Chesapeake Bay Program | Indicator Analysis and Methods Document
Toxic Contaminants | Updated March 2022

Indicator Title: Percent of Tidal Tributaries with Partial or Full Impairments Due to Chemical Contaminants. (As determined by Virginia, Maryland, Delaware, and DC under Clean Water Act requirements)

Relevant Outcome(s): Toxic Contaminants Policy and Prevention

Relevant Goal(s): Toxic Contaminants

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?*

Data were collected by MDE, VA DEQ, DE DNREC and DC to identify waters with fish tissue contamination or other water quality impairments at levels requiring Clean Water Act 303(d) listing and for inclusion in the 2018 update of the 303(d) lists.

Data were obtained from 2018 303(d) lists for MD, VA, DE, D.C., and EPA. All jurisdictions measured concentrations of contaminants in fish tissue. Fish tissue results are the primary cause of PCB related impairments. In addition to fish tissue, the data include water column and sediment data to capture toxic contaminants that do not bio-accumulate in fish tissue. A variety of other methods are used to determine impairments by states. Detected concentrations that exceed the state's thresholds trigger jurisdictions' CWA 303(d) listings and publication of total maximum daily loads (TMDLs).

Specific listing categories included 4a (TMDL completed), 4b (expected to meet water quality standards for the specified pollutant by the next listing cycle), and 5 (TMDL needed). Waters were added to the indicator that were listed under categories 4a, 4b, and 5 for impairments due to PCBs, chlorpyrifos, metals (mercury, lead, copper, zinc, silver, selenium, and other metals), and organic contaminants (chlordane, PAHs, heptachlor epoxide, and other organic contaminants). No chlorpyrifos listings under 303(d) categories 4a, 4b, or 5 were published in 2018.

This indicator calculates the number of fully or partially impaired tidal segments as a percentage of the total number of the 92 tidal segments designated under the nitrogen and phosphorus TMDL. The result is an indicator value that is a calculated percentage based on jurisdictions' CWA 303(d) listings. The data are used to indicate the frequency of impairments that result from chemical contaminants. The coordination between the Chesapeake Bay Program and jurisdictions to utilize these data helps to ensure consistent communications among the Bay Program partners.

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: Maryland's 303(d) list is available through the Maryland Department of the Environment (MDE), Virginia's is available through the Virginia Department of Environmental Quality (VADEQ). District of Columbia's is available through the DC Department of Energy and Environment (DOEE). Delaware's is available through the Delaware Department of Natural Resources and Environmental Control (DNREC). Supporting data was provided by contacts in these jurisdiction agencies.

A description of methodology is provided by the states (see the answer to question 3 below).

Maryland:
- *Toxic Contaminants Workgroup (TCW) State Rep:* Len Schugam at leonard.schugam@maryland.gov
- *303d Listings:* same as above

Virginia:
- *TCW State Rep:* Mark Richards at mark.richards@deq.virginia.gov
- *303d Listings:* same as above

Delaware:
- *TCW State Rep:* John Cargill at John.Cargill@delaware.gov
- *303d Listings:* Dave Wolanski at David.Wolanski@delware.gov

District of Columbia:
- *TCW State Rep:* George Onyullo at George.onyullo@dc.gov
- *303d Listings:* Nicoline Shulterbrandt (DDOEE) at nicoline.shulterbrandt@dc.gov / Lucretia Brown at lucretia.brown@dc.gov

Custodian/Chesapeake Bay Program Contact: Greg Allen (allen.greg@epa.gov | 410-267-5746)

3) *Please provide a link to the location of the data set. Are metadata, data-dictionaries and embedded definitions included?*

Maryland
https://mde.maryland.gov/programs/Water/TMDL/Integrated303dReports/Pages/2018IR.aspx
(Link to the report)

https://mdewin64.mde.state.md.us/WSA/IR-TMDL/index.html
(Includes downloadable spatial data)

Virginia
https://www.deq.virginia.gov/water/water-quality/assessments/integrated-report
(Link to the report)

https://geohub-vadeq.hub.arcgis.com/search?q=2018%20WQA
(Includes downloadable spatial data)

DC
https://doee.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/2018%20IR%20Final%20Approved%20%204-05-2019.pdf
(The 2018 report exists, but no downloadable data are available. Email correspondence confirmed no changes in indicator status in 2018 for the tidal Anacostia and upper Potomac in DC).

Delaware
https://documents.dnrec.delaware.gov/Watershed/Assessment/Reports/2018%20Final%20Delaware%20IR%201-24-2019.pdf
(The 2018 report exists, but no downloadable data are available. Email correspondence confirmed no changes in indicator status in 2018 for the CB watershed portions of the C&D canal and Nanticoke River)

B. Temporal Considerations

4) *Data collection date(s):*

The data used in this indicator are the same data used by the states of Virginia, Maryland, Delaware, and DC to determine impairments for the 2018 impairments. The data were accumulated during a period of time preceding the listing reports based on the jurisdictions' internal policies and methods.

5) *Planned update frequency (e.g., annual, biannual, etc.):*

Source Data: States update 303(d) listings every even year.

Indicator: Updates to the toxic contaminants' indicator generally follow a biannual schedule to update in the odd years following even-year IR publication from the jurisdictions.

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

2020 IR data are currently available for all states excluding Maryland, who has combined their 2020 and 2022 data and will be made available later this year. TCW plans to update the indicator in the near future once these Maryland data are made available.

C. Spatial Considerations

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

This indicator is aggregated to the CBP's 92 tidal segments for the Bay and its major tributaries, determining whether each tidal segment identified contains a partial or segment-wide impairment due to toxic contaminants.

8) *Is there geographic (GIS) data associated with this data set? If so, indicate its format (e.g., point, line polygon).*

The Chesapeake Bay Program has defined 92 tidal segments, and this indicator aggregates to the tidal segments from jurisdiction-defined monitoring areas.

9) *Are there geographic areas that are missing data? If so, list the areas.*

No areas are missing.

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

There are previous iterations of the indicator map, but this is the only portrayal available.

D. Communicating the Data

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

The goal is for 100% of segments analyzed to contain no impairments due to toxic chemicals. The goal was established though a consensus process involving the Chesapeake Bay Program signatory partners.

12) *What is the current status in relation to the goal, target, threshold or expected outcome? Why? Would you define our outlook[1] toward achieving the outcome goal or target as on course, off course, uncertain, or completed? Upon what basis are you forecasting the outlook?*

Based on the 2018 303(d) assessments of 92 tidal segments analyzed, 77 (83.7%) are fully or partially impaired due to PCBs, organic contaminants, metals, unknown causes, or some combination of these causes. The time series of data points from this indicator shows a continual trend of increasing frequency of full or impartial impairments due to toxic contaminants, indicating it is unlikely for this outcome to be achieved. Therefore, the outlook for this outcome is "off course."

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.

15) *What is the long-term data trend (since the start of data collection)?*

The number of segments with full or partial impairment have increased each year of data collection since 2006 when data reporting began. Trend analysis has not been conducted to determine if this trend is significant.

16) *What change(s) does the most recent data show compared to the last reporting period? To what do you attribute the change? Would you characterize that change in the recent progress[2] as an increase, decrease, no change, or completed for this outcome?*

The number of impaired segments has increased slightly from 75 fully or partially impaired segments in 2016 (81.5%) to 77 fully or partially impaired segments in 2018 (83.7%). The change may be due to increased loads of contaminants in the ecosystem but may also be due to expanded monitoring coverage or enhanced analytical technology. As a result, we characterize the recent progress as a decrease.

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

83.7 % of segments in the Bay and its tidal tributaries contain partial or full impairments related to chemical contaminants. Metals, PCBs, and priority organics are found exceeding state water quality criteria in part or the entirety of tidal tributaries that deliver water to the mainstem of the Chesapeake Bay. This gives some idea regarding the extent of toxic contamination in Bay tidal waters. PCB listings are present in 100% of impaired or partially impaired segments.

Due to the bioaccumulative nature of many of these substances, even if inputs to the tributaries decreases, fish tissue concentrations will not respond quickly. There may be little positive change seen in the short term for this indicator since a large majority of partially or fully impaired segments contain a PCB impairment based on fish tissue.

It is important to communicate the prevalence of toxic contamination in fish tissue, sediment, and the water column as it has both an ecosystem and human health connection. Contamination due to bioaccumulative substances in fish tissue gives an indication of the overall presence of these substances in the Chesapeake Bay ecosystem. Due to their bioaccumulative nature, these substances will end up in predatory species and potentially humans through fish consumption.

The issue of chemical contamination within the Chesapeake Bay is often characterized as a localized problem pertaining to “hot spots” or the “Regions of Concern”; this indicator shows that chemical contaminants are a concern for segments beyond these emphasized areas.

E. Adaptive Management

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

- Broad geographic extent and distribution of PCBs

- Political will to modify regulatory programs and/or create voluntary programs
- High cost of remedies
- Variety of sources and pathways for PCBs entering the environment that necessitate a wide range of very different management responses
- Need to shift paradigm to acknowledge that there are ongoing sources of PCBs (i.e., PCBs are not static "legacy" contaminants)
- Knowledge gaps on relative sizes of PCB sources

For more information about these factors, please refer to the management strategy here: https://www.chesapeakebay.net/documents/22048/toxic_contaminanats_policy_and_prevention_management_strategy_v3.pdf

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

1. Stormwater
    a. **Monitoring:** limited PCB monitoring data for unregulated and NPDES-regulated stormwater from all jurisdictions within the Chesapeake Bay watershed. Except for very few municipal, industrial, or MS4 stormwater permittees, NPDES regulated stormwater dischargers in most Bay jurisdictions are not currently required to monitor for PCBs under any permit category. Without this information it is not feasible for TMDL programs to estimate loads from specific dischargers to identify sources of PCBs that require reductions as well as to track-down sources of PCB contamination within the watershed. High resolution/low detection limit data is needed as demonstrated in the Delaware Bay TMDL where such data was critical to target PCB reductions.
    b. **Regulatory Gaps:** Transformers and other electrical equipment that contain PCBs remain in operation. These transformers have the potential to release PCBs during failure and to contaminate stormwater at levels that may impact water quality. Bulk products such as paints and caulks also release PCBs to stormwater. There is a need to determine whether there is an opportunity to modify EPA's proposed Multi-sector General Permit for Industrial Stormwater for 2020 to address PCBs more effectively.
    c. **Programmatic Gaps:** PMPs are required to address PCB load reductions from unregulated and NPDES-regulated stormwater that have been allocated through TMDL development. Currently no jurisdiction within the Bay watershed has begun implementing TMDLs to reduce these loads. There is insufficient knowledge regarding the effectiveness of PCB removal from Stormwater BMPs designed to reduce nutrients and sediment. The public is generally unaware of the potential health impacts of consuming fish with elevated levels of PCBs and continued presence of PCBs in many sources (e.g., transformers, building materials, paints) within the environment that may contribute to unregulated and DES-regulated stormwater.
    d. **Research Gaps:** Limited information is available on whether land application of biosolids containing PCBs are a pathway of PCBs in unregulated and NPDES regulated stormwater. Limited information is available on whether land application

of dredged materials is a source of PCBs in unregulated and NPDES regulated stormwater. Limited information is available on whether construction activities are a source of PCBs in unregulated and NPDES regulated stormwater.

2. Wastewater
    a. **Tools to Support Trackdown Studies:** The current high resolution analytical method for PCBs is expensive relative to the costs of most other organic contaminant monitoring and may be cost-prohibitive for large-scale trackdown studies. An inexpensive tool that can provide real-time data can greatly improve the efficacy of a trackdown study in municipal service areas. Information regarding lessons learned in other PCB trackdown studies would be useful in guiding municipalities in their own local efforts.
    b. **Coordination among CERCLA, RCRA, TSCA and CWA targets:** Two issues relating to PCB investigations and remediation could benefit from efforts promoting improved coordination. First, there are inconsistencies across programs in the methods used to analyze PCBs in environmental media. Second, lack of coordination among programs may lead to inconsistencies in approaches to PCB investigation and remediation. Delaware has started to make more efficient progress towards PCB reductions when CWA and State CERCLA programs started to work together to overcome these exact challenges.
3. Groundwater Sources
    a. **Groundwater Gaps:** A gap may exist in the availability of high resolution-low detection data on groundwater PCB concentrations.
4. Atmospheric Sources
    a. Atmospheric Monitoring Gaps:
        i. Consistency in interpretation of data among air/water/waste programs some of which use low resolution non-congener PCB methods and others that use congener-specific methods.
        ii. Data is needed on atmospheric sources. Such data should be generated by matching data quality objectives to appropriate analytical methods.
        iii. Monitoring of fuel oil burning facilities in order to determine the extent of PCB releases
    b. Information on Localized Air Deposition Gaps: The lack of PCB air depositional data is of particular concern because it limits the ecosystem-scale understanding of the delivery pathway of PCBs to the Chesapeake Bay watershed. It is of regulatory relevance because permit holders of stormwater-derived effluents believe that air deposition comprises a significant portion, if not all, of their PCB loads. There are no current comprehensive atmospheric deposition source studies for the watershed. Available studies are from late 1990's.
5. In- stream Sediment Sources
    a. Defining the source of anthropogenic contamination into waterway sediments can be a difficult task. This is particularly true in settings where multiple point sources are present along with persistent non-point sources. This situation often results in complex mixtures of contaminants in sediments.
    b. Many PCB contaminated sediments can be large-scale, measured in acres, river miles, or tons of sediment. The sheer volume and mass of PCB contaminated in-stream sediments makes the application of remediation options a difficult task. The

implementation of a comprehensive risk management strategy is even more complex. Management of these sites is further complicated by the fact that many of the sediments also contain other chemicals of concern, including polycyclic aromatic hydrocarbons, metals, and pesticides. The time required to design and implement a management strategy and to evaluate the need for in-stream sediment remediation might reasonably range from years to decades.

6. Contaminated Sites
    a. There is currently limited PCB monitoring data from Bay jurisdictions for regulated contaminated sites using high resolution congener-based methods such as EPA Method 1668. It is infeasible for TMDL programs to monitor contaminated sites using EPA Method 1668 due to limited resources. Regulated contaminated sites are only required to use Aroclor based methods (e.g., EPA Methods 608 and 8082) to assess PCB concentrations in environmental media (i.e., soil, water, and sediment). This method is sufficient to assess violations of soil clean-up standards. However, detection levels for this method are insufficient to accurately estimate loads conveyed via stormwater from contaminated sites for TMDL development.
    b. Contaminated sites are regulated to ensure protection of human health through direct exposure but may not effectively consider potential impacts through fish consumption. Responsible parties for contaminated sites are not required to determine whether stormwater PCB concentrations are in violation of human health water quality criteria. Ecological Risk Assessments may not account for the bioaccumulation of PCBs to protect aquatic biota (including fish) to meet the fish consumption designated use.

Available in current (2018-2020) management strategy, posted to Chesapeake Progress: https://www.chesapeakebay.net/documents/22048/toxic_contaminanats_policy_and_prevention_management_strategy_v3.pdf

20) What are the current overlaps in existing management efforts?

We are not aware of programmatic overlaps. Our intention is to build off what our jurisdiction and federal partners are doing in compliance with the Clean Water Act (CWA) and through new voluntary efforts, like PCBS in Schools. Our strategy is meant to be complimentary of ongoing actions and not overlapping with duplicative efforts.

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?

To assess performance toward the goal, we do not currently have a means for assessing short-term progress. There is some potential for using jurisdiction fish tissue data or other data sets for short-term progress monitoring in the future. In the long-term, this assessment of jurisdiction impairments will assess progress toward the goal. Adaptive management, reducing uncertainty so that the highest-return interventions are implemented, will be done on a project specific basis where data and/or best-professional judgement will be used to continually improve the effectiveness of strategic actions that are taken.

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 indicator represents the percent of tidal segments containing some impairment (partial or segment-wide). The calculated percentage, indicator title, and description are accurate and make clear what is being presented, however there is some concern that presenting 303(d) listings in this way could be misleading, as some partial impairments are due to local contamination and do not necessarily indicate conditions throughout an entire segment.

Impairments listed by MD, VA, DE, and DC are used as the raw data for this indicator. Following a pass or fail pattern, a segment containing one or more impairments "fails" and one containing no impairments within its boundaries "passes." The indicator value is the total number of "failing" segments as a percentage of the total number of segments considered. Each segment is given equal weighting toward this calculation. Raw data on impairments, such as tissue concentrations in fish, is collected by the states to develop their 303(d) lists. If concentrations exceed thresholds for designated uses, then part or all of a segment is listed with impairment due to that contaminant. These listings are used to develop the percentage of impaired rivers or river segments that is presented in the indicator. Listing categories included in this indicator data are 4a (TMDL completed), 4b (expected to meet water quality standards by next listing cycle), and 5 (needs a TMDL).

Spatial reporting of water quality impairments at the state level is established at different scales and spatial boundaries than the Chesapeake Bay Program's segmentation scheme (92 tidal segments). State-reported data is re-aggregated and sorted by CBP staff in order to present the indicator using the CBP-designated spatial segments. This spatial discrepancy led to the decision to report some segments as partial impairments rather than full reported impairments for a given CBP segment.

For several segments in Maryland, state monitoring areas partially overlapped with a tidal segment in the 2014 indicator (see section H, question 37). This overlap has been clarified for subsequent updates to MD's data for 2016.

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.

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

The calculated percentage, indicator title, and description are accurate and make clear what is being presented, however there is some concern that presenting 303(d) listings in this way

could be misleading, as some partial impairments are due to local contamination and do not necessarily indicate conditions throughout an entire segment.

There is also concern that an increase in the percentage of segments with full or partial impairments could be indicative of more extensive state monitoring, rather than a degradation of the actual environmental condition. Also, state monitoring does not cover all waters in the state each year, so new information could become available in subsequent years that could actually reflect a previous yet unknown impairment.

25) *Are there established reference points, thresholds, ranges, or values for this indicator that unambiguously reflect the desired state of the environment?*

States have identified concentrations of contaminants found in fish tissue and water that drive impairment listings when those concentrations exceed water quality standards These are tied to ecological risk, fish consumption and human health. Similar criteria combined with best-professional-judgement are used to determine other listings in sediment or the water column. Please refer to jurisdiction environmental agencies for detailed documentation on methods used to determine impairments.

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)?*

No extrapolation of this data is recommended.

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.***

Yes, the data was collected and processed according to an EPA approved QAPP. However, most agencies do not upload their QAPPs online and the Chesapeake Bay Program stopped doing so because EPA wants to ensure 508 compliance. Copies of each jurisdiction's QAPP can be provided by reaching out to Durga Gosh (dghosh@chesapeakebay.net), who is in charge of QA compliance at the Bay Program.

- DNREC's QAPP was approved in 2019.
- MDNR's QAPP was approved in 2020 but doesn't specifically address PCBs.
- MDE's PCB TMDL QAPP was approved in 2021 and includes PCBs.
- DOEE's QAPP was approved in 2021 but doesn't specifically address PCBs.
- DOEE's fish tissue study QAPP was approved in 2022 and might help to supplement their 2021 QAPP.

- VADEQ's QAPP was approved in 2021, but a revision was conditionally approved pending their addition of a QAPP revision table summarizing the changes that were made.

28) *If applicable: Are the sampling, analytical and data processing procedures accepted as scientifically and technically valid?*

N/A

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?*

N/A

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?*

The Chesapeake Bay Program relied upon the state QA procedures and oversight by EPA Region 3 to eliminate unacceptable data and data outliers and ensure methods are consistent.

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?*

Data are supplied to the states from multiple sources. Each must follow a procedure that allows all data sets to be deemed comparable if they are to be included in 303(d) determination. These procedures are within each state with some oversight provided by EPA Region 3 during review of the draft Integrated 305(b) and 303(d) reports. However, there are some differences between the jurisdictions in data collection, sampling, analysis, and reporting that may contribute to differences in how states determine impairments in different water bodies.

For example, many PCB listings are driven by fish tissue contamination. VA DEQ includes migratory fish tissue data in determining their tidal 303(d) listings, but MD does not sample migratory fish for their listings since it cannot be determined where migratory fish in tidal waters accumulated PCBs in their tissues.

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?*

No levels of uncertainty are available for the indicator and/or the underlying data set.

35) *For chemical data reporting: How are data below the Method Detection Limit (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?*

The jurisdictions have established policies for assessing data reported as <MDL. Please refer to jurisdiction environmental agencies for detailed documentation on the approach used to process <MDL data.

36) *Are there noteworthy limitations or gaps in the data record?*

There are currently no noteworthy limitations or gaps in the data record.

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.*

Under Executive Order 13508, EPA released a technical report titled Toxic Contaminants in the Chesapeake Bay and its Watershed: Extent and Severity of Occurrence and Potential Biological Effects. This report is available at http://executiveorder.chesapeakebay.net/page/Reports-Documents.aspx.

Data Assumptions

1. Spatial reporting of water quality impairments at the state level is established at different scales and spatial boundaries than the Chesapeake Bay Program's segmentation scheme (92 tidal segments). State-reported data is re-aggregated and sorted by CBP staff to present the indicator using the CBP-designated spatial segments. This spatial discrepancy led to the decision to report some segments as partial impairments rather than full reported impairments for a given CBP segment.
2. The 2014 indicator update involved meetings with a representative from Maryland Department of Environment where decisions were made as to how to represent Maryland segments CB1TF, CB3MH, CB4MH, CB5MH, and TANMH, where Maryland data overlaps with CBP segment boundaries were unclear. Those decisions are documented in the 2014 indicator data file. Maryland has not yet updated their IR segmentation scheme for 2014 but will do so for future updates to clarify those boundaries.
3. CBP segment MDPOTOH, listed in the 2016 indicator data file, was not found in the 2018 indicator data file. We believe MDPOTOH was rolled up into MDPOTOH1,

which is why it is not present in the "2016 Impairments" tab and on the TC Indicator Map. Since the “2016 Impairment” tab data is used to determine the percentage of fully or partially impaired segments in the tidal portion of the Bay Watershed, these changes did not affect any calculations. Moving forward, it will not be included in the data file.

[1]*Outlook:* Outlook is the forecasted trajectory for whether the Chesapeake Bay Program is on course to achieving the outcome. An outcome's outlook may be on course, off course, uncertain, or completed. This information will be incorporated into the outcome's progress page. An outcome's course outlook is reviewed and updated during the outcome's Strategy Review System (SRS) Quarterly Progress Meeting in addition to when recent progress is assessed.

[2]*Recent Progress:* Recent Progress describes the change in the indicator based on the most recent data collected since the last reporting period. The recent progress icon will reflect this change as an increase, decrease, no change, or completed, depending upon this progress. This information will be discussed at the outcome's Strategy Review System (SRS) Quarterly Progress Meeting.