

Application of a Weighted Regression Model for Reporting Nutrient and Sediment Concentrations, Fluxes, and Trends in Concentration and Flux for the Chesapeake Bay Nontidal Water-Quality Monitoring Network, Results Through Water Year 2012

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Appendix 3. Tabular WRTDS results for all stations and constituents modeled through water year 2012.

Appendix 3 contains listings of annual and monthly concentration and flux results, based on models estimated using WRTDS, for all CBNTN stations and constituents for which flux and (or) trend results through water year 2012 were published on the CBNTN Web site (<http://cbrim.er.usgs.gov/index.html>). Findings in this report motivated one modification to WRTDS along with several modifications to its application across the CBNTN that were adopted concurrently with the final preparation of the manuscript; the results tabulated in this appendix were computed with these modifications in place. As such, these results may differ from numerical results discussed or tabulated in the body of the report; however, they reflect the most up-to-date CBNTN results through water year 2012 available at the time this report was published. The specific differences in model formulation and application between results reported in the body of the report and those reported in this appendix are as follows:

1. Partly in response to the findings reported in the section “Sensitivity of Trends to Incremental Incorporation of New Data,” the version of WRTDS used to produce the results tabulated in this appendix, distributed in the EGRET R package v. 2.2.1 and all subsequent versions, was modified to reduce curvature in flow-normalized trends near the beginning and ends of the record. The feature, called “edgeAdjust,” is an input parameter to the routine modelEstimation() and is enabled by default. Concurrent with its implementation is a reduction in the default time half-window width from 10 to 7 years.
2. As discussed in the section “Dense Sub-Daily Sampling,” in some instances more than one water-quality observation was recorded on a single day. In producing results reported in the body of the report, only the two observations representing the highest and lowest concentration observed on that day were retained. Subsequently, the model developers recommended that all samples on such days be replaced by a single sample, representing the median of all the samples observed on that day; this recommendation was adopted in producing the results tabulated in this appendix.
3. As described in the section “Description of Scenarios Considered,” the historical practice for estimating 10-year trends at stations where the record length exceeds 10 years has been to truncate the water-quality record to the most recent 10-year period. Results presented in the section “Results: Variability in Storm Sampling Effort” indicate that in some cases 10-year trends obtained from long-term datasets in this manner can differ substantially from those extracted from the last 10 years of a trend based on the entire record. All data reported in this appendix were obtained using WRTDS simulations based on the longest usable water-quality record available, as indicated in table 1. In cases where 10-year trends are needed, the trends should be determined using the last 10 years of the data tabulated in this appendix.
4. In the section “WRTDS Estimated Flux and Trend Results for Nutrients and Sediment for the Chesapeake Bay Nontidal Water-Quality Monitoring Network Through Water Year 2012,” flow-normalized trends were reported over the period-of-record for stations in the “LONG_TERM” scenario and over the most recent 10 years for stations in the “10_YEAR” scenario. Annual concentration and flux values, both raw and flow-normalized, are reported in this appendix for all stations, regardless of record length. However, because short records reflect a more limited range of hydrologic conditions, the USGS does not endorse reporting, or recommend interpreting, trends in flow-normalized concentration of flux for records shorter than 10 years in length.
5. Model results reported in this appendix do not reflect any adjustment to the period of reporting associated with known or suspected changes in storm sampling protocol, as discussed in the section “Variability in Annual Sampling Effort and Storm Sampling Effort.”