

Chesapeake Bay Program | Indicator Analysis and Methods Document
Environmental Literacy Planning | Updated July 2018

Indicator Title: Percentage of Local Education Agencies (LEAs) that are “Well Prepared” or “Somewhat Prepared” to implement environmental education program(s).

Relevant Outcome(s): Environmental Literacy Planning

Relevant Goal(s): Environmental Literacy

Location within Framework (i.e., Influencing Factor, Output or Performance):
 Performance

A. Data Set and Source

(1) Describe the data set. What parameters are measured? What parameters are obtained by calculation? For what purpose(s) are the data used?

The Environmental Literacy Indicator Tool (ELIT) is a survey of public school districts that measured:

1. Degree of preparedness to provide Environmental Education
2. Extent to which MWEs are provided to students in elementary, middle, and high schools

Analysis: Information from this tool was used to determine local education agency (LEA; also referred to as school district) capacity to provide systemic environmental education. The Chesapeake Bay Program (CBP) first screened data to include only LEAs that have 25% or more of their geographic area within the Chesapeake Bay Watershed; this used a GIS analysis based on school district polygons from NCES/American Community Survey School District Data 2013, available at <https://deptofed.maps.arcgis.com/home/item.html?id=93dd62a783d2495e9e0b241a968a8f2f>. Responding LEAs answered a series of six items about elements of preparedness to provide environmental education across the district, which were scored to arrive at a total preparedness score for the district. Raw preparedness scores were coded into one of three preparedness categories (well prepared, somewhat prepared, not prepared); the number of LEAs in each category was calculated as a percentage of the total school districts within the watershed, including those that did not respond to the survey.

Survey Response Rate: The response rate to the survey was 28% regionwide for LEAs both within and outside of the watershed. 40 % of school districts within the watershed portion of DE, DC, MD, PA, VA, and WV responded to this question; their responses form this indicator. Individual jurisdiction response rates can be viewed in the data file at <http://www.chesapeakeprogress.com/engaged-communities/environmental-literacy->

[planning](#). All jurisdictions in the watershed participated in the 2017 survey except New York and West Virginia.

For the purposes of the CBP data analysis only data from LEAs within the watershed was used. The data file does provide the data for all LEAs throughout all areas of the states, regardless of their inclusion in the Chesapeake Bay Watershed.

- (2) List the source(s) of the data set, the custodian of the source data, and the relevant contact at the Chesapeake Bay Program.
- Source: Environmental Literacy Indicator Tool (ELIT) - survey of LEAs in all Chesapeake Bay Watershed jurisdictions except New York
 - Custodian: Laura Free, free.laura@epa.gov, (410) 267-5713
 - Chesapeake Bay Program Contact (name, email address, phone number): Shannon Sprague, shannon.sprague@NOAA.GOV, (410) 267-5664
- (3) Please provide a link to the location of the data set. Are metadata, data-dictionaries and embedded definitions included? N/A

B. Temporal Considerations

- (4) Data collection date(s): [May-November 2017](#)
- (5) Planned update frequency (e.g., annual, biannual, etc.):
- Source Data: [Biennial](#)
 - Indicator: [Biennial](#)
- (6) Date (month and year) next data set is expected to be available for reporting: [January 2020](#)

C. Spatial Considerations

- (7) What is the ideal level of spatial aggregation (e.g., watershed-wide, river basin, state, county, hydrologic unit code)? [School district](#)
- (8) Is there geographic (GIS) data associated with this data set? If so, indicate its format (e.g., point, line polygon). [None at this time.](#)
- (9) Are there geographic areas that are missing data? If so, list the areas.
There is no data from New York or West Virginia and relatively small amounts of data from Pennsylvania (16% response rate from within the Chesapeake Bay watershed. An update in July 2018 allowed for additional Delaware data, bringing their response rate from 25% to 88% of school districts within the watershed. Because of this lack of data

(NY and WV), or lack of sufficient data (PA), it is difficult to make statewide generalizations about these jurisdictions.

(10) Please submit any appropriate examples of how this information has been mapped or otherwise portrayed geographically in the past. N/A

D. Communicating the Data

(11) What is the goal, target, threshold or expected outcome for this indicator? How was it established?

This has yet to be determined, but will be proposed to the Education Workgroup for consideration. The Environmental Planning Literacy outcome in the 2014 Chesapeake Bay Watershed Agreement does not specify a target.

(12) What is the current status in relation to the goal, target, threshold or expected outcome? 2015 data posted in 2017 represents the baseline data collected. 2017 is the second data collection year.

(13) Has a new goal, target, threshold or expected outcome been established since the last reporting period? Why? No.

(14) Has the methodology of data collection or analysis changed since the last reporting period? How? Why?

It should be noted that the 2107 ELIT survey included wording changes to some items, and one of the 2015 items was removed. As a result of the change in number of items, the procedure for scoring the responses into the three categories (well-prepared, somewhat prepared, and not prepared) also changed slightly. However, a report done by the data collector showed that when 2015 data were re-analyzed (removing responses to the eliminated item and applying 2017 scoring), the patterns generally held. See the report for more details, available at https://www.chesapeakebay.net/who/group/education_workgroup.

In April 2017, the 2015 data set was updated from its original, which used a binary analysis of location within the Chesapeake watershed (in or out), and as a result many school districts that simply intersected with the watershed boundary were included in that analysis. Working together, the Education workgroup leadership, GIS analyst, and Indicators Coordinator determined that a rule should be used that includes school districts with 25% or more area within the watershed as the basis for this indicator. This approach more accurately reflects the reach of the Education workgroup of the Chesapeake Bay Program. This change in approach resulted in a slightly higher percentage of well-prepared LEAs (23% of those who responded, as opposed to 21% in the first version of the 2015 data analysis). The change in approach also resulted in other small changes in categories and response/nonresponse rates across the

jurisdictions. West Virginia has only one response included in the indicator for the Chesapeake Bay watershed, but the other of the 2 responses received for the survey is included in the calculations on the Jurisdiction tab, reflecting LEAs who responded to the survey throughout the various states.

(15) What is the long-term data trend (since the start of data collection)? N/A (this is the second data point)

(16) What change(s) does the most recent data show compared to the last reporting period? To what do you attribute the change? Is this actual cause or educated speculation?

Significant changes (greater than five percentage points) are highlighted in **bold**.

- Watershed-wide: There was some indication of positive shifts in LEAs' levels of preparedness for EE between 2017 and data collected in a pilot in 2015. Most notably, the proportion of LEAs that scored as somewhat prepared seemed to increase, while the proportion of unprepared LEAs decreased.
- Delaware: first year of data included in the indicator.
- DC: No change.
- MD: **A shift from Well Prepared to Somewhat Prepared.** No districts in the "Not Prepared" category, as opposed to 4% in 2015.
- PA: Not enough data to generalize statewide. Although % of respondents Somewhat Prepared increased from 2015-2017, % of all LEAs in PA Somewhat Prepared decreased. This is likely due to a 2017 response rate even lower than the 2015 response rate.
- **VA: Shift from Not Prepared to Somewhat Prepared.**
- WV: No data for 2017.

(17) What is the key story told by this indicator?

This indicator shows the extent to which public school districts within the watershed are prepared to put a comprehensive and systemic approach to environmental literacy in place as called for in the Environmental Literacy Planning Outcome of the Environmental Literacy Goal of the 2014 Chesapeake Bay Watershed Agreement.

The 2017 ELIT showed that the majority of responding LEAs in the watershed are somewhat prepared to implement high quality environmental education. Nearly all of the Well Prepared districts were in Maryland and Virginia.

Pennsylvania had the highest rate of responding districts that were unprepared (low response rates in PA and DE limits generalizability of these data).

State departments of education and local education agencies play an important role in establishing expectations and guidelines, and providing support for the development and implementation of environmental education programs within their schools. In the

development of plans and the delivery of programs, local education agencies can also benefit from partnerships with environmental education organizations, natural resource agencies, universities, businesses, and other organizations that have a wealth of applicable products and services as well as a cadre of scientific and professional experts that can complement the classroom teacher's strengths and heighten the impact of environmental instruction both in the classroom and in the field.

E. Adaptive Management

(18) What factors influence progress toward the goal, target, threshold or expected outcome?

- **State-level Advocacy for Environmental Literacy:** There is a need for high level support for environmental literacy that flows from administrations or legislatures and is communicated to school systems so there can be a shared vision among stakeholders and state leadership. Organized support from stakeholders for such positions is also important in advancing any state policy initiatives.
- **Local Education Agency Support for Environmental Literacy:** Education in most of the states in the Chesapeake Bay watershed are controlled by local education agencies (600+ in the region), each with their own leadership and management structure. With the exception of state laws and regulations, education priorities are largely determined at the local level and may not mirror state priorities. Meaningful Watershed Educational Experiences (MWEEs) and sustainable school practices are often left out of established accountability mechanisms between state and local education agencies.
- **Education Reform:** This is a time of tremendous change in education for many of the watershed jurisdictions. While national education reform efforts including STEM, Common Core, and Next Generation Science Standards lend themselves to using the environment as an integrating context for learning, the extensive efforts to support and implement the necessary shifts in teaching and learning required by these reforms pose on-going challenges to systemic approaches to environmental education.
- **Funding to Support Environmental Literacy Projects:** A major limiting factor is funding, including support for sustainable school initiatives, student projects, teacher professional development, and transportation.
- **Decision Making Authority:** Many facets of school sustainability (environmental performance, health and wellness, etc.) rest with disparate departments and individuals within a school division or individual school. These different groups are often not coordinated within a jurisdiction.

(19) What are the current gaps in existing management efforts?

- Better engagement of State DOE leaders and dedicated staff support at State DOEs

- School district environmental literacy plans and their active participation in ELIT survey
- Curriculum alignment/integration embedding MWEs and environmental literacy content
- Additional funding to support projects
- Established state environmental literacy plans and state level coordination among partners
- Teacher and administrator professional development

(20) What are the current overlaps in existing management efforts? *None.*

(21) According to the management strategy written for the outcome associated with this indicator, how will we (a) assess our performance in making progress toward the goal, target, threshold or expected outcome, and (b) ensure the adaptive management of our work?

The Chesapeake Bay Program will maintain the Environmental Literacy Indicator Tool and collate and report data. The survey will be administered every two years through the state departments of education. In FY 2014 and 2017, funding from National Oceanic and Atmospheric Administration (NOAA)'s Bay Program augmented by NOAA B-WET funding was available to provide technical assistance to states to develop strategies to collect voluntary data from local education agencies to feed into the new Bay Program environmental literacy metrics and to support the work of a professional evaluator to review the data and establish meaningful baselines. Additional resources may be needed to continue these activities after FY 2017.

The Leadership Team of the Education Workgroup, which includes federal representatives from the NOAA and U.S. Environmental Protection Agency (EPA), along with at least two representatives per state (generally from the state departments of education and lead natural resource agencies), convenes monthly to discuss priorities and progress towards meeting the Environmental Literacy Goals and Outcomes. The full Education Workgroup, which includes broader representation from federal agencies, state agencies, nonprofits, local education agencies, and others, meets twice a year. In addition, the group holds an Environmental Literacy Summit every two years around specific issues or priorities. Moving forward, these Summits will serve as good opportunities to re-assess where the group is in achieving the outcomes of the agreement and adjusting strategies as appropriate.

F. Analysis and Interpretation

Please provide appropriate references and location(s) of documentation if hard to find.

(22) What method is used to transform raw data into the information presented in this indicator? Please cite methods and/or modeling programs.

ELIT included a set of questions intended to help assess the current capacity of school districts/LEAs to implement a comprehensive and systemic approach to environmental

education. This included six questions to determine if the LEA had the following things in place specific to environmental education: an established program leader, regular communication among staff about EE, a support system for high quality professional development, a program that integrated EE into appropriate curricular areas, a plan to provide MWEs for students, and/or community partnerships. For each question LEAs were awarded points if they had the item fully in place (2 points), partially in place (1 point), or not in place (0 points). Break points were then set to determine if LEAs were well prepared (9-12), somewhat prepared (4-8), or not prepared (0-3) to deliver implement environmental education.

(23) Is the method used to transform raw data into the information presented in this indicator accepted as scientifically sound? If not, what are its limitations?

Due to low response rates from some jurisdictions we are limited to talking about the characteristics of those LEAs that responded and are not able to generalize the data to make regionwide conclusions. Based on workgroup feedback, the Education Workgroup, in consultation with the Status and Trends workgroup, decided to discuss the results in relation to all LEAs within the watershed to show progress towards the outcome, rather than limiting the conversation only to respondents. This was done by calculating the percentage of LEAs in each category (well prepared, somewhat prepared, and not prepared) out of the school districts in a jurisdiction's portion of the watershed, including those school districts that did not respond to the survey. The number of nonreporting LEAs are also included in the chart and data file. There was not a non-response survey done to be able to determine how to extrapolate the data to non-respondents. Non-response analysis suggested that state was the main determinant of who responded to the survey. For Maryland and DC, responses were received from virtually every district in the population (i.e., data are a census, not a sample); as a result, results are an accurate picture of the conditions within those jurisdictions. Virginia's dataset is also very thorough for the state, with over 75% of districts reporting, representing over 90% of students in the watershed. Similarly, Delaware data covers 88% of its LEAs in the watershed, representing 98% of the Delaware students in the watershed.;Therefore, for these jurisdictions, it is reasonably safe to consider data reported in 2017 to be a thorough representation of conditions and generalizations are warranted. Data from Pennsylvania, however, include a very limited, self-selected sample of districts in the state; those data do not support generalizations of conditions across those states. See the answer to question 9 of this document for additional data gaps.

(24) How well does the indicator represent the environmental condition being assessed?

The indicator represents LEAs that chose to respond to these specific ELIT questions. Therefore, this indicator does not represent all LEAs in the watershed or within the watershed jurisdictions. The indicator does not include charter and private schools.

- (25) Are there established reference points, thresholds, ranges or values for this indicator that unambiguously reflect the desired state of the environment? **No.**
- (26) How far can the data be extrapolated? Have appropriate statistical methods been used to generalize or portray data beyond the time or spatial locations where measurements were made (e.g., statistical survey inference, no generalization is possible)? See the answer to question 23 of this document, as well as the response rates for individual jurisdictions, located in the data file housed at <http://www.chesapeakeprogress.com/engaged-communities/student>.

G. Quality

Please provide appropriate references and location(s) of documentation if hard to find.

- (27) Were the data collected and processed according to a U.S. Environmental Protection Agency-approved Quality Assurance Project Plan? If so, please provide a link to the QAPP and indicate when the plan was last reviewed and approved. **If not, please complete questions 29-31.**
- (28) *If applicable:* Are the sampling, analytical and data processing procedures accepted as scientifically and technically valid? **Yes.**
- (29) *If applicable:* What documentation describes the sampling and analytical procedures used? A report of the 2017 survey procedures and results is available at: https://www.chesapeakebay.net/who/group/education_workgroup.
- (30) *If applicable:* To what extent are procedures for quality assurance and quality control of the data documented and accessible? A report of the 2017 survey procedures and results is available at: https://www.chesapeakebay.net/who/group/education_workgroup. Support for completion of the ELIT survey is provided by state education representatives from the Education Workgroup for districts within their jurisdiction, and staff from the CBP is available to answer questions. In addition, districts are provided access to their previously completed ELIT surveys (from 2015) to aid new staff in answering the questions by considering how their district responding to the items (including open-ended explanations) in previous years. This was intended to reduce burden on districts and to provide some year-to-year reliability.
- (31) Are descriptions of the study design clear, complete and sufficient to enable the study to be reproduced? **Yes.**
- (32) Were the sampling, analytical and data processing procedures performed consistently throughout the data record? **No.** See the answer to question 14 of this document.

- (33) If data sets from two or more sources have been merged, are the sampling designs, methods and results comparable? If not, what are the limitations? N/A
- (34) Are levels of uncertainty available for the indicator and/or the underlying data set? If so, do the uncertainty and variability impact the conclusions drawn from the data or the utility of the indicator? [See the answer to question 9 of this document for information about data gaps.](#)
- (35) For chemical data reporting: How are data below the MDL reported (i.e., reported as 0, censored, or as < MDL)? If parameter substitutions are made (e.g., using orthophosphate instead of total phosphorus), how are data normalized? How does this impact the indicator? N/A
- (36) Are there noteworthy limitations or gaps in the data record? [See the answer to questions 9 and 23 of this document.](#)

H. Additional Information (*Optional*)

- (37) Please provide any further information you believe is necessary to aid in communication and prevent any potential misrepresentation of this indicator. N/A