# FY 2017 NWPG Measure Definitions Chesapeake Bay

Measure Code: CB-05.N14

**Measure Language:** Percent attainment of water quality standards for dissolved oxygen, water clarity/underwater grasses, and chlorophyll a in Chesapeake Bay and tidal tributaries.

**Type of Measure:** Long-term measure (no annual target); cumulative measure

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## Measure Definition

**Terms and phrases:** Dissolved oxygen (DO) refers to the amount of oxygen that is present in the water. It is measured in units of milligrams per liter (mg/L), or the milligrams of oxygen dissolved in a liter of water[1]. Underwater grasses refers to the 16 species found in the Chesapeake Bay. Bay grasses are used as a measure of the Bay's condition because they are not under harvest pressure and their health is closely linked to the overall health of the Bay[2]. Chlorophyll a is used as a measure of phytoplankton (microalgae) biomass. Phytoplankton biomass is controlled by factors such as water temperature and the availability of light and nutrients. Elevated phytoplankton levels can lead to reduced water clarity and decomposing phytoplankton can lead to reduced dissolved oxygen levels.

**Methodology for computation of results:** The methodology used for the calculation of the indicator considers the achievement or non-achievement of the water quality standards applicable to a designated use within a segment. This methodology reports when a water quality standard is met for each of the designated uses in that segment. There are 5 designated uses across the Bay, which is split into 92 segments. Some segments have all 5 designated uses, while others may have fewer than 5. Each of these 5 designated uses has its own set of criteria for dissolved oxygen, water clarity/underwater grasses and chlorophyll *a* designed to protect those uses. In all, the Bay and its tidal tributaries contain 291 segment and designated use combinations. This indicator looks at each designated use within each segment and determines whether that segment is meeting the established criteria for attainment of the water quality standards for that designated use. The indicator is a roll-up of all of these attainment determinations within all 92 segments and uses a surface area-weighted approach, which multiplies the surface area of each of the 92 segments by the number of applicable designated uses for that segment. This approach accounts for the relative size of each segment, ensuring the best available measure of how much of the Bay tidal waters achieved water quality standards[3]. This approach gives equal weight to achievement of the criteria protective of each designated use and segment.

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[1] For more information about Dissolved Oxygen, refer to Chesapeake Bay Program website: Dissolved Oxygen (Volume Assessment)

[2] For more information about Under Water Bay Grass, refer to Chesapeake Bay Program website: Underwater Bay Grass Abundance

[3] For more information about Water Quality Standards, refer Chesapeake Progress website: Water Quality Standards Attainment and Monitoring

**Units:** Percent of Bay tidal waters in attainment with water quality standards

**Universe:** Dissolved oxygen, water clarity/underwater bay grasses, and chlorophyll a water quality standards applicable to a designated use in 291 designated-use segments within the 92 Chesapeake Bay segments used for the establishment and management of the Chesapeake Bay TMDL.

**Baseline:** Percent attainment over a 3-year period (FY 2011 marks the beginning of measure reporting (baseline) but data exists starting in 1985)

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Measure Code: CB-SP35

**Measure Language:** Percent of goal achieved for implementing nitrogen pollution reduction actions to achieve the final TMDL allocations, as measured through the phase 5.3 watershed model.

**Type of Measure:** Target measure; cumulative measure

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**Measure Definition**

**Methodology for computation of results:** The Chesapeake Bay Program Phase 5.3 Watershed Model is used to simulate pollution loads in any particular year, based on pollution reduction actions that have been implemented, and compare those loads to the Total Maximum Daily Load (TMDL) allocations. The difference in simulated loads between the baseline year and the TMDL is considered the goal. The difference in simulated loads between the baseline year and the most current year is considered the most recent progress. Dividing the progress by the goal provides "percent achievement of goal". For a detailed description of the Phase 5.3 Watershed Model, refer to chapter 5.8 of the Chesapeake Bay TMDL Document[4] (pages 5-30 through 5-38).

**Units:** Percent of goal achieved.

**Universe:** Simulated load reductions from FY 2010 (2009 loads scenario) to the Total Maximum Daily Load (TMDL) load allocation. For a description of the 2009 Scenario and the simulated loads for 2009, refer to Appendix J of the Chesapeake Bay TMDL Document (page J-1 and Tables J-2, J-4 and J-6). For the TMDL load allocations, refer to the Executive Summary of the Chesapeake Bay TMDL Document (page E-7, table ES-1). See footnote 4 for appropriate link.

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[4] For more information about the Chesapeake Bay TMDL Document, refer to the EPA website: Chesapeake Bay TMDL.

**Baseline:** 0% in FY 2010 (based on 2009 Scenario). Percent of goal achieved for implementation of nitrogen reduction actions to achieve final TMDL allocations, as measured through the phase 5.3 watershed model. Tracking began in FY 2010 with zero percent of goal achieved.


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Measure Code: CB-SP36

**Measure Language:** Percent of goal achieved for implementation of phosphorus pollution reduction actions to achieve final TMDL allocations, as measured through the phase 5.3 watershed model.

**Type of Measure:** Target measure; cumulative measure

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**Measure Definition**

**Methodology for computation of results:** The Chesapeake Bay Program Phase 5.3 Watershed Model is used to simulate pollution loads in any particular year, based on pollution reduction actions that have been implemented, and compare those loads to the Total Maximum Daily Load (TMDL) allocations. The difference in simulated loads between the baseline year and the TMDL is considered the goal. The difference in simulated loads between the baseline year and the most current year is considered the most recent progress. Dividing the progress by the goal provides "percent achievement of goal". For a detailed description of the Phase 5.3 Watershed Model, refer to chapter 5.8 of the Chesapeake Bay TMDL Document (pages 5-30 through 5-38). See footnote 4 for the appropriate link.

**Units:** Percent of goal achieved.

**Universe:** Simulated load reductions from FY 2010 (2009 loads scenario) to the Total Maximum Daily Load (TMDL) load allocation. For a description of the 2009 Scenario and the simulated loads for 2009, refer to Appendix J of the Chesapeake Bay TMDL Document (page J-1 and Tables J-2, J-4 and J-6). For the TMDL load allocations, refer to the Executive Summary of the Chesapeake Bay TMDL Document (page E-7, table ES-1).See footnote 4 for the appropriate link.

**Baseline:** 0% in FY 2010 (based on 2009 Scenario). Percent of goal achieved for implementation of phosphorus reduction actions to achieve final TMDL allocations, as measured through the phase 5.3 watershed model. Tracking began in FY 2010 with zero percent of goal achieved.

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Measure Code: CB-SP37

**Measure Language:** Percent of goal achieved for implementation of sediment pollution reduction actions to achieve final TMDL allocations, as measured through the phase 5.3 watershed model.

**Type of Measure:** Target measure; cumulative measure

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**Measure Definition**

**Methodology for computation of results:** The Chesapeake Bay Program Phase 5.3 Watershed Model is used to simulate pollution loads in any particular year, based on pollution reduction actions that have been implemented, and compare those loads to the Total Maximum Daily Load (TMDL) allocations. The difference in simulated loads between the baseline year and the TMDL is considered the goal. The difference in simulated loads between the baseline year and the most current year is considered the most recent progress. Dividing the progress by the goal provides "percent achievement of goal". For a detailed description of the Phase 5.3 Watershed Model, refer to chapter 5.8 of the Chesapeake Bay TMDL Document (pages 5-30 through 5-38). See footnote 4 for the appropriate link.

**Units:** Percent of goal achieved

**Universe:** Simulated load reductions from FY 2010 (2009 loads scenario) to the Total Maximum Daily Load (TMDL) load allocation. For a description of the 2009 Scenario and the simulated loads for 2009, refer to Appendix J of the Chesapeake Bay TMDL Document (page J-1 and Tables J-2, J-4 and J-6). For the TMDL load allocations, refer to the Executive Summary of the Chesapeake Bay TMDL Document (page E-7, table ES-1).See footnote 4 for the appropriate link.

**Baseline:** 0% in FY 2010 (based on 2009 Scenario). Percent of goal achieved for implementation of sediment reduction actions to achieve final TMDL allocations, as measured through the phase 5.3 watershed model. Tracking began in FY 2010 with zero percent of goal achieved.