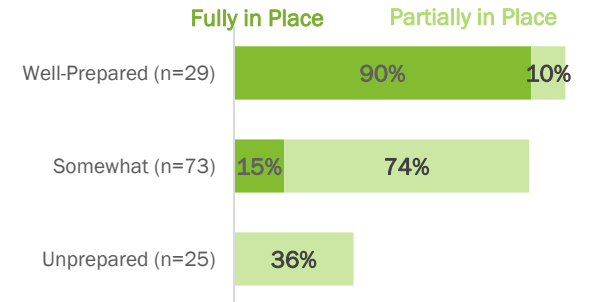
Established Program Leader for EE



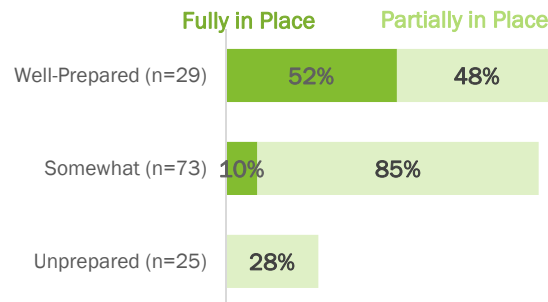
Community Partnerships for EE Delivery



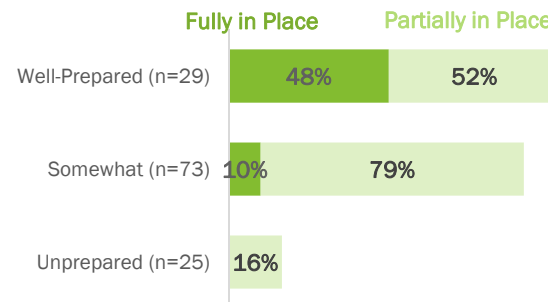
Plan for Student MWEEs across Levels



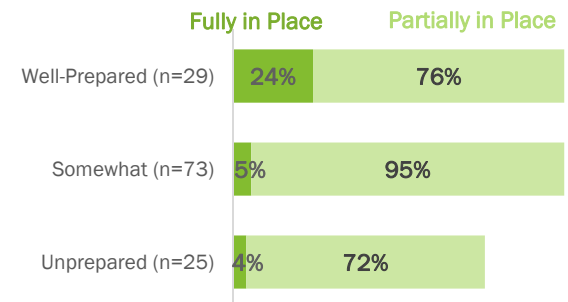
Regular Communication among Staff



Support for High Quality PD



Integrated EE Program



Preparedness

Results

**Student Participation in
Meaningful Watershed
Educational Experiences
(MWEEs)**

Results: Student Participation in MWEEs

Measurement: Student Participation

To assess the level of student participation in MWEEs within each LEA, respondents were asked to assess the presence of MWEEs within curricular offerings within each grade level (K-12), considering if they were system-wide or isolated to schools or classes. (See detail, right.) Respondents were given a reminder of the complete definition of a MWEE before the questions.

Although respondents reported at individual grade levels, analysis aggregated these data to report results by grade band (elementary, middle, or high school). The aggregation grouped each LEA into one of three levels within each grade band:

- At least one system-wide MWEE provided in the grade band;
- Some MWEE programming in the grade band, but not system-wide;
- No MWEE programming provided in the grade band.

For elementary (K-5) and middle school (6-8) grades, respondents indicated whether the district had:

- A system-wide MWEE experience for students in this grade
- Some schools or classes in this grade participate in MWEEs
- No evidence that students in this grade participate in a MWEE

For high school, where MWEEs are more likely to correspond to a course than a grade level, respondents reflected on the district's **required courses** at the high school level, and within each required course indicated whether the district had:

- A system-wide MWEE experience for students in this course
- Some schools or classes participate in MWEEs for this course
- No evidence that students in this course participate in a MWEE

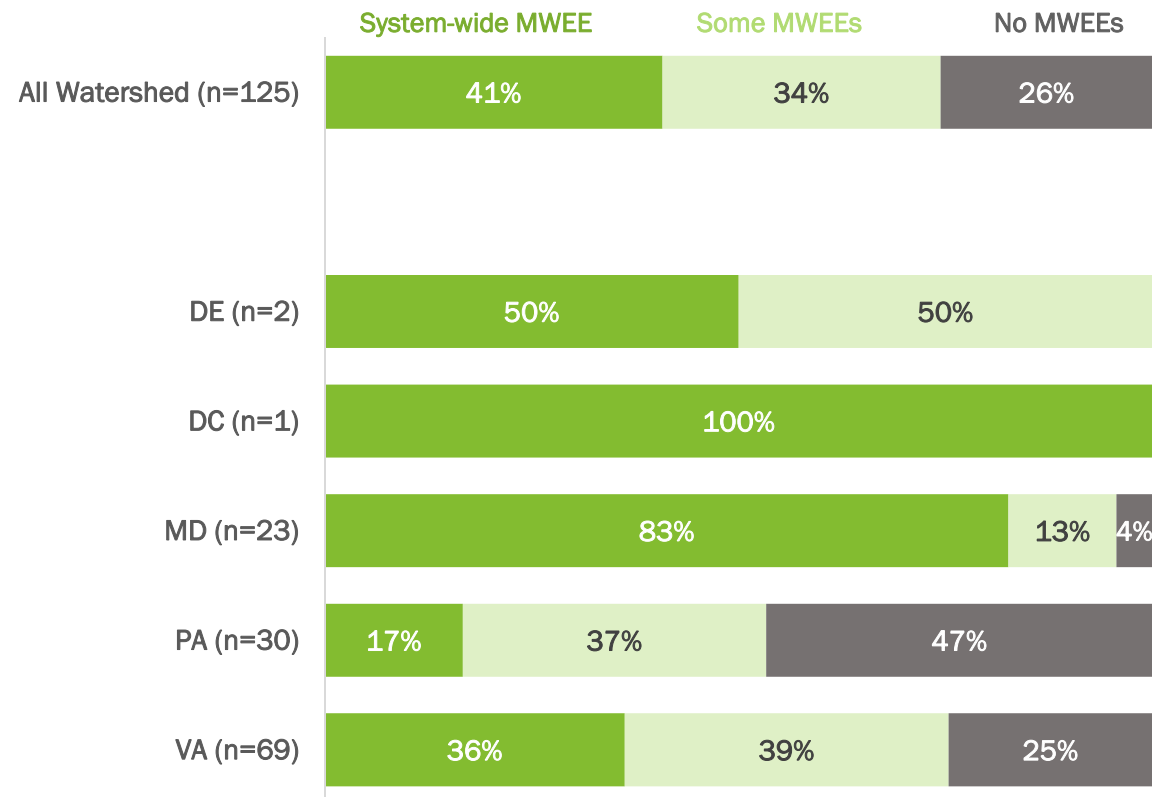
Results: Student Participation in MWEEs

Elementary School: Student Participation in MWEEs

41% of responding LEAs in the watershed have a system-wide MWEE in place at the elementary grade levels.

As with preparedness scores, there was great variation between the states. Again, Maryland demonstrated state-wide success in this indicator, with 83% of districts having system-wide MWEEs for elementary students. Virginia reported more than one-third of districts at this level.

Pennsylvania's responding districts had the greatest prevalence of no MWEE programs at all; however, about one-quarter of Virginia's respondents similarly reported a lack of MWEE offerings in elementary school.



Student MWEEs

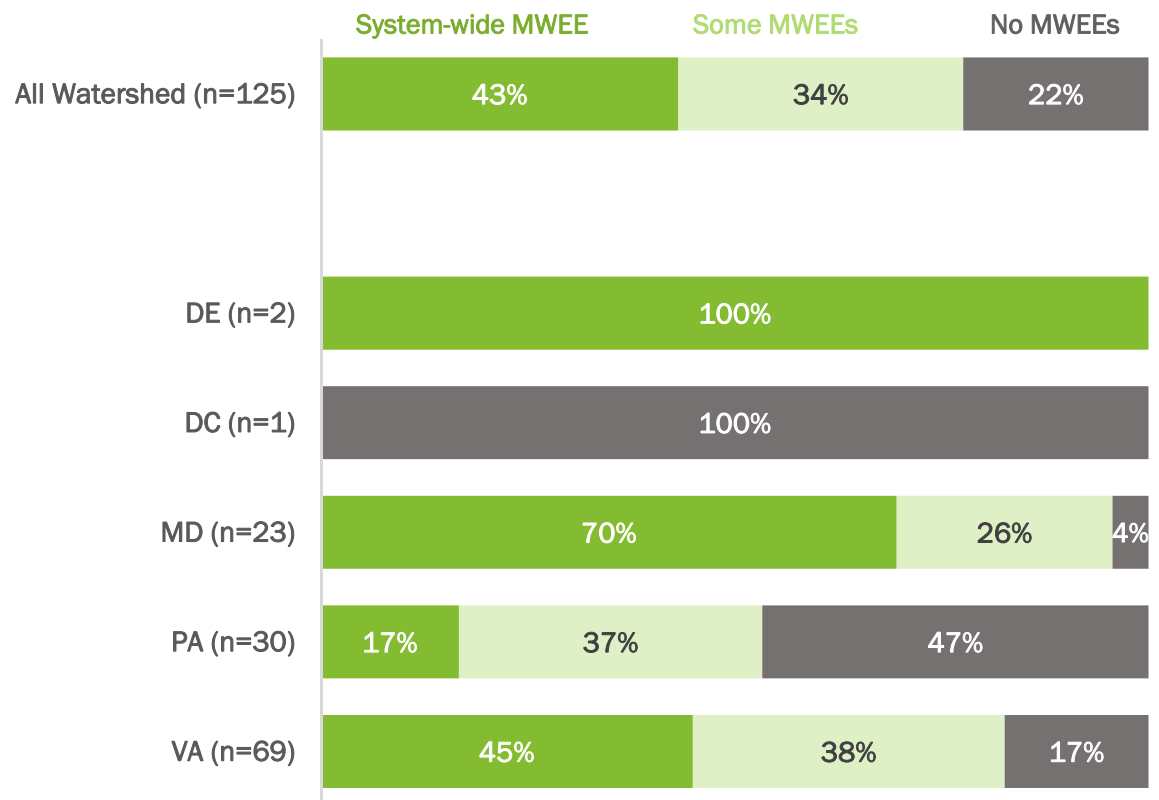
Results: Student Participation in MWEEs

Middle School: Student Participation in MWEEs

43% of responding LEAs in the watershed have a system-wide MWEE in place at the middle school grade levels.

The overall breakdown of the presence of MWEEs in middle grades was similar to elementary grades. At the state-level, Maryland had the greatest penetration of system-wide MWEEs, but slightly fewer than for elementary grades. Virginia reported more system-wide MWEEs for middle grades.

Again, just under half of responding districts from Pennsylvania reported no MWEE programs at all, although it was a limited dataset. DC Public Schools also does not have a MWEE at the middle school level, although it did at the elementary level.



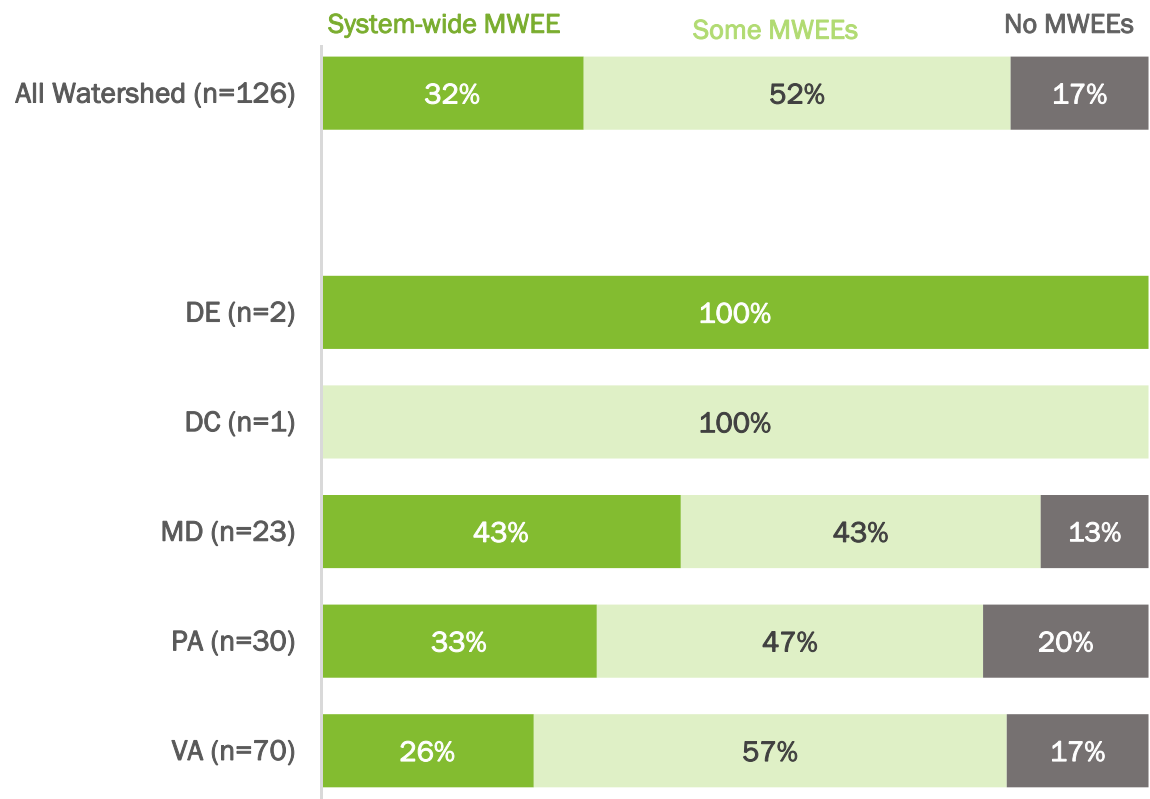
Results: Student Participation in MWEEs

High School: Student Participation in MWEEs

Over 30% of responding LEAs in the watershed have a system-wide MWEE in place within required high school courses.

System-wide MWEEs in high school are less common than at younger grades. However, there's a slightly greater prevalence of MWEEs isolated within individual schools or classes. Maryland and Virginia both had lower rates of system-wide MWEEs, and greater proportions of school-level MWEEs.

Both Pennsylvania and Delaware respondents seemed to indicate that MWEEs, generally, are more prevalent at the high school level than they were at the younger grades. The low response rates make it difficult to know if this is generalizable for the states, but is a notable trend to explore.



Student MWEEs

Results: Student Participation in MWEEs

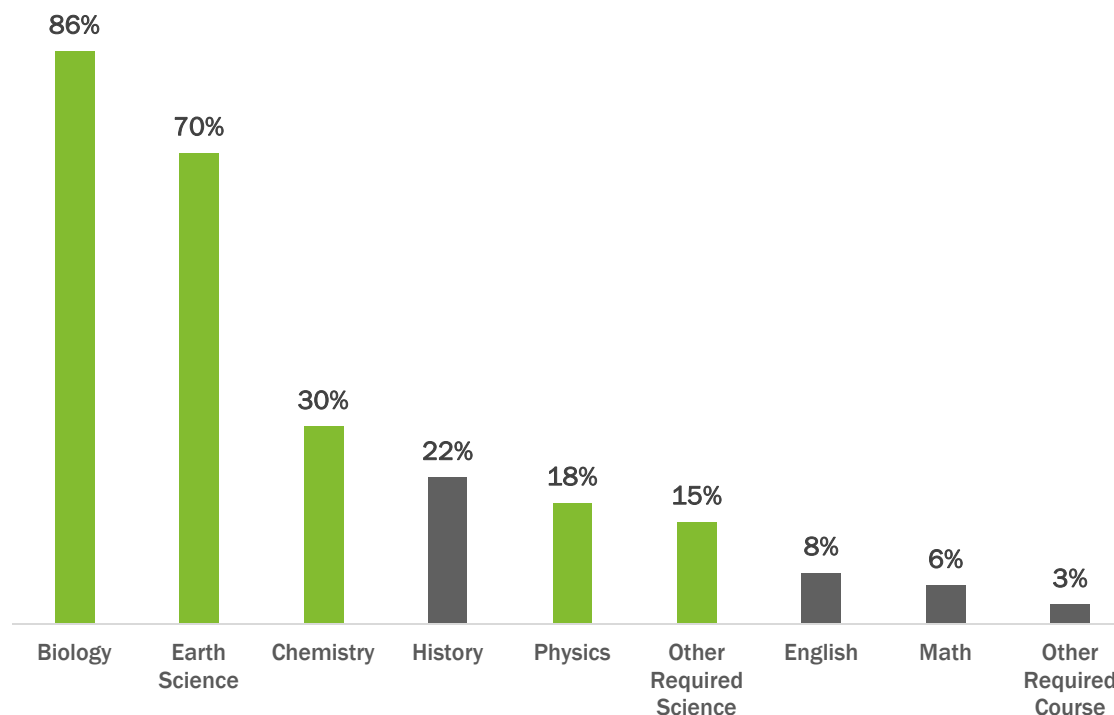
High School: Required Courses Using MWEEs

Of the 105 LEAs that reported any MWEEs in high school, all indicated that at least one MWEE was part of a required science course.

Biology and earth science were the most common required science subjects that used MWEEs. Biology was consistently the highest across the states; however, Virginia had greater use of MWEEs in earth science (83% of reporting LEAs) than Maryland or Pennsylvania (60% and 54%, respectively). Science courses in the “other” category were primarily environmental science or ecology.

Among non-science courses, history was the most common subject for a MWEE. A strong portion of this number came from Maryland, where 50% of LEAs identified high school MWEEs occurring within history subjects.

% of LEAs that Provide MWEEs across Required Subjects
(n=105 LEAs that reported any HS MWEE)



Student MWEEs

Results: Student Participation in MWEEs

High School: Elective Courses Using MWEEs

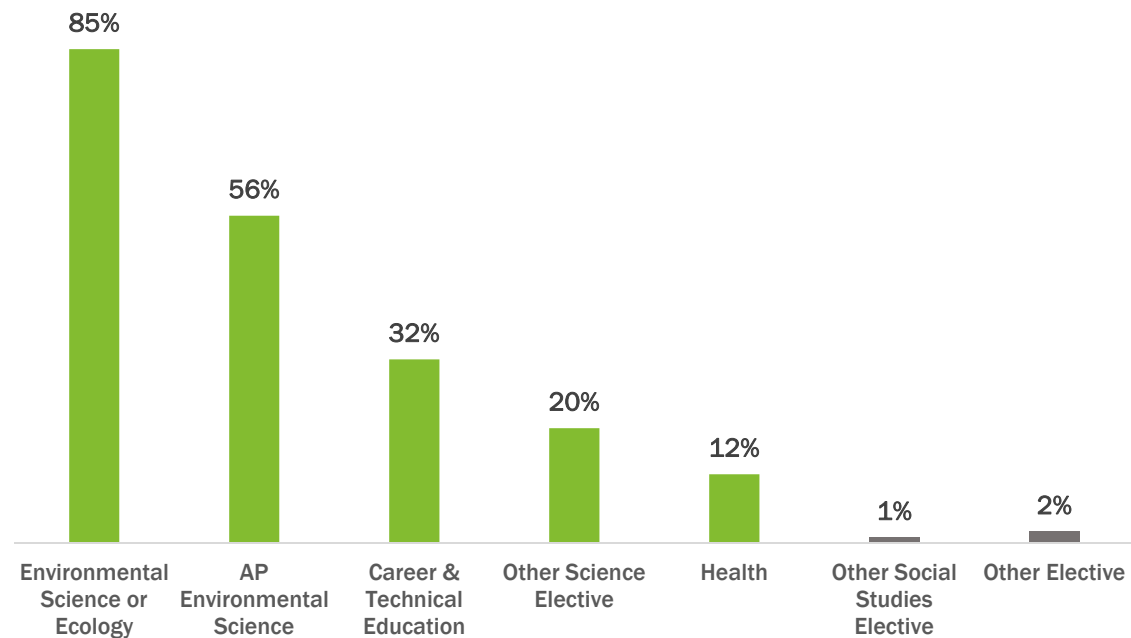
101 LEAs reported offering MWEEs within high school elective courses; most of these were in environmental science or ecology courses, including AP environmental science.

MWEEs within general environmental science and ecology electives were common across states, but MWEEs within AP environmental science was more common in Maryland LEAs.

Just under one-third of responding LEAs include MWEEs within career and technical education (or CTE) coursework. Among the “other science electives” that use MWEEs were various marine science courses (marine biology, oceanography, aquatic ecology), as well as agriscience, botany, climate, earth science, and STEM capstone or inquiry courses.

% of LEAs that Provide MWEEs within Electives

(n=101 LEAs that reported HS MWEE in electives)



Student MWEEs

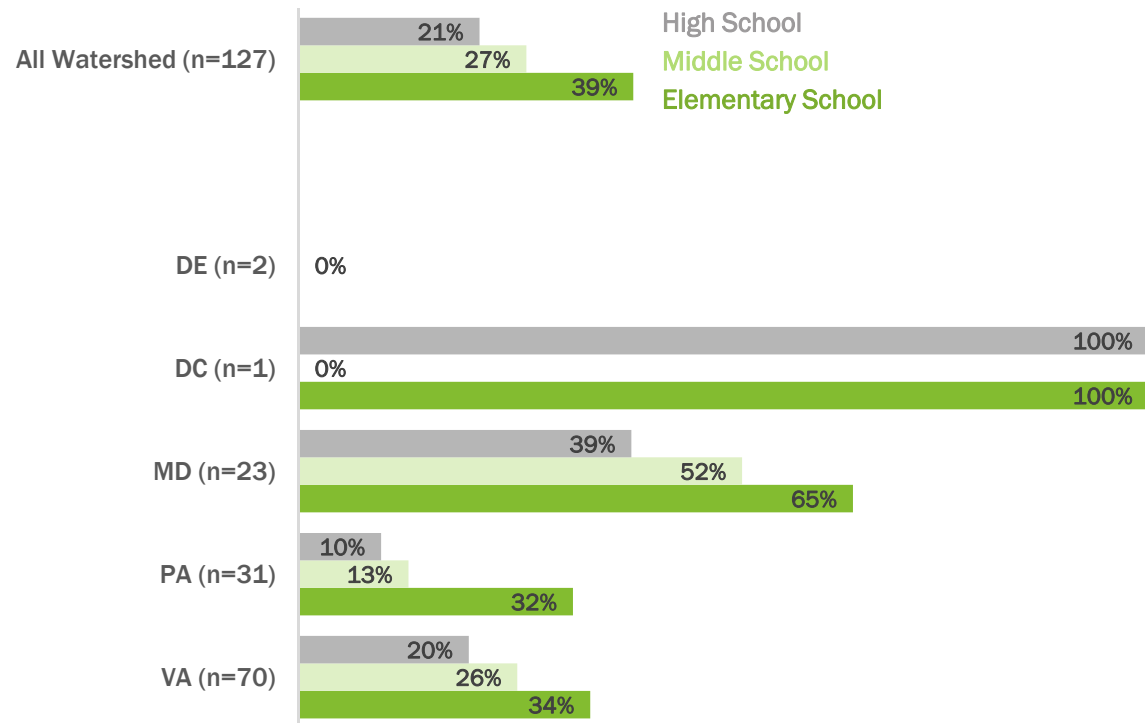
Results: Student Participation in MWEEs

System-wide Outdoor Student Experiences

Separate from complete MWEEs (which include more than outdoor experiences), a segment of responding LEAs indicated that they offer other system-wide outdoor experiences for students.

While the primary target for the ELIT measurement is the incorporation of MWEEs for students in each grade band, the survey also inquired about the use of system-wide outdoor experiences for students. The idea is that districts that have already implemented a system-wide field experience within a grade level may be able to leverage this infrastructure to expand into a full-scale, system-wide MWEE. This seems most common in the elementary grade levels, and least common at high school.

% of LEAs with a system-wide outdoor student experience (not full MWEE)



Student MWEEs

Results

Sustainable Schools

Results: Sustainable Schools

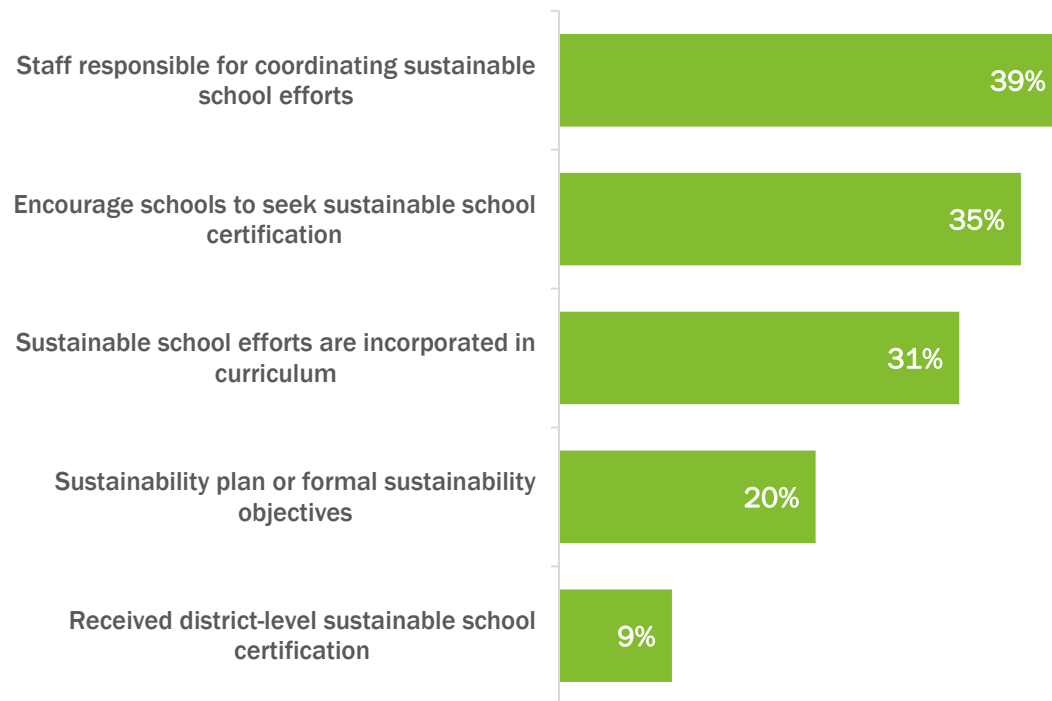
Sustainable Schools Best Practices

Over one-third of responding LEAs reported they have staff designated to coordinate sustainable schools efforts and that the district encourages schools to seek sustainable school certification.

Slightly less common was LEAs incorporating sustainable school efforts in the curriculum. One in five responding LEAs reported having a formal sustainability plan for their district, and very few had received district-level sustainable school certification.

The following page shows the state-by-state distribution of these responses. Of the states with robust responses, Maryland seems to have the strongest sustainable schools practices, including 91% reporting they encourage schools to pursue certification.

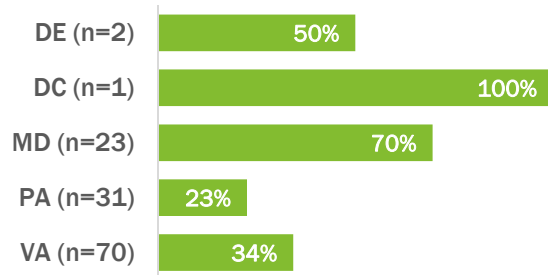
% of LEAs in the Watershed Reporting a Sustainable Schools Practice in Place (n=127)



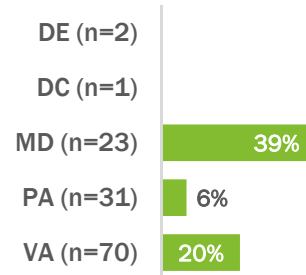
Results: Sustainable Schools

Sustainable Schools Best Practices: By State

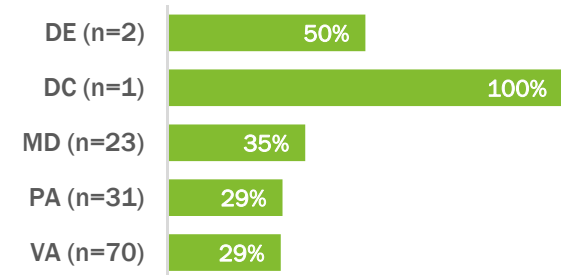
LEAs with staff responsible for coordinating sustainable school efforts



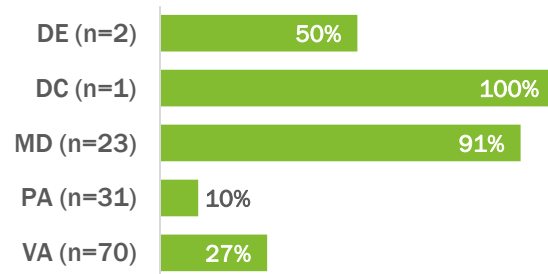
LEAs that have a sustainability plan or formal sustainability goals



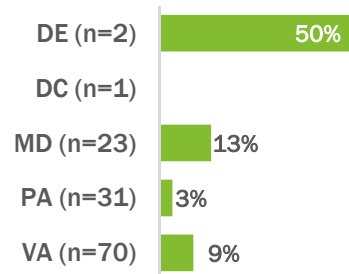
LEAs where sustainable school efforts are incorporated in curriculum



LEAs that encourage schools to seek sustainable school certification



LEAs that have received district-level sustainable school certification



Results

**Environmental Education
Support Needs**

Results: EE Support Needs

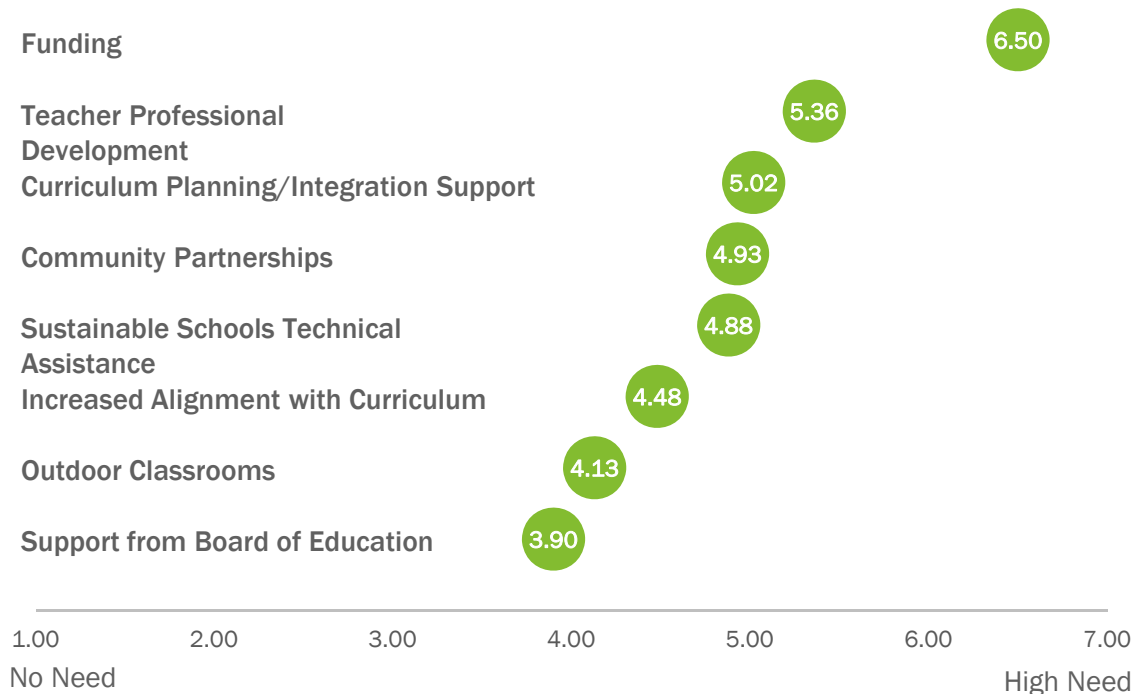
Greatest Areas of Need for Support

There was consensus that the greatest need for improving EE was funding, with an average rating of 6.50 and a median of 7 (out of 7).

The next greatest need was support for teacher professional development, rated a moderately high need (around 5.4). While no areas were rated as “no need,” two topics were a weaker need, rated around the mid-point: support from boards of education and outdoor classrooms.

The next page shows state-by-state priorities via the median of respondents ratings on each item. On the whole, states mirror national trends. Delaware was an exception, however; but because only two LEAs responded, it is difficult to determine if this is generalizable to the state or just these LEAs.

Watershed-wide mean rating of need (n=122)



Support Needs

Results: EE Support Needs

Greatest Needs for Support State-by-State

State	Median (n)	State	Rating (n)	State	Median (n)
Maryland	Median (n=23)	District of Columbia	Rating (n=1)	Delaware	Median (n=2)
Funding	7	Funding	7	Curriculum Planning/Integration Support	6.5
Teacher Professional Development	5	Teacher Professional Development	5	Sustainable Schools Technical Assistance	6.5
Increased Alignment with Curriculum	5	Curriculum Planning/Integration Support	5	Increased Alignment with Curriculum	6.5
Curriculum Planning/Integration Support	4	Sustainable Schools Technical Assistance	5	Funding	6
Sustainable Schools Technical Assistance	4	Increased Alignment with Curriculum	4	Teacher Professional Development	6
Outdoor Classrooms	4	Outdoor Classrooms	4	Community Partnerships	5.5
Support from Board of Education	4	Community Partnerships	3	Outdoor Classrooms	5
Community Partnerships	3	Support from Board of Education	1	Support from Board of Education	3.5
Virginia	Median (n=70)	Pennsylvania	Median (n=31)		
Funding	7	Funding	7		
Teacher Professional Development	6	Community Partnerships	6		
Curriculum Planning/Integration Support	5	Teacher Professional Development	5		
Community Partnerships	5	Curriculum Planning/Integration Support	5		
Sustainable Schools Technical Assistance	5	Sustainable Schools Technical Assistance	5		
Increased Alignment with Curriculum	4	Increased Alignment with Curriculum	5		
Outdoor Classrooms	4	Outdoor Classrooms	4		
Support from Board of Education	4	Support from Board of Education	4		

Conclusions

**Discussion & Conclusions
of ELIT Results**

Indicator Changes: 2015 to 2017

Indicators measured by the ELIT were generally stable between 2015 and 2017, with evidence of slight increases in some areas.

Preparedness Levels

There was some indication of increases in LEAs' preparedness for EE between 2017 and data collected in a 2015 pilot. Most notably, the proportion of LEAs that scored as prepared increased, while the proportion of unprepared LEAs decreased.

It should be noted that the 2017 ELIT included wording changes to these items, and one of the 2015 items was removed. When 2015 data were re-analyzed (removing responses to the eliminated item and applying 2017 scoring), the patterns held. The percentage of LEAs in the "well prepared" group increased from 19% to 23%, and the "somewhat prepared" group increased from 55% to 57%. The unprepared group dropped from 26% to 20%.

Prevalence of MWEEs

The prevalence of system-wide MWEEs within LEAs appeared to stay relatively steady between data gathered in 2015 and 2017. Middle school and high school rates remained essentially the same between the two years, and elementary school grades showed a modest increase in the percentage of system-wide MWEEs (from 37% to 41%). The elementary school increase seemed to be largely attributable to increases in system-wide MWEEs within Maryland, where 83% of districts reported system-wide MWEEs for elementary students, up from 65% in 2015.

Key Takeaways from Trends in ELIT Indicators

Initial Preparedness Steps

Examining each element of the Preparedness score, patterns show three elements that are fully implemented by nearly all well-prepared LEAs. These elements – an established program leader, community partners, and a plan for student MWEEs at all levels – may be foundational elements for a well-prepared district. This suggests that these elements may be good starting points for districts looking to improve their overall preparedness.

Cross-curricular integration of EE programs was the most challenging element to fully implement, even by well-prepared LEAs. Most districts did report partial efforts at integration, however, suggesting this element may require ongoing effort and be difficult to fully realize for LEAs.

Difference in High School MWEEs

Reports of MWEEs within grade-bands suggest that it may be easier to implement system-wide experiences in the younger grades, where they were more common. Reports of high school courses showed that MWEEs occur, but more often at the school or class level. This may reflect the nature of high school curricula and teaching that allows for more variation in instruction, even in required courses. In high school, MWEEs mainly (but not exclusively) fit within the biology and earth science requirements.

Field Experiences as Starting Point

A building block to increase the penetration of MWEEs, especially in elementary grades, may be to leverage and expand existing system-wide field experiences for students that do not currently fit the definition of a MWEE. The data showed that 40% of LEAs without a system-wide MWEE at the elementary level *did* report having a system-wide outdoor experience for students. Because field experiences are central to a MWEE, these existing system-wide programs could represent an asset that districts could modify into a full MWEE, without having to start from scratch.

Key Takeaways from Trends in ELIT Indicators

Sustainable School Starting Points

The data showed that the most common sustainable school practice among LEAs in the watershed was identifying a responsible staff person to be in charge of sustainable school efforts. This may indicate that identifying leadership and responsibility in this way is a common first step toward sustainable school activities and/or certification. Similarly, it was also relatively common for districts to report encouraging districts to pursue sustainable school certification and to make efforts to incorporate those efforts into curriculum.

Priority Needs for EE Support

Unsurprisingly, funding was far and away reported as the greatest need by LEAs within the watershed, which was consistent with data collected in 2015. Beyond the need for funding, support for teacher professional development and for curriculum planning/integration were the next biggest priority, which was generally consistent across the six states. This finding aligns with the LEA preparedness results, which showed that curriculum integration is the most challenging step for districts to fully integrate.

The lowest priorities were support from Boards of Education and for outdoor classrooms. Although the questions were asked differently in 2015, the overall pattern of priorities was quite consistent between the years.

Chesapeake Bay Watershed: 2017 ELIT Results

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