Chesapeake Bay Program | Indicator Analysis and Methods Document
Sustainable Schools | Updated July 2018

Indicator Title: Percentage of sustainable schools out of all schools within watershed boundary

Relevant Outcome(s): Sustainable Schools

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 data set contains sustainable public and charter schools in the Chesapeake Bay Watershed. The set includes sustainable schools recognized in the following programs (lists obtained directly from the program itself):
- Maryland Green Schools
- US Green Ribbon Schools
- Virginia Naturally Schools
- NWF Eco Schools

The indicator is calculated as percent of sustainable schools. Using the list of sustainable schools from the programs listed above, analysts determined which schools were within the Chesapeake Bay Watershed (see answer to question 22 of this document for more information on that process). Analysts then used GIS layers and counts from jurisdictions to determine the number of schools (public and charter) within the watershed portion of all jurisdictions. Sustainable schools are a portion of this number of schools.

(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: programs listed above.
- Custodian: Kevin Schabow, kevin.schabow@noaa.gov, (410) 295-3145
- Chesapeake Bay Program Contact (name, email address, phone number): Kevin Schabow, kevin.schabow@noaa.gov, (410) 295-3145

(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): This indicator features schools newly recognized or that continue to be recognized by Maryland Green Schools, Virginia Naturally Schools, and NWF Eco Schools (bronze or higher) during the 2016-2017 school year. The indicator includes all US Green Ribbon Schools recognized between 2012 and 2017.

(5) Planned update frequency (e.g., annual, biannual, etc.):
   • Source Data: annual
   • Indicator: annual

(6) Date (month and year) next data set is expected to be available for reporting: October 2018

C. Spatial Considerations

(7) What is the ideal level of spatial aggregation (e.g., watershed-wide, river basin, state, county, hydrologic unit code)? Watershed wide

(8) Is there geographic (GIS) data associated with this data set? If so, indicate its format (e.g., point, line polygon). Yes, point (address of sustainable school). A map of sustainable schools is available at http://www.chesapeakeprogress.com/engaged-communities/sustainable-schools.

(9) Are there geographic areas that are missing data? If so, list the areas. Programs used to calculate this number include national programs and some state-specific programs. While no area of the watershed is excluded from this count, not every jurisdiction has a state-specific sustainable school program. Staff will continue to monitor sustainable school programs in the region to include other programs that meet sustainable school criteria as identified by the U.S. Department of Education. See the response to question 19 in this document for more information about variability among 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? The goal is to monitor participation in school sustainability programs in public and charter schools in the watershed. States have committed to

actions to increase the number of sustainable schools, so this indicator provides a baseline and will track progress toward this outcome.

(12) What is the current status in relation to the goal, target, threshold or expected outcome? There isn't a specific numerical target or threshold, but we do have a baseline number that we anticipate will increase as states implement actions from the Environmental Literacy workplan and management strategy.

(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? No. The data were updated in September 2018 because 2 VA schools were incorrectly listed as in the watershed, and 1 DE school was incorrectly listed as in the watershed.
The data were updated in July 2018 to add inadvertently missed Green Ribbon Schools recognized in 2015 and 2016. Additionally, one VA school was listed incorrectly as within the Chesapeake Bay Watershed in the 2017 data file (the school was correctly listed in the 2015 data file). These corrections were the only changes to the "original" data for 2017 that were provided in January 2017.

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

(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?

Jurisdictions maintained or added sustainable schools within the watershed. . DC, DE, MD, PA, VA, and WV all added sustainable schools in the watershed. NY still has no sustainable schools in the watershed. The total number of sustainable schools increased from 501 to 613, with Maryland schools accounting for about 85% of the increase. The percent of sustainable schools increased from 12% in 2016 to 14% in 2017.

(17) What is the key story told by this indicator? This indicator will tell us if efforts by CBP and its state, local, and NGO partners, are increasing the number of sustainable schools in the watershed.

E. Adaptive Management

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

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.

Underrepresented Stakeholders: Architects, school nurses, building managers, and others who might influence different facets of school sustainability are traditionally underrepresented in discussions about "green" schools.

Funding: A major limiting factor is funding, including support for sustainable school initiatives, student projects, teacher professional development, and transportation.

(19) What are the current gaps in existing management efforts? The ability for schools to participate in school sustainability programs varies by jurisdiction. Some states have robust programs administered by a state non-profit, state agency, or both. In other jurisdictions, no state-specific program exists, or the program is not yet well established.

(20) What are the current overlaps in existing management efforts? N/A

(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 plan for assessing performance toward this outcome originally was through the Environmental Literacy Indicator Tool. However, after the first ELIT data collection in 2015 it became evident that a more efficient and complete technique for assessing performance for this outcome was to go directly to the sustainable school certification program contacts for data. We will continue to use this method to track progress.

For adaptive management, we will continue to meet regularly with state department of education representatives, as well as coordinators of sustainable school programs, to share progress and methods for increasing school sustainability. In 2016, NOAA and the Chesapeake Bay Trust provided funding for projects in five watershed jurisdictions to specifically build capacity to meet the Sustainable School outcome. Those project leaders will convene and share results of their projects with the Environmental Literacy Workgroup.

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.

This indicator uses lists of sustainable schools from the programs mentioned in the response to question 1 of this document in each of the watershed jurisdictions as a starting point. These lists contained schools not in the Chesapeake Bay Watershed. Data custodians performed map searches to determine whether a school was in or out of the watershed; where available, GIS analysts used addresses or GIS layers to perform a more precise analysis. The indicator here represents percent sustainable schools in the Chesapeake Bay Watershed, based on the number of public and charter schools in each jurisdiction as reported by jurisdiction representatives on the Education workgroup. Charter schools are included because the GIS layers of schools provided by official state websites or state contacts on the Education workgroup included both public and charter schools. The workgroup weighed in on the issue of including charter schools, and decided to include them. Private schools were included in the initial data collection but are not included in this indicator. The Education Workgroup made this decision because of the limited availability of data on the total number of private schools in the watershed (jurisdictions may have total numbers of private schools, but addresses would be required to determine if each school is within the watershed).

(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? Yes. Data analysts have used the number of sustainable schools in the watershed, along with the number of total schools within a jurisdiction's portion of the watershed, to determine the percentage of sustainable schools in the Chesapeake Bay watershed per jurisdiction.

(24) How well does the indicator represent the environmental condition being assessed? The indicator uses direct records from the recognized programs to populate the number of sustainable schools, and information from state education contacts to fill in the number of schools within a jurisdiction's portion of the watershed. Because some of the jurisdiction's GIS layers of schools included charter schools and some did not, the reported percentage of sustainable schools may be slightly overstated.

This indicator features schools newly recognized or that continue to be recognized by Maryland Green Schools, Virginia Naturally Schools, and NWF Eco Schools (bronze or higher) during the data collection year. These programs include ongoing reenrollment or recertification requirements and, as such, are good indicators of whether sustainable schools once recognized are continuing their commitment to sustainability. The US Green Ribbon Award, from the US Department of Education,

is a one-time award; once a school wins the award, the school cannot reapply for the award. The indicator currently includes all US Green Ribbon School in perpetuity but the workgroup is determining whether this best represents the actual condition of sustainable schools. The workgroup is considering a rule to count Green Ribbon schools for a certain number of years, after which those schools would no longer be counted or included in this indicator. The workgroup's decision will be documented in this Analysis & Methods document when finalized.

(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)? Data represent a count of sustainable schools and should not be extrapolated.

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.** No.

(28) *If applicable:* Are the sampling, analytical and data processing procedures accepted as scientifically and technically valid? Data are provided by each certifying program.

(29) *If applicable:* What documentation describes the sampling and analytical procedures used? N/A

(30) *If applicable:* To what extent are procedures for quality assurance and quality control of the data documented and accessible? This document reflects the data collection and analysis procedures.

(31) Are descriptions of the study design clear, complete and sufficient to enable the study to be reproduced? N/A

(32) Were the sampling, analytical and data processing procedures performed consistently throughout the data record? Yes.

(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? This data set looks at four different sustainable certification programs that all meet minimum criteria. See the answer to question 9 of this document for more details.

(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? N/A

(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?
The total number of schools in each jurisdiction portion of the watershed, used to calculate the percentage of sustainable schools, represents public and charter schools, but not private schools. To ensure a more accurate representation of sustainable schools, this indicator does not include sustainable private schools in either the count or the percentage. Subsequent years may allow for more accurate reporting of total schools, to include private schools.

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.

This indicator captures NWF Eco-Schools that have achieved Bronze, Silver, or Green Flag status. It does not include schools that are participating in the program but have yet to achieve this additional recognition.

Eight school districts within the watershed received US Green Ribbon awards. This does not mean that all of the schools in these districts qualify as sustainable schools, but the districts should be recognized for their efforts. The districts are:
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- Maryland:
  - Montgomery County Public Schools
  - Howard County Public Schools
  - Anne Arundel County Public Schools

- Virginia:
  - Albemarle Public Schools
  - Charlottesvilel City Schools
  - Fairfax County Public Schools
  - Henry County Public Schools
  - Virginia Beach City Public Schools

Several school districts outside of the watershed were recognized as well, including 3 districts in Pennsylvania, one in Delaware, and one in West Virginia.