Chesapeake Bay Program | Indicator Analysis and Methods Document
Citizen Stewardship | Updated November 2017

Indicator Title: Citizen Stewardship Index

Relevant Outcome(s): Citizen Stewardship

Relevant Goal(s): Stewardship

Location within Framework (i.e., Influencing Factor, Output or Performance):
Performance (Citizen Stewardship Index) and Influencing Factor (Behavior Likelihood, Individual Engagement and Volunteerism/Civic Engagement Likelihood)

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 Citizen Stewardship Index is generated using survey responses derived from a random probability sample of Chesapeake Bay watershed residents, conducted by telephone. A total of 5,200 residents were surveyed, with a questionnaire that averaged 13 minutes in length. The survey captured scaled measures of 19 individual stewardship behaviors, likelihood to perform those behaviors in the future, volunteerism, civic engagement, and attitudes and perceptions that impact personal stewardship. The indicator aggregates these various measures on a scale of zero to 100 to a Stewardship Score. The score could be 100 if everyone in the region was doing everything they could in their daily lives to help improve water quality and environmental health. These practices include personal actions, volunteering, and advocating for the environment. To see the full questionnaire, see the Detailed Methodology document, which will be available at the Stewardship Goal Implementation Team page: https://www.chesapeakebay.net/who/group/fostering_stewardship_goal_implementation_team.

The Stewardship Score is made up of three component scores:

- The Personal Actions score measures 19 actions that individual residents can take to help improve water quality and environmental health.
- The Volunteering score measures the share of the public that is participating in community efforts to help improve water quality and environmental health.
- The Advocating score measures the share of the public that engages in local and regional civic activities on behalf of water quality and environmental health.

Three factors influencing measures help to predict future stewardship action. The closer each score is to 100, the greater the number of people who are likely to take stewardship action in the near future.

- The Likely to Take Personal Actions (Behavior Likelihood) score measures residents' willingness to consider taking personal actions that they are not taking today.
- The Likely to Volunteer and Advocate (Volunteerism/Civic Engagement) score measures residents' interest in participating in community efforts or engaging in civic activities on behalf of water quality and environmental health.
- The Motivating Attitudes (Individual Engagement) score measures five key perceptions that help motivate personal stewardship action.

(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: For the 2015 baseline, the Chesapeake Bay Program collected survey responses via a contract with OpinionWorks to formulate the index.
- Custodian: Amy Handen, handen.amy@nps.gov, 410-260-2493
- Chesapeake Bay Program Contact (name, email address, phone number): Amy Handen, handen.amy@nps.gov, 410-260-2493

(3) Please provide a link to the location of the data set. Are metadata, data-dictionaries and embedded definitions included?
The data set is available at http://www.chesapeakeprogress.com/engaged-communities/stewardship/citizen-stewardship.

B. Temporal Considerations

(4) Data collection date(s): March 14-June 13, 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: May 2019

C. Spatial Considerations

(7) What is the ideal level of spatial aggregation (e.g., watershed-wide, river basin, state, county, hydrologic unit code)?
Survey results are statistically significant at the state level. The most populous counties, and some rural counties that were heavily represented in the stratified sample, may have enough survey responses to make their results statistically significant at the county level as well. These counties have at least 100 interviews in the sample and may lend themselves to dedicated analysis: Baltimore City, Baltimore County, Montgomery County, and Prince George's County, Maryland; Fairfax County, Virginia; Cumberland County and Lancaster County, Pennsylvania;

Kent County and Sussex County, Delaware; Broome County, New York; and Berkeley County and Jefferson County, West Virginia.

(8) Is there geographic (GIS) data associated with this data set? If so, indicate its format (e.g., point, line polygon). No.

(9) Are there geographic areas that are missing data? If so, list the areas. No.

(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? There is no specific goal, target, or threshold for the Citizen Stewardship outcome, which states our objective to "increase the number and diversity of trained and mobilized citizen volunteers …." Therefore, this indicator will be monitored for a general increase in citizen stewardship activity.

(12) What is the current status in relation to the goal, target, threshold or expected outcome? This year's data will serve as a baseline from which to measure future progress.

(13) Has a new goal, target, threshold or expected outcome been established since the last reporting period? Why? N/A; first year of reporting.

(14) Has the methodology of data collection or analysis changed since the last reporting period? How? Why? N/A; first year of reporting.

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

(17) What is the key story told by this indicator?
This indicator describes citizen stewardship in terms of three facets: volunteerism, environmentally-friendly behavior, and civic engagement on behalf of environmental causes. The survey asks residents about their actions in each of these categories. This approach focuses on the attitudes and actions of the lower two levels in the Citizen Stewardship Framework (Individual Citizens Actions & Behaviors, and Volunteerism/Collective Community Action), represented in the

graphic below and discussed further in the <u>Citizen Stewardship management strategy</u>.

All behaviors included in the survey are feasible for the public to adopt and are not pre-emergent, meaning that they're currently in the public consciousness.

E. Adaptive Management

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

The ability of the public to perform a certain number of these behaviors will impact the growth potential of the behavior component of this index. For example, not all residents have dogs; therefore, not all residents can answer questions about picking up pet waste. Similarly, many renters in the urban areas of the watershed may be unable to install things like rain barrels on their property, either because of restrictions or because of property type. The Chesapeake Bay Program has attempted to account for this in the configuration of the index, so that the potential for citizen stewardship reflects the ability of certain audiences to adopt a range of environmentally friendly behaviors. For example, the response of a resident who does not have a dog does not negatively affect the overall index.

Other factors, such as individual engagement and the future likelihood of respondents to adopt environmentally-friendly behaviors in the future, will impact the continued increase of citizen stewards. This Analysis and Methods document explains methods of data collection and analysis for three factors indicators: Likely to Take Personal Actions (Behavior Likelihood) score; the Likely to Volunteer and Advocate (Volunteerism/Civic Engagement) score; and the Motivating Attitudes (Individual Engagement) score. More information on what these scores represent is included in the answer to question 1 of this document.

Other factors have been identified in the Citizen Stewardship management strategy, including program size, design and coordination; funding incentives and regulatory guidance; information tracking and resources; recruitment and training capacity; public opinion and behavior norms; marketplace regulations and consumer outreach; and lack of public access sites in some areas.

(19) What are the current gaps in existing management efforts?
Gaps identified in the Citizen Stewardship management strategy include many items around developing and implementing a stormwater outreach program, better understanding the relationship between awareness and behavior change, understanding of target audiences, coordination to reduce duplication and create more standardization so as to make different tracking efforts comparable, and a better understanding of the ways community (for example, the farming community) can support stewardship. For a fuller discussion of the reports that offer recommendations related to these gaps, please refer to the Citizen Stewardship management strategy.

(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? (a) Assess performance by conducting assessment biennially through the partnership's Strategy Review System (b) Through comparison of results we will determine how to best utilize indicator results as well as individual behavior trends over time in adaptively managing work. It is the intention of the team that future projects will support the use of the data in decision-making by stewardship program implementers to ensure greater success.

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.

The citizen stewardship index is a roll-up indicator of three components. See the answer to question 1 of this document for more information about these components. The index is a straight average of those component indicators. These scores were determined based on the respondents' answers to the survey questions.

The behavior score consists of 19 behaviors that are weighted to reflect their comparative impact on water quality and the ability of the entire population to perform that behavior. For example, apartment dwellers are unable to install a rain barrel.

A more complete discussion of methodology can be found at the Stewardship Goal Implementation Team page: https://www.chesapeakebay.net/who/group/fostering_stewardship_goal_implementati on_team.

(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? The methods used follow survey research best practices for summarizing the behaviors and intentions of a population.

(24) How well does the indicator represent the environmental condition being assessed?
The indicator is based on the responses to the survey conducted. See the answers to questions 7 and 22 of this document for more information.

(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)?
In the administration of data collection, best practices of telephone-based random sampling of a population have been adhered to. Among these are the use of only trained and supervised live interviewers, presence of both wireless and landline telephones in the sampling frame in about equal proportions, administration of survey interviews in Spanish as needed, periodic callbacks for hard-to-reach respondents, and similar measures to reduce sampling bias.
According to the principles of probability sampling, the survey results are statistically significant at the state level, and subject to maximum potential sampling error at the 95% confidence level, as follows:
- Maryland (1,005 interviews), Pennsylvania (1,003), and Virginia (1,001), ±3.1%;
- District of Columbia, 801 interviews, ±3.5%;
- West Virginia, 600 interviews, ±4.0%;

- Delaware (402 interviews) and New York (400), ±4.9%.

Survey results can also be segmented for a wide variety of subgroups within the overall sample and therefore extrapolated corresponding subgroups of the watershed population for various demographics, socio-economic characteristics, community attributes, behaviors, and attitudes.

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? Yes.

(29) *If applicable:* What documentation describes the sampling and analytical procedures used? A detailed Methodology document has been produced to explain the survey and analytical procedures and can be found on the Stewardship Goal Implementation Team page:
https://www.chesapeakebay.net/who/group/fostering_stewardship_goal_implementati on_team.

(30) *If applicable:* To what extent are procedures for quality assurance and quality control of the data documented and accessible?
A detailed Methodology document has been produced to explain the survey and analytical procedures and can be found on the Stewardship Goal Implementation Team page:
https://www.chesapeakebay.net/who/group/fostering_stewardship_goal_implementati on_team.

(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? N/A; first year of reporting.

(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 #26 above. The sampling error is normal and within acceptable ranges.

(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? No.

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.
A pilot version of this survey was conducted in 2015 and changes to the questionnaire were made as a result of those observations. These changes included refined question wording to ensure that all questions were properly understood, revised question ordering for better interview flow, addition of content of interest to the Bay Program, and translation of the questionnaire into Spanish.